

JAI NARAIN VYAS UNIVERSITY JODHPUR



2016 - 2021

1.2.2 percentage of programme in which choice based credit system (CBCS)/elective course system has been implemented

SYLLABUS

**M.Sc. BOTANY
(COSIST PROGRAM)**

Under Choice Based Credit System (CBCS)

M.Sc. (PREVIOUS) EXAMINATION, 2021-22

M.Sc. (FINAL) EXAMINATION, 2022-23



JAI NARAIN VYAS UNIVERSITY

JODHPUR

**POST-GRADUATE STUDIES IN BOTANY
(COSIST Program) 2020-2022
General Information for Students**

Jai Narain Vyas University (erstwhile University of Jodhpur), Jodhpur (established in July, 1962), had been a residential University operating within the Municipal limits of Jodhpur city. As per notification of Govt. of Rajasthan dated September 26th, 2012 all colleges situated in Barmer, Jaisalmer, Jalore and Pali districts shall be affiliated to Jai Narain Vyas University, Jodhpur. The Department of Botany, Jai Narain Vyas University, Jodhpur was at Jaswant Campus on inception during 1948 and is now at the New Campus since 1962. The Department of Botany is situated in the New Campus of the University, near the Bhagat-ki-Kothi Railway Station along Pali Road. This Department has a strong foundation laid by the stalwarts: Prof. UN Chatterjee (Physiology), Prof. HC Arya (Tissue culture and Pathology), Prof. M.M. Bhardari (Taxonomy) Prof. Narendra Sankhla (Physiology), Prof. David N. Sen (Ecology), Prof. BD Sharma (Palaeobotany) and continuously nurtured by their disciples.

The Department of Botany imparts post-graduate education in the fields of Plant Sciences and allied subjects. This department has made impressive progress in research and teaching activities during the last 50 years. Students and Researchers work for their Ph.D. and D.Sc. degrees in the Department of Botany. About eight laboratories are actively engaged in different areas of plant research. The research and development activities attract national and international attention. Research and Development projects are funded by national and international agencies. These include, The European Economic Community, FAO, UNDP/UNIDO, US-PL-480, CSIR, UGC, DST, DBT, DRDO, DOEn, ICAR, ICFRE, CSB, Ministry of Health, State DST, etc. Since 1980 this department has been receiving grants under Special Assistance Program (SAP) of the University Grants Commission of India. UGC Sponsored SAP-DSA Phase III Program has been successfully completed and after review by the UGC team during 2014, the Department is upgraded to **Center of Advanced Study in Botany**. Since 1980 grants worth Rs. 650 lakhs have been received for development of infrastructure and for implementation of R&D Projects.

In 1983, on the recommendation of the Science Advisory Committee to the Cabinet (SACC), the University Grants Commission of India launched the COSIST (Committee on Strengthening of Infrastructure in Science and Technology). The basic objective of COSIST is to assist selected Science and Technology departments in the Indian Universities; which has already exhibited and achieved high quality performance to attain excellence in the post-graduate education and research. The department of Botany has been selected for implementation of COSIST program by the UGC from April 1999 for raising the standard of post-graduate education and research to international level. The M.Sc. (COSIST) Botany course under this new scheme was started from July 1999. With the implementation of COSIST programme, on an average six students of this Department qualify CSIR-NET examination every year. This department is selected by the Department of Science and Technology, Government of India for support under FIST (Funds for Improvement of S & T Infrastructure). FIST program-I and FIST program-II was successfully completed. DST has evaluated the Department Progress as "VERY GOOD" for both the phases and accordingly awarded FIST-III with a financial outlay of 74 lakhs for next five years 2017-22.

ACADEMIC AND RESEARCH PROGRAMMES IN PLANT SCIENCES

Under the COSIST programme, the Department of Botany offers a two years integrated program leading to Masters (M.Sc.) degree in Botany. From the academic year 2015-16, the Department offers to students Choice Based Credit System (CBCS) with semesterization of the examination pattern under COSIST programme.

Students are admitted on an all India basis. The basic specializations offered are in the areas of Stress Physiology and Biochemistry, Physiology of Plant Growth, Ecology and Environmental Biology, Plant Microbe-Interactions, Mycology and Plant Pathology, Biological Nitrogen Fixation, Molecular characterization of Bacteria/rhizobia, Bacterial genomics, Microbiology, Genetics and Plant Breeding, Plant Resources, Systematics and Biodiversity, Plant Molecular Biology, Biotechnology, Plant Prospecting and Plant genomics. The Department has facilities for advance research in major areas of plant biology leading to Ph.D. and D.Sc. degree.

FACILITIES

The Department possesses modern equipments required for teaching and research. Major equipments available in the department of Botany are:

- Agarose Electrophoresis System(s)
- Chlorophyll Fluorescence Meter
- Cold Room
- Computer Networking System
- Deep Freezers
- Electrophoresis Systems: 1-D and 2-D
- Electroporation cum Protoplast Fusion System
- Fluorescence Microscope
- Gel Documentation Systems
- HPLC system
- Humidifiers and Fog Systems
- Ice making machine
- Incubator(s) and Incubator Shaker
- Industrial Oven
- Laminar Air Flow Benches
- Master Thermal Cycler (PCR Machines)
- Microbial storage facility
- Micropropagation/Green House Facilities
- Microscopes with photo-micrographic and image merging facilities
- Microtome
- Millipore Water Purification System
- Nat Steel Autoclave(s)
- Osmometer
- Plant Canopy Analyzer
- Portable Photosynthetic system Li-6400
- Portable Photosynthetic Systems (CID, USA)
- Real Time-PCR
- Spectrofluorimeter-JASCO
- Steady State Porometer
- Submerged Electrophoresis System
- Super Speed Refrigerated Centrifuge
- Ultra Freezers
- UV-VIS-Spectrophotometers
- Slide/Overhead Projectors/Multimedia System/ Smart Board

In addition, there are other facilities to work with certain instruments available with U.S.I.C. The Departmental library caters to the needs of post-graduate students, research scholars and the faculty members.

GUIDELINES FOR CHOICE BASED CREDIT SYSTEM:

Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete **four skill courses**: two within the Department and two from other Department within JNV University or the Universities approved by JNV University
3. **Course:** Usually referred to, as „papers“ is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period of teaching (lecture or tutorial) or two periods of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a

semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.

12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/ December and even semester from December/January to May.

Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May. The Department shall conduct the Practical examinations of odd and even semesters as per the Panel of Examiners approved by the University. Each Board of examiners shall consist of one external Examiner from other University/Institute and another from the Department.

13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly, the Faculty of Science resolves the following:

- a. All internal assessments shall be open assessment system only and that are based on Quizzes, term test and seminar
- b. Attendance shall carry the prescribed marks in all papers and Practical examination CCA
- c. In each semester three out of four theoretical component University examination shall be undertaken by external examiners from outside the university conducting examination, who may be appointed by the competent authority

Grievances and Redressal Mechanism

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head/Principal of the College or the Chairperson of the University Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.
- b) The appeal will be assessed by the Chairman and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Dean, Faculty of Science comprising all HODs of the Faculty and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	„O“	Outstanding	10
2	„A+“	Excellent	9
3	„A“	Very Good	8
4	„B+“	Good	7
5	„B“	Above Average	6
6	„C“	Average	5
7	„P“	Pass	4
8	„F“	Fail	0
9	„Ab“	Absent	0

- i. A student obtaining Grade F in a paper shall be considered failed and will be required to reappear in the University End Semester examination.

- ii. For noncredit courses (Skill Courses) „Satisfactory“ or “Unsatisfactory“ shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

- = and > 95 % marks Grade Point 10.0
- 90 to less than 95 % marks Grade Point 9.5
- 85 to less than 90 % marks Grade Point 9.0
- 80 to less than 85 % marks Grade Point 8.5
- 75 to less than 80 % marks Grade Point 8.0
- 70 to less than 75 % marks Grade Point 7.5
- 65 to less than 70 % marks Grade Point 7.0
- 60 to less than 65 % marks Grade Point 6.5
- 55 to less than 60 % marks Grade Point 6.0
- 50 to less than 55 % marks Grade Point 5.5
- 45 to less than 50 % marks Grade Point 5.0
- 40 to less than 45 % marks Grade Point 4.5
- 35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,
i.e.

$$SGPA (Si) = \frac{\sum (Ci \times Gi)}{\sum Ci}$$

Where, Ci is the number of credits of the ith course and Gi is the grade point scored by the student in the ith course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,
i.e.

$$CGPA = \frac{\sum (Ci \times Si)}{\sum Ci}$$

where Si is the SGPA of the ith semester and Ci is the total number of credits in that semester.

- iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	4	B	6	4 x 6 =24
2	Course 2	4	B+	7	4 X 7 =28
3	Course 3	4	B	6	4X 6 = 24
4	Course 4	4	O	10	4 X 10 =40
5	Course 5- Practical I	4	C	5	4 X 5 =20
6	Course 6 – Practical II	4	B	6	4 X 6 = 24
	Total	24			24+28+24+40+20+24 =160

Thus, SGPA =160/24 =6.67

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	6.67	7.25	7	6.25

$$\text{CGPA} = (24 \times 6.67 + 24 \times 7.25 + 24 \times 7 + 24 \times 6.25) / 96$$

$$652.08/96 = 6.79$$

Semester-wise Theory Papers/Practical / Skill component

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Semester I							
Core course 1	Bot 101	Cell and Molecular Biology of Plants	4-0-0	4	30	70	100
Core course 2	Bot 102	Cytology and Genetics	4-0-0	4	30	70	100
Core course 3	Bot 103	Biology and Diversity of Microbes, Algae and Fungi	4-0-0	4	30	70	100
Core course 4	Bot 104	Biology and Diversity of Archegoniate	4-0-0	4	30	70	100
Core course practical 1	Bot 105	Board I consisting of first two theory papers	0-0-8	4	30	70	100
Core course practical 2	Bot 106	Board II consisting of next two theory papers	0-0-8	4	30	70	100
Skill Course I	As per the list		2-0-2				
Total				24	180	420	600
Semester II							
Core course 5	Bot 201	Taxonomy and Diversity of Seed Plants	4-0-0	4	30	70	100
Core course 6	Bot 202	Plant Development and Reproductive Biology	4-0-0	4	30	70	100
Core course 7	Bot 203	Plant Resource Utilization, Conservation and Biostatistics	4-0-0	4	30	70	100
Core course 8	Bot 204	Plant Physiology	4-0-0	4	30	70	100
Core course practical 3	Bot 205	Board I consisting of first two theory papers	0-0-8	4	30	70	100
Core course practical 4	Bot 206	Board II consisting of next two theory papers	0-0-8	4	30	70	100
Skill course II	As per the list		2-0-2				
Total				24	180	420	600

Semester III							
Core course 9	Bot 301	Plant Ecology	4-0-0	4	30	70	100
Core course 10	Bot 302	Plant Metabolism	4-0-0	4	30	70	100
Discipline Specific Elective 1	One paper from the list of Group I		4-0-0	4	30	70	100
Discipline Specific Elective 2	One paper from the list of Group II		4-0-0	4	30	70	100
Core course practical 5	Bot 305	Board I consisting of first two theory papers	0-0-8	4	30	70	100
Discipline Specific Elective practical 1	Bot 306	Board II consisting of next two elective theory papers	0-0-8	4	30	70	100
Skill course III	As per the list		2-0-2				
Total				24	180	420	600
Semester IV							
Core course 11	Bot 401	Applied Ecology	4-0-0	4	30	70	100
Core course 12	Bot 402	Biotechnology and Genetic Engineering of Plants	4-0-0	4	30	70	100
Discipline Specific Elective 3	One paper from the list of Group I		4-0-0	4	30	70	100
Discipline Specific Elective 4	One paper from the list of Group II		4-0-0	4	30	70	100
Core course practical 6	Bot 405	Board I consisting of first two theory papers	0-0-8	4	30	70	100
Discipline Specific Elective practical 2	Bot 406	Board II consisting of next two elective theory papers	0-0-8	4	30	70	100
Skill course IV	As per the list		2-0-2				
Total				24	180	420	600

*** The Department shall offer two skill courses per semester from the list of skill courses approved for the Department.**

In view of the course content, the Department of Botany distributed the Periods between Theory/Tutorial/Practical as under per paper

- 4 : 0 : 0 (four lectures only (no tutorial and no practical) per week) – For Theory
- 0 : 0 : 4 (no lecture, no tutorial, and four practical only per week) – For Practical per paper
- 2+0+2 (two lectures, no tutorial and two practical/field experimentations) – For Skill course

The Duration of the Period shall be forty-five minutes. In each of these combinations, the first value stands for the same number of lecture instructions per week, whereas the last two values stand for double the number of tutorial / practical instructions per week.

In each practical group the number of students that can be accommodated will be fifteen.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective) involve an evaluation system of students that has the following two components: -

- Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and

(ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.

(i) **Continuous Comprehensive Assessment (CCA)**: This would have the following components:

- a. **Quizzes**: Two Quiz examinations of 45 minutes duration each having a maximum of 40 marks shall be arranged for theory paper during the semester course period
- b. **Term Test**: One term test shall be arranged for each theory paper prior to End-Semester Examination; examination duration shall be of three hours; maximum marks shall be 70
- c. **Seminar**: Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 15. The seminar shall commence after first quiz examination and shall be completed prior to term test for all the papers.
- d. **Classroom Attendance** – Each student will have to attend a minimum of 75% Lectures / Tutorials / Practicals. A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE). Attendance shall have 15 marks and will be awarded by following the system proposed below:

Those having greater than 75% attendance (for those participating in Co-curricular activities, 25% will be added to per cent attendance) will be awarded CCA marks as follows: -

75% to 80%	=	3 marks
>80% to 85%	=	6 marks
>85 to 90%	=	9 marks
>90% to 95%	=	12 marks
> 95%	=	15 marks

Each student's cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Science.

Condonation of Shortage of attendance shall be governed in accordance with the provisions in the Act and Statute of the University vide Ordinance 78 to Ordinance 80 as amended from time to time.

- e. CCA are based on open evaluation system without any bias to any student
- f. Any grievance received in the Department from student shall be placed before the **Grievance Redressal Committee** with adjudicated comments

Each component marks will be added without rounding and the total thus obtained is ratio by a factor of six. This value shall be rounded.

Illustration: Quiz 1 – Marks obtained = 30
Quiz 2 – Marks obtained = 35.5
Term Test Marks obtained = 50.5
Seminar Marks obtained = 14
Attendance Marks obtained = 9

Total	=	139.00
Conversion	=	139/6 = 21.16666
Award	=	22.00

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective Department shall declare the result as “Satisfactory” or “Non-Satisfactory”; each student need to get a minimum of three “Satisfactory” declaration for the course completion

In laboratory courses (having only practical (P) component), the CCA will be based on students attendance (50%); collection of plant material (25%) and hands on Practical, records, etc. (25%)

For QUIZ (2 quizzes per semester), 40 marks per Quiz and total of 80 marks, 45 minutes duration for each quiz:

Types of question	Number of Questions	Marks per question	Total marks per type
1. Multiple choice	10	1	10
2. Fill in the blanks	10	2	20
3. Short answer (15 words)	5	2	10
Total	25		40

For the Term test and ESE:

Part A

Ten short type questions (Definitions, illustrations, functions, short explanations, etc; 25-50 words) for two marks each. $10 \times 2 = 20$ marks; two questions from each Unit; no choice in this part

Part B

Five short answer (250 words) type questions for four marks each. $5 \times 4 = 20$ marks; one question from each Unit with internal choice

Part C

Five questions of long/explanatory answer (500 words) type, one drawn from each Unit; student need to answer any three; ten marks each; $3 \times 10 = 30$ marks

20+20+30 = 70 marks

Qualifying for Next semester

1. **A student acquiring minimum of 40% in total of the CCA is eligible to join next semester.**
2. A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as „Fail“), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.
3. A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time, i.e. three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted, for additional chances examination fee shall be on additive basis.

Improvement Option:

Every student shall have the opportunity to improve Credit through University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final. There shall be no improvement opportunity in Practical examinations.

Result Declaration:

The ESE (End Semester Examination/University Examination) results shall be declared within twenty days of the last examination. The Theory/ Practical Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation.

Students Failed in CCA:

Any student declared “Not Eligible” by the Department based on CCA in Semester I, II, III or IV and accordingly did not appear in ESE; can be readmitted as an additional student in that Semester in the **following year only**. Such student need to deposit the annual university fee as prescribed for that academic year.

POST -GRADUTE COURSE: A DESCRIPTION

The academic program at M.Sc. level is through a semester examination scheme. The course work includes lectures, seminars and laboratory works. It shall be compulsory for all students to attend at least one long distance excursion either to a hill station or to seashore or to desert area for field study and for collection of plant materials for class work in addition to 3 to 4 local excursions. For every 15 students or part thereof, one teacher shall accompany the party.

The full course is of FOUR SEMESTERS spread for TWO YEARS duration. A semester-wise list of courses to be offered is given below:

SEMESTER I

- Bot 101. Cell and Molecular Biology of plants
- Bot 102. Cytology and Genetics
- Bot 103. Biology and Diversity of Microbes, Algae and Fungi
- Bot 104. Biology and Diversity of Archegoniate
- SC I Skill course I (for students of Botany Department only)

SEMESTER II

- Bot 201. Taxonomy and Diversity of Seed Plants
- Bot 202. Plant Development and Reproductive Biology
- Bot 203. Plant Resource Utilization, Conservation and Biostatistics
- Bot 204. Plant Physiology
- SC II Skill course II (for students of other Departments)

SEMESTER III

- Bot 301. Plant Ecology
- Bot 302. Plant Metabolism
- Elective I Elective paper I
- Elective II Elective paper II
- SC III Skill course III (for students of Botany Department only)

SEMESTER IV

- Bot 401. Applied Ecology
- Bot 402. Biotechnology and Genetic Engineering of Plants
- Elective I Elective paper I
- Elective II Elective paper II
- SC IV Skill course IV (for students of other Departments)

Elective paper group – First – Semester III

- Bot 303A. Genomics, Proteomics and Bioinformatics - I
 - Bot 303B. Plant Molecular Biology and Biotechnology
 - Bot 303C. Principles of Plant Pathology
 - Bot 303D. Plant Microbe Interaction (PMIs) - I
 - Bot 303E. Cytogenetics and Plant Breeding -I
 - Bot 303F. Industrial Microbiology - I
-

Elective paper group – Second – Semester III

- Bot 304A. Population Biology
- Bot 304B. Microbial Ecology-I
- Bot 304C. Stress Physiology-I
- Bot 304D. Advanced Physiology
- Bot 304E. Biosystematics of Plants -I
- Bot 304F. Environmental Monitoring, Management and Restoration - I

Elective paper group – First – Semester IV

- Bot 403A. Genomics, Proteomics and Bioinformatics - II
- Bot 403B. Applied Molecular Biology and Plant Biotechnology
- Bot 403C. Plant Diseases and their Management
- Bot 403D. Plant Microbe Interaction (PMIs) - II
- Bot 403E. Cytogenetics and Plant Breeding - II
- Bot 403F. Industrial Microbiology - II

Elective paper group – Second – Semester IV

- Bot 404A. Desert Ecology
- Bot 404B. Microbial Ecology-II
- Bot 404C. Stress Physiology-II
- Bot 404D. Advanced Physiology
- Bot 404E. Biosystematics of Plants - II
- Bot 404F. Environmental monitoring, management and Restoration-II

Skill Courses in Botany

- Bot-SC-1 Intellectual Property Rights
- Bot-SC- 2 Agrotechniques for Desert Plants
- Bot-SC- 3-Data Analysis and Presentation
- Bot-SC- 4-Bioinformatics
- Bot-SC- 5-Micropropagation
- Bot-SC- 6-Value Addition for Bioresources
- Bot-SC- 7-Chromosome Analysis
- Bot-SC- 8-Mushroom Cultivation
- Bot-SC- 9-Molecular Techniques
- Bot-SC- 10-Nutrient Management

ADMISSION

The minimum qualification for admission to M.Sc. Course is B.Sc. (10+2+3) degree with Botany as a major subject. The details of eligibility conditions and admission procedure are given in the admission form. The admission will be done on the basis of merit calculated by the aggregate marks obtained at the B.Sc. level including the marks award under the category (a) and (b) mentioned in the admission form [i.e. (a) benefit to the candidates who are resident of Rajasthan, and (b) benefit for candidates of J. N. Vyas University, Jodhpur]. Reservation of Scheduled Caste/Scheduled Tribes/Disabled/OBC and Teacher candidates will be as per university rules. The candidates are required to attend minimum of a 75% of classes in both theory and practical.

TEACHING AND EXAMINATION SCHEME

Per Semester

Course	Periods/Week	Examination hours	CCA	ESE	Total
Theory Papers					
Course I	4	3	30	70	100
Course II	4	3	30	70	100
Course III	4	3	30	70	100
Course IV	4	3	30	70	100
Practical Courses					
Board I	8 per paper	6	30	70	100
Board II	8 per paper	6	30	70	100

Students are required to pass in theory and Practical Board individually in each semester. In III and IV semester Practical Board II shall have two independent Boards assessing each special paper; the total of both these assessments shall be considered for the Board II.

UNIVERSITY EXAMINATION

Each course paper shall be of three hours duration.

The model examination schedule for odd semester shall be:

Day	Morning session	Next session
1	Paper I Semester I	Paper I semester II
2	Paper I Semester III	Paper I semester IV
3	Paper II Semester I	Paper II semester II
4	Paper II Semester III	Paper II semester IV
5	Paper III Semester I	Paper III semester II
6	Paper III Semester III	Paper III semester IV
7.	Paper IV Semester I	Paper IV semester II
8	Paper IV Semester III	Paper IV semester IV

The model examination schedule for Even semester shall be:

Day	Morning session	Next session
1	Paper I Semester II	Paper I semester I
2	Paper I Semester IV	Paper I semester III
3	Paper II Semester II	Paper II semester I
4	Paper II Semester IV	Paper II semester III
5	Paper III Semester II	Paper III semester I
6	Paper III Semester IV	Paper III semester III
7.	Paper IV Semester II	Paper IV semester I
8	Paper IV Semester IV	Paper IV semester III

PRACTICALS

The practical examination in M.Sc. (Prev.) and M.Sc. (Final) shall consist of Two Parts- Board I and Board II for all the four semesters

BOARD I: Maximum Marks: 100 (including 30% CCA). It includes course work of two theory papers.
Duration: Six hours in a single day.

BOARD II: Maximum Marks: 100 (including 30% CCA). It includes course work of next two theory papers.
Duration: Six hours in a single day.

In the fourth Semester, Board II shall also evaluate the dissertation submitted by the student that is the part of Practical examination. Each student shall submit one dissertation allotted by lottery between two special papers.

Note: Number of elective to be taught from each group in a particular year shall be decided by the Department. Elective offered will be announced at the beginning of the academic session. Each student shall be assigned one Elective paper from Group ONE and the second from Group TWO. Elective papers will be allotted on merit-cum-choice basis with equal number of students in each paper.

SEMESTER I

Bot 101- CELL AND MOLECULAR BIOLOGY OF PLANTS

Unit I

Basic concept of Cell and Cell theory: Multicellularity. Composition, structure and function of biomolecules (carbohydrates, lipids, proteins). Chemical foundation: Covalent and non-covalent bonds. Bioenergetics.

Cell wall. Cell membrane: Dynamic structure, compositions, function, biogenesis and structural model.

Plant Vacuoles: Tonoplast membrane, function as storage and transport. Cytoskeleton, organization and role of microtubules, microfilaments and associated motor proteins.

Cell junction and adhesions, Intercellular transport of endogenous macromolecules: Structure and functional significance of plasmodesmata.

Unit II

The nucleus: Nuclear envelope, nuclear pore complex, nucleolus. Mitochondrial and plastid biogenesis and development, concept of endosymbiosis. Organellar genome: organization and function of plastome and chondriome. Cell cycle regulation (Cyclins, CDKs), Senescence and Programmed Cell Death

Unit III

Protein Sorting and Vesicle Traffic; concept of signal peptide, transport of soluble and membrane bound proteins in Endoplasmic Reticulum, ER chaperone proteins and their functions. Targeting to nucleus, mitochondria, chloroplasts, vacuoles and secretory pathway. Replication of genetic material in prokaryotes and eukaryotes: initiation, elongation and termination.

Unit IV

Prokaryotic transcription: Transcription units; RNA polymerase structure and assembly; Promoters; Initiation, elongation and termination.

Eukaryotic transcription: RNA polymerase structure and assembly; eukaryotic promoters and enhancers; transcription factors.

Post transcriptional processing of mRNA: Capping, adenylation and Splicing, RNA editing.

DNA damage and repair.

Unit V

Translation: Translation machinery; Ribosomes: composition and assembly. Genetic code: degeneracy of codons, initiation and termination codons, wobble hypothesis, genetic code in mitochondria; Isoaccepting tRNA

Mechanism of protein synthesis: Translational factors; initiation, elongation and termination

Co- and post-translational modifications: Glycosylation, phosphorylation, ubiquitination, Mechanism of protein degradation

Laboratory Exercises

1. Demonstration of fluorescent microscope and visualization of GFP-proteins
 2. Cytochemical staining of cell wall constituents.
 3. Fluorescence staining of nuclei with DAPI.
 4. Cell wall staining with calcofluor white.
 5. Isolation of genomic DNA from plants/bacteria.
 6. Amplification of genes using PCR
 7. Demonstration of agarose gel electrophoresis.
 8. One-dimensional SDS-PAGE protein profiling.
 9. Demonstration of Southern/Northern blotting and Western Immunoblotting.
 10. Gene tagging and screening
 11. Techniques in cell biology: Phase contrast, Fluorescence microscopy, Laser confocal microscopy, electron microscopy (SEM, TEM), LCM (laser capture micro dissection), Flow cytometry, FACS.
-

Suggested readings

- Alberts, B., Bray, D., Lewis, J., Raff, M., Roberts, K. and Watson, J. D. 1999. *Molecular Biology of the Cell*. Garland Publishing, Inc., New York.
- Buchanan, B. B., Gruissem, W. and Jones, R. L. 2000. *Biochemistry and Molecular Biology of Plants*. American Society of Plant Physiologists, Maryland, USA
- Snustad, D. P. and Simmons, M. J. 2000. *Principles of Genetics* (2nd edition). John Wiley & Sons Inc., USA.
- Nelson, D. L. and Cox, M. M. *Lehninger Principles of Biochemistry* (4th edition). CBS Publishers & Distributors.
- Lewin, B. 2000. *Genes VII*, Oxford University Press, New York.
- Lodish, H., Berk, A., Zipursky, S. L., Malsudaira, P., Baltimore, D. and Darnell, J. 2000. *Molecular Cell Biology* (V Edition). W.H. Freeman and Co., New York, USA.
- De, D. N. 2000. *Plant Cell Vacuoles: An Introduction*. CSIRO Publication, Collingwood, Australia.
- Glick, B. R. and Thompson, J. E. 1993. *Methods in Plant Molecular Biology and Biotechnology*. CRC Press, Boca Raton, Florida.
- Glover, D. M. and Hames, B. D. (eds) 1995. *DNA Cloning I: A Practical Approach-, Core Techniques*, 2nd edition, PAS, IRL Press at Oxford University Press, Oxford.

Suggested Readings (Laboratory Exercises)

- Sambrook, J. and Russell D.W. 2001. *Molecular Cloning: A Laboratory Manual*. Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York.
- Gunning, B. E. S. and Steer, M. W. 1996. *Plant Cell Biology: Structure and Function*. Jones and Bartlett Publishers, Boston, Massachusetts.
- Hackett, P. B., Fuchs, J. A. and Messing, J. W. 1988. *An Introduction to Recombinant DNA Techniques: Basic Experiments in Gene Manipulation*. The Benjamin/Cummings Publishing Co., Inc Menlo Park, California.
- Hall, J. L. and Moore, A. L. 1983. *Isolation of Membranes and Organelles from Plant Cells*. Academic Press, London, UK.
- Harris, N. and Oparka, K. J., 1994. *Plant Cell Biology: A Practical Approach*, IRL Press at Oxford University Press, Oxford, U.K.
- Klein smith, L. J. and Kish, V. M. 1995. *Principles of Cell and Molecular Biology* (Edition), Harper Collins College Publishers, New York, USA.
- Krishnamurthy, K. V. 2000. *Methods in Cell Wall Cytochemistry*. CRC Press, Boca Raton, Florida.
- Rost, T. et al., 1998. *Plant Biology*. Wadsworth Publishing Co., California, USA.
- Shaw, C. H. (Ed.), 1988. *Plant Molecular Biology: A Practical Approach*. IRL Press, Oxford.
- Wolfe, S. L. 1993. *Molecular and Cellular Biology*. Wadsworth Publishing Co., California, USA.

Review Journals:

- Annual Review of Plant Physiology and Molecular Biology.
- Current Advances in Plant Sciences.
- Trends in Plant Sciences.
- Nature Reviews: Molecular and Cell Biology.

Bot 102: CYTOLOGY AND GENETICS

Unit 1

Genome organization: Chromosome structure and packaging of DNA, Chromosomal banding patterns, karyotype analysis and evolution; specialized types of chromosomes; polytene, lampbrush, B-chromosomes and sex chromosomes, molecular basis of chromosome pairing.

Unit 2

Structural and numerical alterations in chromosomes: breeding behaviour of duplications, deficiency, inversion and translocation heterozygotes. Origin, occurrence, production and meiosis of autopolyploids and allopolyploids. Evolution of major crop plants: *Brassica* and Groundnut.

Unit 3

Mendelian and Non-Mendelian Inheritance (epigenetic and extra nuclear), Independent assortment, crossing over, linkage groups and chromosome mapping. Genetic recombination and genetic mapping: Correlation of genetic and physical maps; molecular markers and construction of linkage maps.

Unit 4

Genetics of prokaryotes and eukaryotes: Genetic recombination in bacteria. Fine structure of prokaryotic and eukaryotic genes. Regulation of gene expression in prokaryote and eukaryotes. Introns and their significance.

Unit 5

Transposons; transposable elements in prokaryotes and eukaryotes. Transfer of whole genome, examples from wheat, *Arachis* and *Brassica*. Genetic basis of inbreeding and heterosis, chromosome micro dissection and micro cloning, Genetics, evolution and breeding of wheat, rice and cotton.

Laboratory Exercises

1. Linear differentiation of chromosomes through banding techniques, such as G- banding, C- banding and Q- banding. Silver banding for staining nucleolus-organizing region, where 18S and 28S rDNA are transcribed
2. Orcein and Feulgen staining of the salivary gland chromosomes of *Chironomas* and *Drosophila*
3. Characteristics and behaviour of B chromosomes using maize or any other appropriate material
4. Working out the effect of mono- and tri-somy on plant phenotype, fertility and meiotic behaviour
5. Induction of polyploidy using colchicine; different methods of the application of colchicine
6. Effect of induced and spontaneous polyploidy on plant phenotype, meiosis, pollen and seed fertility and fruit set
7. Effect of translocation heterozygosity on plant phenotype, chromosome pairing and chromosomedisjunction and pollen and seed fertility
8. Meiosis of complex translocation heterozygotes
9. Isolation of chlorophyll mutants following irradiation and treatment with chemical mutagens
10. Estimation of nuclear DNA content through microdensitometry and flow cytometry.
11. Fractionation and estimation of repetitive and unique DNA sequences in nuclear DNA.
12. Analysis of Mitotic index in desert plants

Suggested Readings

- Acquaah G (2007). Principles of Plant Genetics and Breeding, Blackwell Publishing Ltd.USA.
- Hartl DL and Jones EW (2007). Genetics – Analysis of Genes and Genomes, 7th edition, Jones and Barletta publishers.
- Hartwell LH, Hood L, Goldberg ML, Reynolds AE, Silver LM, Veres RC (2006). Genetics –From Genes to Genomes, 3rd edition, McGraw Hill.
- Lewin B (2008). Genes IX, Jones and Barlett Publishers.
- Singh RJ (2002). Plant Cytogenetics, 2nd edition, CRC Press.
- Strickberger MW (2008). Genetics, 3rd Edition, Pearson (Prentice Hall).
- Weising K, Nybom H, Wolff K and Kahl G (2005) DNA Fingerprinting in Plants

Bot 103- BIOLOGY AND DIVERSITY OF MICROBES, ALGAE AND FUNGI

Unit I

Microbes: A brief idea of history of microbiology, Origin and evolution of microorganisms, Biological status of microorganisms, General account of Prion and Viroid. Viruses: morphology, architecture, chemistry, transmission and genetics of viruses.

Unit II

A general account of ultra structure, reproduction and economic importance of Bacteria and Archaea: Mycoplasma, Phytoplasma, Cyanobacteria and Actinomycetes.

Unit III

Mycology: General characters and classification of fungi, Phylogeny of fungi. General account of Mastigomycotina, Zygomycotina, Ascomycotina, Basidiomycotina and Deuteromycotina. Economic importance of Fungi.

Unit IV

Phycology: Algae in diversified habitats; thallus organization; cell ultra structure; reproduction; criteria for classification of algae. Classification and salient features of Protochlorophyta, Chlorophyta and Charophyta.

Unit V

Phycology: Classification and salient features of Xanthophyta, Bacillariophyta, Phaeophyta and Rhodophyta. Algal blooms, algal biofertilizers; algae as food, feed and uses in industry.

Laboratory Exercises

1. Preparation of basic liquid media (broth) for the cultivation of microorganism.
2. Preparation of basic solid media, agar slants for the cultivation of microorganisms.
3. Isolation and enumeration of microorganisms from soil by the serial dilution-agar plating method.
4. Staining of bacteria (Gram staining, Negative staining, Acid fast staining).
5. Microscopic preparation and study of cyanobacteria (*Nostoc*, *Oscillatoria*, *Lyngbya*, *Scytonema*, *Microcystis*).
6. Morphological study of representative members of fungi:
Peronospora, *Sclerospora*, *Albugo*, *Mucor*, *Rhizopus*, *Pilobolus*, *Saccharomyces*, *Erysiphae*, *Chaetomium*, *Morchella*, *Melampsora*, *Puccinia*, *Ustilago*, *Agaricus*, *Phellorinia*, *Podaxis*, *Ganoderma*, *Penicillium*, *Aspergillus*, *Alternaria*, *Curvularia*, *Helminthosporium*, *Drechslera*, *Fusarium*, *Trichoderma*, *Phoma* and *Colletotrichum*.
7. Morphological study of representative members of algae: *Pediastrum*, *Hydrodictyon*, *Spirogyra*, *Ulva*, *Pithophora*, *Stigeoclonium*, *Draparnaldiopsis*, *Codium*, *Closterium*, *Cosmarium*, *Chara*, *Ectocarpus*, *Fucus*, *Sargassum* and *Polysiphonia*.

Suggested readings

- Alexopoulos, C. J., Mims, C. W. and Blackwell, M. 1996. *Introductory Mycology*. John Wiley & Sons Inc.
- Aneja, K.R., Experiments in Microbiology, Plant Pathology and Biotechnology, New Age International Publishers.
- Dube, H. S. 2013. An introduction of Fungi. Scientific Publishers. India.
- Kumar, H. D. 1988. *Introductory Phycology*. East-West Press Ltd., New Delhi.
- Mehrotra, R. S. and Aneja, R. S. 1998. *An Introduction to Mycology*. New Age Intermediate Press.
- Morris, I. 1986. *An Introduction to the Algae*. Cambridge University Press, U.K.
- Pelczar, M.J., Chau, E.C.G. and Kreig, N.R., Microbiology Concepts and application McGraw Hill.
- Prescott, L., Harley, J.P. and Klein, D. A., Microbiology. 6th ed. McGraw Hill.
- Round, F. E. 1986. *The Biology of Algae*. Cambridge University Press, Cambridge.
- Stainer, R., Ingraham, J.I., Wheelis, M.I., and Painter, P.R., General Microbiology. The Mc millan Press Ltd.
- Tortora, Gerad, J, Funke, B.R. and Case, C.L., Microbiology: An Introduction. Benjamin/ Cummings publishing: Menlo Park, California.
- Webster, J. 1985. *Introduction to Fungi*. Cambridge University Press.

Bot 104- BIOLOGY AND DIVERSITY OF ARCHEGONIATE

Unit I

Bryophytes: General introduction and salient features; origin and classification; evolution of sporophytes and gametophytes; alternation of generations of bryophytes.

Unit II

Comparative study of structures, reproduction and life cycles of order Marchantiales, Jungermanniales, Anthocerotales and Sphagnales. Economic and biological importance of bryophytes.

Unit III

Pteridophytes: General introduction; salient features of Psilopsida, Lycopsida, Sphenopsida, Pteropsida; Geological time scale; types and nomenclature of fossils, fossilization.

Unit IV

Structure and evolution of stelar system in Pteridophytes. Evolution of sporophytes. Alternation of generation; Apogamy and Apospory; Heterospory and seed habit; economic importance of Pteridophytes.

Unit V

Gymnosperms: General account of distribution of Gymnosperms in India; Classification. General account of structure, reproduction and evolutionary relationship of Cycadales, Coniferales, Ginkgoales, Ephedrales and Gnetales. Economic importance of Gymnosperms.

Laboratory Exercises

Morphological and reproductive study of following members of Bryophytes, Pteridophytes and Gymnosperms:

1. *Marchantia, Dumortiera, Targionia, Reboulia, Asterella, Cythodium, Pellia, Porella, Anthoceros, Notothylus, Sphagnum, Funaria, Polytrichum.*
2. *Psilotum, Lycopodium, Selaginella, Equisetum, Gleichenia, Pteris, Ophioglossum, Isoetes, Osmunda.*
3. *Cycas, Ginkgo, Cedrus, Abies, Picea, Cupressus, Araucaria, Cryptomeria, Taxodium, Podocarpus, Agathis, Taxus, Ephedra and Gnetum.*

Suggested Readings

- Chopra, R.N. and P. K. Kumra. Biology of Bryophytes. Wiley Eastern Ltd., New Delhi, 1988.
- Chopra, R.S. Taxonomy of Indian mosses. CSIR, New Delhi, 1975.
- Chopra, R.S. and S.S. Kumar. Mosses of Western Himalayas and Adjacent Plains. Chronica Botanica, New Delhi, 1981.
- Dyer, A. F. and J. G. Duckett.(Eds.). The Experimental Biology of Bryophytes. Academic press, London, 1984.
- Goffinet, B. and A.J. Shaw. Bryophyte Biology. 2 nd Ed. Cambridge Univ. Press, Cambridge, 2009.
- Kashyap, S.R. Liverworts of Western Himalayas and the Punjab Plains. Vols I II. Researchco Publications, New Delhi, 1932
- Kumar, S.S. An Approach towards Phylogenetic Classification of Mosses. Jour. Hattori Bot. Lab. Nichinan, Japan, 1984.
- Rashid, A. An Introduction to Bryophyta. 1st Ed. Vikas Publishing House Pvt. Ltd., New Delhi, 1998. 9.
- Richardson, D.H.S. Biology of Mosses. Blackwell Scientific Publications, Oxford, 1981.
- Schofield, W.B. Introduction to Bryology. Macmillan Publishing Co., New York., 1983.
- Schuster, R.M. (Ed.). New Manual of Bryology. Vols. I & II. Jour. Hattori Bot. Lab., Nichinan, Japan, 1983-84.
- Vashishta, B.R., A.K. Sinha and A. Kumar. Bryophyta. S. Chand & Co. Ltd., New Delhi, 2003.
- Watson, E.V. The Structure and Life of Bryophytes. Hutchinson University Library, London, 1964. 14.
- Bierhorst, D.W. Morphology of Vascular Plants. The MacMillan, New York, 1971.
- Bold, H.C., C.J. Alexopolous and T. Delevoryas. Morphology of Plants and Fungi. 4th Ed. Harper and Row Publishers, Inc., New York, 1980.
- Chandra, S. and M. Srivastava (Eds.). Pteridology in the New Millenium. Kluwer Acad. Publishers, Dordrecht / Boston / London, 2003.
- Dyer, A.F. The Experimental Biology of Ferns. Academic Press, London, 1979.
- Foster, A.S. and E.M. Gifford. Comparative Morphology of Vascular Plants. 2nd Ed. W.H. Freeman and Co., San Francisco, 1974.
- Gifford, E.M. and A.S. Foster. Morphology and Evolution of Vascular Plants. 3rd Ed. W.H. Freeman & Co., New York, 1989.
- Khullar, S.P. An Illustrated fern Flora of West Himalayas . Vols. I & II. International Book Distributors, Dehradun, 2000.
- Kubitzki, K. The Families and Genera of Vascular Plants, Vol. I. Pteridophytes and Gymnosperms. Kramer, K.U. and P.S. Green (Ed.) Narosa Publishing House, New Delhi, 1991.
- Mehra, P.N. and A. Gupta. Gametophytes of Himalayan Ferns. Publisher: Mehra, P.N., Botany Department, P.U., Chandigarh, 1986.
- Parihar, N.S. An Introduction to Embryophyta Vol. II, Pteridophytes. Central Book Depot, Allahabad, 1965.
-

- Raghavan, V. Developmental Biology of Fern Gametophytes (Developmental and Cell Biology Series). Cambridge Univ. Press, Cambridge, 1989.
- Ranker, T. and C.H. Haufler (Eds.) The Biology and Evolution of Ferns and Lycophytes. Cambridge Univ. Press, Cambridge, New York, 2008.
- Rashid, A. An Introduction to Pteridophyta .Vikas Publishing House Pvt. Ltd., New Delhi, 1999.
- Sporne, K.R. The Morphology of Pteridophytes. Hutchinson University Library , London./ B.I. Publications, Bombay/ Delhi / Madras, 1982.
- Andrews, H.N.Jr. Studies in Paleobotany . John Wiley and Sons, New York, 1961.
- Arnold, C.A. An Introduction to Paleobotany. McGraw Hill, New York, 1947.
- Bhatnagar, D.W. Morphology of Vascular Plants. The Macmillan and Co., New York, 1971.
- Bhatnagar, S.P. and A. Moitra. Gymnosperms. New Age International Ltd., New Delhi, 2000.
- Bierhorst, D.W. Morphology of Vascular Plants. The Macmillan and Co., New York, 1971.
- Chamberlain, C.J. Gymnosperms: Structure and Evolution. University of Chicago Press, Chicago, 1935.
- Coulter, J.M. and C.J. Chamberlain. Morphology of Gymnosperms. Univ. of Chicago Press, Chicago, 1917.
- Dallimore, W. and A.B. Jackson. A Handbook of Coniferae and Ginkgoaceae . 4 th Ed. Edward Arnold and Co., London, 1966.
- Delevoryas, T. Morphology and Evolution of Fossil Plants. Holt, Rinehart and Winston, New York, 1962.
- Foster, A.S. and E.M. Gifford. Comparative Morphology of Vascular Plants. 2 nd Ed. W.H. Freeman and Co., San Francisco, 1974.
- Sharma, O.P. and S. Dixit. Gymnosperms. Pragati Prakashan, Meerut, 2002.
- Sporne, K.R. The Morphology of Gymnosperms. Hutchinson Univ. Library, London, 1974.

SEMESTER II

Bot 201- TAXONOMY AND DIVERSITY OF SEED PLANTS

UNIT I

Plant Taxonomy-principles and significance. Nomenclature: International Code of Botanical Nomenclature (2012)-Taxonomic hierarchy-concept of species, genus, family and other categories; typification, rule of priority, effective and valid publication.

UNIT II

Angiosperm classifications: Phenetic versus phylogenetic systems; cladistics in taxonomy. Classification, relative merits and demerits of major systems of classifications-Bentham and Hooker, Cronquist, Takhtajan,

UNIT III

Plant explorations. Herbarium methodology-collection and preservation of plant specimens. World and Indian herbaria. Plant identification-taxonomic keys; floras and taxonomic journals.

Taxonomic evidence: Morphology, Anatomy, Palynology, Embryology, Cytology, Phytochemistry, Nucleic acid hybridization as a tool in taxonomy; DNA Barcoding. Computer applications and GIS.

UNIT IV

Evolution and differentiation of species. Phenotypic plasticity. Abrupt and gradual speciation. Isolating mechanism – geographical, ecological, seasonal, temporal, mechanical and ethological.

Principles of phytogeography: Static and dynamic concepts. Continental drift theory and Endemism. Biodiversity hotspots. Invasions and introductions; Local plant diversity and its socio-economic importance.

UNIT V

Salient features, floral diversity, diversity of families and phylogeny of the following orders: Ranales, Centrospermae, Amentiferae, Tubiflorae, Helobieae and Glumiflorae.

Laboratory Exercises

1. Study of about 40 wild taxa representing different families and identification to species level.
2. Study of flora of the University/ college campus.
3. As a part of botanical tour, student should observe and record the flora and vegetation types of the study area and submit a report at the time of practical examination.

4. Part of practical - student should submit 10 herbaria specimens or image softcopies of 10 plants of common wild plant taxa.
5. Construction of taxonomic keys.
6. Demonstration of the utility of secondary metabolites in the taxonomy of some appropriate genera.
7. Comparison of different species of a genus and different genera of a family to calculate similarity coefficients and preparation of dendrograms.
8. Nomenclatural exercise.

Suggested Readings

- Angiosperm Phylogeny Group website. 2012. Consult www.apgweb.
- Cole, A. J. 1969. Numerical Taxonomy, Academic Press, London.
- Davis, P. H. and Heywood, V. A. 1973. Principles of Angiosperms Taxonomy. Robert E. Kreiger Pub. Co., New York.
- Grant, V. 1971. Plant Speciation. Columbia University Press, New York.
- Grant, W. F. 1984. Plant Biosystematics. Academic Press, London.
- Harrison, H. J. 1971. New Concepts in Flowering Plant Taxonomy. Hieman Educational Books Ltd., London.
- Heslop-Harrison, J. 1967. Plant Taxonomy. English Language Book Soc. & Edward Arnold Pub. Ltd., UK.
- Heywood, V. H., Brummitt, R. K., Culham, A. and Seberg, O. 2007. Flowering Plant Families of the World. Firefly books Ltd. New York.
- Heywood, V. H. and Moore, D. M. 1984. Current Concepts in Plant Taxonomy. Academic Press, London.
- Jones, A. D. and Wilkins, A. D. 1971. Variations and Adaptations in Plant Species. Hieman & Co-Educational Books Ltd., London.
- Jones, S. B. and Luchsinger, A. E. 1986. Plant Systematics (1st edition). McGraw-Hill Book Co., New York.
- Judd, W. S., Campbell, C. S., Kellogg, E. A., Stevens, P. F. and Donoghue, M. J. 2007. Plant Systematics: A Phylogenetic Approach, 3rd ed. Sinauer.
- Lawrence, G. H. M. 1951. Taxonomy of Vascular Plants. McMillan, New York.
- Naik, V. N. 1992. Taxonomy of Angiosperms. 2nd Edn. Tata McGraw Hill.
- Nordenstam, B., El Gazaly, G. and Kassar, M. 2000. Plant Systematics for 21st Century. Portlant Press Ltd., London.
- Pullaiah, T. 2005. Taxonomy of Angiosperms. Regency Publications, New Delhi.
- Radford, A. E. 1986. Fundamentals of Plant Systematics. Harper & Row Publications, USA.
- Radford, A. E. et al., 1974. Vascular Plant Systematics. Harper & Row, New York.
- Ravi Prasad Rao, B. 2009. Plant Name Directory. ABCD, Planographers, Hyderabad.
- Simpson, M. G. 2006. Plant Systematics. Elseiver & Academic Press.
- Singh, G. 2005. Plant Systematics. Oxford & IBH, New Delhi.
- Sivarajan, V. V. 1991. Introduction to Principles of Plant Taxonomy. Oxford & IBH.
- Solbrig, O. T. 1970. Principles and Methods of Plant Biosystematics. The MacMillan Co. Collier-Mac Millan Ltd., London.
- Solbrig, O. T. and Solbrig, D. J. 1979. Population Biology and Evolution. Addison-Wesley Publishing Co. Inc., USA.
- Stace, C. A. 1989. Plant Taxonomy and Biosystematics. Edward Arnold Ltd., London.
- Stebbin, G. L. 1974. Flowering Plant- Evolution Above Species Level. Edward Arnold Ltd., London.
- Takhtajan, A. L. 1997. Diversity and Classification of Flowering Plants. Columbia University Press, New York.
- Woodland, D. W. 1991. Contemporary Plant Systematics. Prentice Hall, New Jersey.

Bot 202-PLANT DEVELOPMENT AND REPRODUCTIVE BIOLOGY

Unit I

Introduction: Unique features of plant development. Seed germination and seedling development. Concept of stem cells in plants. Shoot apical meristem (SAM) and development of shoot. Cell to cell communication. Regulation of tissue differentiation with special reference to xylem and phloem, secretory ducts and laticifers. Wood development in relation to environmental factors.

Unit II

Differentiation and development of Leaf. Phyllotaxy. Differentiation of epidermis (with special reference to stomata and trichomes) and mesophyll. Programmed cell death, aging and senescence. Root apical meristem (RAM) and development of root(s), lateral roots and root hairs. Hormonal control of root development.

Unit III

Reproduction: Vegetative and sexual reproduction; flower development; genetics of floral organ differentiation; homeotic mutants in *Arabidopsis* and *Antirrhinum*; sex determination in plants. Male gametophyte: microsporogenesis, role of tapetum; pollen development and gene expression; pollen germination, pollen tube growth and guidance; pollen storage; pollen allergy; pollen embryos.

Unit IV

Female gametophyte: Ovule development; megasporogenesis; organization and structure of the embryo sac. Pollination, pollen-pistil interaction, sporophytic and gametophytic self-incompatibility in plants. Double fertilization and *in vitro* fertilization in plants.

Unit V

Endosperm development during early, maturation and desiccation stages; Embryogenesis, Storage proteins of endosperm and embryo; polyembryony; apomixes. Seed development. Fruit development and maturation: biochemistry and molecular biology aspects. Seed dormancy: Importance and types.

Laboratory/Field Exercises

1. Study of living shoot apices by dissections using aquatic plants such as *Ceratophyllum* and *Hydrilla*.
2. Study of cytohistological zonation in the shoot apical meristem (SAM) in sectioned and double-stained permanent slides of a suitable plant such as *Coleus*, *Kalanchoe*, tobacco. Examination of shoot apices in a monocotyledon in both T.S. and L.S. to show the origin and arrangement of leaf primordia.
3. Study of alternate and distichous, alternate and superposed, opposite and superposed; opposite and decussate leaf arrangement. Examination of rosette plants (*Launaea*, *Mollugo*, *Raphanus*, *Hyoscyamus*, etc.) and induction of bolting under natural conditions as well as by GA treatment.
4. Microscopic examination of vertical sections of leaves such as *Cannabis*, tobacco, *Nerium*, maize and wheat to understand the internal structure of leaf tissues and trichomes, glands, etc. Also study the C3 and C4 leaf anatomy of plants.
5. Study of epidermal peels of leaves such as *Coccinia*, *Gaillardia*, *Tradescantia*, *Notonea*, etc. to study the development and final structure of stomata and prepare stomatal index. Demonstration of the effect of ABA on stomatal closure.
6. Study of whole roots in monocots and dicots. Examination of L.S. of root from a permanent preparation to understand the organization of root apical meristem and its derivatives (use maize, aerial roots of banyan, *Pistia*, *Jussiaea*, etc.). Origin of lateral roots. Study of leguminous roots with different types of nodules.
7. Study of microsporogenesis and gametogenesis in sections of anthers.
8. Examination of modes of anther dehiscence and collection of pollen grains for microscopic examination (maize, grasses, *Cannabis sativa*, *Crotalaria*, *Tradescantia*, *Brassica*, *Petunia*, *Solanum melongena*, etc.).
9. Tests for pollen viability using stains and *in vitro* germination. Pollen germination using hanging drop and sitting drop cultures, suspension culture and surface culture.
10. Estimating percentage and average pollen tube length *in vitro*.
11. Study of nuclear and cellular endosperm through dissections and staining.
12. Isolation of zygotic globular, heart-shaped, torpedo stage and mature embryos from suitable seeds and polyembryony in citrus, jamun (*Syzygiumcumini*), etc. by dissections.
13. Study of seed dormancy and methods to break dormancy.

Suggested Readings

- Atwell, B. J., Kriedemann, P. E. and Jumbull, C. G. N. (eds) 1999. *Plants in Action: Adaptation in Nature, Performance in Cultivation*, MacMillan Education, Sydney, Australia.
- Bewley, J. D. and Black, M. 1994. *Seeds: Physiology of Development and Germination*, Plenum Press, New York.
- Bhojwani, S. S. and Bhatnagar, S. P. 2000. *The Embryology of Angiosperms* (4th revised and enlarged edition), Vikas Publishing House, New Delhi.
-

- Burgess, J. 1985. *An Introduction to Plant Cell Development*. Cambridge University Press, Cambridge.
- Fageri, K. and Van der Pil, L. 1979. *The Principles of Pollination Ecology*, Pergamon Press, Oxford.
- Fahn, A. 1982. *Plant Anatomy* (3rd edition), Pergamon Press, Oxford.
- Fosket, D. E. 1994. *Plant Growth and Development. A Molecular Approach*. Academic Press, San Diego.
- Howell, S. H. 1998. *Molecular Genetics of Plant Development*. Cambridge University Press, Cambridge.
- Leins, P., Tucker, S. C. and Endress, P. K. 1988. *Aspects of Floral Development*. J. Cramer, Germany.
- Lyndon, R. F. 1990. *Plant Development. The Cellular Basis*, Unnin Hyman, London.
- Murphy, T. M. and Thompson, W. F. 1988. *Molecular Plant Development*. Prentice Hall, New Jersey.
- Proctor, M. and Yeo, P. 1973. *The Pollination of Flowers*. William Collins Sons, London.
- Raghavan, V. 1997. *Molecular Embryology of Flowering Plants*. Cambridge University Press, Cambridge.
- Raghavan, V. 1999. *Developmental Biology of Flowering Plants*. Springer-Verlag, New York.
- Raven, P. H., Evert, R. F. and Eichhorn, S. E. 1992. *Biology of Plants* (5th edition), Worth, New York.
- Salisbury, F. B. and Ross, C. W. 1992. *Plant Physiology* (4th edition), Wadsworth Publishing, Belmont, California.
- Sedgely, M. and Griffin, A. R. 1989. *Sexual Reproduction of Tree Crops*. Academic Press, London.
- Shivanna, K. R. and Johri, B. M. 1985. *The Angiosperm Pollen: Structure and Function*. Wiley Eastern Ltd., New York.
- Shivanna, K. R. and Rangaswamy, N. S. 1992. *Pollen Biology: A Laboratory Manual*, Springer-Verlag, Berlin.
- Shivanna, K. R. and Sawhney, V. K. (eds) 1997. *Pollen Biotechnology for Crop Production and Improvement*. Cambridge University Press, Cambridge.
- Steeves, T. A. and Sussex, I. M. 1989. *Patterns in Plant Development* (2nd edition), Cambridge University Press, Cambridge.
- The Plant Cell. Special Issue on Reproductive Biology of Plants*, Vol. 5(10), 1993. The American Society of Plant Physiologists, Rockville, Maryland, USA.
- Waisel, Y., Eshel, A. and Kafkaki, U. (eds) 1997. *Plant Roots: The Hidden Hall* (2nd edition), Marcel Dekker, New York.

Suggested Readings (Laboratory Exercises)

- Chopra, V. L. 2001. *Plant Breeding: Field Crops*. Oxford Pvt. Ltd., New Delhi.
- Chopra, V. L. 2001. *Plant Breeding: Theory and Practice*. Oxford IBH Pvt. Ltd., New Delhi.
- Shivanna, K. R. and Rangaswamy, N. S. 1992. *Pollen Biology: A Laboratory Manual*. Springer-Verlag, Berlin-Heidelberg (and references therein).

Bot 203- PLANT RESOURCE UTILIZATION AND CONSERVATION

Unit I

Origin of Agriculture and Green Revolution: Domestication of plants, Origin of Agriculture; Primary and Secondary centers of diversity of cultivated plants. History of agriculture revolution. Green revolution and new challenges of food security.

Unit II

Desert Plant Resources: Important fire-wood and timber yielding plants with special reference to Indian Thar desert. Non-wood forest products (NWFPs) and their uses. Bamboos, Gums, resins, dyes and tannins from natural plant resources and their economic utility.

Unit III

Food, Fiber, Medicinal and Aromatic Plants: Origin, botany, cultivation and utilization of food, forage, fodder and fiber crops of Rajasthan.

Origin, botany, cultivation, chemical constituents and uses of medicinal, aromatic, and vegetable oil-yielding crops of Rajasthan

General Introduction of Unutilized plants of Indian Thar desert

Unit IV

Biostatistics: Central tendency, dispersion, standard error, coefficient of variation; Probability distributions (normal, binomial of Poission) and Confidence limits. Test of statistical significance (t-test; Chi-square): Analysis of variance- RBD and its application in plant breeding and genetics; Correlation and Regression.

Unit V

Techniques for *In-situ* and *Ex-situ* Conservations and Institutes: Strategies for *in-situ* conservation: protected areas in India – biosphere reserves, national parks, sanctuaries, wetlands, mangroves and coral reefs for conservation of wild biodiversity. Strategies for *ex-situ* conservation: botanical gardens, field gene banks, seed banks, *in vitro* repositories and cryobanks.

General account of the activities of Botanical Survey of India (BSI), National Bureau of Plant Genetic Resources (NBPGR), AYUSH (Ministry of Ayurveda, Yoga and Naturopathy, Unanai, Siddha and Homeopathy) and Indian Spice Board.

A. FIELD SURVEY

Firewood and timber-yielding plants and NWFP's

- a) Prepare a short list of 10 most important sources of firewood and timber in your locality. Give their local names, scientific names and families to which they belong. Mention their properties.
- b) A survey of a part of the town or city should be carried out by the entire class in batches. Individual student will select one avenue/road and locate the trees planted on a graph paper. They will identify the trees, mention their size, canopy shape, blossoming and fruiting period and their status (healthy, diseased, infested, mutilated, misused or dying) and report whether or not the conditions in which they are surviving are satisfactory. The individual reports will be combined to prepare a larger map of the area, which can be used for subsequent monitoring either by the next batch of students/teachers/local communities/NGO's/or civic authorities.

The purpose of exercise in item (b) above is to make the students aware of the kinds of trees and value in urban ecosystems and ecological services.

B. Laboratory Exercises

1. To locate the centers of origin of agriculture in the given map
 2. To locate the primary and secondary centers of origin in the given map
 3. Quantification of starch in food and forage crops (wheat, rice, maize, potato, sweet potato, sorghum, bajra, gram & guar bean)
 4. Micro-chemical test for fats & oils
 5. Morpho-anatomical features of plant fibers (cotton, jute, coir & silk cotton)
 6. Quantification of acid, iodine and saponification values in vegetable oils (mustard, groundnut, soybean, coconut, sunflower & castor)
 7. Micro-chemical test for gums (guar & kumbhatia), tannins (*Acacia*, *Terminalia*, *Cassia* & tea leaves) and dyes (*Butea* & henna powder)
 8. Adulteration test for natural products (honey, saffron, spices & mustard oil)
 9. Distribution pattern of a biological character in a population
 10. Measurement of central tendency (mean, variance & standard deviation)
 11. Regression and confidence limits
 12. Analysis of variance (RBD, split & strip)
 13. Estimation of pcv, gcv, heritability and genetic advance using RBD analysis
 14. Student's t-test for comparison of means
 15. Correlation and testing deviation of correlation coefficient
 16. To locate the various national parks, sanctuaries, biosphere reserves, wetlands, /mangroves and coral reefs in the given Indian map.
 17. **Specimen identifications:**
 - Food crops:** Wheat, Maize Potato, Chickpea, Sugarcane & Sweet potato
 - Forage/Fodder crops:** Sorghum, Bajra, Gram & Guar bean
 - Fiber crops:** Cotton, Jute, Coir & Silk cotton
 - Medicinal plants:** *Papaver*, *Catharanthus*, *Adhatoda*, *Allium*, *Rauwolfia*, *Withania*, *Phyllanthus* & *Aloe*
 - Aromatic plants:** *Mentha*, *Rosa*, *Majorana*, *Jasminum*, *Cymbopogon* & *Pandanus*
 - Non-wood forest products:** Silk, Honey comb, Bidi, Flute, Hand fan & Kraft paper
-

C. Scientific visits*

The students should be taken to one of the following:

- i. A protected area (biosphere reserve, national park, or a sanctuary)
- ii. A wet land
- iii. A mangrove
- iv. National Bureau of Plant Genetic Resources, New Delhi – 110012 or one of its field stations
- v. Headquarters of the Botanical Survey of India or one of its Regional Circles
- vi. A recognized botanical garden or a museum (such as those at the Forest Research Institute, Dehradun; National Botanical Research Institute, Lucknow; Tropical Botanical Garden and Research Institute, Trivandrum), which has rich collection of plant products.

* Note: The students are expected to prepare a brief illustrated narrative of the Scientific Visits. After evaluation, the grades awarded to the students by the teachers should be added to the final assessment of the practical examination.

Suggested Readings

- Anonymous 1997. National Gene Bank: Indian Heritage on Plant Genetic Resources (Booklet). National Bureau of Plant Genetic Resources, New Delhi.
- Arora, R.K. and Nayar, E.R. 1984. Wild Relatives of Crop Plants in India. NBPGR Science Monograph No. 7.
- Baker, H.G. 1978. Plants and Civilization (3rd ed.). C.A. Wadsworth, Belmont.
- Bole, P.V. and Vaghani, Y. 1986. Field Guide to Common Indian Trees. Oxford University Press, Mumbai.
- Chandel, K.P.S., Shukla, G. and Sharma, N. 1996. Biodiversity of Medicinal and Aromatic Plants in India: Conservation and Utilization. National Bureau of Plant Genetic Resources, New Delhi.
- Chrispeels, M.J. and Sadava, D. 1977. Plants, Food and People. W.H. Freeman and Co., San Francisco.
- Conway, G. 1999. The Doubly Green Revolution: Food for All in the 21st Century, Penguin Books.
- Conway, G. and Barbier, E. 1990. After the Green Revolution, Earthscan Press, London.
- Conway, G. and Barbier, E. 1994. Plant, Genes and Agriculture, Jones and Bartlett Publishers, Boston.
- Council of Scientific & Industrial Research (1948-2005). The Wealth of India. A Dictionary of Indian Raw Materials and Industrial Products, New Delhi. Raw Materials I-XII, Revised Vol. I-III (1985-1992) Supplement (2000).
- Cristi, B.R. (ed.) 1999. Handbook of Plant Sciences and Agriculture, Vol. I. In-situ Conservation, CRC Press, Boca Raton, Florida, USA.
- Cronquist, A. 1981. An Integrated System of Classification of Flowering Plants. Columbia University Press, New York, USA.
- Directory of Indian Wetlands, 1993. WWF INDIA, New Delhi and AWS, Kuala Lumpur.
- Dodds, J.H. 1991. In vitro method for Conservation of Plant Genetic Resources. Springer
- Falk, D.A., Olwell, M. and Millan, C. 1996. Restoring Diversity, Island Press, Columbia, USA.
- FAO/IBPGR 1989. Technical Guidelines for the Safe Movement of Germplasm. FAO/IBPGR, Rome.
- Frankel, O.H., Brown, A.H.D. and Burdon, J.J. 1995. The Conservation of Plant Diversity, Cambridge University Press, Cambridge, U.K.
- Gadgil, M. and Guha, R. 1996. Ecology and Equity: Use and Abuse of Nature in Contemporary India. Penguin, New Delhi.
- Gaston, K.J. (ed). Biodiversity: A Biology of Numbers and Differences, Blackwell Science Ltd., Oxford, U.K.
- Gomez, A. Kwanchai and Gomez, A. Arturo. 1984. Statistical Procedures for Agricultural Research (second Edition), John Wiley & Sons, New York
- Guerrant, E.O., Havens, K. and Maunder, M. 2004. Ex situ Plant Conservation. Island Press.
- Hamilton, A. 2013. Plant Conservation: An Ecosystem Approach. Routledge.
- Henry, R.J. 2010. Plant Resources for Food, Fuel and Conservation. Earthscan.
- Heywood, V. (ed) 1995. Global Biodiversity Assessment. United Nations Environment Programme. Cambridge University Press, Cambridge, U.K.
- Heywood, V.H. and Wyse Jackson, P.S. (eds) 1991. Tropical Botanical Gardens: Their Role in Conservation and Development. Academic Press, San Diego.
- Kochar, S.L. 1998. Economic Botany of the Tropics, 2nd edition, Macmillan India Ltd., Delhi.
- Kohli, R., Arya, K.S., Singh, P.H. and Dhillon, H.S. 1994. Tree Directory of Chandigarh, Lovedale Educational, New Delhi.
- Kothari, A. 1997. Understanding Biodiversity: Life Sustainability and Equity, Orient Longman.
- Mishra, B.N. and Mishra M.K. 1989. Introductory Practical Biostatistics. NayaPrakash Publication, Calcutta.
- Nair, M.N.B. et al. (eds) 1998. Sustainable Management of Non-wood Forest Products. Faculty of Forestry,
-

- University Putra Malaysia, 434004 PM Sardong, Selanger, Malaysia.
- Panse, V.G. and Sukhatme, P.V. 1989. Statistical Methods for Agricultural Workers. Indian Council of Agricultural Research, New Delhi.
- Paroda, R.S. and Arora, R.K. 1991. Plant Genetic Resources Conservation and Management. IPGRI (Publication), South Asia Office, C/o NBPGR, Pusa Campus, New Delhi.
- Pimentel, D. and Hall, C.W. (eds) 1989. Food and Natural Resources, Academic Press, London-New York.
- Pinstrup-Anderson, P. et al. 1999. World Food Prospects: Critical Issues for the Early 21st Century. International Food Policy Research Institute, Washington, D.C., USA.
- Plant Wealth of India 1997. Special Issue of Proceedings Indian National Science Academy B-63.
- Plucknett, D.L., Smith, N.J.H., William, J.T. and MurliAnnishetty, N. 1987. Gene Banks and Worlds Food. Princeton University Press, Princeton, New Jersey, USA.
- Quinn, P. Gerry and Keough, J. Michael. 2002. Experimental Design and Data Analysis for Biologists. Cambridge University Press Cambridge, UK.
- Rao, Sundar P.S.S. and Richard, J. 2011. Introduction to Biostatistics and Research Methods. (4th Ed), PHI Learning Pvt. Ltd., New Delhi.
- Reed, B.M. 2008. Plant Cryopreservation – A Practical Guide. Springer.
- Rodgers, N.A. and Panwar, H.S. 1988. Planning a Wildlife Protected Area Network in India. Vol. I. The Report. Wildlife Institute of India, Dehradun.
- Sahni, K.C. 2000. The Book of Indian Trees, 2nd edition. Oxford University Press, Mumbai.
- Schery, R.W. 1972. Plants for Man, 2nd ed. Englewood Cliffs, New Jersey Prentice Hall.
- Sharma, O.P. 1996. Hill's Economic Botany (Late Dr. A.F. Hill, adapted by O.P. Sharma). Tata McGraw Hill Co. Ltd., New Delhi.
- Sofo, A. 2011. Biodiversity (Ed), InTech Publisher, DOI: 10.5772/1836
- Swaminathan, M.S. and Kocchar, S.L. (eds) 1989. Plants and Society. Macmillan Publication Ltd., London.
- Thakur, R.S., Puri, H.S. and Husain, A. 1989. Major Medicinal Plants of India. Central Institute of Medicinal and Aromatic Plants, CSIR, Lucknow.
- Thomas, P. 2000. Trees: Their National History. Cambridge University Press, Cambridge, U.K.
- Wagner, H., Hikino, H. and Famswarth, N. 1989. Economic and Medicinal Plant Research, Vols. 1-3, Academic Press, London.
- Walter, K.S. and Gillett, H.J. 1998. IUCN Red List of Threatened Plants. IUCN, the World Conservation Union. IUCN, Gland, Switzerland and Cambridge, UK.
- Williams, Brain. 1993. Biostatistics- Concepts and Applications for Biologist. Chapman & Hall, London

Bot 204 - PLANT PHYSIOLOGY

UNIT I

Membrane transport and Translocation of water and solutes: Mechanism of water transport through xylem, stomatal regulation, nutrient deficiency, root microbe interactions in facilitating nutrient uptake, phloem loading and unloading, passive and active solute transport, Protein transporters.

UNIT II

Photosynthesis: Photosynthetic apparatus, photosynthetic pigments and light harvesting complexes, photooxidation of water, mechanisms of electron and proton transport, carbon assimilation the Calvin cycle, photo respiration and its significance, the C4 cycle, the CAM pathway. Light regulation of C3 and C4 cycle enzymes.

UNIT III

Signal transduction: Overview, receptors, signaling molecules, G-proteins, phospholipids signaling, role of cyclic nucleotides, calcium-calmodulin cascade, and phosphatases, specific signaling mechanisms, e.g. two-component sensor-regulator system in bacteria and plants. Sensory photo receptors.

UNIT IV

Plant growth regulators: Physiological effects and general mechanism of action of plant hormones. Brief account on brassinosteroids, polyamines, Jasmonic acid, salicylic acid and nitric oxide (NO). Photoperiodism and its significance, endogenous clock and its regulation. Vernalization.

UNIT V

Stress physiology- Plant responses to biotic and abiotic stress, general mechanisms of abiotic stress tolerance, drought and salinity stress, freezing and heat stress, oxidative stress and antioxidants system in plants.

Laboratory Exercises

1. Extraction of chloroplast pigments from leaves and preparation of the absorption spectrum of chlorophylls and carotenoids.
2. To determine the chlorophyll a/chlorophyll b ratio in C3 and C4 plants.
3. Desalting of proteins by gel filtration chromatography employing Sephadex G25.
4. SDS PAGE for soluble proteins extracted from the given plant materials and comparison of their profile by staining with Coomassie Brilliant Blue or silver nitrate.
5. Isolation of intact chloroplasts and estimation of chloroplast proteins by spot protein assay.
6. To demonstrate photophosphorylation in intact chloroplasts, resolve the phosphoproteins by SDS PAGE and perform autoradiography.
7. Radioisotope methodology, autoradiography, instrumentation (GM counter and Scintillation counter) and principals involved.

Suggested Readings

- Ahmad, P. and Wani, M.R. 2014. Physiological Mechanisms and Adaptation Strategies in Plants Under Changing Environment (eds). Springer New York
- Buchanan, B. B., Gruissem, W. and Jones, R. L. 2000. Biochemistry and Molecular Biology of Plants. American Society of Plant Physiologists. Maryland, USA.
- Dennis, D. T., Turpin, D. H., Lefebvre, D. D. and Layzell, D. B. (eds) 1997. Plant Metabolism (2nd edition). Longman, Essex, England.
- Galston, A. W. 1989. Life Processes in Plants. Scientific American Library, Springer Verlag, New York, USA.
- Hooykaas, P. J. J., Hall, M. A. and Libbenga, K. R. (eds) 1999. Biochemistry and Molecular Biology of Plant Hormones. Elsevier, Amsterdam, The Netherlands.
- Hopkins, W. G. 1995. Introduction to Plant Physiology. John Wiley & Sons, Inc., New York, USA.
- Hopkins, W.G. and Huner, N.P.A . 2009. Introduction to Plant Physiology (4th Edition). John Wiley & Sons, Inc. New York, USA
- Lodish, H., Berk, A., Zipursky, S.L., Matsudaira, P., Baltimore, D. and Darnell, J. 2000. Molecular Cell Biology (4th edition). W.H. Freeman and Company, New York, USA.
- Moore, T. C. 1989. Biochemistry and Physiology of Plant Hormones (2nd edition). Springer Verlag, New York, USA.
- Nobel, P. S. 1999. Physiochemical and Environmental Plant Physiology (2nd edition). Academic Press, San Diego, USA.
- Ricardo, A. 2012. Plant Responses to Drought Stress - From Morphological to Molecular Features (ed). Springer
- Salisbury, F. B. and Ross, C. W. 1992. Plant Physiology (4th edition). Wadsworth Publishing Co., California, USA.
- Singhal, G. S., Renger, G., Sopory, S. K., Irrgang, K. D. and Govindjee. 1999. Concepts in Photobiology: Photosynthesis and Photomorphogenesis. Narosa Publishing House. New Delhi.
- Taiz, L. and Zeiger, E. 1998. Plant Physiology (2nd edition). Sinauer Associates, Inc., Publishers, Massachusetts, USA.
- Tripathi, B.N. and Müller, M. 2015. Stress Responses in Plants: Mechanisms of Toxicity and Tolerance(eds). Springer
- Thomas, B. and Vince Prue, D. 1997. Photoperiodism in Plants (2nd edition). Academic Press, San Diego, USA.
- Westhoff, P. 1998. Molecular Plant Development: from Gene to Plant. Oxford University Press, Oxford, UK.
- SUGGESTED READINGS (FOR LABORATORY EXERCISES)
- Bajracharya, D. 1999. Experiments in Plant Physiology: A Laboratory „Manual. Narosa Publishing House, New Delhi.
- Cooper, T. G. 1977. Tools in Biochemistry. John Wiley, New York, USA.
- Copeland, R. A. 1996. Enzymes: A Practical Introduction to Structure, Mechanism, and Data Analysis. VCH Publishers, New York.
-

- Dennison, C. 1999. A Guide to Protein Isolation. Kluwer Academic Publishers, Dordrecht, The Netherland.
- Devi, P. 2000. Principles and Methods of Plant Molecular Biology, Biochemistry and Genetics. Agrobios, Jodhpur, India.
- Dryer, R. L. and Lata, G. F. 1989. Experimental Biochemistry. Oxford University Press, New York.
- Harborne, T. C. 1981. Phytochemical Methods: A Guide to Modern Techniques of Plant Analysis. Chapman & Hall, London.
- Harries, B. D. (Ed.) 1998. Gel Electrophoresis of Proteins: A Practical Approach, 3rd edition. PAS, Oxford University Press, Oxford, U.K.
- Moore, T. C. 1974. Research Experiences in Plant Physiology: A Laboratory Manual. Springer Verlag, Berlin.
- Ninfa, A. J. and Ballou, D. P. 1998. Fundamental Laboratory Approaches for Biochemistry and Biotechnology. Fitzgerald Science Press, Inc., Maryland, USA.
- Plummer, D. T. 1988. An Introduction to Practical Biochemistry. Tata McGraw Hill Publishing Co. Ltd., New Delhi.
- Scott, R. P. W. 1995. Techniques and Practice of Chromatography. Marcel Dekker, Inc., New York.
- Wilson, K. and Goulding, K. H. (eds.), 1986. A Biologists Guide to Principles and Techniques of Practical Biochemistry. Edward Arnold, London, UK.
- Wilson, K. and Walker, J. 1994. Practical Biochemistry: Principles and Techniques, 4th edition. Cambridge University Press, Cambridge, UK.

SEMESTER III

Bot 301- PLANT ECOLOGY

Unit I

Climate and Vegetation: Introduction to concepts developments in ecology. Atmosphere, Hydrosphere and Biosphere – Life zones. Major biomes of the world; Vegetation types of the world and India.

Unit II

Plant Community and Population Biology: Concepts of community, analytical and synthetic characters, community coefficients, Continuum concept, interspecific associations, Ordination and organisation, Concept of habitat; species coexistence and niche.

Population Biology: Concepts and Growth models

Unit III

Ecosystem: Structure and function. Energy dynamics – energy flow models and efficiencies.

Mineral cycles: C, N, P and S mineral cycles, pathways, processes and budgets in terrestrial and aquatic systems. Global biogeochemical cycles of C, N, P and S.

Unit IV

Productivity and Plant Succession: Productivity: definition, types. Primary productivity – measurements, global pattern and controlling factors.

Succession (Ecosystem development): Concept, kinds, mechanisms and models, changes in ecosystem properties during succession.

Unit V

Environmental Pollution and Standard Parameters: Air, water and soil pollution – definition, kinds, sources, quality parameters, effects on plants and ecosystem. Methods/techniques used in Phytoremediation/ Bioremediation. Environment Impact Assessment and its model formats.

Laboratory/field exercises

1. Species distribution variation and distribution pattern, identifying mode of dispersion.
 2. To prepare ombrothermic diagram for different sites on the basis of given data and to comment on climate.
 3. To compute phenothermal indices for some desert plants
 4. To find out the relationship between two ecological variables using correlation and regression analysis.
 5. To determine minimum size and number of quadrates required for reliable estimate of biomass in a natural field.
-

6. To find out association between important species using chi-square test.
7. To compare protected and gochar land vegetation using similarity indices.
8. To analyze plant communities using Bra-Curtis/Twin span ordination method.
9. To determine diversity indices (concentration of dominance, Shannon-Wiener, species richness, equitability and β diversity) for protected and gochar land vegetation.
10. To estimate IVI of the species in protected and gochar land vegetation
11. To determine productivity in terrestrial (CO₂ Analyzer) and aquatic (Light and dark bottle method) systems.

Suggested Readings

- Barbour, M. G., Burk, J. H. and Pitts, W. D. 1987. *Terrestrial Plant Ecology*. Benjamin/Cummings Publication Company, California.
- Begon, M., Harper, J. L. and Townsend, C. R. 1996. *Ecology*. Blackwell Science, Cambridge, U.S.A.
- Brady, N. C. 1990. *The Nature and Properties of Soils*. Macmillan.
- Cadish, G. and Giller, K. E. 1997. *Driven by Nature, Plant Litter Quality and Decomposition*, CAB International Wallingford, U.K.
- Chapman, B. and Bilharz, S. 1997. *Sustainability Indicators*. John Wiley & Sons, New York.
- Heywood, V. H. and Watson, R. T. 1995. *Global Biodiversity Assessment*. Cambridge University Press.
- Hill, M. K. 1997. *Understanding Environmental Pollution*. Cambridge University Press.
- Koromondy, E. J. 1996. *Concepts of Ecology*. Prentice-Hall of India Pvt. Ltd., New Delhi.
- Ludwig, J. and Reynolds, J.F. 1988. *Statistical Ecology*. John Wiley & Sons.
- Mason, C. F. 1991. *Biology of Freshwater Pollution*. Longman.
- Muller-Dombois, D. and Ellenberg, H. 1974. *Aims and Methods of Vegetation Ecology*, Wiley, New York.
- Odum, E. P. 1971. *Fundamentals of Ecology*, Saunders, Philadelphia.
- Odum, E. P. 1983. *Basic Ecology*, Saunders, Philadelphia.
- Smith, R. L. 1996. *Ecology and Field Biology*. Harper Collins, New York.
- Treshow, M. 1985. *Air Pollution and Plant Life*. Wiley Interscience.

SUGGESTED READINGS (FOR LABORATORY EXERCISES)

- APHA-Standard Methods for the Examination of Water and Waste Water. American Public Health Association, Washington, D.C.
- Krebs, C. J. 1989. *Ecological Methodology*. Harper and Row, New York, USA.
- Ludwig, J. A. and Reynolds, J. F. 1988. *Statistical Ecology*. Wiley, New York.
- Magurran, A. E. 1988. *Ecological Density and its Measurement*. Chapman & Hall, London.
- Misra, R. 1968. *Ecology Work Book*. Oxford & IBH, New Delhi.
- Moore, P. W. and Chapman, S. B. 1986. *Methods in Plant Ecology*. Blackwell Scientific Publications.
- Muller-Domois, D. and Ellenberg, H. 1974. *Aims and Methods of Vegetation Ecology*. Wiley, New York.
- Pielou, E. C. 1984. *The Interpretation of Ecological Data*. Wiley, New York.
- Smith, R. L. 1996. *Ecology and Field Biology*. Harper Collins, New York.
- Sokal, R. R. and Rohlf, F. J. 1995. *Biometry*. W.H. Freeman & Co., San Francisco.

Bot 302-PLANT METABOLISM

UNIT I

Metabolic processes and Fundamentals of enzymology: Anabolic and catabolic processes, General aspects of enzymes, allosteric mechanism, regulatory and active sites, isozymes.

UNIT II

Metabolism of Carbohydrate, Lipids and Secondary Metabolites: Biosynthesis and degradation of Sugar and Starch, Biosynthesis and degradation of fatty acids, Lipidomics- techniques and profiling, Major biosynthesis pathways of secondary metabolites- terpenes, phenolics, N-containing and S- containing compounds, biosynthesis of plant hormones and growth regulators.

UNIT III

Respiration: Overview of plant respiration, glycolysis, the TCA cycle, electron transport and ATP synthesis, pentose phosphate pathway, glyoxylate cycle, alternative oxidase system.

UNIT IV

Nitrogen metabolism: Overview of biological nitrogen fixation, Nitrogenase, Mechanism of nitrate uptake and reduction, ammonia assimilation, GS-GOGAT system, amino acids synthesis, Nucleotide synthesis, Protein degradation.

UNIT V

Sulphur metabolism and bio analytical techniques: sulfate uptake, transport and assimilation, metabolic control of sulfate uptake and assimilation in plants. Concepts and applications of spectroscopy, visible and UV spectroscopy. Principles and applications of centrifugation, low speed, high speed, cooling and ultracentrifugation.

Laboratory Exercises

1. Effect of time and enzyme concentration on the rate of reaction of enzyme (e.g. acid phosphatase, nitrate reductase).
2. Demonstration of the substrate inducibility of the enzyme nitrate reductase.
3. Extraction of seed proteins depending upon the solubility.
4. Desalting of proteins by gel filtration chromatography employing Sephadex G25.
5. Preparation of the standard curve of protein (BSA) and estimation of the protein content in extracts of plant material by Lowry's or Bradford's method.
6. Separation of isozymes of esterases, peroxidases by native polyacrylamide gel electrophoresis.
7. Principles of colorimetry, spectrophotometry and fluorimetry.
8. Effect of substrate concentration on activity of any enzyme and determination of its K_m value.

Suggested Readings

- Barker A.V. and Pilbeam D.J. 2007. *Handbook of Plant Nutrition* (eds.). Taylor & Francis
- Buchanan, B. B., Gruissem, W. and Jones, R. L. 2000. *Biochemistry and Molecular Biology of Plants*. American Society of Plant Physiologists. Maryland, USA.
- Dennis, D. T., Turpin, D. H., Lefebvre, D. D. and Layzell, D. B. (eds) 1997. *Plant Metabolism* (2nd edition). Longman, Essex, England.
- Galston, A. W. 1989. *Life Processes in Plants*. Scientific American Library, Springer-Verlag, New York, USA.
- Hooykaas, P. J. J., Hall, M. A. and Libbenga, K. R. (eds) 1999. *Biochemistry and Molecular Biology of Plant Hormones*. Elsevier, Amsterdam, The Netherlands.
- Hopkins, W. G. 1995. *Introduction to Plant Physiology*. John Wiley & Sons, Inc., New York, USA.
- Hopkins, W.G. and Huner, N.P.A. 2009. *Introduction to Plant Physiology* (4th Edition). John Wiley & Sons, Inc. New York, USA
- Lodish, H., Berk, A., Zipursky, S.L., Matsudaira, P., Baltimore, D. and Darnell, J. 2000. *Molecular Cell Biology* (4th edition). W.H. Freeman and Company, New York, USA.
- Moore, T. C. 1989. *Biochemistry and Physiology of Plant Hormones* (2nd edition). Springer-Verlag, New York, USA.
- Morison, J.I.L. and Morecroft, M.D. 2006. *Plant Growth and Climate Change* (eds). Blackwell Publishing Ltd, Oxford, UK
- Nobel, P. S. 1999. *Physiochemical and Environmental Plant Physiology* (2nd edition). Academic Press, San Diego, USA.
- Pessarakli, M. 2014. *Handbook of Plant Crop Physiology* (ed.). CRC Press
- Salisbury, F. B. and Ross, C. W. 1992. *Plant Physiology* (4th edition). Wadsworth Publishing Co., California, USA.
- Singhal, G. S., Renger, G., Sopory, S. K., Irrgang, K. D. and Govindjee. 1999. *Concepts in Photobiology: Photosynthesis and Photomorphogenesis*. Narosa Publishing House. New Delhi.
- Taiz, L. and Zeiger, E. 1998. *Plant Physiology* (2nd edition). Sinauer Associates, Inc., Publishers, Massachusetts, USA.
- Thomas, B. and Vince-Prue, D. 1997. *Photoperiodism in Plants* (2nd edition). Academic Press, San Diego, USA.
- Westhoff, P. 1998. *Molecular Plant Development: from Gene to Plant*. Oxford University Press, Oxford, UK.
-

Suggested Readings (Laboratory Exercises)

- Bajracharya, D. 1999. *Experiments in Plant Physiology: A Laboratory Manual*. Narosa Publishing House, New Delhi.
- Cooper, T. G. 1977. *Tools in Biochemistry*. John Wiley, New York, USA.
- Copeland, R. A. 1996. *Enzymes: A Practical Introduction to Structure, Mechanism, and Data Analysis*. VCH Publishers, New York.
- Dennison, C. 1999. *A Guide to Protein Isolation*. Kluwer Academic Publishers, Dordrecht, The Netherlands.
- Devi, P. 2000. *Principles and Methods of Plant Molecular Biology, Biochemistry and Genetics*. Agrobios, Jodhpur, India.
- Dryer, R. L. and Lata, G. F. 1989. *Experimental Biochemistry*. Oxford University Press, New York.
- Harborne, T. C. 1981. *Phytochemical Methods: A Guide to Modern Techniques of Plant Analysis*. Chapman & Hall, London.
- Harries, B. D. (Ed.) 1998. *Gel Electrophoresis of Proteins: A Practical Approach*, 3rd edition. PAS, Oxford University Press, Oxford, U.K.
- Maathuis, F. J.M. 2013. *Plant Mineral Nutrients: Methods and Protocols* (ed.). Springer
- Moore, T. C. 1974. *Research Experiences in Plant Physiology: A Laboratory Manual*. Springer-Verlag, Berlin.
- Ninfa, A. J. and Ballou, D. P. 1998. *Fundamental Laboratory Approaches for Biochemistry and Biotechnology*. Fitzgerald Science Press, Inc., Maryland, USA.
- Pansu M. and Gautheyrou J. 2006. *Handbook of Soil Analysis - Mineralogical, Organic and Inorganic Methods*. Springer
- Plummer, D. T. 1988. *An Introduction to Practical Biochemistry*. Tata McGraw-Hill Publishing Co. Ltd., New Delhi.
- Samuelson, J.C. 2013. *Enzyme Engineering: Methods and Protocols* (ed). Springer, New York
- Scott, R. P. W. 1995. *Techniques and Practice of Chromatography*. Marcel Dekker, Inc., New York.
- Wilson, K. and Goulding, K. H. (eds.), 1986. *A Biologists Guide to Principles and Techniques of Practical Biochemistry*. Edward Arnold, London, UK.
- Wilson, K. and Walker, J. 1994. *Practical Biochemistry: Principles and Techniques*, 4th edition. Cambridge University Press, Cambridge, UK.

Bot 303 A- GENOMICS, PROTEOMICS AND BIOINFORMATICS -I

Unit I

Genomics: Introduction, Structural, functional and comparative genomics. Introduction to Sequencing strategies, High throughput sequencing; Next generation sequencing (NGS) platforms. Genome sequence analysis, annotation and gene prediction.

Unit II

Mapping of genes; Genetic and Physical mapping: restriction hybridization analysis, FISH and related techniques, Chromosome walking and jumping. Major Genome sequencing projects: Arabidopsis, RNB-GEBA, Model Legumes.

Unit III

Functional genomics: Approaches to analyze differential gene expression: Transcriptomics, Serial Analysis of Gene Expression (SAGE), microarray and its applications. Validation of transcriptome and microarray data: Quantitative Real Time PCR.

Unit IV

Comparative Genomics: Concept, approaches and applications. Synteny; Gene search and comparison tools. Comparative genomics of model plants and related crop species. Application of genomics for crop improvement.

Bioinformatics: Introduction and applications. Major gene and protein sequence/structure databases: Genbank, EMBL, DDBJ, ENTREZ, UniProt, PDB, Literature database- PubMed, Rice and Arabidopsis databases: RGAP/RAP-DB, TAIR. Searching database and locating genes, Storage, Retrieval and analysis of sequences.

Unit V

Editing/refinement of sequences. Alignment of gene/protein sequences: Local and Global. Multiple sequence alignments, Sequence similarity search. Generating phylogenetic trees based on DNA sequence and evolutionary relationship.

Selected Model Organismal Genomes and Databases; Gene Ontology (GO) Database; IMG Resource for Comparative Analysis and Annotation; GOLD: Data resource for genomic and metagenomic projects, Phytozome.

Laboratory Exercises

1. Demonstration of PCR and Real time PCR.
2. Qualitative and quantitative analysis of nucleic acids using agarose gel electrophoresis and Nanodrop spectrophotometer.
3. Searching and retrieval of gene/protein sequences.
4. Assembly of sequences using GENETOOL software.
5. Multiple Sequence alignment using ClustalW
6. Similarity searching using BLAST (n and p-blast).
7. Use of SILVA or RDP vs Clustal software for 16S rRNA alignment
8. Phylogenetic tree construction using MEGA.
9. Genome Annotation using RAST
10. Multiple genome alignments using MAUVE
11. Estimating average nucleotide identity between two genomic datasets
12. *In silico* DNA-DNA hybridization using GGDC (Genome-to-Genome Distance Calculator)
13. Submission of nucleotide sequences at NCBI-GenBank using Sequin

Suggested Readings

- Gustafson, J. P. 2000. *Genomes*. Kluwer Academic Plenum Publishers, New York, USA.
- Brown, T. A. 1999. *Genomes*. John Wiley & Sons (Asia) Pvt. Ltd., Singapore.
- Primrose, S. B. 1995. *Principles of Genome Analysis*. Blackwell Science Ltd., Oxford, UK.
- Singer, M. and Berg, P. 1991. *Genes and Genomes: A Changing Perspective*. University Science Books, CA, USA.
- Attwood, T.K. and Parry-Smith, D.J. 2004. *Introduction to Bioinformatics*. Pearson Education(Singapore) Pvt. Ltd.
- David, E. (Ed.) 2007. *Plant Bioinformatics: Methods and Protocol*. Humana Press, New Jersey, USA.

Suggested Readings (Laboratory Exercises)

- Sambrook, J. and Russell, D.W. 2001. *Molecular Cloning – A Laboratory Manual, Vols I–III*, Cold Spring Harbor Laboratory, USA.
- Gelvin, S.B. and Schilperoort, R.A. (eds) 1994. *Plant Molecular Biology Manual*, 2nd edition, Kluwer Academic Publishers, Dordrecht, The Netherlands.
- Glick, B. R. and Thompson, J.E. 1993. *Methods in Plant Molecular Biology and Biotechnology*. CRC Press, Boca Raton, Florida.
- Glover, D. M. and Harnes, B. D. (eds) 1995. *DNA Cloning: A Practical Approach. Core Techniques*, 2nd edition, PAS, IRL Press at Oxford University Press, Oxford.
- Peter, C. and Rolf, B. 2000. *Computational Molecular Biology: An Introduction*. John Wiley & Sons Ltd.

Journals/Research papers

1. Nature reviews
2. BMC Genomics
3. Genome
4. Journal of Genetics & Genomics
5. DNA Research
6. Genomics Proteomics & Bioinformatics
7. Bioinformatics
8. Journal of Bioinformatics and Computational Biology

The Arabidopsis Genome Initiative (2000) Analysis of the genome sequence of the flowering plant *Arabidopsis thaliana*. Nature 408:796–815

Tamura K, Stecher G, Peterson D, Filipinski A, and Kumar S (2013) MEGA6: Molecular Evolutionary Genetics Analysis Version 6.0. Molecular Biology and Evolution 30: 2725-2729.

Aziz RK, Bartels D, Best AA, DeJongh M, Disz T, et al. (2008) The RAST Server: rapid annotations using

subsystems technology. BMC Genomics. 8;9:75.

Darling AC, Mau B, Blattner FR, Perna NT. (2004) Mauve: multiple alignment of conserved genomic sequence with rearrangements. Genome Res.;14(7):1394-403.

Meier-Kolthoff, J.P., Auch, A.F., Klenk, H.-P., Göker, M. Genome sequence-based species delimitation with confidence intervals and improved distance functions. BMC Bioinformatics 14:60, 2013

Goris J, Konstantinidis KT, Klappenbach JA, Coenye T, Vandamme P, Tiedje JM. (2007) DNA-DNA hybridization values and their relationship to whole-genome sequence similarities. Int J SystEvol Microbiol.;57(Pt 1):81-91.

Bot 303 B- PLANT MOLECULAR BIOLOGY AND BIOTECHNOLOGY

Unit I

Techniques in Molecular Biology: Electrophoresis, blotting techniques, thermocyclers; Protein extraction, purification and separations techniques.

Unit II

Gene expression and function analysis: Separation of chromosome and localization of gene on chromosome. Various means of transcript analysis. Localization and identification of protein binding sites and control sequences of gene expression. Identification and study of translation products of gene.

Unit III

Transcriptomics and metabolomics: techniques and applications. Site directed mutagenesis: technique and applications. Transcript and proteome analysis of plants of arid regions: prospects and limitations.

Unit IV

Multilocus and locus specific DNA markers, applications of DNA profiling, Molecular marker based genetic analysis of plants of arid environment.

Unit V

Somatic cell genetics of plants of arid regions, molecular biology of somatic embryogenesis and organogenesis. Genetic fidelity analysis of *in vitro* regenerated plants by DNA markers.

Laboratory Exercises

1. Genomic DNA, Protein and RNA extraction from plants of arid environment.
2. Qualitative and quantitative analysis of DNA, RNA and Protein
3. Molecular analysis of somatic embryogenesis and organogenesis
4. Genetic diversity analysis of plants of arid environment
5. Genetic fidelity analysis of *in vitro* regenerated plants
6. Gene analysis by RT-PCR
7. *Agrobacterium*-mediated plant genetic transformation of tomato.
8. Bioinformatics exercises:
 - (a) Labeling and scoring of molecular markers and phylogenetic tree preparation through NTYSIS software, and analysis of genetic diversity relationship.
 - (b) Database searching and sequence retrieval of nucleic acids and proteins.
 - (c) BLAST (n and p-blast).
 - (d) Primer designing.
 - (e) Multiple sequence alignment using ClustalW.
 - (f) Protein structural modeling.

Suggested Readings

- Bhojwani, S.S. 1990. *Plant Tissue Culture: Applications and Limitations*. Elsevier Science Publishers, New York, USA.
- Bhojwani, S.S. and Razdan, M.K. 1996. *Plant Tissue Culture: Theory and Practice* (a revised edition). Elsevier Science Publishers, New York, USA.
- Brown, T.A. 1999. *Genomes*. John Wiley & Sons (Asia) Pvt. Ltd., Singapore.
- Brown, T. A. *Gene Cloning and Data Analysis an Introduction*, Blackwell Publishing
- Gustafson, J.P. 2000. *Genomes*. Kluwer Academic Plenum Publishers, New York, USA.
- Hartl, D. L. and Jones, E. W. 1988. *Genetics: Principles and Analysis* (4th edition). Jones & Bartlett

Publishers, Massachusetts, USA.
Henry, R.J. 1997. *Practical Applications of Plant Molecular Biology*. Chapman & Hall, London, UK.
Jolles, O. and Jornvall, H. (eds) 2000. *Proteomics in Functional Genomics*. Birkhauser Verlag, Basel, Switzerland.
Kayser, O. and Quax, W. (eds) 2007. *Medicinal Plant Biotechnology From Basic Research to Industrial Applications*. Wiley-VCH Verlag.
Old, R.W. and Primrose, S.B. 1989. *Principles of Gene Manipulation*. Blackwell Scientific Publications, Oxford, UK.
Primrose, S.B. 1995. *Principles of Genome Analysis and Genomics*. Blackwell Science Ltd., Oxford, UK.
Raghavan, V. 1986. *Embryogenesis in Angiosperms: A Developmental and Experimental Study*. Cambridge University Press, New York, USA.
Raghavan, V. 1997. *Molecular Biology of Flowering Plants*. Cambridge University Press, New York, USA.
Russel, P. J. 1998. *Genetics* (5th edition). The Benjamin/Cummings Publishing Company Inc., USA.
Snustad, D. P. and Simms, M. J. 2000. *Principles of Genetics* (2nd edition). John Wiley & Sons Inc., USA.
Vasil, I.K. and Thorpe, T.A. 1994. *Plant Cell and Tissue Culture*. Kluwer Academic Publishers, The Netherlands.

Suggested Readings (Laboratory Exercises)

Butenko, R.G. 2000. *Plant Cell Culture*. University Press of Pacific.
Collin, H.A. and Edwards, S. 1998. *Plant Cell Culture*. Bios Scientific Publishers, Oxford, UK.
Dixon, R.A. (ed.) 1987. *Plant Cell Culture: A Practical Approach*. IRL Press, Oxford.
Gelvin, S.B. and Schilperoort, R.A. (eds) 1994. *Plant Molecular Biology Manual*, 2nd edition, Kluwer Academic Publishers, Dordrecht, The Netherlands.
Glick, B.R. and Thompson, J.E. 1993. *Methods in Plant Molecular Biology and Biotechnology*. CRC Press, Boca Raton, Florida.
Hall, R.D. (ed) 1999. *Plant Cell Culture Protocols*. Humana Press, Inc., New Jersey, USA.
Sambrook, J, Fritsch, E.F. and Maniatis, T. (1989) *Molecular Cloning: a laboratory manual*. 2nd ed. N.Y. Cold Spring Harbor Laboratory, Cold Spring Harbor Laboratory press.
Shaw, C.H. (ed) 1988. *Plant Molecular Biology: A Practical Approach*. IRL Press, Oxford.
Smith, R.H. 2000. *Plant Tissue Culture: Techniques and Experiments*. Academic Press, New York.

Bot 303 C - PRINCIPLES OF PLANT PATHOLOGY

Unit I

Terminology of plant pathology, General symptoms of plant diseases, Components of plant disease, Disease diagnosis. Host parasite interaction (Genetics and Molecular basis) and Pathogenesis.

Unit II

Role of enzymes and toxins in plant diseases, Effects of infection on the host, Plant defense against pathogens, Plant disease epidemiology and Plant disease forecasting.

Unit III

Principles of plant protection, Management of plant diseases (Physical, Chemical and Biological management, biocides, microbial pesticide), Induced resistance in Plants, Breeding for disease resistance, Transgenic plants for disease resistance.

Unit IV

Principles and methods of seed health testing, Seed borne pathogenic microorganisms, important disease caused by seed borne pathogen. Morphology and anatomy of seed in relation of infection, Mechanism of seed infection and Factors affecting seed infection.

Unit V

Seed deterioration, mycotoxins, detection of mycotoxins, management of mycotoxin contaminant seeds, principles of seed borne disease controls, seed treatments (physical, chemical and biological methods), Quarantine for seed, seed laws and Seed certification.

Laboratory Exercises

1. Studies of some local Bacterial, Fungal, Nematode, Phytoplasma and Viral diseases.
-

2. Field visit for demonstration of diseases on wild and crop plants.
3. Isolation of fungal and bacterial pathogens from leaves.
4. Isolation of fungal and bacterial pathogens from stem, fruits and other aerial plant parts.
5. Isolation of seed borne mycoflora by standard blotter method.
6. Isolation of Seed borne mycoflora using potato dextrose agar plate method.
7. Location of infection in seed through hand section and microtome section.
8. Detection of aflatoxin contamination in stored seed samples by UV fluorescence light.
9. General study of Pesticides and their application.
10. Symptomology of some diseased specimens: White rust, downy mildew, powdery mildew, rust, smut, ergot, leaf spot, red rot, wilt, bacterial canker, bacterial blight, angular leaf spot, mosaic, little leaf, phyllody.

Suggested Readings

- Agrios, G.N. 1997. Plant Pathology. Academic Press, London.
- Albajes, R., Gullino, M.L., Van Lenteren, J.C. and Elad, Y. 2000. Integrated Pest and Disease management in Greenhouse Crops. Kluwer Academic Publishers.
- Mehrotra, R.S. 1993. Plant Pathology, Tata McGraw Hill.
- Rangaswamy, G. and Mahadevan, A. 1999. Disease of crop plants in India. Prentice Hall of India, New Delhi.
- Trivedi, P.C. 1998. Nematode disease in Plants CBS Publisher & Distributors, New Delhi.
- Roger, H. 2001. Mathew's Plant Virology, Academic Press, NY.
- Strange, R.N. 2003. Plant resistance mechanism (SAR, ISR) –Introduction to plant Pathology, John Wiley & Sons, USA.
- Singh, R.S. 1998. Plant disease. Oxford and IBH Publication Co. Pvt. Ltd.
- Singh, R.S. 2005. Introduction to Principles of Plant Pathology. Oxford & IBH Publication Co. Pvt. Ltd.
- Sharma, P.D. 2006. Plant Pathology. Narosa Publishing House, India
- Pandey, B.P. 1997. Plant Pathology, Pathogen and Plant Disease. S. Chand and Company Ltd.
- Agarwal, V.K. and Sissclair, J.B. 1993. Principles of Seed Pathology. Vol. I & II CBS Publishers and Distributors, India
- Neergaard, P. 1997. Seed pathology, Vol. I & II. The Macmillan Press.Ltd, London.
- Suryanarayana, D. 1978. Seed pathology. Vikas Publishing House, Pvt, Ltd.

Bot 303 D-PLANT MICROBE-INTERACTIONS (PMIs)-I

Unit I

Biology of plant-microbe interactions: Rhizosphere, rhizodeposition. Concepts of competition, mutualism and parasitism. Evolution of parasitism and symbiosis. Plant immunity: Gene for gene concept, r-gene and avr gene, evolution of susceptibility and resistance.

Unit II

Chemistry of Plant–Microbe Interactions in Rhizosphere and Rhizoplane: Metabolomics studies in understanding the cross-talk between plant hosts and rhizospheric microorganisms. Bacterial quorum sensing in symbiosis and pathogenesis. Microbial biofilms. Bacterial secretory systems- Type- I, II, III, IV, V, VI and VII and their role in symbiosis, pathogenesis and defense.

Unit III

Mycorrhizae and their types, Biology of AM Fungi and their application, Classification of AM Fungi (Mortan & Benny, 1990; Schüßler et al., 2001; Walker and Schüßler, 2010), Phosphorus mobilization and uptake mechanism of AM Fungi, Nitrogen assimilation and metabolism of AM Fungi. Biology of symbiotic fungus *Piriformospora indica* and its applications.

Unit IV

Legume-rhizobia symbiosis, Actinorhizal plants and *Frankia*; Plant and bacterial factors in establishing root nodule (RN) symbiosis. *Sym* genes; regulation of Nitrogenase. Host inducible regulation. Mechanism of auto-regulation.

Unit V

Fungi as endophytes; Products/secondary metabolites in response to fungal endophytes; Bacterial endophytes in cereals/grasses and their significance (*Herbaspirillum*, *Gluconacetobacter*, *Azorcus*, *Burkholderia*). Known examples of bacterial endophytes in sugar cane, sugar beet, *Poplar*, *Pinus* etc.

Laboratory Exercises

1. Preparation of culture media (TY, YEMA, LB)
2. Study of types of root nodules/morphology/anatomical preparation showing infection zone etc.
3. Isolation of bacteria from various sources (root nodules, roots and stems and phyllosphere).
4. Methods of culturing bacteria
5. Purification of bacterial isolates
6. Preservation of bacterial cultures (short term and long term)
7. Phenotypic characterization of bacterial isolates
 - (i) Intrinsic antibiotic resistance (IAR) pattern
 - (ii) NaCl tolerance
 - (iii) Acid or alkali production
 - (iv) High temperature tolerance
 - (v) Carbon utilization profile
8. Biochemical characterization of bacterial isolates
 - (i) Nitrate reductase activity
 - (ii) Catalase activity
 - (iii) Oxidase activity
 - (iv) Citrate Utilization
9. Molecular characterization of bacterial isolates
 - (i) Assessing genetic diversity among the bacterial isolates on the basis of RAPD and ARDRA.
 - (ii) Amplification of protein-coding housekeeping genes in rhizobial strains.
 - (iii) Amplification of symbiotic genes in rhizobial strains.
 - (iv) Analyzing the gene sequences using NCBI-BLAST.
10. Extraction and identification of Mycorrhizal spores from rhizosphere soil.
11. Staining of roots for assessment of Mycorrhizal colonization.
12. Mass multiplication of monospecific culture of AM fungi.
13. Microscopic preparation and study of fungus *Piriformospora indica* (If available)

Suggested Readings

- Bergey's Manual of Systematic Bacteriology*. Second Edition. Volume Two (The Proteobacteria). Springer.
- Nitrogen fixing Actinorhizal symbioses edited by Katharina Pawlowsky and William E Newton; Springer Nitrogen Fixation: Origins, Applications and Research Progresses, Volume 6 (2008)
- Boyd, R. F. 1984. *General Microbiology*. Times Mirror Publishers, New Delhi.
- Chandra, S. and Kehri, H. K. 2006. *Biotechnology of VA Mycorrhizae: Indian Scenario*. New India Publishing Agency, New Delhi.
- Dilworth, M. J., James, E. K., Sprent, J. I. and Newton, W. E. 2008. *Nitrogen-fixing Leguminous Symbioses*. Springer.
- Pawlowski, K. and Newton, W. E. 2008. *Nitrogen-fixing Actinorhizal Symbioses*. Springer.
- Pelczar, M. J., Chau, E. C. G. and Krieg, N. R. 1993. *Microbiology concepts and application*. McGraw Hill, New Delhi.
- Power, C. B. and Dagainawala, H. F. 1992. *General Microbiology*. Himalaya Pub. House, New Delhi.
- Prescott, S. C. and Dunn, C. G. 1993. *Industrial Microbiology*. McGraw Hill Pub., New Delhi.
- Salle, A. J. 2004. *Fundamental & Principles of Bacteriology*. Tata McGraw Hill Pub., New Delhi.
- Smith, S. E. and Read, D. J. 1997. *Mycorrhizal Symbiosis*, Third Edition. Academic Press, London.
- Somasegaran, P. and Hoben, H. J. 1994. *Handbook of Rhizobia (Methods in Legume-Rhizobium Technology)*. Springer-Verlag.
- Sprent, J. I. 2001. *Nodulation in legumes*. Kew Publishing.
- Stéphane, D., Georges, S. D. and André, F. J. 2005. *In Vitro Culture of Mycorrhizas*. Springer.
- Tiwari, M. and Sati, S. C. 2008. *The Mycorrhizae: Diversity Ecology & Applications*. Daya Publisher, New Delhi.
- Vincent, J. M. 1970. *A manual for the practical study of the root nodule bacteria*. Blackwell Scientific Publications.
- Lugtenberg B (ed) 2015. Principles of plant-microbe interactions. Springer International Publishing, Cham, Switzerland. <https://doi.org/10.1007/978-3-319-08575-3>
- Mhlongo MI, Piater LA, Madala NE, Labuschagne N, Dubery IA (2018) The Chemistry of Plant-Microbe Interactions in the Rhizosphere and the Potential for Metabolomics to Reveal Signaling Related to Defense Priming and Induced Systemic Resistance. *Front Plant Sci.* 9:9:112.
-

Bot 303E- CYTOGENETICS AND PLANT BREEDING -I

Unit I

Structure and function of chromosomes. - nucleosome morphology and higher-level organization, chemical composition, telomeres, centromeres and kinetochores, nucleolar organizers, chromomeres, euchromatin and heterochromatin, unique and repetitive DNA, chromosome structure throughout the cell cycle, banded, lampbrush, polytene, B chromosomes.

Unit II

Molecular mechanism of crossing over, chromosomal evidence of crossing over, genetic factors which affect the frequency of crossing over, genetic control of meiosis.

Unit III

Variations in chromosome structure: The origin and adaptive significance (and use in plant breeding where appropriate) of duplications, deletions, inversions, and translocations, isochromosomes, ring chromosomes, centric fusions and fissions.

Unit IV

Aneuploidy and euploidy in plants, their origins, cytogenetic effects, use in crop breeding, and adaptive significance, chromosome diminution and elimination.

Unit V

Mutation – Classification, mechanism, repair, role in cytogenetic analysis and evolution, role of cytogenetics in evolution and improvement of crops.

Laboratory Exercises

1. Preparation of important stains
2. Microscopy; Preparation of slides
3. Fixing of the materials for mitotic and meiotic analyses
4. Demonstration of crossing over/chiasmata
5. Karyotype analysis
6. Chromosomal aberration
7. Chromosome banding
8. Photomicrography and image analysis.

Suggested Readings

- Acquaah G (2007). Principles of Plant Genetics and Breeding, Blackwell Publishing Ltd., USA.
Gupta, R.K. 1999. Cytogenetics. Rastogi Publishers, Meerut.
Prasad, G. 1998. Introduction to Cytogenetics. Kalyani Publishers, New Delhi.
Simmonds (1995). Evolution of Crop Plants (2nd Edition) Longman.
Sinha, U. and Sinha S. 1998. Cytogenetics, Plant Breeding and Evolution. Vikas Publishing House Pvt. Ltd., New Delhi.
Strickberger (2008). Genetics, 3rd Edition, Pearson (Prentice Hall). 1. FISH for rDNA
Swaminathan, M.S., Gupta, P.K. and Sinha, U. 1974. Cytogenetics of Crop Plants. Mac Millan India Ltd., New Delhi.
Swanson, C.P., Merz, T. and Young, J. 1973. Cytogenetics. Prentice Hall of India Private Limited, New Delhi.

Bot 303F- INDUSTRIAL MICROBIOLOGY I

Unit I

Definition, scope and historical development of Industrial microbiology: Fermentors: (Bioreactor): Principle, types, and functions. Development of Industrial fermentation process, Screening of Primary and Secondary Fermentation Products. Stock Cultures, Fermentation media and Biological waste treatment.

Unit II

Dairy microbiology: Milk (composition and constituents), Processing and Pathogens, Pasteurization and grading of milk. Dairy products: Cheese, Yogurt, Cream and Buttermilk

Unit III

Food microbiology: Fermented foods. Food borne illness, microbial spoilage and food preservation.

Unit IV

Industrial production: Fermented and distilled Brews, Vinegar, and Citric acid

Unit V

Other industrial products: Vitamins, enzymes and steroids

Laboratory Exercises

1. Preparation of culture media.
2. Culturing of microorganisms and cultural characteristics of bacteria.
3. Study of some important industrially important genera of fungi.
4. Enzymatic test of Milk by Methyl Blue Reductase Test.
5. Metabolism of microorganisms–carbohydrate fermentation, hydrolysis of starch, urea and gelatin.
6. Microbiological analysis of food product.
7. Presumptive test of coliform group of bacteria.

Suggested Readings

- Casida, L.E. *Industrial Microbiology*. John Wiley and sons. Chum. *Microbiology*. John Wiley & Sons.
Corum, C.J. Development of Industrial Microbiology. American Institute of Bio.Science.
Dube, C., and Maheshwari D.K. , A Text Book of Microbiology , S. Chand and co. Ltd
Dube R. C. and Maheshwari D.K. , Practical Microbiology , S. Chand and co. Ltd
Kaushik, P. *Microbiology*. Emkay Pub., New Delhi.
Pelzer, M.J., Chau, E.C.G. and Krieg, N.R. *Microbiology Concepts and application*. McGraw Hill.
Power, C.B. and Dagainwala, H.F. *General Microbiology*. Himalaya Pub. House.
Prescott, S.C. and Dunn, C.G. *Industrial Microbiology*. McGraw Hill Pub.
Robert F. Boyd. *General Microbiology*. Times Mirror Publishers.
Salle, A. J. *Fundamental & Principles of Bacteriology*. Tata McGraw Hill.
Sivakumar P.K. , Joe M. M., Sukesh K , An Introduction to Industrial Microbiology, Pub.: S. Chand & Co. Ltd
Spencer, J.E.T. and Spencer, D.M. *Yeast Technology*. Springer-Verlag.
Staubury, P.F. and Whiterker, A. *Principles of Fermentation Technology*. Pergamon Press.
Thoma, R.W. *Industrial Microbiology*. Hutchinson & Ross.
Tortora, G.J., Funke, B.R. and Casechristie: *Microbiology*. Benjamin Publishing Co.
Cappuccino, J and Sherman, N. *Microbiology: A Laboratory manual*. Pearson publication.

Bot 304 A- POPULATION BIOLOGY

Unit I

Population and Growth Models: Concepts in population biology, Theories of Evolution, Population growth models: Density independent and density dependent.

Unit II

Population Genetics: Gene frequencies: The Hardy-Weinberg Principle; Genetic variation in population: Polygenic inheritance and natural selection; Quantitative genetics and heritability. Human population: Growth, Environment and Development.

Unit III

Demography: Plant demography and population dynamics. Life tables and their components; Regulation of plant population; Interaction in mixture of species.

Unit IV

Competition and Allelopathy: Competition: Intra and Inter – specific and Models - Lotka-Volterra, Competitive Exclusion Principle, Tilman's resource model. Allelopathy: mode of release, allelochemicals and their role ecosystems.

Unit V

Evolutionary Ecology and Threatened plants: Coexistence and niche; Evolution of mutualism – Basic models; Basic concepts of Evolutionary ecology. Threatened/Endangered/Critically endangered plants of Rajasthan desert and their conservation strategies.

Laboratory/field exercises

1. To determine whether the population is in or not in Hardy-Weinberg equilibrium by using chi-square test of independence
2. Measurement of growth for fitting the growth curve and estimating specific growth rate:
 - a. Soil fungi
 - b. For any two wild weedy annual species
3. Rate of seedling natality and mortality for two weedy dicots.
4. Dominance, diversity and evenness measurements of desert vegetation.
5. Preparation of population growth curve
6. Measurement of niche width for trees/shrubs/annuals.
7. Gene frequency for a character in tree/shrub seedlings.
8. Estimation of inheritance using ANOVA (RBD) tool.
9. Measurement of gochar land carrying capacity for farm animals
10. Qualitative test for allelopathic organic acids in soil
11. Life Table – Life expectancy

Suggested Readings

- Barbour, M.G. Burk, J.H. and Pitts, W.D. 1987. *Terrestrial Plant Ecology*, Benjamin/Cummings Publication Company, California.
- Begon, M. Harper, J.L. and Townsend, C.R. 1996. *Ecology*/Blackwell Science, Cambridge, U.S.A.
- Britton, N.F. 2003. *Essential Mathematical Biology* Springer International Edition, 335 pp.
- Brooker, R.J. 1999. *Genetics – Analysis and Principles*. Benjamin/Cummings an imprint of Addison Westoy Longman, Inc.
- Donovan, T.M. and Weldon, C.W. 2002. *Spreadsheet Exercises in Ecology and Evolution*. Sinauar Associates Inc. Publ. Sunderland, Massachusetts, USA, 556 pp.
- Freysen, A.H.J. and Woldendorp, J. 1978. *Structure and Functioning of Plant Populations* (eds.), North Holland Publ. Co., Amsterdam.
- Harper, J.L. 1977. *Population Biology of Plants*. Academic Press, London and New York.
- Hastings, A. 1997. *Population Biology: Concepts and Models*. Springer Publication.
- Krebs, C.J. 1989. *Ecological Methodology*. Harper and Row, New York, USA.
- Ludwig, J.A. and Reynolds, J.F. 1988. *Statistical Ecology*, Wiley, New York.
- Neel, D. 2004. *Introduction to Population Biology*, Cambridge University Press, 393 pp.
- Turchin, P. 2003. *Complex Population Dynamics: A Theoretical/Empirical Synthesis*, Princeton Uni

Bot 304 B- MICROBIAL ECOLOGY - I

Unit I

Introduction and historical background: Historical overview, relation of microbial ecology with general ecology. Characteristics of microbial life: Structure and evolution of cell shape, metabolic diversity in microbes, growth, reproduction and development.

Unit II

Classification and taxonomy of microbes: Species concept, three domains of life, Bacterial, Archaeal and Eukaryal biodiversity.

Unit III

Microbial genome diversity: Structure, diversity, stability of microbial communities. Species diversity indices, genetic/molecular diversity indices.

Genetic exchange in microbial communities, the breadth and significance of LGT on the process of evolution of microorganisms.

Unit IV

Microorganisms in diverse habitats: Abiotic limitations to microbial growth, starvation strategies and environmental determinants of microbial growth.

Microorganisms in atmo-ecosphere, hydro-ecosphere and freshwater habitats.

Unit V

Microbial populations and communities: Population interactions: Interactions among single and diverse microbial populations. Populations within biofilms; biofilm lifestyle and quorum sensing, neutralism, commensalism, synergism, mutualism, competition, amensalism, parasitism, predation.

Laboratory Exercises

1. Study of a cross section of natural environment using Winograd sky column.
2. Study of multiplication of desired microorganism with the help of enrichment technique.
3. Selection of microorganisms which secrete metabolites.
4. Study of various techniques related to isolation and observation of microorganisms
 - a. Micrometry
 - b. Dilution series
 - c. Surface plate method
 - d. Agar stake method
 - e. Streak feeding
 - f. Overlay method
 - g. Filter disc method
 - h. Hanging drop method
 - i. Staining techniques

Suggested Readings

Atlas, R. M. and Bartha. 1998. *Microbial Ecology: Fundamentals and Applications*. The Benjamin/Cummings Science Publishing.
Coleman, D. C., Crossley, D.A. and Paul, F. H. 2004. *Fundamentals of Soil Ecology*. Academic Press.
McArthur, J.V. 2006. *Microbial Ecology: An Evolutionary Approach*. Academic Press.
Loutit, M. W., and Miles, J. A. R. 2011. *Microbial Ecology*. Springer, London.
Cheeke, T. E., David C. C. and Diana H. W. 2012. *Microbial Ecology in Sustainable Agroecosystems*. CRC Press.

Bot 304 C- STRESS PHYSIOLOGY-I

UNIT I

Plant response to abiotic stresses: Types of stresses, include temperature, water deficit, high irradiation, fluoride and CO₂. Early adaptive response to water deficit; Structure and processes affected by desiccation.

UNIT II

Plant responses to salinity and heavy metal stresses: Ionic and osmotic sensing signaling mechanism (SOS salt overlay pathways). Salinity tolerance determinants (effectors and regulatory molecules). Molecular mechanisms of tolerating heavy metal stress.

UNIT III

Abiotic and biotic stress signaling in plants; Stress sensor, role of MAP Kinases, and Calcium calmodulin in stress sensing. ABA dependent and ABA independent pathways.

UNIT IV

Oxidative stress and anti-oxidant system in plants. Reactive oxygen species (ROS) under stress, ROS production in different organelles, ROS scavenging antioxidant defense mechanism: ROS scavenging enzymatic antioxidants, Non-enzymatic antioxidants; Haliwal Asada pathway.

UNIT V

Biotic stress signaling (plant defense): Role of Jasmonic acid, salicylic acid, ethylene and nitric oxide signaling in plant defense. Systemic acquired resistance.

Laboratory Exercises

1. Find out the ascorbic content in temperature (low and high) and salt stressed samples.
 2. Effect of stress on the activity of following scavenging enzymes:
 - a. Superoxide dismutase,
 - b. Catalase
 - c. Peroxidase
-

- d. Ascorbate peroxidase
3. Estimate anthocyanin content in stressed samples.
4. Effect of stress on membrane damage in relation to lipid peroxidation.
5. Effect of stress on membrane damage in relation to membrane stability index.
6. Effect of water stress and Hyperthermia on the activity of nitrate reductase.

Suggested Readings

- Ahmad, P. 2014. *Physiological Mechanisms and Oxidative Damage to Plants: Antioxidant Networks and Signaling*. Elsevier Science
- Ahmad, P. and Wani, M.R. 2014. *Physiological Mechanisms and Adaptation Strategies in Plants Under Changing Environment*(eds). Springer New York.
- Alscher, R. G. and Cumming, J. R. 1990. *Stress Responses in Plants: Adaptation and Acclimation Mechanisms* (eds.). New York Wiley-Liss, Inc.
- Aroca, R. 2012. *Plant Responses to Drought Stress From Morphological to Molecular Features* (ed). Springer-Verlag Berlin Heidelberg
- Ashraf, M., Ozturk, M. and Athar, H.R. 2009. *Salinity and Water Stress: Improving Crop Efficiency* (eds) .Springer
- Basra, A. S. 2001. *Crop Responses and Adaptations to Temperature Stress* (ed.). Food Products Press, New York.
- Basra, A. S. and Bastra, R. K. 1997. *Mechanisms of Environmental Stress in Plants* (ed.). Amsterdam: The Netherlands, Harwood Academic Publishers.
- Belhassen, E. 1997. *Drought Tolerance in Higher Plants: Genetical, Physiological and Molecular Biological Analysis* (ed.). Kluwer Academic Publishers, Dordrecht.
- Buchanan, B. B., Gruissem, W. and Jones, R. L. 2000. *Biochemistry and molecular biology of plants*. American Society of Plant Physiologists, Maryland, USA.
- Cherry, J. H. 1994. *Biochemical and cellular mechanisms of stress tolerance in plants* (ed.). Springer-Verlag, Berlin.
- Chopra, V. L., Singh, R. B. and Varma, A. 1998. *Crop productivity and substantiality and shaping the future. Proceedings of Second International Crop Science Congress* (ed.). Oxford and IBH Publishing Company, New Delhi.
- Dhaliwal, G. S. and Arora, R. 1999. *Environmental Stress in Crop Plants* (ed.). Commonwealth Publishers, New Delhi.
- Gupta, D. and Sandalio, L.M.2011. *Metal Toxicity in Plants: Perception, Signaling and Remediation*(eds). Springer.
- Grillo, S. and Leone, A. 1997. *Physical Stresses in Plants: Genes and Their Products for Their Tolerance*. Springer-Verlag, Berlin.
- Hedden, P. and Thomas, S.G. 2006. *Plant Hormone Signaling*. Blackwell Publishing Ltd, Oxford, UK
- Hopkins, W.G. and Huner, N.P.A. 2009. *Introduction to Plant Physiology* (4th Edition). John Wiley & Sons, Inc. New York, USA
- Jenks, M.A. and Hasegawa, P.A. 2005. *Plant Abiotic Stress*(eds). Blackwell Publishing Ltd, Oxford, UK
- Lerner, H. R. 1998. *Plant Responses to Environmental Stresses* (from Phytohormones to Genome Reorganization). Marcel Dekker, Inc.
- Levitt, J. 1980. *Responses of plants to environmental stress. Vol. 1. Chilling and temperature stress*. Academic Press, New York, USA.
- Luttge, U., Beck, E. and Bartels, D. 2011. *Plant Desiccation Tolerance (Ecological Studies)*; (eds.). Springer
- Morison, J.I.L. and Morecroft, M.D. 2006. *Plant Growth and Climate Change* (eds). Blackwell Publishing Ltd, Oxford, UK
- Pessarakli, M. 1994. *Handbook of Plant Crop Stress* (ed.) Marcel Dekker, Inc., New York.
- Ricardo, A. 2012. *Plant Responses to Drought Stress - From Morphological to Molecular Features* (ed). Springer
- Scandolios, J. 1997. *Oxidative stress and the molecular biology of antioxidant defenses* (ed.). New York:
-

Cold Spring Harbor Laboratory Press.

Taiz, L. and Ziegler, E. 2003. *Plant Physiology* (3rd edition), Panima Publishing Corporation, New Delhi.

Tuteja, N. and Gill, S.S. 2014. *Climate Change and Plant Abiotic Stress Tolerance* (eds.). Wiley-VCH Weinheim, Germany.

Tripathi, B.N. and , Müller, M.2015. *Stress Responses in Plants: Mechanisms of Toxicity and Tolerance* (eds). Springer.

Bot 304 E - BIOSYSTEMATICS OF PLANTS -I

Unit -I

Plant systematics: The Components of systematics, Major objectives of systematics; Relevance to society and science; Taxonomic History: Natural systems to cladistics; Phenetics and Cladistics analysis.

Unit -II

Plant identification; Botanical Nomenclature:Kinds of names; International Code of Botanical Nomenclature, Names according to rank; Citation of authors; Priority; Type method; Naming a new species; Legitimacy; Synonyms.

Unit -III

Classification: The components of classification; Characters and their states; Sources of characters; Evaluation of characters. Hierarchical classification. Salient feature and principles of majors systems of classification: RMT Dahlgren (1980), Robert F. Thorne(1968) and APG system (upto date).

Unit -IV

Systematic evidence: Palynology, Cytology, Phytochemistry, Nucleic acid hybridization.

Evolutionary trends of angiosperm: -Origin of angiosperms, Basic evolutionary trends, xylem evolution, flower evolution, stamens evolution, Pollen grain evolution, Carpel evolution.

Unit -V

Introduction to general characteristics and evolutionary trends of basal and monocots angiosperms; Salient features of following groups up to orders: Basal angiosperms- ANA grade: Amborellales Nyphaeales, Austrobaileales; Magnoliids Clade: Magnoliales Laurales, Canellales, Piperales; Chloranthales; Basal Monocots- Acorales, Alistmales; Petaloid Monocot-Peterossaviales, Dioscorales, Pandanales, Liliales, Asparagales; Commelinids clade: Commelinales, Zingiberales, Poales

PRACTICALS:

1. Live plants/ Herbarium specimens of the following families will be provided in the class for description and identification (classification based on APG III, 2009):
 - Basal Angiosperm and Magnoliids: Nymphaeaceae, Magnoliaceae
 - Basal monocots: Araceae, Alismataceae
 - Petaloid monocots: Liliaceae, Alliaceae, Asperagaceae, Amaryllidaceae, Iridaceae, Orchidaceae
 - Commelinids monocots: Commelinaceae, Zingiberaceae, Cyperaceae, Poaceae
 2. Writing exercise
 3. Nomenclature exercise
 4. Classification exercise
 5. Systematic evidences studies of pollengrain or metabolite or cytology of selected above families of genus
 6. Preparation of Herbarium and excursion studies of desert region
 7. Make a phenetic cladogram through software
-

SUGGESTED READINGS:

- Angiosperm Phylogeny Group 2003. An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG II. *Botanical Journal of the Linnean Society* 141: 399-436.
- Cronquist, A. 1981. An integrated system of classification of flowering plants. Columbia University Press, New York.
- Friis E.M., Crane P.R. Pedersen K.R. 2011, Early Flowers and angiosperm evolution. Cambridge University Press
- Gurcharan Singh, 2010. Plant Systematics: An Integrative Approach. Science Publishers, Enfield, NH, USA
- Judd, W.S., C.S. Campbell, E.A. Kellogg, P.F. Stevens and M.J. Donoghue 2002. Plant Systematics: A phylogenetic Approach. Sinauer Associates, Inc., Massachusetts.
- Lawrence D.H. Splencer C. H. B 2006, Ecology and evolution of flowers. Oxford University Press
- Scott-Ram, N.R. 1990. Transformed Cladistics, Taxonomy and Evolution. Cambridge University Press.
- Simpson, M.G. 2006. Plant Systematics. Elsevier, Amsterdam.
- Simpson, M.G. 2010. Plant Systematics, Second Edition. Elsevier, Amsterdam
- Soltis D. et al., 2005, Phylogeny and Evolution of the Angiosperm, Sinauer Associates, Inc, Publishers, Sunderland, Massachusetts.
- Soltis D. et al., 2018, Phylogeny and Evolution of the Angiosperm, Revised & updated edition, University of Chicago Press, Chicago & London
- Takhtajan A. 2009. Flowering Plant, Second Edition. Springer
- Wilson K.L., Morrison D.A. 2000, Monocots systematics and Evolution. CSIRO Publishing.
- Winston J.E. 1999. Describing Species: Practical Taxonomic Procedure for Biologists. Columbia University Press.

Bot 304 F- ENVIRONMENTAL MONITORING, MANAGEMENT AND RESTORATION - I

Unit I

Pollution: Definition, kinds, sources, quality parameters; Air, Water, Soil, Radioactive, Noise, Thermal pollution, effects on plants, animals and buildings; control of pollution; indoor air pollution.

Unit II

Management: Introduction and scope of basic concepts of sustainable development: Definition, concepts, capitals, currencies, problems and integration. Indicators for Sustainable Development.

Unit III

Biodiversity: Meanings, levels, estimates, importance and role in ecosystem functioning. Threats to biodiversity, major causes of extinction, vulnerability of species to extinction, IUCN threat categories, Red data book.

Unit IV

Waste management: Solid Waste; Sources and management; Composting and methane production; Hazardous waste; Disposal and management of radioactive waste.

Unit V

Ecology of Disturbed Ecosystems; Wastelands – Description, classification. Disturbance and its impact on the structure and functioning of terrestrial and aquatic ecosystems. Environmental impacts of mining and industrialization.

Laboratory/Field Exercises

1. Determination of phenol contents of the given plant samples growing in polluted and seemingly non-polluted environments.
 2. Determination of chlorophyll „a“, „b“ and total chlorophyll contents of the given plant samples growing in polluted and seemingly non-polluted environments.
 3. Determination of soluble protein contents of the given plant samples growing in polluted and seemingly non-polluted environments.
 4. Determination of carbohydrate contents of the given plant samples growing in polluted and seemingly non-polluted environment.
-

5. Determination of the proline contents of plants growing in polluted and seemingly non-polluted environments.
6. Determination of the activity of acid phosphatase enzyme in the given plant samples growing in polluted and seemingly non-polluted environments.
7. Determination of the activity of peroxidase enzyme in the given plant samples growing in polluted and seemingly non-polluted environments.
8. Determination of the activity of polyphenol oxidase enzyme in the given plant samples growing in polluted and seemingly non-polluted environments.

Suggested Readings

Bradshaw, A.D. and Chadwick, M.J. 1980. *The Restoration of Land*. Blackwell Scientific Publications, Oxford.

Singh, A. and Ward, O.P. (Eds.). *Applied Bioremediation and Phytoremediation*. Springer. 2004.

Abrol, I.P. and Dhruva Narayan, V.V. (Eds.). *Technologies for Wasteland Development*. ICAR, New Delhi. 1998.

Murlikrishnan, K.V.S.G. *Air pollution and control*. Published by Kaushal & Co, New Delhi

Bell, L.H. and Bell, D.H. 1993 *Industrial Noise Control: Fundamentals and Applications*, Second Edition, Marcel Dekker, New York

Masters, M., Gilbert, and Ela P. Wendell. 2007. *Introduction to Environmental Engineering and Science*. Prentice Hall; 3 edition

SEMESTER IV

Bot 401-APPLIED ECOLOGY

Unit I

Soil: Physico-chemical properties, soil-formation and soil classification system, major soil types of World and India, Assessment of soil quality and the use of digital tools in soil mapping. Soil degradation and factors responsible for it, and approaches for soil restoration.

Unit II

Mineralization: Litter fall and decomposition – litter quality, climatic factors, soil microorganisms affecting mineralization. Nutrient synchronization and biological management of soil fertility.

Unit III

Biodiversity: Concept and levels; biodiversity role in ecosystem functions and stability; speciation and extinction; IUCN categories of threat; distribution and global patterns; terrestrial biodiversity hot spots. Biodiversity status in India.

Unit IV

Ecosystem Stability and Management Concept of ecosystem resistance and resilience; natural and anthropogenic ecological perturbations and their impact on plants and ecosystems. Ecosystem restoration. Ecology of plant invasion.

Concepts of sustainable development. Sustainability indicators.

Unit V

Global Warming and Climatic Changes: Climatic changes: Greenhouse gases; CO₂, CH₄, N₂O, CFCs – sources, trends and role; ozone layer and hole; consequences of climatic change – CO₂ fertilization; global warming, sea level rise and UV radiation.

Concepts of Industrial Ecology.

Laboratory/Field Exercises

1. To determine organic carbon content in protected and gochar land soils.
2. To determine nitrogen in protected and gochar land soils.
3. To determine EC and pH in protected and gochar land soils.
4. To determine available phosphorus in protected and gochar land soils.
5. To estimate chlorophyll contents of plants growing in polluted and non-polluted areas.
6. To estimate rate of soil respiration by alkali absorption method.
7. To estimate percent loss of litter using litterbag method.
8. To study environmental impact of a given developmental activity using checklist as an EIA method.

Suggested Readings

- Ali, M. 2012. Diversity of Ecosystems (Eds.), In Tech Publisher. DOI: 10.5772/2276
- APHA-Standard Methods for the Examination of Water and Waste Water. American Public Health Association, Washington, D.C.
- Barbour, M.G., Burk, J.H. and Pitts, W.D. 1987. Terrestrial Plant Ecology. Benjamin/Cummings Publication Company, California.
- Begon, M., Harper, J.L. and Townsend, C.R. 1996. Ecology. Blackwell Science, Cambridge, U.S.A.
- Brady, N.C. 1990. The Nature and Properties of Soils. Macmillan.
- Cadish, G. and Giller, K.E. 1997. Driven by Nature, Plant Litter Quality and Decomposition, CAB International Wallingford, U.K.
- Chapman, B. and Bilharz, S. 1997. Sustainability Indicators. John Wiley & Sons, New York.
- Eisner, T. and Meinwald, J. 1995. Chemical Ecology: The Chemistry of Biotic Interaction. National Academies Press
- Heywood, V.H. and Watson, R.T. 1995. Global Biodiversity Assessment. Cambridge University Press.
- Hill, M.K. 1997. Understanding Environmental Pollution. Cambridge University Press.
- Koromondy, E.J. 1996. Concepts of Ecology. Prentice-Hall of India Pvt. Ltd., New Delhi.
- Krebs, C.J. 1989. Ecological Methodology. Harper and Row, New York, USA.
- Ludwig, J. and Reynolds, J.F. 1988. Statistical Ecology, John Wiley & Sons.
- Ludwig, J.A. and Reynolds, J.F. 1988. Statistical Ecology, Wiley, New York.
- Magurran, A.E. 1988. Ecological Density and its Measurement. Chapman & Hall, London.
- Mason, C.F. 1991. Biology of Freshwater Pollution. Longman.
- Misra, R. 1968. Ecology Work Book. Oxford & IBH, New Delhi.
- Moore, P.W. and Chapman, S.B. 1986. Methods in Plant Ecology. Blackwell Scientific Publications.
- Muller-Dombois, D. and Ellenberg, H. 1974. Aims and Methods of Vegetation Ecology, Wiley, New York.
- Muller-Domois, D. and Ellenberg, H. 1974. Aims and Methods of Vegetaion Ecology, Wiley, New York.
- Odum, E.P. 1971. Fundamentals of Ecology, Saunders, Philadelphia.
- Odum, E.P. 1983. Basic Ecology, Saunders, Philadelphia.
- Pielou, E.C. 1984. The Interpretation of Ecological Data. Wiley, New York.
- Smith, R.L. 1996. Ecology and Field Biology. Harper Collins, New York.
- Smith, R.L. 1996. Ecology and Field Biology. Harper Collins, New York.
- Sokal, R.R. and Rohlf, F. J. 1995. Biometry. W.H. Freeman & Co., San Fransisco.
- Treshow, M. 1985. Air Pollution and Plant Life. Wiley Interscience.

Bot 402-BIOTECHNOLOGY AND GENETIC ENGINEERING OF PLANTS

Unit I

Biotechnology: Basic concepts, principles and scope. Concepts of cellular differentiation and totipotency. Historical development of plant cell, tissue and organ culture. Fundamental aspects of somatic embryogenesis, organogenesis and androgenesis; mechanism, techniques and utility.

Unit II

Somatic hybridization: Protoplast isolation, fusion, culture, hybrid selection, regeneration. Possibilities, achievements and limitations of protoplast research. Various means of Micropropagation.

Unit III

Applications of plant tissue culture: production of hybrids, somaclones and artificial seed, production of secondary metabolites/natural products, cryopreservation and germplasm storage.IPR, possible ecological risk and ethical concern.

Unit IV

Recombinant DNA technology: Gene cloning principles and techniques; vectors and PCR.DNA synthesis and sequencing. DNA fingerprinting, Genetic engineering of plants; aims and strategies for development of transgenics.

Unit V

Genomics and proteomics: molecular markers, functional genomics, microarrays, protein profiling and its significance. Bioinformatics.

Laboratory Exercises

1. Preparation of various types of culture media.
2. Micropropagation of plants of arid environment.
3. Induction of callus for cellular differentiation of plants of arid environment.
4. Demonstration of androgenesis.
5. Isolation of protoplast
6. Demonstration of protoplast fusion
7. Extraction and purification of DNA and proteins.
8. Protein profiling
9. Analysis of secondary metabolite from given plant material
10. Analysis of Plant Genomic DNA using molecular markers
11. Exercises on Bioinformatics:
 - a. Database searching using the web-interface BLASTN and BLASTP.
 - b. Determine the protein coded by nucleotide sequences using the web-interface BLASTX.
 - c. Determine ORF of gene sequences and the translation to a protein sequence in all 6 frames using genetic codes.

Suggested readings

- Bhojwani, S. S. 1990. *Plant Tissue Culture: Applications and Limitations*. Elsevier Science Publishers, New York, USA.
- Bhojwani, S. S. and Razdan, M. K. 1996. *Plant Tissue Culture: Theory and Practice* (a revised edition). Elsevier Science Publishers, New York, USA.
- Brown, T. A. 1999. *Genomes*. John Wiley & Sons (Asia) Pvt. Ltd., Singapore.
- Callow, J. A., Ford-Lloyd, B. V. and Newbury, H. J. 1997. *Biotechnology and Plant Genetic Resources: Conservation and Use*. CAB International, Oxon, UK.
- Chrispeels, M. J. and Sadava, D. E. 2002. *Plants, Genes and Agriculture*. Jones & Bartlett Publishers, Boston, USA.
- Collins, H. A. and Edwards, S. 1998. *Plant Cell Culture*. Bios Scientific Publishers, Oxford, UK.
- Glazer, A. N. and Nikaido, H. 1995. *Microbial Biotechnology*, W.H. Freeman & Company, New York, USA.
- Gustafson, J. P. 2000. *Genomes*. Kluwer Academic Plenum Publishers, New York, USA.
- Henry, R. J. 1997. *Practical Applications of Plant Molecular Biology*. Chapman & Hall, London, UK.
- Jain, S. M., Sopory, S. K. and Veilleux, R. E. 1996. *In Vitro Haploid Production in Higher Plants*, Vols. 1-5, *Fundamental Aspects and Methods*. Kluwer Academic Publishers, Dordrecht, The Netherlands.
- Jolles, O. and Jornvall, H. (eds) 2000. *Proteomics in Functional Genomics*. Birkhauser Verlag, Basel, Switzerland.
- Kartha, K. K. 1985. *Cryopreservation of Plant Cells and Organs*. CRC Press, Boca Raton, Florida, USA.
- Old, R. W. and Primrose, S. B. 1989. *Principles of Gene Manipulation*. Blackwell Scientific Publications, Oxford, UK.
- Primrose, S. B. 1995. *Principles of Genome Analysis*. Blackwell Science Ltd., Oxford, UK.
- Raghavan, V. 1986. *Embryogenesis in Angiosperms: A Developmental and Experimental Study*. Cambridge University Press, New York, USA.
- Raghavan, V. 1997. *Molecular Biology of Flowering Plants*. Cambridge University Press, New York, USA.
- Shantharam, S. and Montgomery, J.F. 1999. *Biotechnology, Biosafety, and Biodiversity*. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
- Vasil, I. K. and Thorpe, T. A. 1994. *Plant Cell and Tissue Culture*. Kluwer Academic Publishers, The Netherlands.

Suggested Readings (Laboratory Exercises)

- Butenko, R. G. 2000. *Plant Cell Culture*. University Press of Pacific.
- Collin, H. A. and Edwards, S. 1998. *Plant Cell Culture*. Bios Scientific Publishers, Oxford, UK.
- Dixon, R. A. (ed.) 1987. *Plant Cell Culture: A Practical Approach*. IRL Press, Oxford.
- Gelvin, S.B. and Schilperoort, R.A. (eds) 1994. *Plant Molecular Biology Manual*, 2nd edition, Kluwer Academic Publishers, Dordrecht, The Netherlands.
- George, E. F. 1993. *Plant Propagation by Tissue Culture, Part 1. The Technology*, 2nd edition, Exegetics Ltd., Edington, UK.
- George, E. F. 1993. *Plant Propagation by Tissue Culture, Part 2. In Practice*, 2nd edition, Exegetics Ltd., Edington, UK.

- Glick, B. R. and Thompson, J.E. 1993. *Methods in Plant Molecular Biology and Biotechnology*. CRC Press, Boca Raton, Florida.
- Glover, D. M. and Harnes, B. D. (eds) 1995. *DNA Cloning: A Practical Approach. Core Techniques*, 2nd edition, PAS, IRL Press at Oxford University Press, Oxford.
- Hackett, P. B., Fuchs, J. A. and Messing, J. W. 1988. *An Introduction to Recombinant DNA Techniques: Basic Experiments in Gene Manipulation*. The Benjamin/Cummings Publishing Co., Inc Menlo Park, California.
- Hall, R. D. (ed.) 1999. *Plant Cell Culture Protocols*. Humana Press, Inc., New Jersey, USA.
- Shaw, C. H. (ed.) 1988. *Plant Molecular Biology: A Practical Approach*. IRL Press, Oxford.
- Smith, R. H. 2000. *Plant Tissue Culture: Techniques and Experiments*. Academic Press, New York.

Suggested Journals

- Plant Cell Tissue and Organ Culture
 In Vitro Cellular and Development Biology-Plant
 Indian Journal of Biotechnology (NISCAIR-CSIR, India)
 Plant Tissue Culture Historical Development and Applied Aspects (2012). Resonance (IASC Bangalore, India) 17(8):759-767.
 Genomics, Proteomics
 Genomics, proteomics and bioinformatics

Bot 403 A- GENOMICS, PROTEOMICS AND BIOINFORMATICS -II

Unit I

Proteomics: Introduction. Top-down and bottom-up proteomics. Shotgun proteomics. Global protein expression profiling and proteome mining: basic methods and tools. Gel-based proteomics: 2-DE workflow and data analysis, Protein identification techniques: Mass spectrometry: MALDI-TOF, sample preparation, in-gel and in-solution digestion, Peptide mass fingerprinting and MS/MS.

Unit II

Quantitative proteomic analysis, DIGE, MUDPIT, ICAT, ITRAQ. Validation of proteomic data: Western Immunoblotting, ELISA, Protein-protein interaction studies: yeast two-hybrid assay

Unit III

Approaches to determine Protein function. Protein chips and microarrays: Introduction and applications. Emerging trends in proteomics. Proteomics in India.

Unit IV

Cell, tissue and organelle proteomics: Cell Wall/ Extracellular matrix/Apoplast proteomics/Secretomics, Nuclear proteomics, Plasma membrane/tonoplast proteomics. Application of proteomics in crop improvement

Unit V

Proteome Informatics: Protein Identification by database searching. *In silico* characterization of proteins for subcellular localization, domain and motif analysis, KEGG An integrated database resource; Metabolic Pathways databases (METACYC). Structural bioinformatics: From sequence to structure: prediction of protein secondary and tertiary structure, homology modeling, tools for structure prediction, validation and visualization.

Laboratory Exercises

1. Gel-based Protein profiling.
2. Demonstration of 2-DE and Western immunoblotting.
3. Protein domain analysis.
4. Homology modeling for protein 3-D structure determination.
5. WebMGA for Protein function annotation by COG database
6. Identifying metabolic pathways using KAAS (KEGG Automatic Annotation Server)
7. WebMGA for tRNA prediction using tRNAscan-SE program

Suggested Readings

- Lieber, D.C. 2006. *Introduction to Proteomics: Tools for New Biology*. Humana Press, NJ.
- Pennington, S.R., Dunn, MJ (Eds.) 2002. *Proteomics: From Protein Sequence to Function*. BIOS Scientific Publishers, United Kingdom.

Jolles, O. and Jornvall, H. (eds) 2000. *Proteomics in Functional Genomics*. Birkhauser Verlag, Basel, Switzerland.
Attwood, T.K. and Parry-Smith, D.J. 2004. *Introduction to Bioinformatics*, Pearson Education(Singapore) Pvt. Ltd.
David, E. (Ed.) 2007. *Plant Bioinformatics: Methods and Protocols*. Humana Press, New Jersey, USA.
Mount, D.W. *Bioinformatics: Sequence and Genome Analysis*. Cold Spring Harbor Laboratory, USA.

Suggested Readings (Laboratory Exercises)

Harlow and Lane D. (Eds.) 1988. *Antibodies – A Laboratory Manual*; Cold Spring Harbor Laboratory, USA.
Sambrook, J. and Russell, D.W. 2001. *Molecular Cloning – A Laboratory Manual, Vols I – III*, Cold Spring Harbor Laboratory, USA.
Peter, C. and Rolf, B. 2000. *Computational Molecular Biology: An Introduction*. John Willey & Sons Ltd.
S. Wu, Z. Zhu, L. Fu, B. Niu and W. Li, "WebMGA: a Customizable Web Server for Fast Metagenomic Sequence Analysis", *BMC Genomics* 2011, 12:444.
Moriya, Y., Itoh, M., Okuda, S., Yoshizawa, A., and Kanehisa, M.; KAAS: an automatic genome annotation and pathway reconstruction server. *Nucleic Acids Res.* 35, W182-W185 (2007).

Journals:

Journal of proteome research
Molecular cell proteomics
Journal of proteomics
Genomics Proteomics & Bioinformatics
Bioinformatics
Journal of Bioinformatics and Computational Biology

Bot 403 B- APPLIED MOLECULAR BIOLOGY AND PLANT BIOTECHNOLOGY

Unit-I

Applications of plant biotechnology in agriculture, horticulture, forestry and pharmaceuticals. Biotechnology parks/incubators in India. Public private partnership in biotechnology industry in India: Biotechnology industry research assistance council (BIRAC).

Unit-II

Production of plant products by *in vitro* cultured cells and organs. Bioreactors and optimization strategies of production of plant secondary metabolites. *In vitro* production of Ginseng and Shikonin as a model system for industries.

Unit-III

Bioanalytics: Identification and structural elucidation of pharmaceutical and nutritionally important plant metabolites using chromatography, Mass spectrometry and NMR spectrometry. Determination of characteristics of plant constituents: Markers, Near infra red spectroscopy (NIRS), Solid phase microextraction (SPME), ELISA, Spectrophotometric color measurement.

Unit-IV

Plant molecular biotechnology: Plant cultivar/genotype identification by nuclear/organellar genome/isozyme profiling. Gene tagging and their role in yield and quality improvement. Terminator and traitor technology. Biosensor technology: principles and applications

Unit-V

Intellectual Property Protection of Plant Biotechnology: Utility patents, TRIPS, Plant Variety Protection, Geographical indicators, Biotechnology directives, ethics of patenting plant biotechnology.

Laboratory Exercises

1. Development of regeneration protocols employing direct and indirect organogenesis / somatic embryogenesis in economically important horticultural and/or medicinal plants.
2. Control of phenolics in recalcitrant tissues under culture conditions.

3. Study of various physico-chemical factors (pH, light, hormones, etc.) on *in vitro* growth and development of tissues or organs, rooting of regenerants, and hardening.
4. Isolation of bioactive compounds from medicinal plants using column chromatography and TLC.
5. DNA profiling
6. Protein/enzyme profiling.

Suggested Readings

Weaver, R. F. and Hedrick, P. W. 1992. *Genetics* (2nd ed.). Dubuque, IA: Wm. C. Brown Publishers.

Pauline, M. D. 1997. *Hairy Roots: Culture and Applications*. Harwood Academic Publishers.

Peter, C. and Rolf, B. 2000. *Computational Molecular Biology: An Introduction*. John Wiley & Sons Ltd.

Brown, T.A. 1999. *Genomes*. John Wiley & Sons (Asia) Pvt. Ltd., Singapore.

Phillips, R. L. and Vasil, I. K. 1994. *DNA- Based Markers in Plants*. Kluwer Academic Publishers.

Schena, M. 1996. *DNA microassays (A Practical Approach)*. Oxford University Press.

Woung-Young, S. and Bhojwani, S. S. 1999. *Morphogenesis in Tissue Cultures* (ed.). Kluwer Academic Publishers.

Herman EB (2008) Media and Techniques for Growth, Regeneration and Storage 2005-2008. Agritech Publications, New York, USA.

Pierik RLM (1999) In Vitro Culture of Higher Plants. Kluwer Academic Publishers.

George EF, Hall MA and Geert-Jan De Klerk (2008). Plant Propagation by Tissue Culture (3rd Edition), Springer, Netherlands.

Research Journals

Gene
 Plant Gene
 Gene Reports
 Indian Journal of Biotechnology
In vitro Cellular and Developmental Biology-Plants
 Plant Cell Tissue and Organ Culture

Bot 403 C - PLANT DISEASES AND THEIR MANAGEMENT

Unit I

Non- infectious disease: mineral deficiencies, Black heart of Potato and Khaira disease of Rice
 Viroid and Viral disease: Potato spindle tuber, Tobacco Mosaic, Yellow vein mosaic of Bhindi, Leaf curl of Papaya, yellow mosaic of beans
 Phytoplasma disease: Little leaf of Brinjal, Witches broom of potato, sesamum phyllody, grassy shoot of sugarcane

Unit II

Bacterial disease: Major plant pathogenic bacteria, pathogenic bacteria-host interaction, Citrus canker, Angular leaf spot of cotton, Tundu disease of wheat, Bacterial wilt of Cucurbit & tomato and Crown gall of fruits plants.

Unit III

Fungal disease: Wart disease of potato, Damping off of chilli, Late blight of potato, Downy mildew & Green ear disease of bajra, stem gall of coriander and Powdery mildew of cereals.

Unit IV

Fungal disease: Ergot of Bajra, Smut of Bajra, Rust of Wheat, Early blight of Potato, Tikka disease of Groundnut, Blast of Rice, Red rot of Sugarcane, Wilt of cotton and Blight of Gram.

Unit V

Nematode disease: General characters of plant parasitic nematodes, host parasite interactions, Principles and methods of nematode control, Ear cockle of Wheat, Molya disease of Barley and Root Knot disease of vegetables.

Laboratory Exercises

1. Demonstration of Koch's postulates for pathogenic microbes.
-

2. Isolation and Purification of plant pathogenic viruses.
3. Detection of plant viruses from infected leaf tissue using ELISA and Western Blot.
4. Isolation of Male, Female, II stage larva and eggs of Nematode for disease cycle study.
5. Microscopic study of pathogenic fungi: *Mucor*, *Rhizopus*, *Chaetomium*, *Penicillium*, *Aspergillus*, *Alternaria*, *Curvularia*, *Helminthosporium*, *Drechslera*, *Fusarium*, *Phoma*, *Colletotrichum*.
6. Microscopic study of pathogenic bacteria: *Agrobacterium*, *Xanthomonas* and *Pseudomonas*.
7. Microscopic study of biocontrol agents: *Trichoderma*, *Gliocladium*, *Metarrhizium*, *Paecilomyces*, *Beauveria*, *Streptomyces* and *Bacillus thuringiensis*.
8. In vitro study of effect of different fungicide on growth of pathogenic microbes.
9. In vitro study of effect of different biocide on growth of pathogenic microbes.
10. Antagonistic effect of biocontrol agents on pathogenic microbes.
11. Isolation of genomic DNA from pathogenic fungi and bacteria
12. Qualitative and quantitative analysis of genomic DNA using gel electrophoresis and UV-spectrophotometer.
13. Amplification of ITS-5.8S gene of pathogenic fungi using PCR
14. Amplification of 16S gene of pathogenic bacteria using PCR
15. Blast searching of amplified gene sequences for identification of pathogens

Suggested Readings

- Agarwal, V.K. and Sissclair, J.B. 1993. Principles of Seed Pathology. Vol. I & II CBS Publishers and Distributors, India
- Agrios, G.N. 1997. Plant Pathology. Academic Press, London.
- Albajes, R., Gullino, M.L., Van Lenteren, J.C. and Elad, Y. 2000. Integrated Pest and Disease management in Greenhouse Crops. Kluwer Academic Publishers.
- Mehrotra, R.S. 1993. Plant Pathology, Tata McGraw Hill.
- Neergaard, P. 1997. Seed pathology, Vol. I & II. The Macmillan Press.Ltd, London.
- Pandey, B.P. 1997. Plant Pathology, Pathogen and Plant Disease. S. Chand and Company Ltd.
- Rangaswamy, G. and Mahadevan, A. 1999. Disease of crop plants in India. Prentice Hall of India, New Delhi.
- Roger, H. 2001. Mathew's Plant Virology, Academic Press, NY.
- Sharma, P.D. 2006. Plant Pathology. Rastogi Publications, India
- Singh, R.S. 1998. Plant disease. Oxford and IBH Publication Co. Pvt. Ltd.
- Singh, R.S. 2005. Introduction to Principles of Plant Pathology. Oxford & IBH Publication Co. Pvt. Ltd.
- Strange, R.N. 2003. Plant resistance mechanism (SAR, ISR) –Introduction to plant Pathology, John Wiley & Sons, USA.
- Suryanarayana, D. 1978. Seed pathology. Vikas Publishing House, Pvt. Ltd.

Bot 403 D- PLANT MICROBE-INTERACTIONS (PMIs)-II

Unit I

Genetics and molecular basis of host-parasite interaction. Phenomenon of pathogenic infection. Effect of pathogens on the host physiology. Basic procedure of diagnosis of plant diseases. Management of plant diseases with special references to biological control of plant pathogens. List of major plant diseases caused by Viruses, phytoplasma, Bacteria, Fungi and Nematodes.

Unit II

Plant growth promoting rhizobacteria (PGPR), Mechanisms of PGPR: Phosphate solubilization, siderophore production, ACC-deaminase, Phytohormones production and PGPR as bio-control agent. Consortium of Agriculturally important microbes.

Unit III

Brief account of molecular basis of plant-virus/viroid/phytoplasma interactions and interaction of nematodes with plants; molecular mechanisms of bacterial pathogenicity to plants with special reference to *Agrobacterium* and *Pseudomonas*; Systemic acquired resistance, Hypersensitive response and plant programmed cell death (PCD). Significance of genomic studies in understanding molecular basis of plant-microbe interaction.

Unit IV

Plant-microbiota interactions: composition of plant-associated microbial communities, keystone microbial species in plant-microbiome; cooperative and competitive interactions among plant microbiota members; role of root exudates and

phytohormones in shaping plant's microbial community.

Unit V

Emerging trends in microbial application: plant-microbiota interactions in Next-Generation crop breeding programmes, selection of microbiome for sustainable agro-ecosystems, microbiome-mediated stress resistance in plants, Synthetic microbial communities (SynComs), Plant microbiome engineering, complexity and challenges of field application of plant-associated microbiota.

Laboratory Exercises

1. Metabolism of microorganisms-hydrolysis of starch, urea and gelatin.
2. Demonstration of phosphate solubilization by bacterial isolates using PVK medium
3. Ammonia production by bacterial isolates.
4. Phylogenetic analysis of rhizobia based on housekeeping and symbiotic genes using MEGA software.
5. Tagging of root nodule bacteria with GUS gene and screening of GUS transconjugants.
6. *In-vitro* and glass house based cross-inoculation/host range experiments using rhizobial strains.
7. Performing GUS histochemical staining for localization of GUS tagged bacteria within root nodule.
8. Comparing rhizobial genomes in JGI database using IMG-Genome portal.
9. Analysis of genes related to plant growth promotion (PGP) activities in rhizobial genomes.
10. Preparation of basic solid media, agar slant for cultivation of pathogenic microorganism.
11. Isolation of fungal and bacterial pathogens from leaves.
12. Isolation of fungal and bacterial pathogen from stems fruits and other aerial plant parts.
13. Microscopic preparation and study of pathogenic microbes.
14. Detection of plant viruses from infected leaf tissue using ELISA and Western Blot.
15. Demonstration of Koch's postulates for pathogenic microbes.
16. Screening for antagonism.

Suggested Readings

- Bergey's Manual of Systematic Bacteriology*. Second Edition. Volume Two (The Proteobacteria). Springer.
- Boyd, R. F. 1984. *General Microbiology*. Times Mirror Publishers, New Delhi.
- Chandra, S. and Kehri, H. K. 2006. *Biotechnology of VA Mycorrhizae: Indian Scenario*. New India Publishing Agency, New Delhi.
- Dilworth, M. J., James, E. K., Sprent, J. I. and Newton, W. E. 2008. *Nitrogen-fixing Leguminous Symbioses*. Springer.
- Pawlowski, K. and Newton, W. E. 2008. *Nitrogen-fixing Actinorhizal Symbioses*. Springer.
- Pelczar, M. J., Chau, E. C. G. and Krieg, N. R. 1993. *Microbiology concepts and application*. McGraw Hill, New Delhi.
- Power, C. B. and Dagainawala, H. F. 1992. *General Microbiology*. Himalaya Pub. House, New Delhi.
- Prescott, S. C. and Dunn, C. G. 1993. *Industrial Microbiology*. McGraw Hill Pub., New Delhi.
- Salle, A. J. 2004. *Fundamental & Principles of Bacteriology*. Tata McGraw Hill Pub., New Delhi.
- Smith, S. E. and Read, D. J. 1997. *Mycorrhizal Symbiosis*, Third Edition. Academic Press, London.
- Somasegaran, P. and Hoben, H. J. 1994. *Handbook of Rhizobia (Methods in Legume-Rhizobium Technology)*. Springer-Verlag.
- Sprent, J. I. 2001. *Nodulation in legumes*. Kew Publishing.
- Stéphane, D., Georges, S. D. and André, F. J. 2005. *In Vitro Culture of Mycorrhizas*. Springer.
- Tiwari, M. and Sati, S. C. 2008. *The Mycorrhizae: Diversity Ecology & Applications*. Daya Publisher, New Delhi.
- Vincent, J. M. 1970. *A manual for the practical study of the root nodule bacteria*. Blackwell Scientific Publications.
- Nitrogen Fixation in Agriculture, Forestry, Ecology and the Environment edited by Dietrich Werner and William E. Newton. Springer Nitrogen Fixation: Origins, Applications and Research Progresses, Volume 4 (2005)
- Jones P, Garcia BJ, Furches A, Tuskan GA, Jacobson D (2019) Plant host-associated mechanisms for microbial selection. *Front. Plant Sci.* 10, 862. doi: 10.3389/fpls.2019.00862
- Hassani MA, Durán P & Hacquard S (2018) Microbial interactions within the plant holobiont. *Microbiome* 6, 58 <https://doi.org/10.1186/s40168-018-0445-0>
- Teixeira PJP, Colaianni NR, Fitzpatrick CR, Dangl JL (2019) Beyond pathogens: microbiota interactions with the plant immune system. *Current Opinion in Microbiology*, 49, 7–17. doi:10.1016/j.mib.2019.08.003
- Bulgarelli D, Schlaeppi K, Spaepen S, van Themaat EVL and Schulze-Lefert P (2013). Structure and functions of the
-

bacterial microbiota of plants. *Annu. Rev. Plant Biol.* 64, 807–838. doi: 10.1146/annurev-arplant-050312-120106

Banerjee S, Schlaeppi K, van der Heijden MGA (2018) Keystone taxa as drivers of microbiome structure and functioning. *Nature Reviews Microbiology*, 16(9), 567–576. doi:10.1038/s41579-018-0024-1

Toju H, Peay KG, Yamamichi M et al. (2018) Core microbiomes for sustainable agroecosystems. *Nature Plants* 4, 247–257. <https://doi.org/10.1038/s41477-018-0139-4>

Arif I, Batool M, Schenk PM (2020) Plant microbiome engineering: expected benefits for improved crop growth and resilience. *Trends Biotechnol.* 1–12. 10.1016/j.tibtech.2020.04.015

Gopal M & Gupta A (2016) Microbiome selection could spur next-generation plant breeding strategies. *Frontiers in microbiology*, 7, 1971. <https://doi.org/10.3389/fmicb.2016.01971>

Stanley CE, van der Heijden M G (2017) Microbiome-on-a-chip: new frontiers in plant–microbiota research. *Trends in microbiology*, 25(8), 610-613.

Compant S, Samad A, Faist H, & Sessitsch A (2019) A review on the plant microbiome: Ecology, functions, and emerging trends in microbial application. *Journal of advanced research*, 19, 29-37

de Souza R, Armanhi J, Arruda P (2020) From Microbiome to Traits: Designing Synthetic Microbial Communities for Improved Crop Resiliency. *Frontiers in plant science*, 11, 1179. <https://doi.org/10.3389/fpls.2020.01179>

Qin Y, Druzhinina IS, Pan X, Yuan Z (2016). Microbially mediated plant salt tolerance and microbiome-based solutions for saline agriculture. *Biotechnology Advances*, 34(7), 1245-1259.

Liu H, Brettell LE, Qiu Z, Singh BK (2020) Microbiome-Mediated Stress Resistance in Plants. *Trends in Plant Science*. 25(8), 733-743 <https://doi.org/10.1016/j.tplants.2020.03.014>

Sessitsch A, Pfaffenbichler N, Mitter B (2019) Microbiome Applications from Lab to Field: Facing Complexity. *Trends in Plant Science*. doi:10.1016/j.tplants.2018.12.004

Ding B (2009) The Biology of Viroid-Host Interactions, *Annual Review of Phytopathology*. 47:105-131 (<https://doi.org/10.1146/annurev-phyto-080508-081927>)

Kovalskaya N, Hammond RW (2014) Molecular biology of viroid-host interactions and disease control strategies. *Plant Science : an International Journal of Experimental Plant Biology*. 228:48-60

Adkar-Purushothama CR, & Perreault JP (2020) Current overview on viroid–host interactions. *Wiley Interdisciplinary Reviews: RNA*, 11(2), e1570.

Gheysen G, Jones JT (2006) Molecular aspects of plant-nematode interactions. *Plant nematology*. 234-254.

Shukla N, Kaur P, Kumar A (2016). Molecular aspects of plant-nematode interactions. *Indian Journal of Plant Physiology*, 21(4), 477-488.

Bot 403 E- CYTOGENETICS AND PLANT BREEDING -II

Unit I

Natural breeding systems in plants and their application in plant breeding. Selection and breeding strategies for self-pollinated, cross-pollinated and clonally propagated crop plants.

Unit II

Genetics, evolution and breeding of major crop plants – Wheat, Rice, *Brassica* and Groundnut; Plant breeding work done in India on these crops.

Unit III

Origin and history of crop plants: Plant domestication - morphological, agronomic and genetic features accompanying domestication of plants. Genetic basis of inbreeding and heterosis, exploitation of hybrid vigor, Male sterility and its application on crop improvement.

Unit IV

Mutation breeding, use of polyploidy and distant hybridization in plant breeding. Mechanisms and genetic bases of resistance/tolerance to biotic and abiotic stresses in plants, breeding for resistance/tolerance.

Unit V

Release and registration of new varieties, quality seed - classes, production practices and maintenance of pure seed, seed purity standards, UPOV convention and convention on biodiversity.

Practical Exercises

1. Floral biology in self and cross-pollinating crop species
2. Selfing and crossing techniques in major field crops
3. Determination of extent of outcrossing
4. Male sterility - detection & maintenance;

5. Self-incompatibility and techniques of maintenance and overcoming sporophytic and gametophytic incompatibility
6. Screening for quality traits; resistance/tolerance to biotic & abiotic stresses
7. Demonstration of quality seed production through nucleus and breeders seed production techniques.

Suggested Readings

- Acquaah G (2007). Principles of Plant Genetics and Breeding, Blackwell Publishing Ltd. USA.
- Allard RW (1999). Principles of Plant Breeding (2nd Edition), John Wiley and Sons, ISBN 0471023094, 9780471023098.
- Allard, R.W. 1960. Principles of Plant Breeding. John Wiley & Sons, New York.
- Fehr, W.R. 1987. Principles of Cultivar Development (2 Volumes). Mac Millan Publishing Co., New York.
- Hays, H.K., Immer, F.R. and Smith, D.C. 1955. Methods of Plant Breeding. McGraw Hill Book Company, Inc., New York.
- Lewin B (2008). Genes IX, Jones and Barlett Publishers, ISBN-10: 0763740632.
- Poehlman, J.M. 1986, Breeding Field Crops. AVI Publishing Company, Connecticut.
- Simmonds (1995). Evolution of Crop Plants (2nd Edition) Longman.
- Singh, B.D. 2000. Plant Breeding-Principles and Methods. Kalyani Publishers, New Delhi.

Bot 403 F- INDUSTRIAL MICROBIOLOGY II

Unit I

Antibiotics: Classification, mode of action, commercial production: Penicillin and streptomycin. Production of vaccines.

Unit II

Nitrogen fixing Biofertilizers: *Rhizobium*, *Azospirillum*, and *Azotobacter*. Plant growth promoting *Rhizobacteria*, Blue green algae. Phosphate mobilizing Biofertilizers. Industrial Production of Biofertilizer.

Unit III

Biopesticides and Bioherbicides, Plant incorporated protectants (PIPs). Biofuel: Biogas production. Role of EPA (Environmental Protection Agency)

Unit IV

Biofilm, Biochip, Biosensor, Biosurfactants, Biosorption, Bioremediation and Bioleaching.

Unit V

Textile microbiology: (Cotton and wool). Petroleum microbiology and Leather Microbiology.

Laboratory Exercises

1. Effect of various factors on the growth of microorganisms (pH, Temp, UV light)
2. Cultivation of Nitrogen fixing Biofertilizers: *Rhizobium*, *Azospirillum*, *Azotobacter*.
3. Oligodynamic action of heavy metals.
4. Antibiotic sensitivity test by agar disc diffusion and
5. Antibiotic sensitivity test by tube dilution methods.
6. Isolation & identification of Mycorrhizal fungi from Rhizosphere soil.
7. Production of penicillin
8. Production of citric acid.
9. Isolation and characterization of bacteria from hydrocarbon contaminated soils.

Suggested readings

- Casida, L.E. *Industrial Microbiology*. John Wiley and sons. Chum. *Microbiology*. John Wiley & Sons.
- Corum, C.J. Development of Industrial Microbiology. American Institute of Bio. Science.
- Dube .C., and Maheshwari D.K. , A Text Book of Microbiology , S. Chand and co. Ltd
- Dube R. C., and Maheshwari D.K. , Practical Microbiology , S. Chand and co. Ltd
- Kaushik, P. Microbiology. Emkay Pub., New Delhi.
- Pelzer, M.J., Chau, E.C.G. and Krieg, N.R. Microbiology Concepts and application. McGraw Hill.
- Power, C.B. and Dagainawala, H.F. General Microbiology. Himalaya Pub. House.
- Prescott, S.C. and Dunn, C.G. Industrial Microbiology. McGraw Hill Pub.

Robert F. Boyd. General Microbiology. Times Mirror Publishers.
Salle, A. J. Fundamental & Principles of Bacteriology. Tata McGraw Hill.
Sivakumar P.K., Joe M.M, Suresh K., An Introduction to Industrial Microbiology, Pub.: S. Chand and co. Ltd
Spencer, J.E.T. and Spencer, D.M. Yeast Technology. Springer-Verlag.
Staubury, P.F. and Whiterker, A. Principles of Fermentation Technology. Pergamon Press.
Thoma, R.W. Industrial Microbiology. Hutchinson & Ross.
Tortora, G.J., Funke, B.R. and Casechristie: Microbiology. Benjamin Publishing Co.
Cappuccino, J and Sherman, N. Microbiology: A Laboratory manual. Pearson publication.

Bot 404 A- DESERT ECOLOGY

Unit I

Aeolian sand and sand dunes: Alluvial and aeolian sand, windblown sediments, mechanics of Aeolian sand transport, importance of aeolian sand research; Sand dunes, formation, classification, stabilization and management, spatial analysis of aeolian sand dunes, sand dune dynamics and climate change.

Unit II

Drought and Indira Gandhi Canal: Drought: definition, types, implication and management techniques; Indira Gandhi Canal: History, ecological implications and its present status

Unit III

Saline habitats and Wastelands: Inland Saline: Habitat and vegetation characteristics, germination, growth and survival adaptations. Wasteland development: definition, nature and characteristics of wasteland. Wastelands in Rajasthan.

Unit IV

Wetlands and Desert Resources: Wetlands: Introduction, characteristics, distribution in world, wetlands in India and their importance. Thar Desert Resources: Forest, energy, minerals, livestock and rangeland conditions, Ecology of grazing lands and impact of over-grazing,

Unit V

Desert vegetation and Adaptations: Origin, characters and Geomorphology of Thar desert; Vegetation and floral composition of the Rajasthan desert; Adaptations of plants matching the desert environment; Effect of biotic factors on desert vegetation

Laboratory/field exercises

1. Seed to seedling character relationships.
2. Stomata size, opening rhythm and density in two well adapted desert plants.
3. Measurement of water loss by quick weighing method
4. Measurement of relative water content in desert plants.
5. Measurement of succulence in desert halophytic plants
6. Measurement of soil salinity in Thar desert
7. Quantification of ions (Na^+ and Cl^-) concentrations in halophytes
8. Quantification of proline concentrations in plants of desert/haloxeric environment
9. Quantification of soluble salts (Na^+ and Cl^-) in desert soils.

Suggested Readings

Faroda, A.S. and Singh, M. 1998. *Fifty years of Arid Zone Research in India* (eds.) CAZRI, Jodhpur, 476 pp.
Pachausri, R.K. and Qureshy, L.F. 1997. *Population, Environment and Development* (eds.) TERI, New Delhi.
Rice, E.L. 1984. *Allelopathy* (2nd Edition), Academic Press, New York.
Sen, D.N. 1982. *Environment and Plant Life in Indian Desert*. Geobios International, Jodhpur.
Sen, D.N. 2003. *Ecology and Vegetation of Indian Desert* (eds.) Agro Botanical Publishers, India 340 pp.
Singh, R.P. and Singh S. 2001. *Sustainable Development of the Indian Arid Zone – A Research Perspective* (eds.), Scientific Publishers, Jodhpur.

Bot 404 B- MICROBIAL ECOLOGY - II

Unit I

Microbial communities in extreme environments and their functions: Adaptation and response to stimuli. Measurement of microbial metabolism: Heterotrophic potential, productivity and decomposition.

Unit II

Development and dynamics of microbial communities. Population selection within communities (r and k strategies). Succession within microbial communities (during degradation of organic matter, nutrient cycling, and in biofilms)

Unit III

Detection of microbial populations: Phenotypic detection, lipid profile analysis, molecular detection. Detection of non-culturable bacteria. Determination of microbial numbers (direct count and viable count procedures) and biomass (biochemical assays and physiological approaches).

Unit IV

Association of microbes with other organisms: Interactions of microorganisms with plants and animals, microbial contribution to animal nutrition, gut microbiome and its importance, predation of microorganisms by animals, cultivation of microorganisms for food and food processing, commensal and mutualistic intestinal symbionts, digestion within rumen, mutualistic association of invertebrates with photosynthetic, chemolithotrophic and methanotropic microorganisms.

Unit V

Microbial role in nutrient cycling and remediation of pollutants: Carbon cycle, Nitrogen cycle, Sulfur cycle and Phosphorus cycle.

Biodeterioration and its control. Microbial interaction with xenobiotic and inorganic pollutants, persistence and biomagnification of xenobiotic molecules.

Biodegradability: Biodegradation and heterotrophic production in aquatic environments. Biodegradability and ecological side effect testing, testing for biodegradability and biomagnifications.

Bioremediation: Approaches to bioremediation.

Laboratory Exercises

1. Enumeration of the nutrient requirements of microorganisms
2. Isolation of microorganism with specific capabilities or those adapted to specific habitats
 - a. Isolation of temperature resistant microorganisms
 - b. Isolation of anaerobes
 - c. Isolation of extremely halophilic bacteria
 - d. Isolation of cellulolytic microorganisms
 - e. Isolation of chitin decomposing bacteria
 - f. Enrichment of methane utilizing bacteria
 - g. Isolation of phosphatase active microorganisms
 - h. Enrichment and isolation of photosynthetic bacteria
 - i. Enrichment for nitrifying bacteria
 - j. Isolation and culture of blue green algae
3. Study of enzyme activities of microorganisms
 - a. Dehydrogenase
 - b. Urease
 - c. B-glucosidase
 - d. Acid and alkaline phosphatase

Suggested Readings

- Aronson, S. 1970. *Experimental microbial ecology*. Academic Press.
- Burlage, Robert S. 1998. *Techniques in Microbial Ecology*. Oxford University Press.
- Atlas, R. M. and Bartha. 1998. *Microbial Ecology: Fundamentals and Applications*. The Benjamin/Cummings Science Publishing.
- Bernhard, S. 2000. *Advances in Microbial Ecology*. Springer.
- Singer, S. 2001. *Experiments in Applied Microbiology*. Academic Press.
-
-

Kirchman, D.L. 2012. *Processes in microbial ecology*. Oxford University Press.

Bot 404 C- STRESS PHYSIOLOGY-II

Unit I

Photo-inhibition: Photoinhibition of Photosystem under environmental stresses. Photoprotection and repair mechanism of photosystem II in plants. Stomatal regulation under stress.

Unit II

Strategies and Mechanisms of stress tolerance: Biochemical and molecular basis of water deficit and salt tolerance in plants. Molecular mechanism of salinity tolerance; Strategies to improve crop plants for stress tolerance (water deficit, salinity and low and high temperature stress) using transgenic plants

Unit III

Stress Proteins: Genes regulated by environmental stress. Structure and functions of some important stress proteins (HSPs, ANPs, PR proteins, LEA proteins, aquaporins, osmotin, systemins, defensins, ubiquitins).

Unit IV

Stress induced genes: Expression of Stress Signaling Pathway Genes under Drought, Salinity and temperature stresses. Expression of Cell Expansion Genes under Drought. Improve crop plants for biotic (pathogen: Bacterial, Fungal) stress tolerance using transgenic plants.

Unit V

Plant growth regulators and stress: Role of PGRs in mitigation of stress. Role of ABA, Ethylene, Salicylic acid and Jasmonic acid.

Laboratory Exercises

1. Estimate free amino acids content in the given sample.
2. Estimate proline content in given water stressed samples.
3. Estimate glycine betaine content in salt stressed samples.
4. Estimate total phenol content in salt stressed samples.
5. Find out the soluble sugars in temperature (low and high) and salt stressed samples.
6. Find out the concentration of polyamines in the given stressed samples.
7. Visualization of stress proteins by SDS-gel electrophoresis.

Suggested Readings

- Ahmad, P., Azooz, M.M. and Prasad M.N.V. 2013. *Salt Stress in Plants: Signalling, Omics and Adaptations* (eds). Springer
- Alscher, R. G. and Cumming, J. R. 1990. *Stress Responses in Plants: Adaptation and Acclimation Mechanisms* (eds.). New York Wiley-Liss, Inc.
- Aroca, R. 2012. Plant Responses to Drought Stress From Morphological to Molecular Features. (ed) Springer-Verlag Berlin Heidelberg.
- Basra, A. S. 2001. *Crop Responses and Adaptations to Temperature Stress* (ed.). Food Products Press, New York.
- Basra, A. S. and Bastra, R. K. 1997. *Mechanisms of Environmental Stress in Plants* (ed.). Amsterdam: The Netherlands, Harwood Academic Publishers.
- Belhassen, E. 1997. *Drought Tolerance in Higher Plants: Genetical, Physiological and Molecular Biological Analysis* (ed.). Kluwer Academic Publishers, Dordrecht.
- Buchanan, B. B., Gruissem, W. and Jones, R. L. 2000. *Biochemistry and molecular biology of plants*. American Society of Plant Physiologists, Maryland, USA.
- Cherry, J. H. 1994. Biochemical and cellular mechanisms of stress tolerance in plants (ed.). Springer-Verlag, Berlin.
- Dhaliwal, G. S. and Arora, R. 1999. *Environmental Stress in Crop Plants* (ed.). Commonwealth Publishers, New Delhi.
- Grillo, S. and Leone, A. 1997. Physical Stresses in Plants: Genes and Their Products for Their Tolerance. Springer-Verlag, Berlin.
- Hedden, P. and Thomas S.G. 2006. *Plant Hormone Signaling*. Blackwell Publishing Ltd .Oxford, UK
- Hirt, H. 2009. *Plant Stress Biology: From Genomics to Systems Biology* (ed), Wiley-VCH Verlag Weinheim, Germany
- Jenks, M.A. and Wood A.J. 2009. *Genes for Plant Abiotic Stress Tolerance*. John Wiley & Sons.
-
-

- Khan, M.N. and Mobin M. 2014. Nitric Oxide in Plants: Metabolism and Role in Stress Physiology(eds) Springer
- Lerner, H. R. 1998. *Plant Responses to Environmental Stresses (from Phytohormones to Genome Reorganization)*. Merceel Dekker, Inc.
- Levitt, J. 1980. *Responses of plants to environmental stress. Vol. 1. Chilling and temperature stress*. Academic Press, New York, USA.
- Pandey, G.K. 2015. *Elucidation of Abiotic Stress Signaling in Plants: A Functional Genomic Perspective*. Springer
- Pessarakli, M.2014. *Handbook of Plant Crop Stress* (ed.). CRC Press
- Rout, G. R. and Das, A. B. 2013. *Molecular Stress Physiology of Plants* (eds.) Springer .
- Samuelson, J.C. 2013. *Enzyme Engineering: Methods and Protocols* (ed) .Springer ,New York
- Sarwat, M., Ahmad, A. and Abdin, M.Z. 2013. *Stress Signaling in Plants: Genomics and Proteomics Perspective*. Vol. 1 . Springer
- Taiz, L. and Ziegler, E. 2003. *Plant Physiology* (3rd edition), Panima Publishing Corporation, New Delhi.
- Tuteja, N. and Gill, S.S. 2014. *Climate Change and Plant Abiotic Stress Tolerance* (eds.). Wiley-VCH Verlag Weinheim, Germany.
- Yoshioka, K.and Shinozaki, K. 2009. *Signal Crosstalk in Plant Stress Responses* (eds). Willey-Blackwell.

Bot 404 E- BIOSYSTEMATICS OF PLANTS -II

Unit -I

Taxonomy services and Conservation. Introduction, field inventorisation, Collection, Preservation, documentation and handling of Herbarium, Data information systems, Flora, Monographs, Manuals, Journals, Botanical Gardens, Botanical Survey of India.

Unit -II

Molecular Systematic:Plant genome analysis-Genome size, polyploidy,nuclear, chloroplast and mitochondrial genome sequence data; gene mapping, gene sequencing; DNA Barcoding; Molecular marker- restriction site analysis (RFLPs), Microsatellites, RAPDs, AFLPs, SNPs.

Unit -III

Phylogenetic:- Nature of phylogeny, importance of homology, polarizing character of homology, phylogenetic diagrams, Phylogenetic classification; Analysis of molecular data: alignment of sequences, methods of phylogeny of reconstruction- Parsimony based method, Distance methods, maximum likelihood method, Bayesian method

Unit IV

Biosystematics: Aims and Procedure; Role of biosystematics in evolution.

Systematics of floral diversification: Pathway of morphological evolutionary innovation; Variation in floral form; Pollination morphological elaboration in flower; Systematics of floral developmental diversity of major angiosperm groups, floral developmental genetics.

Unit -V

Introduction to the general characters and evolutionary trends in eudicots angiosperms; Salient features of following groups up to orders:-Basal eudicots-Ranunculales, Proteales;Core eudicot:- Caryophyllids clade-Gunerales, Saxifragales, Caryophyllales; Rosids superclade :- Fabids clade- Zygophyllales, Malpigiales, Fabales, Cucurbitales; Malvids clade-Brassicales, Malvales, Sapindales; Asterids superclade:- Cornales, Ericales,Lamiids clade-Boraginales, Gentianales, Lamiales, Soanales; Campanulids clade- Aquifoliales, Apiales, Astrales.

PRACTICALS:

1. Live plants/ Herbarium specimens of the following families will be provided in the class for description and identification (classification based on APG III, 2009):
 - Basal Eudicots:-Ranunculaceae, Nelumbonaceae
 - Caryophyllids: Caryophyllaceae, Amarathaceae
 - Rosids: Zygophyllaceae, Euphorbiaceae, Rosaceae, Fabaceae, Cucurbitaceae,

Capparaceae, Malvaceae

- Asterids: Boraginaceae, Acanthaceae, Orobanchaceae, Solanaceae, Lamiaceae, Apiaceae, Asteraceae
2. Studies of flower diversities of major angiosperm groups
 3. Techniques in molecular systematic: DNA isolation and amplification, Polymorphism analysis
 4. Computer Exercises: Finding DNA Sequences in Gene Bank; aligning the sequences, and making phylogenetic trees
 5. Preparation of Herbarium and excursion studies of desert region

SUGGESTED READINGS:

- Angiosperm Phylogeny Group 2003. An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG II. *Botanical Journal of the Linnean Society* 141: 399-436.
- Besse, P. 2014. *Molecular Plant Taxonomy: Method and Protocols*. Humana Press.
- Crank, Q.C.B., Bateman, R. M. And Hawkins, J. A. 2002. *Developmental genetics and Plant Evolution*. Taylor and Francis Inc. USA and Canada
- Crawford, D.J. 2003. *Plant Molecular Systematics*. Cambridge University Press, Cambridge, UK.
- Garamszegi, L.Z. 2014, *Modern phylogenetic comparative methods and their application in evolutionary biology-Concepts and Practice*. Springer
- Gurcharan Singh, 2010. *Plant Systematics: An Integrative Approach*. Science Publishers, Enfield, NH, USA
- Hall B.G. 2004, *Phylogenetic Tree Made Easy-A How- to Manual*. Sinauer Associates Inc. Publisher Sunderland, Massachusetts, U.S.A
- Hamilton A. 2014, *The evolution of phylogenetic systematics*. University of California, Press
- Harris, J.G. and Harris, M.W. 2001. *Plant identification terminology: An illustrated Glossory*. Spring Lake Pub.
- Hollingsworth, P.M., Bateman, R.M. and Gornall, R.J. 2002. *Molecular systematic and Plant Evolution*. Taylor and Francis, London and Newyork.
- Judd, W.S., C.S. Campbell, E.A. Kellogg, P.F. Stevens and M.J. Donoghue 2002. *Plant Systematics: A phylogenetic Approach*. Sinauer Associates, Inc., Massachusetts.
- Lemey P., Salemi M., Vandamme A-M. 2009, *The phylogenetic handbook: A practical approach to phylogenetic analysis and hypothesis testing*. Cambridge University Press.
- Nei, M. and S. Kumar 2000. *Molecular Evolution and Phylogenetics*. Oxford University Press, New York.
- Pellen R., Grandcolas P. 2016, *Biodiversity, conservation and phylogenetic systematics-Preserving our evolutionary heritage in an extinction crisis*. Springer
- Radford, A. E., W.C. Dickison, J.R. Massey and C.R. Bell 1974. *Vascular Plant*
- Roderic D.M., Holmes E.C. 1998, *Molecular Evolution: A phylogenetic Approach*. Blackwell Publishing Ltd.
- Scott-Ram, N.R. 1990. *Transformed Cladistics, Taxonomy and Evolution*. Cambridge University Press.
- Semple, C. and Steel M.A. 2003. *Phylogenetics*. Oxford University Press, Oxford.38
- Simpson M.G. 2013, *Plant Systematics-Laboratory manual*. San Diego State University
- Simpson, M.G. 2010. *Plant Systematics*. Elsevier, Amsterdam.
- Soltis D. et al., 2018, *Phylogeny and Evolution of the Angiosperm, Revised & updated edition*, University of Chicago Press, Chicago & London
- Soltis, P.S., Soltis, D.E. and Doyle, J. J. 1992. *Molecular Systematics of Plants*. Chapman and Hall
- Stuessy, T.F. 2009. *Plant Taxonomy: The systematic Evaluation of Comparative Data*. Columbia University Press, New York.
- Wiely, E.O. Libermann R. S. 2011, *Phylogenetics: Theory and practice of phylogenetic systematics*. Wiely-Blackwell Publication

Bot 404 F- ENVIRONMENTAL MONITORING, MANAGEMENT AND RESTORATION - II

Unit I

Global Warming: Green house effect and global warming; ozone depletion; UV- B radiations; acid rain. Environmental monitoring; Biomonitoring; Bioindicators.

Unit II

Management: Survey and classification of natural resources; conservation; management of resources: Management and utilization of inland freshwater resources; management of forest resources. Non-conventional sources of energy; Biomass as a source of energy.

Unit III

Biodiversity: Strategies for biodiversity conservation, principles of biodiversity conservation *in-situ* and *ex-situ* conservation strategies, theory of reserve design; Biosphere reserves. Mega diversity zones and Hot spots, concepts, distribution and importance. Threatened plants of India

Unit IV

Management: Industrial ecology- concepts and principles, importance and recycling of resources in industrial production. Environmental Biotechnology– Scope and applications; Concept of cleaner technology

Unit V

Restoration: Aims and strategies of restoration; physical, chemical, biological and biotechnological tools of restoration. Phytoremediation of disturbed ecosystems; Acceleration of ecological succession, reintroduction of biota.

Laboratory/Field Exercises

1. To calculate the dust capturing capacity of the leaves provided to you.
2. To calculate the percentage of the injured area in the leaves provided to you.
3. Study the effect of different lead and cadmium concentrations on the germination of seeds
4. Determination of the Dissolved Oxygen content in water bodies.
5. Determination of the hardness of in water bodies.
6. Determination of the alkalinity in water bodies.
7. Determination of the acidity in water bodies.
8. Determination of the residual chlorine in water bodies.
9. Determination of the organic carbon contents in water bodies.
10. Determination of the contents of calcium carbonate in water bodies.
11. Field survey of important plants of the region for biodiversity assessment.

Suggested Readings

- Bradshaw, A.D. and Chadwick, M.J. 1980. *The Restoration of Land*. Blackwell Scientific Publications, Oxford.
- Singh, A. and Ward, O.P. (Eds.). *Applied Bioremediation and Phytoremediation*. Springer. 2004.
- Abrol, I.P. and Dhruva Narayan, V.V. (Eds.). *Technologies for Wasteland Development*. ICAR, New Delhi. 1998.
- Owen, S.O. and Chiras, D.D. 1990. *Natural Resource Conservation: An Ecological Approach*. Macmillan USA; 5th edition.
- url: www.iucn.org for Global Biodiversity.

SKILL COURSES IN BOTANY

Bot-SC-1- INTELLECTUAL PROPERTY RIGHTS

1. Introduction, Historical perspectives and Forms of IPR.
2. Concept related to Patent: Requirements, procedure, duration.
3. Revocation of patent, Infringement and Litigation with case studies on patent.
4. Fundamentals of Copy Rights, Trade Marks and Industrial Designs.
5. Basics of Geographical Indications; Trade Secrets and Traditional Knowledge.
6. Protection of Plant Varieties (Plant Breeders Rights and Farmer's Right).
7. IPR and Biodiversity (CBD; Protection in biotechnology, protection of other biological materials).
8. Introduction to the leading International Agreements concerning Intellectual Property Rights: WTO (GATT, TRIPS), WIPO, Madrid Protocol, Berne Convention, Paris Convention.
9. Indian Legislations for the protection of various types of Intellectual Properties.
10. Management and Valuation of Intellectual Property.

Suggested Readings:

- Acharya, NK. 2001. Text book on Intellectual Property Rights. Asia Law House.
-

- Arthur RP and Micheal HD. 2000. Intellectual Property: Patents, Trademarks and Copyright in a nutshell. West Group Publishers.
- Das, HK. 2010. Text book of Biotechnology 4th edition. Willey India.
- Erbisch FH & Maredia K. 1998. Intellectual Property Rights in Agricultural Biotechnology. CABI.
- Ganguli P. 2001. Intellectual Property Rights: Unleashing Knowledge Economy. McGraw-Hill.
- Intellectual Property Rights: Key to New Wealth Generation. 2001. NRDC & Aesthetic Technologies.
- Saha R. (Ed.). 2006. Intellectual Property Rights in NAM and Other Developing Countries: A Compendium on Law and Policies. Daya Publ. House.
- Singh, BD. 2010. Biotechnology: Expanding horizons. Kalyani Publishers.
- Wadhwa BL. 2007. Law Relating to Intellectual Property. Universal Law Publishing.
- Wattal, J. 1997. Intellectual Property Right. Oxford Publication House.

Bot-SC- 2- AGROTECHNIQUES FOR DESERT PLANTS

1. Introduction and WHO guidelines on Good Agricultural and Collection Practices (GACPs)
2. Propagation material(s) and techniques
3. Seed biology and germination behaviour
4. Nursery and field techniques of important desert medicinal plants
5. Harvest management
6. Storage techniques
7. Disease management

Laboratory/Field Exercises

1. Morphological features of desert plant seeds
2. To estimate viability and germination behavior of medicinal plant germplasms
3. Techniques for raising of nursery and transplanting in field conditions
4. To demonstrate techniques for storage of germplasm
5. To evaluate important symptoms of disease causing pathogens.

Suggested Readings

- Agro-techniques of selected medicinal plants, Vol. I, Department of AYUSH, New Delhi, 2008
- Chadha, K.L. and Gupta, R. Advances in Horticulture, Vol. 11, Medicinal and Aromatic Plants, Malhotra Publishing House, New Delhi, 1995.
- 50 Years of Crop Research in India, ICAR, New Delhi, 1996.
- Prospects of Medicinal Plants, NBPGR, New Delhi, 1998.
- The Wealth of India. A Dictionary of Indian Raw Materials and Industrial Products, New Delhi. Raw Materials I-XII, Revised Vol. I-III (1985-1992) Supplement (2000), CSIR, New Delhi.

Bot-SC- 3- DATA ANALYSIS AND PRESENTATION

1. Sampling techniques
2. Central tendency – Mean, Median, Mode, Variance, Normalized Variance, Standard Error, Coefficient of Variance
3. Analysis of Variance
4. Correlation
5. Regression
6. Tables and Graphs
7. Preparation of Power Point Presentation

Laboratory/Field Exercises

1. Basic operations in MS-Excel
2. Computation of Central tendency quantifiers in MS-Excel
3. Computational techniques for ANOVA in MS-Excel
4. Computational techniques for Correlation in MS-Excel
5. Computational techniques for regression in MS-Excel
6. Techniques for table preparation in MS-Excel
7. Hands on exercises for Power point presentation

Suggested Readings

- Gomez, A. Kwanchai and Gomez, A. Arturo. 1984. Statistical Procedures for Agricultural Research (second Edition) , John Wiley & Sons, New York
- Mishra, B.N. and Mishra M.K. 1989. Introductory Practical Biostatistics. Naya Prakash Publication, Calcutta.

- Panse, V.G. and Sukhatme, P.V. 1989. *Statistical Methods for Agricultural Workers*. Indian Council of Agricultural Research, New Delhi.
- Quinn, P. Gerry and Keough, J. Michael. 2002. *Experimental Design and Data Analysis for Biologists*. Cambridge University Press Cambridge, UK .
- Rao, Sundar P.S.S. and Richard, J. 2011. *Introduction to Biostatistics and Research Methods*. (4th Ed), PHI Learning Pvt. Ltd., New Delhi.
- Williams, Brain. 1993. *Biostatistics- Concepts and Applications for Biologist*. Chapman & Hall, London

Bot-SC- 4-BIOINFORMATICS

1. Introduction to Bioinformatics and its applications
2. Bioinformatics databases
3. Database searching
4. Sequence Alignments and Visualization
5. Structural Bioinformatics
6. Genomics: Genome Annotation, Genome Assembly, Structural and Functional Genomics.
7. Comparative Genomics
8. Metabolomics
9. Chemoinformatics
10. Molecular phylogeny and evolution
11. Biodiversity informatics

Laboratory Exercises

1. Demonstration of Molecular Biology Laboratory equipments
2. Demonstration of various Next-generation sequencing technologies
3. Introduction of National Center for Biotechnology Information (NCBI) and biological databases
4. Analysis of sequences using BIOEDIT software.
5. Assembly of sequences using GENETOOL software
6. Similarity search using the Blast and interpretation of the results.
7. Multiple Sequence alignment using ClustalW
8. Phylogenetic analysis using MEGA.
9. Submission of nucleotide sequences at NCBI-Gene Bank using Sequin

Bot-SC- 5-MICROPROPAGATION

1. Basic layout of Micropropagation laboratory and Green House
2. Basic Concepts of Micropropagation
3. Tools and Techniques of Micropropagation: LAFB, Autoclave, Filter Sterilization
4. Medium composition and Preparation
5. Basic concept of Aseptic Culture establishment
6. Hardening and Acclimatization

Laboratory Exercises

1. Selection of explants, surface sterilization and inoculation to initiate cultures of tobacco/cereals/legumes.
2. Studies on effects of plant growth regulators on cell, tissue and organ culture.
3. Experiments on rejuvenation and multiple shoot induction from mature nodal shoot segments of trees/horticultural/floricultural crops.
4. Encapsulation of somatic embryos/buds using alginate.
5. Experiments on root induction from cultured shoots.

Suggested Reading

- Bhojwani, S. S. 1990. *Plant Tissue Culture: Applications and Limitations*. Elsevier Science Publishers, New York, USA.
- Bhojwani, S. S. and Razdan, M. K. 1996. *Plant Tissue Culture: Theory and Practice* (a revised edition). Elsevier Science Publishers, New York, USA.
- Vasil, I. K. and Thorpe, T. A. 1994. *Plant Cell and Tissue Culture*. Kluwer Academic Publishers, The Netherlands
- Woung-Young, S. and Bhojwani, S. S. 1999. *Morphogenesis in Tissue Cultures* (ed.). Kluwer Academic Publishers.

Bot-SC- 6- VALUE ADDITION FOR BIORESOURCES

1. Introduction and bioresource profile
2. Need for identifying real/true value of the bio-resources
3. Wild and domestic bioresources
4. Thar desert resources with special reference to forest, energy (solar and wind) and minerals
5. Energy and petro plants
6. Air-layering technique
7. Concept of Harvest Index
8. Economics (Benefit: Cost ratio)

Laboratory/Field Exercises

1. Methods for bio-resources valuation
2. General idea for desert bioresources with special reference to solar and wind energy plantation
3. Identification of petro plants of desert
4. To perform air layering experiment
5. To calculate Harvest Index
6. To calculate economics of desert plants

Suggested Readings

Agro-techniques of selected medicinal plants, Vol. I, Department of AYUSH, New Delhi, 2008
Handbook of Horticulture, ICAR, 2001
50 Years of Crop Research in India, ICAR, New Delhi, 1996.
Prospects of Medicinal Plants, NBPGR, New Delhi, 1998.
The Wealth of India. A Dictionary of Indian Raw Materials and Industrial Products, New Delhi. Raw Materials I-XII, Revised Vol. I-III (1985-1992) Supplement (2000), CSIR, New Delhi.
Recent Progress in Medicinal Plants, Volume 9 : Plant Bioactives in Traditional Medicine, (eds.) D.K. Majumdar, J.N. Govil, V.K. Singh & R.K. Sharma, Studium Press, LLC, USA, 2005

Bot-SC- 7 –CHROMOSOME ANALYSIS

1. Survey and collection of germplasm
2. Propagation/Maintenance of plant materials
3. Collection and preservation of plant samples
4. Preparation of solutions for chromosome staining
5. Preparation of meiotic and mitotic spreads
6. Observation of various stages for cell division
7. Data analysis

Laboratory Exercises

1. Counting the Number of chromosomes & Observing somatic chromosomes in root tips
2. Analyzing size and morphology of chromosome
3. Observing somatic chromosome in young leaves
4. Gametic chromosome observation in young flower
5. Gametic or meiotic chromosome observation in young frond of fern during sporogenesis
6. Preparation of solutions

Suggested Readings

Setterfield, G., Schreiber, R., and Woodard, J., *Stain Technology*, **29**, 113 (1954).
Pathways, Mechanisms, and Rates of Polyploid Formation in Flowering Plants Justin Ramsey and Douglas W. Schemske *Annual Review of Ecology and Systematics* Vol. 29 (1998), pp467-501
Grubb, Chandra. "Practical Cytology." *Proceedings of the Royal Society of Medicine* 61.5 (1968): 537. Print.
.Grubb, C. (1968). Practical Cytology. *Proceedings of the Royal Society of Medicine*, 61(5), 537.

Bot-SC- 8- MUSHROOM CULTIVATION

1. General Introduction of mushroom.
 2. Taxonomy and Biology of Mushroom.
-

3. Nutraceutical (nutritional) values of mushroom.
4. Pharmaceutical (medicinal) values of mushroom.
5. Mushroom laboratory/ farm design.
6. Mushroom production technology.
7. Spawn production technology.
8. Compost (natural and synthetic).
9. Management of mushroom disease.
10. Post harvest technology of mushroom.
11. Economics of mushroom cultivation.
12. Mushroom producers, Exporters, consultants, literature and sources of inputs.

Laboratory Exercises

1. Survey and collection of local edible mushrooms.
2. Visit to mushroom cultivation Laboratory.
3. General studies on laboratory rules, equipments, tools and Precaution.
4. Principles and demonstration of Laboratory Instruments.
5. Preparation of culture media.
6. Isolation and culture of Spawn (mushroom seed/spore)
7. Preparation of composting.
8. Cultivation of white button mushroom.
9. Post-harvest technique.
10. Preservation of mushroom.

Suggested Reading

- Bahl, N. 1984. Handbook on mushroom, Oxford and IBH, New Delhi
- Chandra, K. L. and Sharma, S. R. 1995. Mushroom, Advances in horticulture, Volume XIII Malhotra Publishing House, New Delhi, India
- Kannaiyan, S. and Ramasamy, K. 1980. A handbook of edible mushroom. Today and tomorrows printers and publishers New Delhi
- Kapoor, J. N. 1989. Mushroom cultivation, ICAR Publishers, Coimbatore
- Purkayastha, R.P. and Chandra, A. 1985. Manual of Indian edible mushrooms. Today and Tomorrows printers and publishers, New Delhi
- Saini, L.C. and Prashar, R.D. 1992 KhumbUtpadan. HAU Publication Hissar
- Sharma, S.R. and Mehta, K.B. 1991. Bibliography of mushroom Research of India. NCMRT Publication, Solan
- Singh, H. 1991. Mushroom- The art of cultivation. Sterling Publishers Pvt. Ltd. New Delhi
- Singh, R.P. 1986 Bulletins of Successful mushroom production. GB pant University, Pantnagar.
- Tewari, S.C. and Kapoor, P. 1988. Mushroom Cultivation: An Economics analysis. Oxford and IBH New Delhi
- Journals: Indian Journal of mushroom and Mushroom research (for update information)

Bot-SC- 9- MOLECULAR TECHNIQUES

1. Methods of isolation and purification of nucleic acids.
2. Quantitative and Qualitative analysis of nucleic acid: Principle and applications of electrophoresis.
3. Nucleic acid hybridization, PCR and Quantitative RT-PCR.
4. Principle and methods of Recombinant DNA technology and Genetic Engineering.
5. Methods of isolation and purification of proteins. Protein purification techniques: size-exclusion, ion-exchange and affinity chromatography.
6. Quantitative and Qualitative analysis of Proteins: Dye-binding methods, native and denaturing SDS-PAGE, Western immunoblotting, ELISA.
7. Tools and techniques used in proteomics: 2-DE, Mass spectrometry, peptide mass fingerprinting.
8. Recombinant protein expression and purification from *E. coli*.
9. Recombinant protein expression and purification from plants.
10. Molecular characterization of transgenic plants.

LABORATORY EXERCISES

1. Preparation of different reagents, buffers and media.
 2. Isolation of genomic DNA from plants.
 3. Isolation of proteins from plants.
-

4. Demonstration of DNA/RNA and protein quantitation using Nanodrop.
5. Agarose gel electrophoresis and Gel documentation.
6. Demonstration of PCR, RT-PCR and Southern/Northern Blotting
7. One-dimensional SDS-PAGE protein profiling
8. Demonstration of 2-DE and Western immunoblotting

SUGGESTED READINGS

Sambrook, J. and Russell, D.W. 2001. *Molecular Cloning – A Laboratory Manual, Vols I – III*, Cold Spring Harbor Laboratory, USA.

Gelvin, S.B. and Schilperoort, R.A. (eds) 1994. *Plant Molecular Biology Manual*, 2nd edition, Kluwer Academic Publishers, Dordrecht, The Netherlands.

Glick, B. R. and Thompson, J.E. 1993. *Methods in Plant Molecular Biology and Biotechnology*. CRC Press, Boca Raton, Florida.

Bot-SC- 10-NUTRIENT MANAGEMENT

1. Soil Analysis: Physical, chemical and Biological properties of soil
2. Nutritional requirement of Plant: Macro and micro nutrients
3. Forms and Sources of nutrients in Soils
4. Uptake, transport and roles of nutrients in plants
5. Symptoms of Deficiency and Excess of nutrients in plants
6. Tissue Testing for nutrient status in plants , recommendation of Fertilizers
7. Types of nutrient media
8. Soil preparation, Soil amendments, bed preparation, transplantation techniques
9. Soil less culture: hydroponic, Nutrient Film Technique (NFT), cocopeat and Airoponics
10. Greenhouse Technology: Importance, types and operation techniques

Laboratory/Field Exercises

1. Assessment of Deficiency and Excess of nutrients on the basis of Visual Symptoms .
2. Soil Analysis(Physical): moisture, temperature and soil texture.
3. Soil analysis (chemical): EC and pH, carbon, phosphorus,.
4. Biological properties: microbial diversity of soil analysis.
5. Tissue Tests for nutrients: (N,P, K & Na)
6. Estimation of photosynthetic pigments in plant leaves.
7. Assay of nitrate reductase activity from plant tissues.
8. Techniques for Soil less culture: hydroponic and Airoponics.

SUGGESTED READINGS

Ahmad P. and Wani M.R. 2014. *Physiological Mechanisms and Adaptation Strategies in Plants Under Changing Environment*(eds). Springer New York

BassiriRad H.2005. *Nutrient Acquisition by Plants - An Ecological Perspective*. Springer .

Barker A.V.andPilbeam D.J. 2007. *Handbook of Plant Nutrition* (eds.). Taylor & Francis

Hopkins W.G. and Norman P. A. HunerN.P.A . 2009. *Introduction to Plant Physiology* (4th Edition) John Wiley & Sons, Inc. New York, USA

Konrad M. and Ernest A. K.2001. *Principles of Plant Nutrition* (eds.). SpringerMaathuis, F. J.M

2013.*Plant Mineral Nutrients :Methods and Protocols* (ed.). Springer

Pansu M. and Gautheyrou J. 2006 .*Handbook of Soil Analysis - Mineralogical, Organic and Inorganic Methods*. Springer

Pessaraki, M.2014. *Handbook of Plant Crop Physiology* (ed.). CRC Press

Resh M. H .2012. *Hydroponic Food Production: A Definitive Guidebook for the Advanced Home Gardener and the Commercial Hydroponic Grower (7th edition)*.CRC Press Taylor& Francis Group

Taiz, L. and Ziegler, E. 2003. *Plant Physiology* (3rd edition), Panima Publishing Corporation,New Delhi.

SYLLABUS

CHEMISTRY

Under Choice Based Credit System (CBCS)

M.Sc. (PREVIOUS) EXAMINATION, 2022-23

JAI NARAIN VYAS UNIVERSITY

JODHPUR

INTRODUCTION

Jai Narain Vyas University, Jodhpur was established in July 1962. It is a regional University now and operates in the limits of Jodhpur, Jalore, Barmer, Pali and Jaisalmer districts. The Department of Chemistry is located in the New Campus of the University, near the Bhagat-ki Kothi Railway Station, Pali Road. (The Department runs post graduate course in chemistry and has various research laboratories). More than 700 candidates have been awarded with degree of Ph.D. and three candidates have been awarded D.Sc. degree. About 1700 research papers from various faculty members and research scholars have been published in the International and National Scientific Journals. The Department have received research projects from different agencies like U.G.C., C.S.I.R., D.S.T., D.B.T., I.C.A.R., DRDO, DAE etc from time to time. In 1983, U.G.C. has formulated a programme under which certain departments, selected on the basis of their

achievements in the field of teaching and research, they were provided with infrastructure for raising the standard of their post-graduate education and research to international level. The programme was formulated as Committee on Strengthening of Infrastructure of Science and Technology (COSIST) of U.G.C.

The Department is one of the three departments of chemistry in the country, which were selected for this programme. M.Sc. was awarded under COSIST programme from 1985 to 2003, there after department was identified by the UGC under SAP (Special Assistance Programme) in 2010 for research support to the department. Thereafter DST awarded II level FIST programme to the department in 2010.

Awards

Apart from the university gold medal for securing highest marks in M.Sc/B.Sc., following awards have been instituted in the Department of Chemistry for the meritorious students:

1. Professor R.C. Kapoor Gold Medal for securing highest marks in M.Sc. (Chemistry)
2. Professor J.P. Saxena Award for excellence in Organic Chemistry
3. Sushila Bhandari Ugam Kanwar Bhandari Memorial Abhay-II Award for excellence in Physical Chemistry
4. Dr. Kamla Tandon Memorial Award for excellence in Inorganic Chemistry.
5. B.M.Gang Memorial Award for excellence in Analytical Chemistry

Academic and Research Programme

Under Special Assistance Program (SAP), Department of Chemistry offers a two year (4 semesters) integrated programme leading to the Master's degree in Chemistry in two sections of 40 students each. Syllabus is designed to cover all four branches of chemistry viz. Inorganic Chemistry, Organic Chemistry, Physical Chemistry and Analytical Chemistry. IInd and IVth semester offers a choice of eight electives each to strengthen diverse field of interdisciplinary nature.

Department of Chemistry has advanced facilities for research in major areas of Chemistry leading to Ph.D.. The major research interests of the faculty members includes: Nanotechnology, Biosensors; Electrochemistry & Electroanalytical Chemistry, Chemical Dynamics & Reaction Mechanism; Mineral Beneficiation; Oil & Fats; Natural Products; Synthetic Heterocyclics; Chemical Spectroscopy; Synthetic & Structural Organo & Organometallic Chemistry; Effluent Treatment; Environmental Chemistry; Synthetic Organic Chemistry; Photochemistry; Solar Energy Conversion & Storage; Co-ordination Chemistry; Green Chemistry and Applied Chemistry.

ADMISSION

The minimum qualification for admission to M.Sc. course is B.Sc. (10+2+3) degree with Chemistry as a major subject. The details of the eligibility conditions and admission procedures are given in the admission forms. The admission would be done on the basis of merit as per university rules. Reservation for SC, ST and OBC would also be done as per J.N.V. University, Jodhpur rules. Candidates are required to attend minimum 75% of the classes in theory and practicals both.

FACILITIES

The Department of Chemistry possesses several sophisticated, advanced and modern equipments required for teaching and research. The specialized instruments includes Electrochemical Analysers, Surface plasmon Resonance Spectrometer, Fluorescence Spectrophotometer, FTIR, UV-VIS spectrophotometers, Stopped-flow spectrophotometers, HPLC, Low temperature thermostats, Flame photometers, Ion meters, Centrifuge and computers for networking. In addition, certain facilities related to equipments are also available with USIC in the Faculty of Science.

FACULTY MEMBERS

PROFESSOR & HEAD

Dr. Kailash Daga

Co-ordination Chemistry , Applied and environmental
Chemistry

Ph.D.

PROFESSOR

Dr. (Miss) Seema Kothari

Reactions Kinetics, Correlation Analysis

Ph.D.

Dr. (Mrs.) Vinita Sharma

Organic Chemistry Reaction Mechanism

Ph.D.

Dr. (Mrs.) S. Loonker

Polymers, Environmental and applied Chemistry

Ph.D.

Dr. (Mrs.) V. Choudhary

Co-ordination Chemistry ,

Ph.D.

Environmental Chemistry

Dr. (Mrs.) S. Gaur

Co-ordination Chemistry ,

Ph.D.

Dr. V. Gupta

Environmental Chemistry, Applied Chemistry;

Ph.D.

Effluent Treatment Studies

Dr. A.V. Singh

Physical Chemistry, Mineral beneficiation and

Ph.D.

Environmental Chemistry

Dr. (Mrs.) P. Mishra

Organic Reaction Mechanism

Ph.D.

Dr. K.R. Genwa

Solar energy conversion technologies

Ph.D.

Dr. R.C. Meena

Photochemistry (Solar energy

Ph.D.

Conversion technologies)

Dr. A. Arora

Natural products, Oils and fats

Ph.D.

ASSOCIATE PROFESSORS

Dr. J.S. Rathore Analytical Chemistry

Ph.D. Environmental Chemistry

Dr. Rajendra Mathur Polymer Science

Ph.D.

Dr. P. Koli Organic Chemistry and Solar Energy Conversion

Ph.D. and storage

ASSISTANT PROFESSOR

Dr. S.L. Meena Photo Electrochemistry, Corrosion & its prevention

Ph.D.

Dr. Jaishree Rathore Organic Chemistry

Ph.D.

Ms. Meenakshi Jonwal Inorganic Chemistry

M.Sc.

Dr. Anita Meena Physical Chemistry

Ph.D.

Dr. Priyanka Purohit Chemical Kinetics

Ph.D.

Dr. Rajni Bais Analytical Electrochemistry

Ph.D.

Dr. Sangeeta Parihar

Environmental Chemistry

Ph.D.

Dr. Om Prakash

Chemical Kinetics

Ph.D.

Dr. R.L. Saini

Organic Chemistry

M.Sc.

Dr. Anurag Choudhary

Chemical Kinetics

Ph.D.

Dr. Seema Parveen

Organic and Phytochemistry

Ph.D.

Dr. Amita Dhariwal

Analytical Chemistry

Ph.D.

GUIDELINES FOR CHOICE BASED CREDIT SYSTEM:

Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course this shall be the part of core programme, during third and fourth semester. Each student has to complete **four skill courses:** two within the Department and two from other Departments within JNV University or the Universities approved by JNV University
3. **Course:** Usually referred to, as 'papers' is a component of a programme. All courses need not carry the same weightage. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period of teaching (lecture or tutorial) or two periods of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.

9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.
12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/ December and even semester from December/January to May. **Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May. The Department shall conduct the Practical examinations of odd and even semesters as per the Panel of Examiners approved by the University. Each Board of examiners shall consist of one external Examiner from other University/Institute and another from the Department.**
13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Science resolves the following:

- a. All internal assessments shall be open assessment system only and that are based on Quizzes, term test, seminar
- b. Attendance shall carry the prescribed marks in all papers and Practical examination internal assessment
- c. In each semester three out of four theoretical component University examination shall be undertaken by external examiners from outside the university conducting examination, who may be appointed by the competent authority

Grievances and Redressal Mechanism

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head/Principal of the College or the Chairperson of the University Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.
- b) The appeal will be assessed by the Chairman and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Dean, Faculty of Science comprising all HODs of the Faculty and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	‘O’	Outstanding	10
2	‘A+’	Excellent	9
3	‘A’	Very Good	8
4	‘B+’	Good	7
5	‘B’	Above Average	6
6	‘C’	Average	5
7	‘P’	Pass	4
8	‘F’	Fail	0
9	‘Ab’	Absent	0

- i. A student obtaining Grade F in a paper shall be considered failed and will be required to reappear in the University End Semester examination.

- ii. For noncredit courses (Skill Courses) ‘Satisfactory’ or ‘Unsatisfactory’ shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

- = and > 95 % marks Grade Point 10.0
- 90 to less than 95 % marks Grade Point 9.5
- 85 to less than 90 % marks Grade Point 9.0
- 80 to less than 85 % marks Grade Point 8.5
- 75 to less than 80 % marks Grade Point 8.0
- 70 to less than 75 % marks Grade Point 7.5
- 65 to less than 70 % marks Grade Point 7.0
- 60 to less than 65 % marks Grade Point 6.5
- 55 to less than 60 % marks Grade Point 6.0
- 50 to less than 55 % marks Grade Point 5.5
- 45 to less than 50 % marks Grade Point 5.0
- 40 to less than 45 % marks Grade Point 4.5
- 35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,

i.e

$$\text{SGPA (Si)} = \frac{\sum(C_i \times G_i)}{\sum C_i}$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,

i.e.

$$\text{CGPA} = \frac{\sum(C_i \times S_i)}{\sum C_i}$$

where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.

- iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	4	B	6	4 x 6 =24
2	Course 2	4	B+	7	4 X 7 =28
3	Course 3	4	B	6	4X 6 = 24
4	Course 4	4	O	10	4 X 10 =40
5	Course 5- Practical I	4	C	5	4 X 5 =20
6	Course 6 – Practical II	4	B	6	4 X 6 = 24
	Total	24			24+28+24+40+20+24 =160

Thus, $\text{SGPA} = 160/24 = 6.67$

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	6.67	7.25	7	6.25

$$\text{CGPA} = (24 \times 6.67 + 24 \times 7.25 + 24 \times 7 + 24 \times 6.25) / 96$$

$$652.08 / 96 = 6.79$$

Semester-wise Theory Papers/Practical / Skill component

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Semester I							
Core course 1	CH 101	Inorganic Chemistry	6-0-0	4	30	70	100
Core course 2	CH 102	Organic Chemistry	6-0-0	4	30	70	100
Core course 3	CH 103	Physical Chemistry	6-0-0	4	30	70	100
Core course 4	CH 104	Instrumental Methods of Analysis	6-0-0	4	30	70	100
Core course practical 1	CH 105	Inorganic Lab	0-0-12	4	30	70	100
Core course practical 2	CH 106	Physical Lab	0-0-12	4	30	70	100

Skill Course I	As per the list		2-0-2				
Total				24	180	420	600
Semester II							
Core course 5	CH 201	Inorganic Chemistry	6-0-0	4	30	70	100
Core course 6	CH 202	Organic Chemistry	6-0-0	4	30	70	100
Core course 7	CH 203	Physical Chemistry	6-0-0	4	30	70	100
Core course 8	CH 204	Analytical Chemistry	6-0-0	4	30	70	100
Core course practical 3	CH 205	Organic Lab	0-0-12	4	30	70	100
Core course practical 4	CH 206	Analytical Lab	0-0-12	4	30	70	100
Skill course II	As per the list		2-0-2	2-0-2			
Total				24	180	420	600
Semester III							
Core course 9	CH 301	Group Theory & Inorganic Spectroscopy	6-0-0	4	30	70	100
Core course 10	CH 302	Application of Spectroscopy	6-0-0	4	30	70	100
Discipline Specific Elective 1	(303A-I/303B-I/303C-I/303D-I)		6-0-0	6-0-0	30	70	100
Discipline	(304A-II/304B-II/304C-II)		6-0-0	6-0-0	30	70	100

Specific Elective 2	II/304D-II)						
Core course practical 5	CH 305/307	Lab. Course1/3	0-0-24	4	30	70	100
Core course practical 6	CH 306/308	Lab. Course2/4	0-0-24	4	30	70	100
Skill course III	As per the list		2-0-2	2-0-2			
Total				24	180	420	600
Semester IV							
Core course 11	CH 401	Solid State Chemistry	6-0-0	4	30	70	100
Core course 12	CH 402	Bio Chemistry	6-0-0	4	30	70	100
Discipline Specific Elective 3	403A-III/403B-III/403C-III/403D-III		6-0-0	4	30	70	100
Discipline Specific Elective 4	404A-IV/404B-IV/404C-IV/404D-IV		6-0-0	4	30	70	100
Core course practical 7	CH 405/407	Lab. Course1/3	0-0-24	4	30	70	100
Core course practical 8	CH 406/408	Lab. Course2/4	0-0-24	4	30	70	100
Skill course IV	As per the list		2-0-2				
Total				24	180	420	600

*** The Department shall offer two skill courses per semester from the list of skill courses approved for the Department.**

In view of the course content, the Department of Chemistry distributed the Periods between Theory/Tutorial/Practical as under per paper

- 4 : 0 : 0 (four lectures only (no tutorial and no practical)) – For Theory
- 0 : 0 : 5 (no lecture, no tutorial, and practical)-For practical
- 2-0-2 (two lectures, no tutorial and two practical/field experimentations) – For Skill course

The Duration of the Period shall be forty five minutes. In each of these combinations, the first value stands for the same number of lecture instructions per week, whereas the last two values stand for double the number of tutorial / practical instructions per week.

In each practical group the number of students that can be accommodated will be fifteen.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective) involve an evaluation system of students that has the following two components:-

- (i) **Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
 - (ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.
- (i) **Continuous Comprehensive Assessment (CCA):** This would have the following components:
- a. **Quizzes:** Two Quiz examinations of 45 minutes duration each having a maximum of 40 marks shall be arranged for theory paper during the semester course period
 - b. **Term Test:** One term test shall be arranged for each theory paper prior to End-Semester Examination; examination duration shall be of three hours; maximum marks is 70
 - c. **Seminar:** Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 15. The seminar shall commence after first quiz examination and shall be completed prior to term test for all the papers.

- d. **Classroom Attendance** – Each student will have to attend a minimum of 75% Lectures / Tutorials / Practicals. A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE). Attendance shall have 15 marks and will be awarded by following the system proposed below:

Those having greater than 75% attendance (for those participating in Co-curricular activities, 25% will be added to per cent attendance) will be awarded CCA marks as follows:-

75% to 80%	=	3 marks
80% to 85%	=	6 marks
85% to 90%	=	9 marks
90% to 95%	=	12 marks
> 95%	=	15 marks

Each student's cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Science.

- e. CCA are based on open evaluation system without any bias to any student
- f. Any grievance received in the Department from student shall be placed before the **Grievance Redressal Committee** with adjudicated comments

Each component marks will be added without rounding and the total thus obtained is ratio by a factor of six. This value shall be rounded.

Illustration:

Quiz 1 – Marks obtained	=	30
Quiz 2 – Marks obtained	=	35.5
Term Test Marks obtained	=	50.5
Seminar Marks obtained	=	14
Attendance Marks obtained	=	9
Total	=	139.00
Conversion	=	$139/6 = 21.16666$
Award	=	22.00

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective Department shall declare the result as “Satisfactory” or “Non-Satisfactory”; each student need to get a minimum of three “Satisfactory” declaration for the course completion

In laboratory courses (having only practical (P) component), the CCA will be based on students attendance (50%); hands on Practical and sessional (50%).

For QUIZ (2 quizzes per semester), 40 marks per Quiz and total of 80 marks, 45 minutes duration for each quiz:

Types of question	Number of Questions	Marks Per question	Total marks per type
1. Multiple choice	10	1	10
2. Fill in the blanks	10	2	20
3. Short answer (15 words)	5	2	10
Total	25		40

For the Term test and ESE:

Part A

Ten short type questions (Definitions, illustrations, functions, short explanations, etc ;) for two marks each. $10 \times 2 = 20$ marks; two questions from each Unit; no choice in this part

Part B

Five short answer (250 words) type questions for four marks each. $5 \times 4 = 20$ marks; one question from each Unit with internal choice.

Part C

Five questions of long/explanatory answer (400 words) type, one drawn from each Unit; student need to answer any three; ten marks each; $3 \times 10 = 30$ marks

$20+20+30 = 70$ marks

Qualifying for Next semester

- 1. A student acquiring minimum of 40% in total of the CCA is eligible to join next semester.**
2. A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as 'Fail'), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.
3. A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time i.e three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted. Additional chances examination fee shall be on additive basis.

Improvement Option:

Every student shall have the opportunity to improve Credit through University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final. There shall be no improvement opportunity in Practical examinations.

Result Declaration:

The ESE (End Semester Examination/University Examination) results shall be declared within twenty days of the last examination. The Theory/ Practical Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation.

2022-23

Skill Based Course in Chemistry

S.No.	Course No.	Name of Course
A	SK-CH-1	Water Analysis
B	SK-CH-2	Food Adulteration and Testing
C	SK-CH-3	Application of solar Energy
D	SK-CH-4	Ores and building material
E	SK-CH-5	Polymer Technology
D	SK-CH-6	Conservation and Management of cultural Heritage

M.Sc. Chemistry

(Under CBCS)

First Year (2022-23)

(Two Semesters each of 15 weeks)

TEACHING AND EXAMINATION SCHEME:

I SEMESTER

1.	THEORY PAPERS (Four Papers)	Periods/ Wk	No. of Credits	CCA	ESE	Total
CH-101	Inorganic Chemistry	6	4	30	70	100
CH-102	Organic Chemistry	6	4	30	70	100
CH-103	Physical Chemistry	6	4	30	70	100
CH-104	Instrumental Methods of Analysis	6	4	30	70	100

Grand Total

400marks

2. PRACTICALS EXAMINATIONS:

Lab Course	Periods/Wk	No. of Credits	CCA	ESE	Total
CH-105 Inorganic Lab	12	4	30	70	100
CH-106 Physical Lab	12	4	30	70	100

Total

200

Total marks of I Semester

600

II SEMESTER

1.	THEORY PAPERS (Four Papers)	Periods/ Wk	No. of Credits	CCA	ESE	Total
CH-201	Inorganic Chemistry	6	4	30	70	100
CH-202	Organic Chemistry	6	4	30	70	100
CH-203	Physical Chemistry	6	4	30	70	100
CH-204	Analytical Chemistry	6	4	30	70	100

Grand Total

400marks

2. PRACTICALS EXAMINATIONS:

Lab Course	Periods/Wk	No. of Credits	CCA	ESE	Total
CH- 205 Organic Lab	12	4	30	70	100
CH- 206 Analytical Lab	12	4	30	70	100
Total					200

Total marks of II Semester

600

Total marks of M. Sc. I Year

1200

3.SKILL BASED COURSE

SK-CH for I Semester	4pd/wk	(For students of Chemistry Department only)
SK-CH for II Semester	4pd/wk	(For students of Other Department only)

M.Sc Chemistry

I YEAR-2022-23

SEMESTER – I

CH- 101: INORGANIC CHEMISTRY

Unit I

Stereochemistry and bonding in compounds : Mulliken symbols for s,p and d orbitals in C_{2v} , D_{3h} , D_{4h} , T_d , & O_h point groups, σ , π - π bonds and synergic bonding, Bent's rule and valence shell electron pair repulsion(VSEPR) theory in structure elucidation with applications, Wave functions and Energetics of different types of hybridization. Simple reactions of covalently bonded molecules related to atomic inversion, Berry pseudo rotation, Nucleophilic displacement and free radical reactions. Limitations of crystal field theory, Jahn Teller theorem and distortion of molecules

Unit II

Molecular orbital theory (MOT) : Shapes of molecular orbitals, Walsh diagram of tri atomic molecules with special reference to H_2O , molecular orbital theory of hetero atomic molecules viz . BeH_2 , CO_2 , NO_2 , BF_3 . Coulson diagram of CO. Molecular orbital theory (MOT) of octahedral, tetrahedral and square planer complexes, π - bonding and molecular orbital theory, Comparison with VBT and CFT.

Unit III

Metal Ligand Equilibrium in solution : Thermodynamic and kinetic stability of complexes, stepwise and overall formation constant, trends in stepwise constants, factors affecting the stability of metal complexes with reference to the nature of metal ion and ligand, Chelate effect and its thermodynamic origin, determination of binary formation constants by pH metry and Spectrophotometry viz Bjerrum, Job, Dey and Mukherjee, Asmus methods.

Unit IV

Correlation diagrams of Transition Metal Complexes: Types of transitions, selection rules and relaxation for electronic transition, coupling and micro states, Spectroscopic ground States and Term symbols, correlation diagrams, Orgel and Tanabe Sugano diagrams. Racah Parameters and Calculations of Dq , B and β parameters for d^1 to d^{10} states in Transition metal complexes

Unit V

Electronic spectra and Magnetic properties of transition metal Complexes

Charge transfer spectra, Spectroscopic methods of assignment of absolute configuration in optically active metal chelates and their stereo chemical information using ORD and CD based Cotton effect, Anomalous magnetic moment, spin crossover and its affecting factors, magnetic exchange coupling for ferromagnetism and anti ferromagnetism, Curie temperature (T_C) and Neel Temperature (T_N)

Books Suggested:

1. Advanced Inorganic Chemistry, F.A. Cotton and Wilkinson, John Wiley.
2. Inorganic Chemistry, J.E. Huhey, Harpes & Row.
3. Chemistry of the Elements, N.N. Greenwood and A. Earnshaw, Pergamon.
4. Inorganic Electronic Spectroscopy, A.B.P. Lever, Elsevier.
5. Magnetochemistry, R.L. Carlin, Springer Verlag.
6. Comprehensive Coordination Chemistry eds., G. Wilkinson, R.D. Gillars and L.A. McCleverty, Pergamon.
7. Advanced Inorganic Chemistry, S.K. Agarwal, Keemti Lal, Pragati Prakashan.

CH -102: ORGANIC CHEMISTRY

UNIT I

Nature of Bonding in Organic Molecules

Delocalized chemical bonding-conjugation, cross conjugation, resonance hyperconjugation, bonding in fullerenes, tautomerism.

Aromaticity in benzenoid and non-benzenoid compounds, alternate and non-alternate hydrocarbons, Huckel's rule, energy level of π -molecular orbitals, annulenes aromaticity, homoaromaticity, Double aromaticity, High Temperature Aromaticity, excited state aromaticity, PMO (approach).

Bonds weaker than covalent- addition compounds, crown ether complexes, cryptands inclusion compounds, cyclodextrins, catenanes and rotaxanes.

UNIT II

Stereochemistry I

Conformational analysis of cycloalkanes, decalins, effect of conformation on reactivity conformation of sugars, steric strain due to unavoidable crowding. Stereochemistry of the compounds containing nitrogen, sulphur and phosphorus.

UNIT III

Stereochemistry II

Elements of symmetry, chirality, molecules with more than one chiral center, threo and erythro isomers, methods of resolution, optical purity, enantiotopic and diastereotopic atoms, groups and faces, stereospecific and stereoselective synthesis. Asymmetric synthesis. Optical activity in the absence of chiral carbon (biphenyls, allenes and spiranes), chirality due to helical shape.

UNIT IV

Reaction Mechanism: Structure and Reactivity

Types of mechanisms, types of reactions, thermodynamic and kinetic requirements, Kinetic and thermodynamic control. Hammond's postulate, Curtin-Hammett principle, Potential energy diagrams, transition states and intermediates, methods of determining mechanism isotope effects. Hard and Soft acids and bases.

Generation, structure, stability and reactivity of carbocations, carbanions free radicals, carbenes and nitrenes.

Effect of structure on reactivity – resonance and field effects, steric effect, quantitative treatment. The Hammett equation and linear free energy relationship. substituent and reaction constants. Taft equation.

UNIT V

Pericyclic Reactions

Molecular orbital symmetry, Frontier orbitals of ethylene, 1,3- butadiene, 1,3,5-hexatriene and allyl system. Classification of pericyclic reactions. Woodward – Hoffmann correlation diagrams, FMO and PMO approach. Electrocyclic reactions – conrotatory and disrotatory motions, $4n$, $4n+2$ systems, $2+2$ addition of ketenes, 1,3 dipolar cycloadditions and cheletropic reactions.

Sigmatropic rearrangements – suprafacial and antarafacial shifts of H, sigmatropic shifts involving carbon moieties, 3,3- and 5,5- sigmatropic rearrangements. Claisen, Cope and Aza-Cope rearrangements. Fluxional tautomerism. Ene reaction.

Books Suggested:

1. Advanced Organic Chemistry-Reactions, Mechanism and Structure, Jerry March, John Wiley.
2. Advanced Organic Chemistry, F.A. Carey and R.J.Sundberg, Plenum.
3. A Guide Book to Mechanism in Organic Chemistry, Peter Sykes, Longman.
4. Structure and Mechanism in Organic Chemistry, C.K.Ingold, Cornell University Press.
5. Organic Chemistry, R.T. Morrison and R.N.Boyd, Prentice-Hall

6. Modern Organic Reactions, H.O. House, Benjamin.
7. Principles of Organic Synthesis, R.O.C. Norman and J.M. Coxon, Blackie Academic & Professional.
8. Pericyclic Reactions, S.M.Mukherji, Macmillan, India.
9. Reaction Mechanism in Organic Chemistry S.M.Mukherji and S.P. Singh, Macmillan.
10. Stereochemistry Organic Compounds, D.N.asipuri, New Age International.
11. Stereochemistry of Organic Compounds, P.S.Kalsi, New Age International.
12. Pericyclic Reactions by Jagdama Singh.

CH-103: PHYSICAL CHEMISTRY

UNIT I

Chemical Kinetics-I

Chemical Dynamics: Ionic reactions, kinetic salt effects, steady state kinetics, kinetic and thermodynamic control of reactions.

Dynamic chain (hydrogen-bromine reaction, pyrolysis of acetaldehyde). photochemical (hydrogen-bromine and hydrogen-chlorine reactions) .

UNIT II

Chemical Kinetics-II

Homogeneous and heterogeneous catalysis, kinetics of enzyme reactions, general features of fast reactions, study of fast reactions by flow method, relaxation method, and flash photolysis method.

Dynamics of complex Reactions, Collision and Transition state, Theories of Rate Constant, dynamics of unimolecular reaction, Lindemann and Hinshelwood theories of unimolecular reactions.

UNIT III

Adsorption

Surface tension, capillary action, pressure difference across curved surface (Laplace equation), vapour pressure of droplets (Kelvin equation) Gibbs adsorption isotherm, estimation of surface area (BET equation), surface films on liquids Electro-kinetic phenomenon and quantitative treatment of Zeta potential.

Micelles: Surface active agents, classification of surface active agents, micellization, types of ionic micelles present in colloidal electrolytes, critical micellar concentration (CMC), factors affecting the CMC of surfactants,

UNIT IV

Macromolecules

Polymer – definition, types of polymers,, kinetics of polymerization,

Molecular mass, number and mass average molecular mass, molecular mass determination (osmometry, viscometry, diffusion and light scattering methods), sedimentation, calculation of average dimensions of various chain structures.

UNIT V

Electrochemistry

Electrochemistry of solutions. Debye-Huckel – Onsagar treatment and its extension, Debye-Huckel-Jerrum mode, ion - solvent interactions, Born model.

Thermodynamics of electrified interface; Derivation of electrocapillary Lippmann equation (surface excess), Structure of electrified interfaces. Helmholtz, Guoy-Chapman and Stern models.

Books Suggested :

1. Physical Chemistry, P.W. Atkins, ELBS.
2. Chemical Kinetics, K.J.Laidler, Megraw-Hill
3. Kinetics and Mechanism of Chemical Transformation, J.Rajaraman and J.Kuriacose, McMillan.
4. Micelles, Theoretical and Applied Aspects, V.Moroi, Plenum.
5. Modern Electrochemistry Vol. I and Vol. II, J.O.M. Bockris and A.K.N.Reddy, Plenum.
6. Introduction to Polymer Science, V.R.Gowarkar, N.V.Vishwanathan and J.Sridhar, Wiley Eastern.

CH- 104: INSTRUMENTAL METHODS OF ANALYSIS

UNIT I Instrumental analytical methods: Classification of Instrumentation categories, sensitivity and range of determination.

Accuracy and minimization of errors

Precision and its determination (Standard deviation, R.S.D, C.V). confidence limit, Significance of confidence level and types of “t” test in analytical chemistry.

Analysis of variance (ANOVA), Correlation coefficient and linear regression.

Numericals based on above concepts

UNIT II UV Visible Spectrophotometry: Colorimetric estimation of metal ion with specific reagents: Iron with 8-Hydroxyquinoline ; Lead with Dithizone, Technique of dual wavelength and derivative spectroscopy and their applications.

Fluorescence Photometry: Theory with partial energy diagram, instrumentation and applications.

Unit III Atomic spectral analytical techniques: Atomic absorption Spectrophotometry: Theory, Chemical and Spectral interferences , Instrumentation and Application.

Emission spectroscopy: Principle and application of Flame photometry; ICPAES- Salient features and application on multielement determination

UNIT IV Chromatography – I Introduction and terms related to chromatography; Classification of Chromatographic techniques ; Selection of mobile phase.

Thin Layer Chromatographic technique (TLC): Principle, methodology and applications.

Gas chromatography (GC): Principle, Layout of instrument and types of columns; Detectors (TCD, FID, and Electron Capture) and applications.

Introduction to GC-MS, Advantages of GC-MS over GC

UNIT V Chromatography-II High performance liquid chromatography (HPLC)

Principle, Layout of instrument with columns, detectors (UV-Visible, RI and electro chemical) and applications.

Salient features of Super Critical Fluid chromatography (SCFC)

Books:

1. Instrumental Analysis: Skoog, Holler and Crouch, Cengage learning.
2. Vogel's Textbook of Quantitative Chemical Analysis, G.H.Jeffery, J.Bassett, J. Mendham and R.C. Denney, Publ ELBS, Longman, UK
3. Analytical Chemistry, G.D. Christian, John Willy & Sons.
4. Basic Concepts of Analytical Chemistry, S. M. Khopkar, Wiely Eastern.
5. Fundamentals of Analytical Chemistry, D.A. Skoog, D.M. West and F.J.Holler. Publ. W B Saunders.

2022-23

Laboratory Course- I-Semester

CH -105: Inorganic Chemistry

Qualitative Analysis

Eight component mixture including two less common metal ions (Ti, Mo, W, Ti, Zr, Th, V, U in cationic/anionic forms) and insoluble – oxides, sulphates and halides.

Quantitative Analysis

Separation and estimation of metal ions in a binary mixture Cu-Ni, Ni-Zn, Cu-Ag etc. involving volumetric and gravimetric methods.

Chromatography

Separation of cations and anions by

- (a) Paper Chromatography: Separation of chloride, bromide and iodide
- (b) Column Chromatography – separation of Cu, Ni, Co by Ion exchange.

Preparations

Preparation of selected inorganic compounds and their studies by I.R., electronic Mossbauer, E.S.R. and magnetic susceptibility measurements. Handling of air and moisture sensitive compounds.

- (1) VO(acac)₂
- (2) Cis-K[Cr(C₂O₄)₂(H₂O)₂]
- (3) Na[NH₃]₂(SCN)₄
- (4) Mn(acac)₃
- (5) K₃[Fe(C₂O₄)₃]
- (6) Prussian Blue, Turnbull's Blue

(7) $[\text{Co}(\text{NH}_3)_6][\text{Co}(\text{NO}_2)_6]$

(8) $\text{Cis-}[\text{Co}(\text{trine})(\text{NO}_2)_2]\text{Cl}\cdot\text{H}_2\text{O}$

(9) $\text{Hg}[\text{Co}(\text{SCN})_4]$

(10) $\{\text{Co}(\text{Py})_2\text{Cl}_2\}$

(11) $[\text{Ni}(\text{NH}_3)_6]\text{Cl}_2$

(12) $\text{Ni}(\text{dmg})_2$

(13) $[\text{Cu}(\text{NH}_3)_4]\text{SO}_4\cdot\text{H}_2\text{O}$

2022-23

CH - 106: Physical Chemistry

Surface Tension

- (i) To determine the parachor of carbon and hydrogen atoms by drop weight method.
- (ii) To determine the relative efficiencies of different detergents by surface tension measurements.

Chemical Kinetics

- (i) To compare the strengths of HCl and H₂SO₄ by studying the kinetics of hydrolysis of an ester.
- (ii) Determination of the effect of
 - (a) Change of temperature
 - (b) Change of concentration of reactant and catalyst.
 - (c) Ionic strength of the media on the velocity constant of acid hydrolysis of an ester
- (iii) To study the effect of acid strength on the reaction of acetone and iodine.

Adsorption

- (i) To study surface tension-concentration relationship for solutions (Gibbs equation) and hence determine the limiting cross-sectional area of molecule.
- (ii) To study the adsorption of acetic acid/oxalic acid by activated charcoal and verification of Freundlich and Langmuir's isotherms.

Book Suggested:

1. Vogel's Textbook of Quantitative Analysis, revised, J.Bassett, R.C. Denney, GH.H. Jeffery and J. mENDHAM, elbs.
2. Synthesis and Characterization of Inorganic Compounds, W.L.Jolly, Prentice Hall.
3. Practical Physical Chemistry, A.M.James and F.E. Prichard, Longman.
4. Findley's Practical Physical Chemistry, B.P.Levitt, Longman.
5. Experimental Physical Chemistry, R.C.Das and B.Behera, Tata McGraw Hill.

6. Advanced Practical Physical Chemistry, J.B.Yadav, Goel Publishing House.
7. Advanced Experimental Chemistry, Vol. I Physical, J.N.Gurtu and R.Kapoor, S.Chand & Co.

2022-23

Marking Scheme for M.Sc. I Semester Practicals

Inorganic CH-105 Lab Course

- | | |
|--------------------------------------|----------|
| 1. Gravimetric | 20 Marks |
| 2. Inorganic Mixture Eight component | 30 Marks |
| 3. Inorganic Preparation | 10 Marks |
| 4. Viva-voce | 10 Marks |

Total 70 Marks

Physical CH-106 Lab Course

- | | |
|---------------------|----------|
| 1. Major Experiment | 35 Marks |
| 2. Minor Experiment | 25 Marks |
| 3. Viva-Voce | 10 Marks |

Total 70 Marks

M.Sc Chemistry
SEMESTER-II (2022-23)

CH -201: INORGANIC CHEMISTRY

UNIT I

Reaction mechanism of Transitions metal complexes: Energy profile of a reaction (transition state or activated complex), Nucleophilic and Electrophilic Substitution, factors responsible for including SN_1 and SN_2 reaction, Lability and inertness of octahedral complexes acc to VBT and CFT. Acid hydrolysis, factor affecting acid hydrolysis, Base hydrolysis, Conjugate base mechanism (SN_1 CB), Evidences in favour of conjugate base mechanism, anation reactions, Substitution reaction without metal-ligand bond cleavage (Special reference to Co(III) complexes).

UNIT II

Substitution in square planer complexes: Trans-effect, mechanism of substitution reaction, polarization theory and π bonding theory. Redox reaction : electron transfer reaction, mechanism of $1e$ -transfer reaction, outer sphere reaction, Inner sphere reaction, bridge intermediate mechanism.

UNIT III

Metal π -complexes: Metal carbonyls, structure and bonding in metal carbonyls, vibrational spectra of metal carbonyls for bonding and structure elucidation. Preparation, bonding, structure and important reactions of transition metal nitrosyls.

UNIT IV

Boranes : Structure and bonding in diborane, preparations of higher boranes, Lipscomb's concept of bonding elements in higher boranes. Preparation, properties and structure of borazines.

UNIT V

Metal clusters: Metal carbonyl and halide type clusters, compounds with metal-metal multiple bonds, Metalloboranes, Carboranes, Silicates: types and Uses

Books Suggested:

1. F.A. Cotton and Wilkinson: Advanced Inorganic Chemistry, John Wiley.
2. J.E. Huhey: Inorganic Chemistry, Harper and Row.
3. N.N.Green Wood and A. Eafnshow: Chemisry of the element, Pergamon.
4. A.B.P. Lever: Inorganic Electronic Spectroscopy, Elsevier
5. R.L.Carlin: Magnetochemistry, Verlag.
6. G. Wilkinson, R.D. Gillars and J.A. MCELEVERTY: Comprehensive Coordination Chemistry eds. Pergamon.
7. F. Basolo and R.G. Pearson: Mechanism of Inorganic Reaction, Wiley
Eastern

CH- 202: ORGANIC CHEMISTRY

UNIT I

Aliphatic Nucleophilic Substitution

The S_N2 , S_N1 , mixed S_N1 and S_N2 and SET mechanisms.

The neighbouring group mechanism, neighbouring group participation by π and σ bonds, anchimeric assistance.

Classical and nonclassical carbocations, phenonium ions, norbornyl system, common carbocation rearrangements. Application of NMR spectroscopy in the detection of carbocations.

The S_{Ni} mechanism.

Nucleophilic substitution at an allylic, aliphatic trigonal and a vinylic carbon.

Reactivity effects of substrate structure, attacking nucleophile, leaving group and reaction medium, phase transfer catalysis and ultrasound, ambident nucleophile, regioselectivity.

Aliphatic Electrophilic Substitution

Bimolecular mechanisms- S_E2 and SE^i . The S_E1 mechanism, electrophilic substitution accompanied by double shifts. Effect of substrates, leaving group and the solvent polarity on the reactivity.

UNIT II

Aromatic Electrophilic Substitution

The arenium ion mechanism, orientation and reactivity, energy profile diagrams. The ortho/para ratio, ipso attack, orientation in other ring systems. Quantitative treatment of reactivity in substrates and electrophiles. Diazonium coupling, Vilsmeier reaction, Gattermann-Koch reaction.

Aromatic Nucleophilic Substitution

The S_NAr , S_N1 , benzyne and $S_{RN}1$ mechanisms. Reactivity – effect of substrate structure, leaving group and attacking nucleophile. The von Richter, Sommelet-Hauser, and Smiles rearrangements.

UNIT III

Free Radical Reactions

Types of free radical reactions, free radical substitution mechanism, mechanism at an aromatic substrate, neighbouring group assistance.

Reactivity for aliphatic and aromatic substrates at a bridgehead. Reactivity in the attacking radicals. The effect of solvents on reactivity.

Allylic halogenation (NBS), oxidation of aldehydes to carboxylic acids, auto-oxidation, coupling of alkynes and arylation of aromatic compounds by diazonium salts, Sandmeyer reaction. Free radical rearrangement. Hunsdiecker reaction.

UNIT IV

Addition to Carbon-Carbon Multiple Bonds

Mechanistic and stereochemical aspects of addition reactions involving electrophiles, nucleophiles and free radicals, regio- and chemoselectivity, orientation and reactivity. Addition to cyclopropane ring. Hydrogenation of double and triple bonds, hydrogenation of aromatic rings. Hydroboration. Michael reaction. Sharpless asymmetric epoxidation.

Addition to Carbon-Hetero Multiple Bonds

Mechanism of metal hydride reduction of saturated and unsaturated carbonyl compounds, acids, esters and nitriles. Addition of Grignard reagents, Organozinc and Organolithium reagents to carbonyl and unsaturated carbonyl compounds. Wittig reaction.

Mechanism of condensation reactions involving enolates – Aldol, Knoevenagel, Claisen, Mannich, Benzoin, Perkin and Stobbe reactions.

Hydrolysis of esters and amides, ammonolysis of esters.

UNIT V

Elimination Reactions

The E2, E1 and E1cB mechanisms and their spectrum, Orientation of the double bond. Reactivity – effects of substrate structures, attacking base, the leaving group and the medium.

Mechanism and orientation in pyrolytic elimination.

Books Suggested:

1. Advanced Organic Chemistry-Reactions, Mechanism and Structure, Jerry March, John Wiley.
2. Advanced Organic Chemistry, F.A. Carey and R.J.Sundberg, Plenum.
3. A Guide Book to Mechanism in Organic Chemistry, Peter Sykes, Longman.
4. Structure and Mechanism in Organic Chemistry, C.K.Ingold, Cornell University Press.
5. Organic Chemistry, R.T. Morrison and R.N.Boyd, Prentice-Hall
6. Modern Organic Reactions, H.O. House, Benjamin.
7. Principles of Organic Synthesis, R.O.C. Norman and J.M.Coxon, Blackie Academic & Professional.
8. Pericyclic Reactions, S.M. Mukherji, Macmillan, India.
9. Stereochemistry of Organic Compounds, D. Nasipuri, New Age International.

CH- 203: PHYSICAL CHEMISTRY

UNIT- I

Quantum Chemistry I

Introduction to Exact Quantum Mechanical Results: The Schrodinger's wave equation and its Hamiltonian operator form, postulates of quantum mechanics, operators. Discussion of solutions of the Schrodinger's wave equation to some model systems viz; particle in one dimensional box, particle in three dimensional box, the linear harmonic oscillator, the Hydrogen atom.

UNIT- II

Quantum Chemistry II

Concepts of spatial quantization and spinning electron hypothesis, Quantum numbers, Russell-Saunders terms and coupling schemes (L-S and j-j Coupling), spectral terms for p^n and d^n configurations, Magnetic effects: Normal and anomalous Zeeman effects.

UNIT - III

Classical Thermodynamics:

Partial molal properties; free energy – chemical potential, Gibbs – Duhem equation, physical significance of chemical potential, variation of chemical potential with temperature and pressure, chemical potential for ideal gas and mixture of ideal gases, Thermodynamic derivation of law of mass action.

Concept of fugacity, Change in fugacity with temperature and pressure, physical significance of fugacity, fugacity of a gas in a mixture of real gases, determination of fugacity (graphical method).

UNIT - IV

Statistical Thermodynamics I

Concepts of phase space, microstate and macrostate, ensemble, canonical, grand canonical and microcanonical ensembles, ensembles averaging, Maxwell-Boltzmann distribution law using Lagrange's method of undetermined multipliers.

Bose-Einstein statistics, Fermi-Dirac statistics and Maxwell-Boltzmann statistics

UNIT – V

Statistical Thermodynamics II

Partition functions – translational, rotational, vibrational and electronic partition functions, calculation of thermodynamic properties in terms of partition functions- Energy, specific heat at constant volume and constant pressure, entropy, work function, pressure and Gibbs free energy.

Books Suggested:

1. Physical Chemistry, P.W. Atkins, ELBS.
2. Introduction to Quantum Chemistry, A.K. Chandra, Tata McGraw Hill.
3. Quantum Chemistry, Ira N. Levine, Prentice Hall.
4. Coulson's Valence, R. McWeeny, ELBS.
5. Theoretical Chemistry, S. Glasston, Princeton, London.
6. Fundamentals of Chemical Thermodynamics, E.N. Yeregin, Mir Publishers.
7. Introduction to Atomic Spectra, H.E. White, McGraw Hill.

CH- 204: ANALYTICAL CHEMISTRY

Unit I Introduction to Instrumentation:

Basic components of analytical instruments, Analog & digital signals, Basic digital circuit components, DAC & ADC. Operational Amplifiers (for current, potential, resistance/conductance), Automation in analysis: Automatic & Automated instruments, Process control analyzer, Continuous analyzer & Discrete analyzer, Flow injection analysis, Microprocessor controlled smart instruments

Unit II Thermal Analysis: Introduction to thermal Analysis; Thermogravimetric Analysis(TGA) : Basic Principle , Instrumentation and applications. Differential thermal Analysis (DTA) : Principle , Instrumentation and Applications of (DTA) . Introduction to Differential scanning calorimetry (DSC).

Unit III Electrochemistry : Electrochemical Cell, Ion Selective Electrodes: Types (Glass membrane, Precipitate, Solid State, Liquid-Liquid, Enzyme), Mechanism of Glass membrane ISE , Advantages and limitations of ISEs. Introduction to Sensors and their types , Design & working of Glucose Amperometric biosensor.

Unit IV Electroanalytical Methods I :dc Polarography: theoretical principle, Significance of Ilkovic equation, Half wave potential and their significance. Different wave forms & Current-Voltage Curves. Cyclic Voltammetry: Theoretical Principle, Randle-Sevick Equation, Determination of Heterogenous Rate Constant (K_s), Criteria of reversibility by CV.

Unit V: Electroanalytical Methods II :

Theoretical Principle, Methodology and applications, Differential Pulse Voltammetry ; Square Wave Voltammetry, Stripping Voltammetry (Anodic, Cathodic and Adsorptive Stripping techniques). Application of Voltammetry in Inorganic & Organic Analysis

Books Suggested:

1. Instrumental Methods of Analysis, H.H. Willard, L.L. Merritt, J.A. Dean and F.A. Settle, CBS Publ. Delhi.
2. Principles of Instrumental Analysis, D.A. Skoog and J.L. Loary, Publ. W B Saunders
3. Vogel's Textbook of Quantitative Chemical Analysis, G.H.Jeffery, J.Bassett, J. Mendham and R.C. Denney, Publ ELBS, Longman, UK

LABORATORY COURSE: II-SEMESTER

CH-205: ORGANIC CHEMISTRY

Qualitative Analysis

Separation, purification and identification of compounds of binary mixture (one liquid and one solid), chemical tests, Interpretation of IR Spectra of simple compounds.

Two Step Organic Synthesis

Acetylation: Acetylation of glucose and hydroquinone.

Oxidation: Adipic acid by chromic acid oxidation of cyclohexanol.

Cannizzaro reaction: 4-Chlorobenzaldehyde as substrate.

Aromatic electrophilic substitutions: Synthesis of p-nitroaniline (1st step synthesis of p-nitroacetanilide from the acetanilide; 2nd step, synthesis of p-nitroaniline from p-nitroacetanilide), and Synthesis of p-bromoaniline (1st step synthesis of p-bromoacetanilide from the acetanilide; 2nd step synthesis of p-bromoaniline from p-bromoacetanilide).

Quantitative Analysis

Determination of the percentage weight and number of hydroxyl group in an organic compound by acetylation method.

Estimation of amines/phenols using bromate bromide solution/or acetylation method.

Determination of Iodine and Saponification values of an oil sample.

Determination of DO, COD and BOD of water sample.

CH- 206: ANALYTICAL CHEMISTRY

Conductometry:

- (1) Estimation of Oxalic acid by Conductometric Titration in following solutions
 - (a) A solution of pure oxalic acid
 - (b) A solution of oxalic acid and HCl
- (2) To titrate a given mixture of sulphuric acid, acetic acid and Copper Sulphate conductometrically.

Environmental Analysis:

- (1) Determination of carbon dioxide, carbon monoxide, oxygen and nitrogen in air sample using Orsat apparatus.
- (2) Determination of NO_2^- by spectrophotometry in environmental samples.

Electrophoresis:

- (1) To study the separation of amino acids in a mixture by electrophoresis.
- (2) To Determine isoelectric point of glutamic acid by paper electrophoresis.

TLC :

- (1) Separation of dyes by TLC
- (2) Separation of pharmaceutical Samples by TLC
- (3) Study of reaction monitoring by TLC

Books Suggested:

1. Vogel's Textbook of Quantitative Chemical Analysis, G.H.Jeffery, J.Bassett, J. Mendham and R.C. Denney, Publ ELBS, Longman, UK
2. Handbook of Organic Analysis – Qualitative and Quantitative, H. Clark, Adward Arnold.
3. Vogel's Textbook of Practical Organic Chemistry, John Wiley. Experiments and Techniques in Organic Chemistry, D. Pasto, C.Johnson and M.Miller, Prentice Hall
4. Macroscale and Microscale Organic Experiments, K.L. Williamson, D.C. Heath.
5. Systematic Qualitative Organic Analysis, H. Middleton, Adward Arnold.

2022-23

Marking Scheme for M.Sc. II Semester Practicals

Organic CH-205 Lab Course

- | | |
|-------------------------------|----------|
| 1. Qualitative Analysis | 25 Marks |
| 2. Two step organic synthesis | 20 Marks |
| 3. Quantitative Analysis | 15 Marks |
| 4. Viva-voce | 10 Marks |

Total 70 Marks

Analytical CH-206 Lab Course

- | | |
|---|----------|
| 1. Conductometry | 25 Marks |
| 2. Environmental Analysis/Electrophoresis | 15 Marks |
| 3. TLC---A | 10 Marks |
| TLC---B | 10 Marks |
| 4. Viva-Voce | 10 Marks |

Total 70 Marks

SKILL BASED COURSE

SK-CH-1 Water Analysis

Introduction, water sources (ground water, surface water, municipal water supplies)

Characteristics of water, water standards, simple water analysis technique: for

a] physical parameter

B] Chemical parameter

Color, odour, turbidity, hardness ($\text{Ca}^{+2}/\text{Mg}^{+2}$) TDS, pH, alkalinity, conductivity, dissolve oxygen(DO), chloride, sulphate, nitrate, fluoride, biological oxygen demand(BOD) and chemical oxygen demand(COD) some important water analysis equipment/instruments. Interpretation of water quality parameter.

LABORATORY

Experiments

- 1- To find out the Colour, Turbidity and Odour of a given sample of water.
- 2- To determine the pH value of a given sample of water.
- 3- To determine the Electrical conductivity value of a given sample of water.
- 4- To determine the carbonate, bicarbonate and hydroxide alkalinity of a given sample of water.
- 5- To find out the concentration of chlorides in the given sample of water.
- 6- To estimate the hardness of the given sample of water by standard EDTA method.
- 7- To find out the amount of water sterilizing powder(Bleaching powder) required by Horrock's test and modified Horrock's test.
- 8- To determine the residual chlorine in a given sample of water.
- 9- To determine the residual chlorine in a water sample volumetrically
- 10- To determine the amount of dissolve oxygen (DO) in the given sample of water by Winkler method.

11- To determine 5 day BOD of the given sample of effluent.

12- To determine the quality of alum required to coagulate a given sample of water by jar test.

13- To determine the amount of chemical oxygen demand (COD) in the given sample of water

14- To determine the Antimicrobial Activity of water /bacteriological examination of water.

Books Recommended:

1. Industrial Chemistry (Including Chemical Engineering) : B.K. Sharma: Goyal Publishing House
2. Engineering Chemistry by Jain & Jain, Goyal Publishing House
3. Water Pollution by B.K. Sharma.

SK-CH-2 FOOD ADULTERATION AND TESTING

Introduction to food adulteration,

Adulterants: types, sources and their impact on health.

Criteria of adulterated food.

Detection methods of food adulterants.

Awareness towards food adulteration.

The Prevention of Food Adulteration Act & Rules

Practical

Detection of adulterants in

1. Milk and milk products
2. Oils and fats
3. Sweetening agents
4. Food grains
5. Spices

Books Recommended:

1. A Textbook Of Foods, Nutrition And Dietetics 2009 M Raheena Begum
2. Textbook of Food Science & Technology: Unique Book For B.SC., M.SC., Home Science, Food Science & Technology, Horticulture, Agriculture, 2006. Avantina Sharma .
3. A First Course in Food Analysis .1999. A.Y. Sathay
4. FSSAI manual.

SK-CH-3 APPLICATION OF SOLAR ENERGY

Theory

Sunlight, spectral composition of surface illumination, solar intensity and solar irradiancy, photo chemistry and electricity generation, solar energy conversion and storage, energy conversion efficiency;

Fabrication, basic principles, characteristics and applications of various solar power devices like photo-electrochemical cells, photo galvanic cells and photovoltaic cells.

Practical

Study of photo galvanic cells; Study, fabrications and characteristics of solar power devices like solar charger, solar calculator, solar heater, solar cap, solar power desalination unit and solar power fountain.

Books Recommended:

1. Organic Photochemistry, J.Coxon and B. Halton, Cambridge University Press.
2. Solar Energy Hand Book, J.F. Kreider and F. Krejth, MacGraw Hill Book Co. 1981.
3. Solar Energy Conversion, R.C. Neville, Elsevier.
4. Alternative Energy Systems, B.K. Hodge, Wiley.
5. Advanced Energy Systems, Second Edition, Nicolai V. Khartchenko; Vadym M. Kharchenko, Taylor & Francis.
6. Non- Conventional Energy Resources, D.S. Chauhan, New Age International

SK-CH-4 ORES AND BUILDING MATERIAL

Theory:

Ceramics- general properties and classification

Cement-classification, composition, basic constituents and their significance. manufacturing of Portland cement by rotary kiln method, setting and hardening of cement.

Lime- manufacture of lime, setting and hardening and lime mortar.

Plaster of paris- manufacture, setting and hardening of plaster of paris.

Ore- definition, basics of ores.

Ore and building material

Practical

1. determination of % of Cu in Cu ore.
2. estimation of calcium in lime stone.
3. determine the % of iron in the given iron ore.
4. determine the amount of chromium in the chromite ore.
5. analysis of cement.

List of books for Ores and Building Materials

Books Recommended:

1. Building Materials: S. K. Duggal
2. Industrial Chemistry: B K Sharma
3. Material Chemistry: S S Dara & S S Umare
4. Engineering Chemistry: Dr. Sunita Rattan
5. Engineering Chemistry: Jain & Jain
6. Experiments and Calculations in Engineering Chemistry: S S Dara
7. Laboratory Manual on Engineering Chemistry: S K Bhasin & Sudha Rani

2022-23

SK-CH-5 POLYMER TECHNOLOGY

Polymer: Classification, introduction to concept of Average Molecular Mass, polydispersity, amorphous and crystalline state. Introductory rheology, polymer degradation, diffusion and mechanical properties.

Polymer Processing:

Mixing: Introduction, material flow to the mixture, feeding, incorporation, dispersion, distribution and plasticization.

Extrusion: Basic principles of extrusion, types of extruders; ram type and screw type.

Calendering: Types of calender rolls, roll positioning and adjustments. Calendering Operations, sheeting, fractioning, coating, profiling and embossing.

Moulding: Types; Compression, transfer, injection and blow moulding of low viscosity materials: casting.

Polymer testing and characterization: Introduction to thermal techniques; TGA, DTA.

Introduction to Chemical Characterization: Identification of materials by thermal, elemental, solubility and color tests.

Practical

1. Synthesis of PMMA, PS, PAN
2. Determination of free phenol and free formaldehyde in one stage synthesis of PF resin.
3. Identification of polymers by color test:
 - i. Thermoplastics: PE, PS, PVC.
 - ii Thermosetting: PF, UF, MF, Epoxy resin.
4. Determination of moisture content.
5. Determination of ash content.
6. Determination of Bulk Density.

7. Determination of percentage DOP absorption.

Books Recommended:

1. Polymer Science- V R Gowarikar, N V Vishwanathan and J Sridhar
2. Polymer Science & Technology: J R Fried
3. Science & Technology of Polymers-Plastics and Rubber: P Ghosh
4. Rubber Technology: M Morton

2022-23

SK-CH-6 Conservation and Management of cultural Heritage

Course Objectives: The primary objective is to build awareness and competence in the country on the recent developments in Heritage and historical aspects of conservation and Protecting and save our culture and civilization.

Course Contents / Syllabus:

Heritage and their types, Heritage and historical aspects of corrosion in India. Ethics of conservation, restoration and preservation and its history. Importance of knowledge of archaeology, chemistry, geology, Anthropology, art and architecture for conservation of heritage monuments. Guiding principles for conservation / preservation of monuments as per international conventions. Distribution of monuments in different geographical / seismic zones and their conservation problem. Stone, Building materials and their classifications, degradation equation. Causes of Decay of Heritage structure and Antiquities. Electrochemical basis of corrosion of cultural heritage, management of heritage site, economic value of cultural heritage, methods and technique in conservation treatment, An overview on analytical methods and approach to the conservation process, Procedures for scientific analysis research of cultural heritage. ionic and non-ionic solutions ,Micro-climate, preparation techniques for lime mortar.

ESTABLISHMENT OF LABORATORY (NECESSARY INSTRUMENTS, TOOLS, EQUIPMENTS AND CHEMICALS) AND FIELD STUDY TOUR/VISIT.

PRACTICAL:

1. Preparation of conservation notes (history, architecture, building materials, problems, remedial measures to be adopted)
2. Macroscopic analysis by visual examination or the aid of a hand lens to record the texture, colour, shine, transparency, type of fracture.
3. Physical tests to determine hardness, cohesion, density, porosity, permeability, effect of heat.
4. Laboratory procedures and determination of pH, etc
5. Practical training in -(i) Testing and chemical analysis of heritage building materials in the field study visit/ tour and in -situ treatment .
6. Treatment and cleaning of metal antiquities
7. Cleaning and treatment of stones, marble, etc
8. Special form of examination to determine structure using high powered equipment such as x-rays crystallography.

Books:

1. History of Indian Archaeology: The Beginning to 1947 by Dilip K . Chakrabarti ,Munshiram Manoharlal Publishers (1 May 1995)
2. An Introduction to Archaeological Chemistry by By T. Douglas Price, James H. Burton ,Springer Science
3. Electrochemical Methods in Archaeometry, Conservation and Restoration by **Antonio Doménech-Carbó**, María Teresa, Virginia **Costa**, Springer.
4. Chemical Methods of Rock Analysis (Third Edition) by *D. Hutchison and P.G. Jeffrey* Pergamon press New York.
5. Petrology Igneous, Sedimentary, and Metamorphic by Ernest G. Ehlers, Harvey Blatt, W. H. Freeman& Company, USA.
6. Protection, Conservation and Preservation of Indian Monuments by S.L. Nagar, Aryan Books International, Ansari Road Delhi (November 30, 1993)
7. Conservation of Cultural Property in India by O.P. Agrawal, Publisher: Agam Kala Prakashan.
8. The Conservation of Antiquities and Works of Art: Treatment, Repair and Restoration by H. J. Plenderleith, A. E. A. Werner, Oxford University Press; 2nd edition (March 9, 1972).
9. Conservation science: Heritage Materials by Eric May and Mark Jones, RSC Publication Cambridge U.K.

SYLLABUS

CHEMISTRY

Under Choice Based Credit System (CBCS)

M.Sc. (FINAL) EXAMINATION- 2022 -23

JAI NARAIN VYAS UNIVERSITY

JODHPUR

M.Sc. Chemistry

(CBCS)

Second Year (2022-23)

(Two Semesters each of 15 weeks)

III SEMESTER:

1. THEORY PAPERS	Pds/Wk	No. of Credits	CCA	ESE	Total
CH 301 Group Theory & Inorganic Spectroscopy	6	4	30	70	100
CH 302 Application of Spectroscopy	6	4	30	70	100
Elective Paper I (303A-I/303B-I/303C-I/303D-I)	6	4	30	70	100
Elective Paper II (304A-II/304B-II/304C-II/304D-II)	6	4	30	70	100
Grand Total				Marks	400

A student will opt for any one of the four elective groups.

Elective Group A C. No 303A-I /304A-II

Elective Group B C. No 303B-I /304B-II

Elective Group C C. No 303C-I/304C-II

PRACTICALS:

Practicals

24 pds./week

375 pds./semester

There will be 4 Labs. Namely Lab. 1, Lab. 2, Lab. 3 and Lab.4. Students will be divided into four groups. Each group of students will work for 7 weeks for two Lab Courses in one semester.

CH -305 : Lab. Course 1 (Inorganic)

CH -306 : Lab. Course 2 (Analytical)

CH -307 : Lab. Course 3 (Organic)

CH -308: Lab. Course 4 (Physical)

PRACTICALS EXAMINATION SCHEME

Lab Course	Pds/Wk	No. of Credits	CCA	ESE	Total
Lab Course 1 / Lab Course 3	24	4	30	70	100
Lab Course 2 / Lab Course 4	24	4	30	70	100
Grand Total				Marks	200
Total marks of III Semester					600

IV SEMESTER:

1. THEORY PAPERS	Pds/Wk	No. of Credits	CCA	ESE	Total
CH 401 Solid State Chemistry	6	4	30	70	100
CH 402 Bio Chemistry	6	4	30	70	100
Elective Paper I (403A-III/403B-III/403C-III/403D-III)	6	4	30	70	100
Elective Paper II (404A-IV/404B-IV/404C-IV/404D-IV)	6	4	30	70	100
Grand Total				Marks	400

(A student who had opted group in III Semester will continue with the same group in the IV Semester.)

There will be 4 Labs. Namely Lab. 1, Lab. 2, Lab. 3 and Lab.4. Students will be divided into four groups. **Each group of students will work for 7 weeks for two**

Lab Courses in one semester.

CH -405 : Lab. Course 1 (Inorganic)

CH -406 : Lab. Course 2 (Analytical)

CH -407 : Lab. Course 3 (Organic)

CH -408: Lab. Course 4 (Physical)

Lab. Course	Pds/Wk	No. of Credits	CCA	ESE	Total
Lab Course 1 / Lab Course 3	24	4	30	70	100
Lab Course 2 / Lab Course 4	24	4	30	70	100
Total				Marks	200
<u>Total marks of IV Semester</u>					600
SK-CH for III Semester	4pd/week	(For students of Chemistry Department only)			
SK-CH for IV Semester	4pd/week	(For students of Other Department only)			

M.Sc Chemistry

II YEAR-2022-23

SEMESTER III

There will be two compulsory papers and two elective papers.

A student has to take any one of the four elective groups. (The group a student chooses this Semester, they would have to continue with the same group in the IV Semester.)

LIST OF TWO COMPULSORY PAPERS:

Compulsory Paper-I

CH 301 GROUP THEORY & INORGANIC SPECTROSCOPY

Compulsory Paper-II

CH-302 APPLICATIONS OF SPECTROSCOPY

List of Elective Groups in M.Sc. III Semster:

GROUP A

CH 303A-I: ORGANOTRANSITION METAL CHEMISTRY.

CH 304A-II: NANOSCIENCE AND NANOTECHNOLOGY

GROUP B

CH 303B-I: PHOTOCHEMISTRY

CH 304B-II: ORGANIC SYNTEHSIS-I

GROUP C

CH 303C-I: BIOINORGANIC AND SUPRAMOLECULAR CHEMISTRY

CH 304C-II: HETEROCYCLIC CHEMISTRY

GROUP D

CH 303D-I: NUCLEAR AND RADIOCHEMISTRY

CH 304D-II: MEDICINAL & PHARMACEUTICAL CHEMISTRY

Compulsory Paper-I

CH-301: GROUP THEORY & INORGANIC SPECTROSCOPY

Unit I

Molecular Symmetry and Group theory (A) : Symmetry elements and operation. Symmetry classification of group, relation between orders of a finite group and its sub groups. Conjugacy relation and classes. Schoenflies symbols, representation of groups by matrices (representation for the $C_n, C_{nv}, C_{nh}, D_{nh}$ etc. groups to be worked out explicitly types of Matrices, Matrix Multiplications, Transformations of Matrices,). Characters of representations.

Unit II

Molecular symmetry and group theory (B) : The great orthogonality theorem and its importance, character table and its constructions, use in spectroscopy. Mulliken Symbols for Irreducible representations areas of character tables, reduction formula and its application, unit vector transformation, direct product.

Unit III

Orbital symmetries and overlap, hybridization in linear trigonal planar, tetrahedral square planar, square pyramidal and trigonal pyramidal molecules. symmetry and hybridization in Buta-1,3-diene and benzene.

Vibrational Spectroscopy: Symmetry and shapes of AB_2 AB_3 AB_4 AB_5 & AB_6 mode of bonding of ambidentate ligands, ethylenediamine and di ketonato complexes, applications of Resonance . Raman Spectroscopy particularly for the study of activesites of metalloproteins.

Unit IV

Electron Spin Resonance Spectroscopy: Hyperfine coupling, spin polarization for atoms and transition metal ion, spin-orbit- coupling and significance of g-tensors, Applications to transition metal complexes (having one unpaired electron) including biological systems and to inorganic free radicals such as PH_4 , F_2 and $[BH_3]$.

Unit V

Nuclear Magnetic Resonance of Paramagnetic substances in solution. The contact and pseudo contact shifts, factors affecting nuclear relaxation, some applications including biochemical systems, an overview of NMR of metal nuclides with emphasis on ^{195}Pt and ^{119}Sn NMR. Mossbauer Spectroscopy: Basic principles, spectral display applications of the technique of the studies of (1) bonding and structures of Fe^{2+} and Fe^{3+} compounds including those of intermediate spin, (2) Sn^{2+} and Sn^{4+} compounds nature of M-L bond, coordination number, structure and (3) detection of oxidation state and in equivalent MB atoms.

Books Suggested:

1. Chemical Applications of Group Theory. F.A. Cotton
2. Physical Methods in Chemistry, R.S.Drago, Saunders College.
3. NMR, NQR, EPR and Mossbauer Spectroscopy in Inorganic Chemistry, R.V.Parish, Ellis Harwood.
4. Structural Methods in Inorganic Chemistry, E.A.V. Ebsworth, D.W.H. Rankin and S. Cradock, ELBS.
5. Infrared and Raman Spectra: Inorganic and Coordination Compounds, K. Nakamoto, Wiley.
6. Progress in Inorganic Chemistry vol., 8 ed., F.A. Cotton, vol., 15, ed. S.J. Lippard, Wiley.

Compulsory Paper-II

CH-302: APPLICATIONS OF SPECTROSCOPY

UNIT I

Ultraviolet and Visible Spectroscopy

Various electronic transitions (185-800 nm), Instrumentation, Beer-Lambert law, effect of solvent on electronic transitions, ultraviolet bands for carbonyl compounds, unsaturated carbonyl compounds, dienes, conjugated polyenes. Fieser-Woodward rules for conjugated dienes and carbonyl compounds, ultraviolet spectra of aromatic and heterocyclic compounds. Steric effect in biphenyls.

UNIT II

Infrared Spectroscopy

General introduction, Instrumentation and sample handling, Characteristic vibrational frequencies of alkanes, alkenes, alkynes, aromatic compounds, alcohols, ethers, phenols and amines. Detailed study of vibrational frequencies of carbonyl compounds (ketones, aldehydes, esters, amides, acids, anhydrides, lactones, lactams and conjugated carbonyl compounds). Effect of hydrogen bonding and solvent effect on vibrational frequencies, overtones, combination bands and Fermi resonance. FT IR. IR, of gaseous, solids and polymeric materials..

Optical Rotatory Dispersion (ORD) and Circular Dichroism (CD): Definition, deduction of absolute configuration, octant rule for ketones.

UNIT III

Nuclear Magnetic Resonance Spectroscopy

General introduction and definition, chemical shift, spin-spin interaction, shielding mechanism, mechanism of measurement, chemical shift values and correlation for protons bonded to carbon (aliphatic, olefinic, aldehydic and aromatic) and other nuclei (alcohols, phenols, enols, carboxylic acids, amines & amides), chemical exchange, effect of deuteration, complex spin-spin interaction between two, three, four and five nuclei (first order spectra), virtual coupling. Stereochemistry, hindered rotation, Karplus curve-variation of coupling constant with dihedral angle. Simplification

of complex spectra-nuclear magnetic double resonance, contact shift reagents, solvent effects. Fourier transform technique, nuclear Overhauser effect (NOE). Resonance of other nuclei-F, P.

UNIT IV

Carbon-13 NMR Spectroscopy

General considerations, chemical shift (aliphatic, olefinic, alkyne, aromatic, heteroaromatic and carbonyl carbon), coupling constants.

Two dimension NMR spectroscopy – COSY, NOESY, DEPT, INEPT, APT and INADEQUATE techniques. Instrumentation of H¹ and C¹³ NMR and sample handling.

UNIT V

Mass Spectrometry

Introduction, ion production – EI, CI, FD and FAB, factors affecting fragmentative, ion analysis, Instrumentation and sample handling. Mass spectral fragmentation of organic compounds, common functional groups, molecular ion peak, metastable peak, McLafferty rearrangement. Nitrogen rule. High resolution mass spectrometry. Examples of mass spectral fragmentation of organic compounds with respect to their structure determination.

Books Suggested:

1. NMR, NQR, EPR and Mossbauer Spectroscopy in Inorganic Chemistry, R.V. Parish, Ellis Horwood.
2. Practical NMR Spectroscopy, M.L. Martin, J.J. Delpeuch and G.J. Martin, Heyden.
7. Spectrometric Identification of Organic Compounds, R.M. Silverstein, G.C. Bassler and T.C. Morrill, John Wiley.
3. Introduction to NMR Spectroscopy, R.J. Abraham, J. Fisher and P. Loftus, Wiley.
4. Application of Spectroscopy of Organic Compounds, J.R. Dyer, Prentice Hall.
5. Spectroscopic Methods in Organic Chemistry, D.H. Williams, I. Fleming, Tata McGraw-Hill.

2022-23

Group A

Elective Paper-I

CH-303A-I: ORGANOTRANSITION METAL CHEMISTRY

UNIT I

Organotransition metal compounds : Definition, Classification and nomenclature of organotransition metal compounds. Comparison of bonding between metal carbonyls and Organotransition metal compounds. Organometallic compounds of inner transition elements

UNIT II

Alkyls and Aryls of Transition Metals: Types, methods of synthesis, thermal stability and decomposition pathways.

UNIT III

Transition Metal π -Complexes

Transition metal π -complexes with unsaturated organic molecules, alkenes, cyclopentadienyls and arenes, methods of synthesis, properties, nature of bonding and structural features.

UNIT IV

Homogeneous Catalysis

Homogeneous catalytic hydrogenation of Alkenes, Zeigler Natta polymerization of olefins, Isomerisation of Alkenes, Hydroformylation, Dimerisation and polymerization of Alkenes and Alkynes.

UNIT V

Organocopper in Organic Synthesis : Conjugated additions, halogen substitution, alkylation of epoxides, alkylation of allylacetates, ketones from acid chlorides.

2022-23

Books Suggested:

1. Principles and Application of Organotransition Metal Chemistry, J.P. Collman, L.S. Hegsdus, J.R. Norton and R.G. Finke, University Science Books.
2. The Organomettalic Chemistry of the Transition Metals, R.H. Crabtree, John, Wiley.
3. Metallo-organic Chemistry, A.J. pearson, Wiley.
4. Organometallic Chemistry, R.C. Mehrotra and A. Singh, New Age International.

2022-23

Group A

Elective Paper-II

CH-304A-II: NANOSCIENCE & NANOTECHNOLOGY

Unit I Introduction and Preparation: Introduction to Nano Scale and Nanomaterials, Unique properties of Nanomaterials; Optical, Magnetic, electrical, thermal and chemical properties of Nanomaterials. Bonding, self-assembly, catalysis.

Synthesis of nanomaterial: Chemical Approaches: Chemical reduction; sonochemical synthesis; Sol-Gel Synthesis; Self assembly. Physical Approaches: Aerosol spray; Chemical vapour deposition(CVD) and lithography.

Unit II Nanostructured materials: Classification of nano materials based on dimension and configuration, Nanorods, Nanotubes and Nanofibres, wells & wires. Semiconductors quantum dots.

Inorganic nano materials: Metal/Oxide nanoparticles (NPs).

Organic nano materials- Polymer NPs

Carbon nano materials: Graphenes, Fullerenes, Carbon Nano tubes (CNTs)- Single walled carbon nanotubes (SWNTs), Multiwalled Carbon nanotubes (MWNTs)

Unit III Characterization techniques for Nanomaterials-I:

Electron Microscopy: Scanning electron microscopy (SEM), Scanning tunneling microscopy (STM), Scanning Probe Microscopy- Atomic force Microscopy (AFM)

Unit IV Characterization techniques for Nanomaterials-II

Particle size Analyser (Dynamic light scattering), X-ray Diffraction (XRD), Auger Emission Spectroscopy, Electron Spectroscopy for Chemical analysis (ESCA)

Unit V Application of Nanomaterials and Nanotechnology:

Impact of Nanotechnology in various fields. Pharmaceutical-Advance drug delivery system, Medical & Health diagnosis through biosensors. Environment-water purification and air pollution control. Consumer goods-cosmetics and sports goods, Defence- Light Military platform and soldier protection.

Books Recommended:

1. Essentials in Nanoscience and Nanotechnology, N. Kumar & S. Kumbhat ; John Wiley & Sons.
2. Concise Concepts of Nanoscience & Nanomaterials, N. Kumar & S. Kumbhat ; Scientific Publishers.
3. Charles P. Poole, Jr. and Frank J.Owens ;Introduction to Nanotechnology, , Wiley, 2003
4. G. Cao, Nanostructures and Nanomaterials: Synthesis, Properties and Applications, ICP, London, 2004.
5. C.M. Niemeyer and C.A. Mirkin, Nanobiotechnology, Concepts, Applications and perspectives, WILEY-VCH, Verlag Gmb H&Co, 2004.
6. G.M.Chow and K.E.Gonslaves ;Nanotechnology - Molecularly Designed Materials, (American chemical society)
7. K.P.Jain,Physics of semiconductor Nanostructures: Narosa Publishers, 1997
8. S.P. Gaponenko, Optical Properties of semiconductor nanocrystals, Cambridge University Press, 1980.
9. G. Cao, Nanostructures & Nanomaterials: Synthesis, Properties & Applications, Imperial College Press, 2004.
10. T.Pradeep, “Nano: The essentials, Tata Mc Graw Hill, New Delhi, 2007.
- 11.** Willard, “Instrumental Methods of Analysis”, 2000.

Group B

Elective Paper-I

CH-303B-I: PHOTOCHEMISTRY

UNIT I

Solar radiation spectrum, Insolation; Photochemical Reactions: Interaction of electromagnetic radiations with matter, types of excitations, fate of excited molecules, quantum yield, transfer of excitation; Properties of excited states: Structure, dipole moment, acid-base strengths, Reactivity; Bimolecular deactivation-quenching. Determination of Reaction Mechanism: Classification, rate constants and life time of reactive energy states- determination of rate constants of reaction, Effect of light intensity on the rate of photochemical reactions, Types of photochemical reaction- photodissociation, gas-phase photolysis.

UNIT II

Photochemistry of Alkenes and Carbonyl Compounds: Intramolecular reactions of the olefinic bond – geometrical isomerism, cyclisation reactions, rearrangement 1,4- and 1,5- dienes; Intramolecular reactions of carbonyl compounds – saturated, cyclic and acyclic, β,γ – unsaturated and α,β -unsaturated compounds, Cyclohexadienones; Intermolecular cycloaddition reactions – dimerisations and oxetane formation.

UNIT III

Photochemistry of Aromatic Compounds : Isomerisations, additions and Substitutions; Miscellaneous Photochemical Reactions; Photo-Fries reaction of anilides, Photo-Fries rearrangement, Barton reaction, Singlet molecular oxygen Reactions; Photochemical formation of smog, Photo degradation of polymers, Photochemistry of vision.

UNIT IV

Excited states of metal complexes: Excited states of metal complexes: Comparison with organic compounds, electronically excited states of metal complexes, charges transfer spectra, charge transfer excitations; Ligand field photochemistry: Photosubstitution, Photoreduction, lability and Selectivity, Zero vibrational levels of ground state and excited state, energy content of excited state, zero-zero spectroscopic energy, development of the equations for redox potentials of the excited states; Redox reactions by excited metal complexes: Redox reactions of metal complexes in excited states, excited electron transfer using examples $[\text{Ru}(\text{bpy})]^{2+}$ complexes and $[\text{Fe}(\text{bpy})_3]^{3+}$ complex, role of spin-orbit coupling, life times of excited states in these complexes; Metal complex sensitizers: Metal complex sensitizer, electron relay, metal colloid systems, semiconductor supported metal or oxide systems, water photolysis, nitrogen fixation and carbon dioxide reduction.

UNIT V

Photochemistry and electricity generation; solar energy conversion and storage; Concepts of solar power, maximum current, open-circuit potential, short-circuit current, i-v characteristics, Energy conversion efficiency, Thermodynamic efficiency limit, Quantum efficiency, Maximum power, Fill factor. Solar power storage; Basic principles, fabrication, characteristics, application and latest status of various solar power techniques like Solar steam generator (solar concentrating solar power), Solar chimney or solar cells, Organic/Polymer solar cells, Nanocrystal solar cells, Multijunction photovoltaic cells, Photoelectrochemical cells, Photogalvanic cells, Point-contact solar cells, Porous Nanoparticulate PEC, Perovskite Solar Cell.

Books Suggested:

1. Fundamentals of Photochemistry, K.K. Rohtagi-Mukherji, Wiley-Easter.
2. Molecular Photochemistry, N.J. Turro, W.A. Benjamin.
3. Introductory Photochemistry, A. Cox and T. Camp, McGraw-Hill.
4. Photochemistry, R.P. Kundall and A. Gilbert, Thomson Nelson.
5. Organic Photochemistry, J. Coxon and B. Halton, Cambridge University Press.
6. Solar Energy Hand Book, J.F. Kreider and F. Krejth, MacGraw Hill Book Co. 1981.

7. Solar Energy Conversion, R.C. Neville, Elsevier.
8. Alternative Energy Systems, B.K. Hodge, Wiley.
9. Advanced Energy Systems, Second Edition, Nicolai V. Khartchenko; Vadym M. Kharchenko, Taylor & Francis.
10. Non- Conventional Energy Resources, D.S. Chauhan, New Age International
11. Concepts of Inorganic Photochemistry, A.W. Adamson and P.D. Fleischauer, Wiley
12. Inorganic Photochemistry, J.Chem.Educ.vol. 60 No. 10, 1983.
13. Progress in Inorganic Chemistry, Vol. 30ed. S.J. Lippard. Wiley.
14. Photochemistry of Coordination Compounds, V. Balzari and V. Carassiti, Academic Press.
15. Elements in Inorganic Photochemistry, G.J. Ferraudi, Wiley..

Group B

Elective Paper-II

CH-304B-II: ORGANIC SYNTHESIS I

UNIT I

Organometallic Reagents

Principle, preparations, properties and applications of the following in organic synthesis with mechanistic details.

Group I and II metal organic compounds- Li, Mg, Hg, Cd, and Zn compounds.

Transition metals- Cu, Pd, Ni, Fe, Co, and Ti compounds.

Other elements- Si and B compounds.

UNIT II

Oxidation

Introduction, Different oxidative processes.

Hydrocarbons- alkenes, aromatic rings, saturated C-H groups (activated and unactivated).

Alcohols, diols, aldehydes, ketones, ketals and carboxylic acids.

Amines, hydrazines, and sulphides.

Oxidations with ruthenium tetraoxide, iodobenzene diacetate and thallium (III) nitrate.

UNIT III

Reduction

Introduction. Different reductive processes.

Hydrocarbons – alkanes, alkenes, alkynes and aromatic rings.

Carbonyl compounds – aldehydes, ketones, acids and their derivatives

Epoxides.

Nitro, nitroso, azo and oxime groups.

Hydrogenolysis.

UNIT IV

Rearrangements

General mechanistic considerations – nature of migration, migratory aptitude, memory effects. A detailed study of the following rearrangements:

Pinacol-pinacolone, Wagner-Meerwein, Demjanov, Benzil-Benzilic acid, Favorskii, Arndt-Eistert synthesis, Neber, Beckmann, Hofmann, Curtius, Schmidt, Baeyer-Villiger, Shapiro reaction.

UNIT V

Metallocenes, Nonbenzenoid Aromatics and Polycyclic Aromatic Compounds.

General considerations, synthesis and reactions of some representative compounds.

Books Suggested:

1. Modern Synthetic Reactions, H.O. House, W.A. Benjamin.
2. Somer Modern Methods of Organic Synthesis, W. Carruthers, Cambridge Univ. Press.
3. Advanced Organic Chemistry, Reactions Mechanisms and Structure, J. March, John Wiley.
4. Principles of Organic Synthesis, R.O.C. Norman and J.M. Coxon, Blackie Academic & Professional.
5. Advanced Organic Chemistry Part B. F.A. Carey and R.J. Sundberg, Plenum Press.
6. Rodd's Chemistry of Carbon Compounds, Ed. S. Coffey, Elsevier.

Group C

Elective Paper-I

CH-303C-I: BIOINORGANIC AND SUPRAMOLECULAR CHEMISTRY

UNIT I

Metal storage Transport: Iron storage and Transport;

Oxygen carriers: Hb, Mb , ferritin and transferrin;

Bio-mineralization;

Iron Transport in Microbs: siderophores.

Calcium in Biology: Storage and Transport of Calcium & calcium in Muscle contraction, transport and regulation, intramolecular process, extracellular binding protein, Ca^{2+} ATP ase structure, Ca^{2+} ATP ase reaction cycle, intracellular Ca^{+2} transport.

UNIT II

Metalloenzymes: Zinc enzymes- carboxy peptidase and carbonic anhydrase. Iron enzymes- Reactivity and structure of catalase, peroxidase and cytochrome P450. Copper enzymes- Reactivity and structure of superoxide dimutase (SOD).

Co enzyme vitamin B_{12} – Names of different forms, biochemical function of cobalamin, Vitamin B_{12} , special characteristics of B_{12} co-enzyme.

UNIT III

Metals and chelates in medicine, metal deficiency and disease, toxic effect of metals, metal used for diagnosis and chemotherapy with particular reference to anticancer drugs.

UNIT IV

Supramolecular chemistry: Concepts and language molecular recognition, Principal of molecular receptors designs for different types of molecules, design and synthesis of co- receptor molecules and multiple recognition.

UNIT V

Supramolecular reactions and catalysis, supramolecular assemblies, Molecular and supramolecular devices, molecular and supra molecular photonic , electronic and ionic devices. supramolecular photochemistry

Books suggested:

2. Principles of Bioinorganic chemistry, SJ Lippard and J.M. Berg, University science books.
3. Bioinorganic chemistry, I Bertini, H.B. Garg, S.J. Lippard and J.S. Valentine, University science books.
4. Inorganic Biochemistry, Vol I and II Ed. G.S. Eichhorn, Elsevier progress in inorganic chemistry Vol. 18 and 38 ed. J.J. Lippard, Wiley.
5. Supra molecular chemistry, J.M. Lehn, VCH.
6. Bioinorganic chemistry, A K. Das Books and allied (P) Ltd.
7. Bioinorganic and supra molecular chemistry, Ajay kumar bhagi, G.R. Chatwal Himalaya publishing house.

Group C

Elective Paper-II

CH-304C-II: HETEROCYCLIC CHEMISTRY

UNIT I

Nomenclature of heterocycles: Systemic nomenclature of monocyclic, fused & bridge heterocycles.

Three Membered Heterocyclic Compounds With One Hetero Atom:

Aziridines, Oxiranes and Thiiranes

UNIT II

Four Membered Heterocyclic Compounds with One Hetero Atom:

Azities & Azetidines; Oxitanes, Thietanes

Bicyclic Ring Systems Derived from Pyrrole, Furan and Thiophene:

Benzopyrroles, benzofurans and benzothiophenes

UNIT III

Five Membered Heterocyclic Compounds with One Hetero Atom:

Tautomerism

Pyrroles, Furans and Thiophenes

Five Membered Heterocyclic Compounds with Two Hetero Atoms:

Pyrazoles, Imidazoles, Oxazoles and Thiazoles

UNIT IV

Six Membered Heterocyclic Compounds With One Hetero Atom:

Pyridines, Pyrylium salts and α - and γ -Pyrones

Six Membered Heterocyclic Compounds with Two Hetero Atoms:

Pyrazines, Pyridazines and Pyrimidines,

Cinnolines and Phthalazines

UNIT V

Seven Membered Heterocyclic Compounds with Two Hetero Atoms:

Azepines, Oxepins and Thiepins

Bicyclic Ring Systems Derived from Pyridine:

Quinoline and Isoquinoline

Books Suggested:

1. Heterocyclic Chemistry Vol. 1-3, R.R. Gupta, M. Kumar and V. Gupta, Springer Verlag.
2. The Chemistry of Heterocycles, T. Eicher and S. Hauptmann, Thieme.
3. Heterocyclic Chemistry, J.A. Joule, K. Mills and G.F. Smith, Chapman and Hall.
4. Heterocyclic Chemistry, T.L., Gilchrist, Longman Scientific Technical.
5. Contemporary Heterocyclic Chemistry, G.R. Newkome and W.W. Paudler, Wiley-Interscience.
6. An Introduction to the Heterocyclic Compounds, R.M. Acheson, John Wiley.
7. Comprehensive Heterocyclic Chemistry, A.R. Katritzky and C.W. Rees, eds. Pergamon Press.

Group D

Elective Paper-I

CH-303D-I: NUCLEAR AND RADIOCHEMISTRY

UNIT I

Stability of the nucleus, Mass Energy relationship for nuclear reactions, Properties of nucleus, Nuclear Models (The shell model, the liquid drop model, the fermi gas model, the collective model and the optical model).

Nuclear reactions, Energetics of nuclear reactions, fission and fusion reactions, spallation, fragmentation, stripping and pick up reactions, photonuclear and thermonuclear reactions.

UNIT II

Interaction of radiation with matter, passage of neutrons through matter, interaction of radiation with matter; measurement of radiations. Radiolysis of water, counting techniques (GM Ionisation, proportional and scintillation counter), counting statistics.

UNIT III

Applications of radioactivity, Activation Analysis, isotopic dilution analysis, radiometric titrations, application in chemical investigations and synthesis in physiochemical analysis, in age determination and in prospecting of natural resources. Medical agricultural and industrial applications, source of electricity. Radiation hazards and protection.

UNIT IV

Nuclear reactors: Basic features, materials and design of nuclear power reactors, Conversion and Breeding, safety features of reactors, Health Physics: Radiation unit (exposure unit), External and doses from various sources of radiations, allowed limit of intake (ALI)

UNIT V

Applications of radioisotopes in biology & molecular biology: biodistribution, metallic & biochemical pathways for protein synthesis, purine nucleotide synthesis, role of methionine in research, radioligand assay, autoradiography, primer extension, Nick translation , hybridization, nucleic acid sequencing.

Books Recommended:

1. Essentials of Nuclear Chemistry, H.J. Arnikar.
2. Introduction to Nuclear Science, M.W. Sarton, East West Edition.
3. Theory of Nuclear Structure, M.K. Pal, East West Edition.
4. Principles of Radiochemistry, G.W.A. Newton and V.J. Robinson, Macmilan Education Ltd.
5. Nuclear Chemistry, A. Vertes and I. Kiss.
6. Fundamental of radiation Chemistry, A. Mojumdar, J. David, Morrisey, G. T. Seaborg
7. Fundamentals of Analytical Chemistry, D.A. Skoog, D.M. West and F.J.Holler. Publ. W B Saunders.

Group D

Elective Paper-II

CH-304D-II: MEDICINAL AND PHARMACEUTICAL CHEMISTRY

UNIT I

Drug design & Pharmacodynamics

Procedure followed in drug design, Concepts of lead compound and lead modification, concepts of pro drugs & soft drugs, structure-activity relationship(SAR), Theories of drug activity : occupancy theory, rate theory, induced fit theory .

An Introduction of pharmacodynamics, Mechanism of drug action, elementary treatment of enzyme stimulation, enzyme inhibition, sulphonamides , drug metabolism

UNIT II

Antineoplastic agents :

Introduction, cancer chemotherapy, role of alkylating agents and antimetabolites in treatment of cancer. Mention of carcinolytic antibiotics and mitotic inhibitors.

Synthesis of cyclophosphamide , Uracil and mustards .

UNIT III

Cardiovascular Drugs :

Introduction , Cardiovascular diseases, drug inhibitors of peripheral sympathetic function , Synthesis of amyl nitrite, sorbitrate, Methyldopa and atenolol.

UNIT IV

Drugs: Psychotic and Antipsychotic –

Introduction, CNS depressants, general anaesthetics, mode of action of; hypnotics, sedatives, anti-anxiety drugs. Anti depressants, stereochemical aspects of psychotropic drugs. Synthesis of diazepam, alprazolam and barbiturates..

UNIT V

Antibiotics :

Cell wall biosynthesis , inhibitors , β -lactam rings , antibiotics inhibiting protein synthesis , synthesis of penicillin –G , penicillin – V, Chloramphenicol and Tetracyclin.

Books Suggested:

1. Introduction to Medicinal Chemistry, A. Gringuage, Wiley-VCH.
2. Wilson and Gisvold's Text Book of Organic Medicinal and Pharmaceutical Chemistry, Ed. Robert F. Dorge.
3. An Introduction to Drug Design, S.S. Pandeya and J.R. Dimmock, New Age International.
4. Burger's Medicinal Chemistry and Drug Discovery, Vol-1 (Chapter-9 and Ch-14), Ed. M.E. Wolff, John Wiley.
5. Goodman and Gilman's Pharmacological Basis of Therapeutics, McGraw-Hill.
6. The Organic Chemistry of Drug Design and Drug Action, R.B. Silverman, Academic Press.
7. Strategies for Organic Drug Synthesis and Design, D. Lednicer, John Wiley.

Marking Scheme for Practicals III & IV Semester

Inorganic CH-305/405 Lab Course

- | | |
|--------------------------|----------|
| 1. Gravimetric Analysis | 25 Marks |
| 2. Rare earth Mixture | 20 Marks |
| 3. Inorganic Preparation | 10 Marks |
| 4. Viva-voce | 15 Marks |

Total 70 Marks

Physical CH-308/408 Lab Course

- | | |
|---------------------|----------|
| 1. Major Experiment | 35 Marks |
| 2. Minor Experiment | 20 Marks |
| 3. Viva-Voce | 15 Marks |

Total 70 Marks

Organic CH-307/407 Lab Course

- | | |
|-----------------------------|----------|
| 1. Mixture three components | 25 Marks |
| 2. Extraction | 10 Marks |
| 3. Organic Preparation | 10 Marks |
| 4. Spectroscopy | 10 Marks |
| 5. Viva-voce | 15 Marks |

Total 70 Marks

Analytical CH-306/406 Lab Course

- | | |
|--------------------|----------|
| 1. Instrumental-I | 20 Marks |
| 2. Instrumental-II | 20 Marks |
| 3. COD/DO etc | 15 Marks |
| 4. Viva-voce | 15 Marks |

Total 70 Marks

M Sc II YEAR-2022-23

SEMESTER-IV

There will be two compulsory papers and two elective papers.

(A student who had opted group in III Semester will continue with the same group in the IV Semester.)

List of two compulsory papers:

Compulsory Paper-I

CH-401: SOLID STATE CHEMISTRY

Compulsory Paper-II

CH-402: BIO-CHEMISTRY

List of Elective Groups in M.Sc. IV Semester:

GROUP- A

CH 403A-III: INDUSTRIAL CHEMISTRY

CH 404A-IV: POLYMERS

GROUP- B

CH 403B-III: ORGANIC SYNTHESIS II

CH 404B-IV: ADVANCED ELECTROCHEMISTRY AND APPLICATIONS

GROUP- C

CH 403C-III: CHEMISTRY OF NATURAL PRODUCTS

CH 404C-IV: ENVIRONMENTAL CHEMISTRY

GROUP- D

CH 403D-III: PHYSICAL ORGANIC CHEMISTRY

CH 404D-IV: CHEMISTRY OF MATERIALS

Compulsory Paper I

CH-401: SOLID STATE CHEMISTRY

UNIT I

Solid State Reactions and Non-Stoichiometry

Crystalline solid, Solid State Reactions - General principles and Experimental procedures, Wagner's theory in reference to MgO and Al₂O₃, Enhancement of reactivity of solids, Co-precipitation as a precursor to solid state reaction, Kinetics of solid state reaction

Non-Stoichiometry – Introduction, Classification – Small and Large deviations from stoichiometry, Superlattice ordering of defects

UNIT II

Crystal Defects

Perfect crystal and Crystal Defect, Thermodynamic requirement of defect, Intrinsic and Extrinsic defects, Point defects - Schottky, Frenkel, Interstitial atom, Substitutional impurity atom and Color Centre, Line defect – Dislocation (edge and screw), Plane defects - Lineage boundary, Grain Boundary, Stacking fault, Thermodynamics of Schottky and Frenkel defect

UNIT III

Electronic Structure of Solids

Introduction to Free electron theory of Metals, Formation of Energy bands, Valence and Conduction bands, Kronig-Penny Model, Band theory of solids, Brillouin zone, Motion of electrons in a band – velocity and effective mass of an electron, f_k factor, Distinction between metal, semiconductor and insulator on the basis of Band theory

Electrically conducting solids – Conjugated systems, Charge-transfer complexes

UNIT IV

Semiconductors and Properties of Solids

Intrinsic and Extrinsic semiconductors, p-type and n-type semiconductors, Dependence of conductivity of n-type and p-type semiconductors on temperature, p-n Junction

Optical Properties – Photoconduction and Photoelectric effect

Magnetic Properties: Classification of materials – para-, dia-, ferro-, and antiferromagnet, Effect of temperature on magnetic susceptibility of para-, dia-, ferro-, antiferromagnetic substances, Magnetic Hysteresis

UNIT V

Superconductor

Superconductivity, Factors affecting superconductivity, Isotope effect, Meissner Effect, Magnetic effects – Type I and Type II superconductors, Persistent current, BCS theory of superconductivity, Cooper pair, Occurrence of superconductivity– conventional, organic and high temperature superconductors, Fullerene as superconductor

Books Suggested:

1. Solid State Chemistry and its Applications, A.R. West, Plenum
2. Principles of Solid State, H.V. Keer, Wiley Eastern
3. Solid State Chemistry, D.K. Chakrabarty, New Age International
4. Fundamentals of Solid State Physics, B.S. Saxena, R.C. Gupta and P.N. Saxena
5. Solid State Physics, A. J. Dekkar, Macmillan

Compulsory Paper II

CH-402: BIO-CHEMISTRY

UNIT I

Metal ions in Biological Systems: Role of metal ions in biological processes.

Dioxygen Uptake: Structure and function of haemoglobin, myoglobin, hemocyanins and hemerythrin, model system and synthetic complexes of iron and Copper. Electron Transfer in Biology: Structure and function of metalloproteins, Cytochromes and iron-sulphur proteins, synthetic models, peroxidases and catalases.

Nitrogenases: Biological nitrogen fixation, molybdenum nitrogenases, model systems

UNIT II

Enzymes: Introduction and historical perspective, chemical and biological catalysis, remarkable properties of enzymes like catalytic power, binding energy specificity and regulation. Kinetics of enzyme action that is activation energy, Michaelis- Menten equation, Lineweaver Burk plot & factors effecting enzyme activity. Nomenclature and classification. Fischer's lock and key and Koshland's induced fit hypothesis. Types of inhibition, concept and identification of active site by the use of inhibitors and affinity labeling. Transition state theory, acid-base catalysis and covalent catalysis.

UNIT III

Co-Enzyme Chemistry: Cofactors as derived from vitamins, coenzyme, prosthetic groups, apoenzymes. Structure and biological functions of coenzyme A, thiamine pyrophosphate, pyridoxal phosphate, NAD⁺, NADP⁺, FMN, FAD, lipoic acid, vitamin B12, Mechanism of reaction catalysed by the above cofactors. Large-scale production and purification of enzymes, techniques.

UNIT IV

Bio-energetic and Bio-polymer Interactions: Standard free energy change in biochemical reactions, exergonic, endergonic. Hydrolysis of ATP, synthesis of ATP from ADP.

Forces involved in biopolymer interactions. Electrostatic charges and molecular expansion, hydrophobic forces, dispersion force interactions. Multiple equilibria and various types of binding processes in biological systems. Hydrogen ion titration curves.

UNIT V

Diffraction Methods and Statistical Mechanics in Biopolymers: Evaluation of size, shape, molecular weight by various experimental techniques. Light scattering, X-ray scattering, X-ray diffraction and photo correlation spectroscopy ORD. Chain configuration of macromolecules and calculation of average dimensions. Polypeptide and protein structures, introduction to protein folding.

Books Suggested:

1. The Inorganic Chemistry of Biological Processes, M.N.Hughes Wiles (1972).
2. Bioinorganic Chemistry-An Introduction, Enchiroochiai.
3. Principles of Bioinorganic Chemistry, S.J. Lippard and J.M.Berg, University Science Books.
4. Bioinorganic Chemistry, I Bertini, H.B. Gray, S.J.Lipard and J.S. Valentine, University Science Books.
5. Bioorganic Chemistry: A Chemical Approach to Enzyme Action, Hermann Dugas and C.Penny, Springer-Verlag.
6. Understanding Enzymes, Trevor Palmer, Prentice Hall.
7. Enzyme Chemistry: Impact and Applications, Ed. Collin J. Suckling, Chapman and Hall.
8. Enzyme Mechanisms Ed. M.I.Page and A.Williams, Royal Society of Chemistry.
9. Fundamentals of Enzymology, N.C. Price and L. Stevens, Oxford University Press.
10. Immobilized Enzymes: An Introduction and Applications in Biotechnology, Michael D. Tevan, John Wiley.
11. Enzymatic Reaction Mechanisms, C.Walsh, W.H. freeman.
12. Enzynie Structure and Mechanism, A Fersht, W.H. Freeman.
13. Biochemistry: The Chemical Reactions of Living Cells, D.E.Metzler, Academic Press.
14. Principles of Biochemistry, A.L.Lehninger, Worth Publishers.
15. Biochemistry, L. Strver, W.H.Freeman
16. Biochemistry, J.David Rawn, Neil Patterson.
17. Biochemistry, Voet and Voet, John Wiley.
18. Outlines of Biochemistry, E.E.Conn and P.K.Stumpf, Johh Wiley.
19. Bioorganic Chemistry: A Chemical Approach to Enzyme Achon. H. Dugas and C.Penny, Springer-Verlag.
20. Macromolecules: Structure and Function, F.World, Prentice Hall.

Group A

Elective Paper-I

CH-403A-III: INDUSTRIAL CHEMISTRY

UNIT I

Chemistry of colors

Introduction, Classification of dyes, according to chemical constitution and according to application. General ideas about the synthesis of different dye intermediate and synthetic dyes i.e. direct and reactive dyes, azoic colours, acid and basic dyes, newer cationic dyes for acrylics, Disperse dye, mordant and sulphur dyes. Pigment and fluorescence brighteners. Colour fastness against light, washing, perspiration, rubbing etc. and its evaluation. Methods of colour measurements.

UNIT II

Industrial/ Commercial polymers and their compounding ingredients:

General characteristics of Fibers, Plastic, Rubbers and Adhesives-

Structure, properties and preparation of Polyamides, Polystyrene, Polychloride, Polymethylmethacrylate, Polymethacrylate, ABS, Epoxide, IR, SBR, NBR & IIR

Compounding Ingredients: Extenders, Fillers, plasticisers, stabilizers, anti oxidant and anti ozonants, Flame retardants, mould release agents, Sulphur vulcanisation.

UNIT III

Ores and Minerals

Inorganic materials of industrial importance, their availability, forms and structure-

Bauxite, clay, mica, zeolites, copper pyrites, zinc blend, dolomite and coal.

UNIT IV

Characteristic Features of surfactants: Conditions under which interfacial phenomena and surfactants become significant. General structural features and behaviour of surfactants : General use of charge types, general effect of nature of hydrophobic group.

UNIT V

Micelle Critical micelle concentration (cmc), factors affecting the value of cmc in aqueous medium. factors determining the extent of Solubilization, effect of Solubilization. Formation of emulsions, factors determining emulsion stability, Mechanism of the cleaning process.

Books Recommended:

1. Hall, A.J.(8TH ed.): The Standard Hand Book of Textiles, Butter-Worth, London.
2. Clark, W.: An Introduction to Textiles Printing, A Practical Manual for use in Laboratories College and School of Arts, Bottonworth, London.
3. Shinai, V.A.: technology OF textile processing, Sevak publication, Bombay, Vols. I to IX
4. Chakravarty, R.R. : Glimpses of Textile Technology, Caxton Press, Delhi.
5. Peters, R.H.: Textile Chemistry, Elsevier, Amsterdam, Vol. I to Vol. II
6. Surfactants and Interfacial Phenomenon. Milton J. Rosen, Johan-Wiley, 1978.
7. Textbook of Polymer Science, F.W. Billmeyer Jr. Wiley.
8. Polymer Science, V.R. Gowariker, N.V. Viswanathan and J. Screehar, Wiley-Eastern.

Group A

Elective Paper-II

CH-404A-IV: POLYMERS

UNIT I

Basics:

Importance of polymers. Basic concepts: Monomers, repeat units, degree of polymerization. Linear, branched and network polymers.

Classification of polymers.

Polymerization: condensation, addition, radical chain-ionic and co-ordination and co-polymerization. Polymerization conditions and polymer reactions. Polymerization in homogeneous and heterogeneous systems.

UNIT II

Polymer Characterization

Polydispersion-average molecular weight concept. Number, weight and viscosity average molecular weights. Polydispersity and molecular weight distribution. The practical significance of molecular weight. Measurement of molecular weights End-group analysis and ultracentrifugation methods.

Analysis and testing of polymers-chemical analysis of polymers, Microscopy.

Thermal techniques: thermo gravimetric analysis, differential thermal analysis, and physical testing-tensile strength, impact. Tear resistance. Hardness and abrasion resistance.

UNIT III

Structure and Properties

Morphology and order in crystalline polymers-configurations of polymer chains. Crystal structures of polymers. Morphology of crystalline polymers, strain-induced morphology, crystallization and melting. Polymer structure and physical properties-crystalline melting point T_m -melting points of

homogeneous series, effect of chain flexibility and other steric factors, entropy and heat of fusion. The glass transition temperature, T_g-Relationship between T_m and T_g, effects of molecular weight, diluents, chemical structure, chain topology, branching and cross linking. Property requirements and polymer utilization.

UNIT IV

Polymer Processing

Plastics, elastomers and fibres. Compounding. Processing techniques: Calendering, die casting, rotational casting, film casting, injection moulding, blow moulding, extrusion moulding, thermoforming, foaming, reinforcing and fibre spinning.

UNIT V

Properties of Commercial Polymers

Polyethylene, polyvinyl chloride, polyamides, polyesters, phenolic resins, epoxy resins and silicone polymers. Functional polymers – Fire retarding polymers and electrically conducting polymers. Biomedical polymers – contact lens, dental polymers, artificial heart, kidney, skin and blood cells.

Books Suggested:

1. Textbook of Polymer Science, F.W. Billmeyer Jr. Wiley.
2. Polymer Science, V.R. Gowariker, N.V. Viswanathan and J. Sreedhar, Wiley-Eastern.
3. Functional Monomers and Polymers, K. Takemoto, Y. Inaki and RM. Ottanbrite.
4. Contemporary Polymer Chemistry, H.R. Alcock and F.W. Lambe, Prentice Hall.
5. Physics and Chemistry of Polymers, J.M.G. Gowie, Blackie Academic and Professional.
6. J.M.G. Gowie, Blackie Academic and Professional.

Group B

Elective Paper-I

CH-403B-III: ORGANIC SYNTHESIS II

UNIT I

Disconnection Approach

An introduction to synthons and synthetic equivalents, disconnection approach, functional group inter-conversions, the importance of the order of events in organic synthesis, one group C-X and two group C-X disconnections, chemoselectivity, reversal of polarity, cyclisation reactions, amine synthesis.

UNIT II

Protecting Groups, & Heterocyclic Compounds

Principle of protection of alcohol, amine, carbonyl and carboxyl groups.

Heterocyclic Compounds

IUPAC of Heterocyclic compounds, saturated heterocyclic compounds containing mono-hetero atom (O, S, N), synthesis of 3-, 4-, 5- and 6-membered rings, aromatic heterocyclic compounds in organic synthesis.

UNIT III

One Group C-C Disconnections

Alcohols and carbonyl compounds, regioselectivity. Alkene synthesis, use of acetylenes and aliphatic nitro compounds in organic synthesis.

UNIT IV

Two Group C-C Disconnections

Diels-Alder reaction, 1,3-difunctionalised compounds, α,β -unsaturated carbonyl compounds, control in carbonyl condensations, 1,5-difunctionalised compounds. Micheal addition and Robinson annelation.

UNIT V

Synthesis of Some Complex Molecules

Application of the above in the synthesis of following compounds:

Camphor, Longifoline, Cortisone, Reserpine, vitamin D, Juvabione, Aphidicolin and Fredericamycin A.

Books Suggested:

1. Designing Organic Synthesis, S. Warren, Wiley.
2. Organic Synthesis- Concept, Methods and Starting Materials, J. Fuhrhop and G. Penzillin, Verlage VCH.
3. Some Modern Methods of Organic Synthesis. W. Carruthers, Cambridge Univ. Press.
4. Modern Synthetic Reactions, H.O. House, W.A. Benjamin.
5. Advanced Organic Chemistry: Reactions, Mechanisms and Structure, J. March, Wiley.
6. Principles of Organic Synthesis, R. Norman and J.M. Coxon, Blackie Academic & Professional.
7. Advanced Organic Chemistry Part B, F. A. Carey and R.J. Sundberg, Plenum Press.

Group B

Elective Paper-II

CH-404B-IV: ADVANCED ELECTROCHEMISTRY AND APPLICATIONS

UNIT I

Electrochemical Energy Storage

Properties of Electrochemical energy stores: measure of battery performance, charging and discharging of batteries, storage density, energy density, Classical Batteries: (i) Lead Acid (ii) Nickel- Cadmium (iii) Zinc- Manganese dioxide

Modern Batteries: (i) Zinc Air (ii) Nickel- Metal Hydride (iii) Lithium battery

Future electricity stores: storage in (i) hydrogen (ii) alkali metals (iii) non aqueous solution

UNIT II

Electrochemical Energy Generators

Fuel cells: Hydrogen –Oxygen Cell, Electrochemical solar cell, and Application of Fuel Cell. Comparisons of batteries, fuel cells and super capacitors, electrochemical processes of particular relevance to energy conversion.

UNIT III

Corrosion and Industrial Electrochemistry

Electrochemical corrosion: Fundamentals and mechanism , thermodynamics and stability of metals, theories of corrosion, forms of corrosion, corrosion current and corrosion potential- Evans diagrams. Measurement of corrosion rate: Non electro chemical method and electrochemical method. corrosion monitoring and prevention methods. anodic protection ,by alternation in the medium, by alternation in the metal and design consideration, inhibitors, Green inhibitors.

UNIT IV

Kinetics of Electrode process and their nature

Kinetically and mass transport controlled electrochemical processes, Mass transport by migration, convection and diffusion. , essential of electrode reaction,. Current density, over potential, Tafel equation, Butler- Volmer equation, Potentiostatic and galvanostatic methods including chronoamperometry, chronopotentiometry.

UNIT-V

Environmental Electrochemistry

Types of electro-organic reactions, constant current and constant potential, electrolysis, cell design, effect of variable, Techniques of electro organic synthesis, overvoltage, application of sewage waste water treatment, electrochemical incineration of human waste in combined space, electro- organic synthesis of novel drugs.

Books Recommended:

1. Modern electrochemistry, Vol. 1, IIA, Vol. II B, JOM Brockris and A.K.N. Raddy, Plenum publication, New York.
2. Electrochemical methods by Allen J. Bard and Larry R.Faulkner, John Wiley.
3. Techniques of Electro-organic synthesis part I, II and III by N.L. Weinberg, John Wiley.
4. Corrosion and Corrosion Engineering chemistry by M.G. Fontana, N.D. Green, McGraw-Hill, New York.
5. Electro chemistry by Carl H. Hamann, Andrew Hammett and Wolf Vielstich. John Wiley.
6. M. G. Fontana "Corrosion Engineering", McGraw Hill, New York, 1997
7. "Corrosion Metal Environment Reactions" eds. L L. Shreir, R. A. Jerman, G. T. Burstein, Butterworths, London, 1994
8. D. Gabe "Principles of Metal Surface Treatment and Protection", Merlin Books, London, 1993
9. Corrosion Inhibitors, Principles & Applications, V.S. Sastry, John Wiley & Sons.
10. Electrochemistry for clean environment by Bockrish
11. Electrochemistry by D R Crow
12. Organic electrochemistry by M.M.Baizer

Group C

Elective Paper-I

CH-403C-III: CHEMISTRY OF NATURAL PRODUCTS

UNIT I

Terpenoids and Carotenoids

Classification, nomenclature, occurrence, isolation, general methods of structure determination, isoprene rule, biosynthesis.

Structure determination, synthesis of the following representative molecules: Citral, Geraniol, α - Terpineol, **Farnesol, Menthol**, Zingiberene, Phytol, Abietic acid and β -Carotene.

UNIT II

Alkaloids

Definition, nomenclature and physiological action, occurrence, isolation, general methods of structure elucidation, degradation, classification based on nitrogen heterocyclic ring, role of alkaloids in plants, biosynthesis.

Structure, synthesis of the following: Ephedrine, (+) - **Coniine**, Nicotine, Quinine and Morphine.

UNIT III

Steroids

Occurrence, nomenclature, basic skeleton, Diel's hydrocarbon, Stereochemistry biosynthesis. Isolation, structure determination of Cholesterol and Bile acids, **Steroid Hormones: Androsterone, Testosterone, Estrone, Progesterone and Aldosterone.**

UNIT IV

Plant Pigments

Occurrence, nomenclature and general methods of structure determination. Isolation structure and synthesis of Apigenin, Luteolin, Quercetin, Myricetin, Vitexin, Daidzein, Butein, Aureusin, Cyanidin, Hirsutidin.

Biosynthesis of flavonoids: Acetate pathway and Shikimic acid pathway.

UNIT V

Porphyrins

Structure of Haemoglobin and Chlorophyll.

Prostaglandins

Occurrence, nomenclature, classification, physiological effects. Synthesis of PGE₂ and PGF_{2α}

Pyrethroids and Rotenones

Structure and reactions.

Books Suggested:

1. Natural Products: Chemistry and Biological Significance, J. Mann, R.S. Davidson, J.B. Hobbs, D.V. Banthrope and J.B. Harborne, Longman, Essex.
2. Organic Chemistry, Vol. 2 I.L. Finar, ELBS.
3. Stereoselective Synthesis: A Practical Approach, M. Nogradi, VCH.
4. Rodd's Chemistry of Carbon Compounds, Ed. S. Coffey, Elsevier.
5. Chemistry, Biological and Pharmacological Properties of Medicinal Plants from the Americas, Ed. Kurt Hostettmann, M.P. Gupta and A. Marston, Harwood Academic Publishers.
6. Introduction to Flavonoids, B.A. Bohm, Harwood Academic Publishers.
7. New Trends in Natural Product Chemistry, Atta-ur-Rahman and M.I. Choudhary, Harwood Academic Publishers.
8. Insecticides of Natural Origin, Sukh Dev, Harwood Academic Publishers.

Group C

Elective Paper-II

CH-404C-IV: ENVIRONMENTAL CHEMISTRY

UNIT I

Environment; An Introduction, Atmosphere & Air Pollution

Concept & scope of Environmental chemistry; Environmental segments; Environmental Pollution; Classification of pollutants; Bio-geological cycles in the environment: Hydrological cycle, C, N, O, S and P cycles in the environment; Bio-distribution of elements;

Structure and Composition of Atmosphere; Particles, Ions & Radicals in the atmosphere; Major sources of Air Pollutants.

Pollution by C, CO, NO_x, SO_x, HC, Acid Rain, Smog, Particulates; Green House effect/Global Warming, Ozone Layer; Effects & Control of Air Pollutants; Air quality standards; Sampling, Monitoring.

UNIT II

Hydrosphere & Water Pollution

Aquatic environment, Chemical composition of water bodies; Lakes, Streams, Rivers.

Classification of water pollution; Pollution by Pesticides, Polymers, Detergents, Agriculture and Sewage wastes; Purification and Treatment of water;

UNIT III

Lithosphere: Soil Pollution

Introduction: Soil formation, composition & classification; Acid-Base and Ion-exchange reactions in Soil; Macro- and Micronutrients, Soil Profile; Soil fertility and Productivity, Soil erosion, Soil Analysis (Moisture, Nitrogen & pH).

Soil Pollution: Sources & Classification, Effects of Pesticides, Fertilizers & Sediments, Control of soil pollution.

UNIT IV

Industrial Pollution & Toxicology

Classification, Nature and treatment of Industrial Effluents, Industrial Effluents from Distillery, Textile, Cement, Electroplating, Paper & pulp, Dairy & Detergent, Fertilizers, Tanning, .

Toxic Chemicals in the Environment, Biochemical Effects of Ozone, PAN, Carcinogens, Cyanides, Pesticides, Natural & Man-made Disasters.

Solutions to Environmental Problems; Preventive Environmental Management, Better Industrial Processes.

UNIT V

Green Chemistry

Principles and Goals of Green Chemistry, Green chemicals, reagents, catalysts, and solvents. Examples of green synthesis / reactions, Microwave assisted synthesis.

Books Recommended/Suggested

1. Environmental Chemistry: Edited by J. O'M. Bockris, Plenum Press.
2. Environmental Chemistry: S.E. Manahan, Lewis Publications.
3. Environmental Chemistry: H. Kaur, Pragati Prakashan.
4. Environmental Chemistry: AK Day, New Age Int. Publishers.
5. Environmental Chemistry: SM Khopkar, Wiley Estern.
6. Physico-chemical Examination of Water, Sewage & Industrial Effluents: K. Manivasakam.
7. An introduction to Green Chemistry, V Kumar, Vishal Publ..

Group D

Elective Paper-I

CH-403D-III: PHYSICAL ORGANIC CHEMISTRY

UNIT I

Principles of Reactivity

Mechanistic significance of entropy, enthalpy and Gibb's free energy. Arrhenius equation. Transition state theory. Uses of activation parameters, Hammond's postulate. Potential energy surface model. Reactivity and selectivity principles.

UNIT II

Kinetic Isotope Effect and Structural Effects:

Theory of isotope effects. Primary and secondary kinetic isotope effects. Heavy atom isotope effects. Tunneling effect. Solvent effects.

Linear free energy relationships (LFER) The Hammett equation, substituent constants, theories of substituent effects. Interpretation of σ -values. Reaction constant ρ . Deviations from Hammett equation. Dual-parameter correlations, inductive substituent constant. The Taft model, σ I- and σ R-scales.

UNIT III

Solvation and Solvent Effects

Qualitative understanding of solvent-solute effects on reactivity. Thermodynamic measure of solvation. Effects of solvation on reaction rates and equilibria. Various empirical indexes of solvation based on physical properties, solvent-sensitive reaction rates, spectroscopic properties and scales for specific solvation.

UNIT IV

Steric and Conformational Properties

Various type of steric strain and their influence on reactivity. Steric acceleration. Molecular measurements of steric effects upon rates. Steric LFER. Conformational barrier to bond rotation, Rotation around partial double bonds. Winstein-Holness and Curtin-Hammett principle.

UNIT V

Nucleophilic and Electrophilic Reactivity

Structural and electronic effects on SN1 and SN2 reactivity. Solvent effects. Kinetic isotope effects. Intramolecular assistance. Electron transfer nature of SN2 reaction. SRN1 mechanism.

Electrophilic reactivity, general mechanism. Kinetic of SE₂-Ar reaction. Structural effects on rates and selectivity.

Books Suggested:

1. Molecular Mechanics, U. Burkert and N.L. Allinger, ACS Monograph 177,1982.
2. Organic Chemists' Book of Orbitals. L. Salem and W.L. Jorgenses, Academic Press.
3. Mechanism and Theory in Organic Chemistry, T.H. Lowry and K.C. Richardson, Harper and Row.
4. Introduction to Theoretical Organic Chemistry and Molecular, Modeling, W.B. Smith, VCH, Weinheim.
5. Physical Organic Chemistry, N.S. Isaacs, ELBS/Longman.
6. Supramolecular Chemistry, Concepts and Perspectives, J.M. Lehn, VCH.
7. The Physical Basis of Organic Chemistry, H. Maskill, Oxford University Press.

Group D

Elective Paper-II

CH-404D-IV: CHEMISTRY OF MATERIALS

UNIT I

Multiphase Materials

Classification and properties of materials, Types of phase diagrams, Isomorphous, Eutectic, Peritectic, Monotectic and Eutectoid systems, Calculation of phase amounts from a phase diagram, Phase rule, Ferrous alloys Fe-C phase diagram, Non Ferro alloys, Phase diagrams of brass and tin bronze.

UNIT II

Ceramic Materials

Raw materials of glass, Cement and Ceramics, Refractories, Characterization, Properties and Applications, Abrasives, kinds and uses, Powder metallurgy, Manufacturing process, Properties and Applications, Advantages and Limitations.

UNIT III

Composite Materials

Traditional composites, concrete, Asphalt and Wood, Synthetic composites, dispersion reinforced, Particle reinforced, Laminated and fiber reinforced composites, applications of composites.

UNIT IV

Polymeric and advanced materials : Brief idea of following :Insulating material, Semiconductors, Superconductors, Fullerenes, Optical fibers, Organic electronic material.

UNIT V

Environmental effects of Materials : Corrosion mechanisms of dry and wet corrosion, Galvanic and concentration cell corrosion, Pitting and stress corrosion, Corrosion control methods, Types, preparation and uses of adhesives, Types and Application of paints and Pigments.

2022-23

Books Suggested:

1. Solid State Physics, N.W. Ashcroft and N.D. Mermin, Saunders College.
2. Material Science and Engineering, An Introduction, W.D. Callister, Wiley.
3. Principles of the Solid State, H.V. Keer, Wiley Eastern.
4. Materials Science, J.C. Anderson, K.D. Leaver, J.M. Alexander and R.D. Rawlings, ELBS.
5. Thermotropic Liquid Crystals, Ed., G.W. Gray, John Wiley.
6. Handbook of Liquid Crystals, Kelker and Hatz, Chemie Verlag.

LABORATORY COURSES

III & IV Semester(2022-23)

LABORATORY COURSE 1

CH-305/405: INORGANIC LAB

I. Preparation of some Inorganic coordination compounds/ Complexes.

II. Analysis the given mixture for four rare elements.

III. Estimation of three constituent in the given sample of alloy / Coin (Two gravimetrically and one volumetrically).

IV. Spectrophotometry

a. Iron- phenanthroline complex: Job's Method of continuous variations.

b. Find out the stability constant of metal complexes by Bjerrum's Method.

V. Complexometry

a. Estimate Zn in given tablet/ sample complexometrically using xylenol orange as an indicator.

b. Estimate Ni in given sample complexometrically using murexide as an indicator.

LABORATORY COURSE 2

CH-306/406: ANALYTICAL LAB

I. pH metry:

1. To determine the dissociation constants of dibasic and tribasic acids.
2. Titration of mixture of acids ($\text{HCl} + \text{CH}_3\text{COOH}$) against strong base.

II. Spectrophotometry:

1. Determination of PK_a of an indicator (e.g. methyl red) in (a) aqueous and (b) micellar media.
2. Determination of stoichiometry and stability constant of inorganic (e.g. Iron– salicylic acid) and organic (e.g. Amine – Iodine).
3. To determine the concentration of chromium and Manganese Complexes in binary mixture.

III. Polarography:

1. To study oxygen wave by polarography.
2. To characterize and determine Pb^{2+} , Cd^{2+} and Zn^{2+} ions by polarography/ cyclic voltammetry

IV Fluorometry

1. Determination of strength of Vitamin B (Riboflavin) and Quinine

V. Nephelometry

1. Determination of sulphate content in water sample.
2. Determination of phosphate content in water sample.

VI. Flame photometry

1. Estimation of Mg, K and Ca.
2. Estimation in a mixture (Na and K; K and Ca).

VII. Water and Waste Water examination:

1. DO and BOD determination.
2. COD estimation.
3. Fluoride and nitrate determination in aqueous sample.

VIII. Cement Analysis

Books Suggested:

1. Systematic Qualitative Organic analysis by H. Middleton.
2. Qualitative and Quantitative hand book of Organic analysis by H. Clark
3. Vogel's Text book of practical Organic Chemistry by Vogel

LABORATORY COURSE 3

CH-307/407: ORGANIC LAB

I. Qualitative Analysis

Separation, purification and identification of three components of a mixture of organic compounds (three solids or two liquids and one solid, two solids and one liquid).

II. Multi-step Synthesis of Organic Compounds

Benzophenone → Benzpinacol → Benzpinacolone

→ Benzophenone → Benzophenone oxime → Benzanilide

Benzoin → Benzil → Benzilic acid

Skraup synthesis: Preparation of quinoline from aniline.

Synthesis using microwaves

To carry out oxidation of alcohols and oxime by PCC.

Synthesis using phase transfer catalyst

Alkylation of diethyl malonate or ethyl acetoacetate with an alkyl halide.

III. Extraction of Organic Compounds from Natural Sources

1. Isolation of caffeine from tea leaves.
2. Isolation of casein from milk (the students are required to try some typical colour reactions of proteins).
3. Isolation of lactose from milk (purity of sugar should be checked by TLC and PC and R_f value reported).
4. Isolation of piperine from black pepper.
5. Isolation of lycopene from tomatoes.

6. Isolation of β -carotene from carrots.
7. Isolation of eugenol from cloves.

IV. Paper Chromatography / TLC

Separation and identification of the sugars present in the given mixture of glucose, fructose and sucrose by paper chromatography and determination of R_f values.

V. Spectroscopy

Identification of organic compounds by the analysis of their spectral data (UV, IR, PMR, MS).

Spectrophotometric (UV/VIS) Estimations

2. Amino acids
3. Proteins
4. Carbohydrates
5. Ascorbic acid
6. Aspirin
7. Caffeine

Books Suggested:

1. Systematic Qualitative Organic analysis by H. Middleton.
2. Qualitative and Quantitative hand book of Organic analysis by H. Clark
3. Vogel's Text book of practical Organic Chemistry by Vogel
4. Practical Organic Chemistry by N.K. Vishnoi.

LABORATORY COURSE 4

CH-308/408: PHYSICAL LAB

I. Chemical Kinetics

- (i) To investigate the kinetics of the reaction between I^- and persulphate ion
 - (a) Order of the reaction
 - (b) Energy of activation of the reaction.
 - (c) Effect of ionic strength on rate.
- (ii) To find out the order of the reaction of saponification of ester using unequal concentrations of reactants.

II. Chemical kinetics

- (i) To investigate the kinetics of the reaction between ceric ammonium sulfate and glycollic acid.
 - (a) Order with respect to ceric ion.
 - (b) Order with respect to glycollic acid.
 - (c) Energy of activation of the reaction.
 - (d) Effect of ionic strength on rate.
- (e) To study the reaction between ceric ammonium nitrate and primary alcohol.

II. Thermodynamics

- (i) Determination of partial molar volume of solute (e.g., KCl) and solvent in a binary mixture.
- (ii) Determination of the temperature dependence of the solubility of a compound in two solvents having similar intermolecular interactions (benzoic acid in water and in DMSO-water mixture) and calculate the partial molar heat of solution.

III. Phase Equilibrium

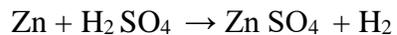
- (i) To find out the equilibrium constant for the triiodide formation:
- (ii) To find the formula of complex cuprammonium ion by distribution method.

IV. Conductometry

- (i) To find out the equivalent conductance of strong electrolytes at different dilutions and to verify Debye Huckel Onsagar equation.
- (ii) To determine the equivalent conductance of a weak electrolyte at infinite dilution.
- (iii) To determine the dissociation constant of acetic acid/Oxalic acid and verify the Ostwald's dilution law.
- (iv) To determine the degree of hydrolysis and hydrolysis constant of ammonium chloride at room temperature.
- (v) To determine the activity coefficient of zinc ions in the solution of 0.002 M ZnSO_4 using Debye-Huckel's Limiting Law.
- (vi) Determination of the velocity constant, order of the reaction and energy of activation for saponification of ethyl acetate by NaOH conductometrically.
- (vii) To determine the solubility and solubility product of sparingly soluble salt (PbSO_4 , BaSO_4)

V. Potentiometry/pH metry

- (i) To determine the dissociation constants of weak acids (oxalic, tartaric, phosphoric) using pH meter.
- (ii) To determine the temperature dependence of emf of a cell.
- (iii) To determine the degree of hydrolysis of aniline hydrochloride for three different solutions at room temperature and hence calculate the hydrolysis constant of the salt and dissociation constant of the base.
- (iv) To study the acid-base titration in a non-aqueous media using a pH meter.
- (v) To find out thermodynamic constants ΔG , ΔS and ΔH for the reaction by emf measurements.



Books suggested:

1. Practical Physical Chemistry, A.M. James and F.E. Prichard, Longman.
2. Findley's Practical Physical Chemistry, B.P. Levitt, Longman.
3. Experimental Physical Chemistry, R.C. Das and B. Behera, Tata McGraw Hill.
4. Advanced Practical Physical Chemistry, J.B. Yadav, Goel Publishing House.
5. Advanced Experimental Chemistry, vol.1 – Physical J.N. Gurtu and R. Kapoor, S. Chand & Co.

SYLLABUS
MA/M. Sc. In HUMAN DEVELOPMENT AND GUIDANCE & COUNSELING

Semester I, II 2022-2023
Semester III & IV 2023-2024

P.G. DEPARTMENT OF HOME SCIENCE, J. N. V UNIVERSITY, JODHPUR
Semester-wise Theory Papers/Practical/Skill component
Teaching and Examination scheme

Type of course	Course code	Title of the course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
<u>Semester I</u>							
Core course – 101		Life Span Development (Prenatal to Infancy)	4	4	30	70	100
Core course – 102		Introductory Guidance and Counseling	4	4	30	70	100
Core course - 103		Children at Risk-I	4	4	30	70	100
Core course - 104		Research methods and Seminar	4	4	30	70	100
Core course Practical - 105		Practical - I	8	4	30	70	100
Core course Practical - 106		Practical - II	8	4	30	70	100
Skill Course I 107		Gender Studies	2-0-2				
Skill Course II 107		Population Education and Community Health	2-0-2				
Skill Course III 107		Nutrition Science: Basic Concepts	2-0-2				
Total				24	180	420	600
<u>Semester II</u>							
Core course - 201		Life Span Development Preschool to Adolescence	4	4	30	70	100
Core course -		Guidance and	4	4	30	70	100

202		counseling- II					
Core course - 203		Theories of Human Development	4	4	30	70	100
Core course -204		Child and Women Welfare Institutes and Tours	4	4	30	70	100
Core course Practical - 205		Practical - I	8	4	30	70	100
Core course Practical - 206		Practical - II	8	4	30	70	100
Skill Course I 207		Gender Studies	2-0-2				
Skill Course II 207		Population Education and Community Health	2-0-2				
Skill Course III 207		Nutrition Science: Basic Concepts	2-0-2				
Total				24	180	420	600
Semester III							
Core course 301	1	Life Span Development (Adulthood to Old Age)	4	4	30	70	100
Core course – 302	2	Guidance and Counseling-III	4	4	30	70	100
Core course – 303	3	Children at Risk-II	4	4	30	70	100
Core course 304	4	Early Child Hood Education and Internship	4	4	30	70	100
Core course Practical 305	Pr. -1	Practical - I	8	4	30	70	100
Core course Practical – 306	Pr. – 2	Practical - II	8	4	30	70	100
Skill Course I 307		Gender Studies	2-0-2				
Skill Course II 307		Population Education and Community Health	2-0-2				
Skill Course III 307		Nutrition Science: Basic Concepts	2-0-2				
Total				24	180	420	600

Semester IV							
Core course – 401		Family Dynamics	4	4	30	70	100
Core course – 402		Guidance and Counseling- IV	4	4	30	70	100
Core course – 403		Trends and Issues in Human Development	4	4	30	70	100
Core course – 404		Scientific Writing and Dissertation	4	4	30	70	100
Core course Practical – 405	Pr. -1	Practical - I	8	4	30	70	100
Core course Practical - 406	Pr. – 2	Practical - II	8	4	30	70	100
Skill Course I 407		Gender Studies	2-0-2				
Skill Course II 407		Population Education and Community Health	2-0-2				
Skill Course III 407		Nutrition Science: Basic Concepts	2-0-2				
Total				24	180	420	600

(SEMESTER - I) 2022-2023
LIFE SPAN DEVELOPMENT (PRENATAL TO INFANCY)
CORE COURSE - 101

MM-70
Pd/ wk- 4

Unit – 1

1. Introduction to genetics principles of genetics
2. Genes & chromosomes: structure & function
3. DNA structure, cell organization, mitosis, meiosis, mendelism- linkage and cross over, gene-mutation, sex determination, identical and fraternal twins, rental screening methods

Unit - 2

4. Pregnancy- physiological and psychological changes,
5. Hormonal changes in pregnancy and lactation
6. Complications during pregnancy and child birth

Unit - 3

1. Prenatal development – stages, trimesters, prenatal environmental influences
2. Birth process – methods of delivery, birth complications,
3. Prematurity – preterm, small for date, impact of prematurity and birth weight on personality

Unit - 4

1. Assessment of newborn – APGAR scale, brazelton neonatal behavioral assessment scale, neonatal ICU network neurobehavioral scale (NNS)
2. REFLEXES IN NEONATE
3. The neonate up to 4 weeks- physical, physiological, cognitive, social capabilities

Unit – 5

1. Four weeks up to 2 years
2. Physical and motor – fine and gross motor skills,
3. social development: ATTACHMENTS AND BOND
4. Emotional development – primary and self conscious emotions
5. Cognitive – attention, memory, thinking and met cognition in life span

References

- L. Alan Sroufe, Robert, G. Cooper: Child Development- Its Nature and Course, Ist Ed. 1988
- Boston, Allyn & Bacon: Child Development, 1989
- Peter, K. Smith & Helen Kowie : Understanding Children’s Development, Smikow 30077, New York, Basil Block, 1988
- Rober S. Feldman: Understanding Psychology, McGraw Hill Book co., New York, 1987
- Olds, S.W. and Papalia, D.E.: Human Development, McGraw Hill Book Co., New York, 1986

INTRODUCTORY GUIDENCE AND COUNSELING
CORE COURSE - 102

MM-70
Pd/ wk- 4

Unit - 1

1. Concept and Definition of guidance and counseling
2. Scope of guidance and counseling

3. Emergence and growth of counseling {briefly}

Unit - 2.

1. Principles ,Philosophy and Aims of guidance and counseling
2. Need of guidance and counseling
3. Counseling and psychotherapy

Unit - 3.

Process of counseling:

Stages

1. Problem exploration and classification
2. Developing new perspective and setting goals
3. Readiness and pre counseling interview
4. Implementation and evaluation

Unit - 4

Terminating skills:

1. Consideration
2. Structuring the process
3. Optimal concern
4. Recording the counseling process

Unit - 5.

Placement and follow up services

1. The placement service, Aims of placement service, Types of placement, , Responsibility of the community for the placement, Phases of placement service,
2. The follow-up service, Importance of follow up, The commandants of success, Purpose of follow up, Organization of follow up service, Planning for follow up service.

CHILDREN AT RISK-I CORE COURSE - 103

**MM-70
Pd/ wk- 4**

Unit – 1

1. Concept definition of special needs, impairments disability handicap
2. Classification & approaches to identification, treatments and rehabilitation
3. Causes and effects of various disabilities on individual
4. Right of children with special needs

Unit – 2

1. Definition, causes, assessment, treatment, education and rehabilitation:
 - a. Orthopedic handicaps
 - b. Sensory deficits – visual and auditory impairments

Unit – 3

1. Definition, causes, assessment, treatment, education and rehabilitation:
 - a. Mental retardation
 - b. Learning disabilities – dyslexia, disgraphia egc.

Unit – 4

1. Definition, causes, assessment, treatment, education and rehabilitation:
 - a. Multiple disorders – spasticity, minimal brain dys-function, epilepsy
 - b. Emotional disturbance

Unit – 5

1. Definition, causes, assessment, treatment, education and rehabilitation:
 - a. Special defects – aphasia
 - b. Social deprivation
 - c. Giftedness

REFERENCES

- Mehta, D.S.: Handbook of Disabled in India, Allied Publishers Private Ltd. Bombay, 1983
- Smith, M.S., Naisworti, J.T.: The Exceptional Child: A Functional Approach, McGraw Hill, 1975
- Encyclopedia of Social Work in India, 3 volumes, Director, Publication Division, Ministry of Information & Broadcasting, India, Planning Commission
- Chaudhary, P.D.: Child Welfare and Development, Atmaram and Sons, New Delhi, 1980
- Cruikshank, W.M. & Johanson, G. O.: Education of Exceptional Children, Oxford Publication Comp. 1970
- Gajendragadkar, D.N.: Disabled in India, Somaiya Publishers, 1983
- Udia Shanker: Exceptional Children, Sterling Publishers Ltd. New Delhi
- Chapman: Management of Emotional Problem of Children and Adolescence
- Jessie Francis Williams: Children with Specific Living Difficulties, Pergamon Press, 2nd ed.
- Frussive, E.C. and Barbe, WE. (Edited); Educating Children with Living Disabilities, Appellatives Century Crofts Pub. New York, 1967
- State, D.H.: Helping Children with Learning Difficulties, World Locke Educational
- Geraheart, B.R.: Learning Disabilities: Education strategies Mosby college publishing, 1985
- Bumard, P. (1999). Counselling skills training. New Delhi: Viva Books.

RESEARCHMETHODS AND SEMINAR CORE COURSE - 104

MM-70
Pd/ wk- 4

Unit – 1

2. Introduction to research methodology: definition and concept of research, objectives
3. Types of research
4. Research problem: selecting the problem, defining the research problem, hypothesis, basic assumption and limitations of a problem

Unit – 2

1. Research design: meaning need for research design, features of good research design, and types of research design
2. Data gathering instruments
3. Accuracy of measurements,
4. Technique of data collection

Unit – 3

1. Types of sample designs, methods of selecting a random sample, random sample from universe, concepts of sample size determination
2. Statistical analysis of data: editing coding, classification, tabulation of data, frequency distributions, diagrammatic: one dimensional (simple bar) and two dimensional (pie diagram)
3. Measures of central tendency-mean, median, measure of dispersion range, quartile deviation, mean deviation, standard deviation

Unit – 4

1. Sampling distribution and standard error: types of errors
2. Level of significance, large sample test for proportions, single mean and difference in two means

Unit – 5

1. Application of t-test for difference of means (independent and paired-t) chi-square test for population variance. Chi-square test (goodness of fit, independence of attributes using 2X2 and rxc contingency tables)

**PRACTICAL – I
CORE COURSE – 105****CCA-30
ESE-70
Pd/ wk- 8**

1. Compiling articles related to guidance
2. writing articles for guidance – preparing theme related brochures, pamphlets etc.
3. Preparing educational/ informational material for lactating and pregnant women.
4. Assessment of developments in infant.

**PRACTICAL – II
CORE COURSE – 106****CCA-30
ESE-70
Pd/ wk- 8**

1. Preparation of a report and present in Seminar
2. Conduct a survey to identify the problems in children.

**GENDER STUDIES
SKILL COURSE - 107****MM-50
Pd/ wk- 2****Unit – 1** Gender and Development:

1. Concept of gender, gender roles, changing trends, gender analysis matrix gender and development.

Unit – 2

1. National and international efforts for gender empowerment.

Unit – 3

1. Meaning of status of women A situational analysis - demographic, education, employment, political and health (general, occupational, and reproductive)
2. Violence against Women- Dowry, divorce, female feticide and infanticide, domestic violence.

Unit – 4

1. Sexual harassment and exploitation, trafficking, portrayal of women in mass media. Efforts for elimination of all forms of discrimination
2. Policies and Programs for Women's Development:

Unit – 5

1. Economic empowerment- Poverty eradication, micro finance and self-help groups,
2. Introduction of laws for domestic violence against women (2005) and sexual harassment (2013)

PRACTICAL COURSE

MM-50

Pd/ wk- 2

1. Preparation of E-content for gender sensitization
2. Identification and assessment of gender issues in current print and electronic media
3. Collection and evaluation of Ten articles on gender issues

POPULATION EDUCATION AND COMMUNITY HEALTH SKILL COURSE - 107

MM-50

Pd/ wk- 2

Unit – 1: Health and Health Care

1. Concepts of health and positive health, Health- disease continuum, factors affecting health, health as a human right.
2. Concept of community health, global health, health for all.

Unit – 2

1. Primary health care- definitions, principles components, comprehensive health care, levels of prevention, Concept of reproductive health for adolescent girls and boys.
2. Health and Development indices
3. Health indices and related indices in community health, fertility indicators, vital statistics, mortality, morbidity indicators, demographic indicators – sex ratio

Unit – 3

1. Indicators for social and mental health, Human Development index, Disability adjusted life years (DALY). Reproductive Health index. Major Health Problems in India
2. Health administrative set up, Peripheral, state, National, urban-rural(Introduction to National Rural Health Mission), National family Health surveys

Unit – 4

1. National Health Programs- ICDS, AIDS prevention Program, Reproductive Child Health (RCH) birth control methods, population education

Unit – 5

1. Concept of population education: Various definitions Significance and scope of population education, Family life education, Sex education, Causes and consequences of population Blast. Trends in population growth terms related to population dynamics

PRACTICAL COURSE

MM-50

Pd/ wk- 2

1. Preparation of teaching Aids on population dynamics
2. First Aid and home nursing
 - i. Bandages
 1. Roller-finger, arm, leg, elbow, knee, cap line
 2. Triangular head, palm/foot, slingh
2. Bed making
3. Recording of temperature
4. Use of kidney tray, spittoon, eye glass, thermometer, hot water bag, ice cap, blood pressure estimations, blood sugar testing

**NUTRITION SCIENCE: BASIC CONCEPTS
SKILL COURSE - 107**

**MM-50
Pd/ wk- 2**

UNIT – I

Food and nutrition – meaning, functions, classification nutrition and health (Basic concepts)

UNIT – II

Food groups – Characteristics of food groups, classification of food groups, Balanced diet, nutrient requirements for various age groups

UNIT – II

Anthropometric assessment of nutritional status

UNIT – IV

- Therapeutic modification of normal diet and reasons for dietary changes in – Obesity, congestive heart disease, diabetes, hypertension.
- Dietary counseling

UNIT – V

Food adulteration – Introduction, common adulterants in foods

PRACTICAL COURSE

**MM-50
Pd/ wk- 2**

1. Assessment of nutritional status of individual and for community group using - weight, height MUAC waist and hip circumferences
2. Qualitative testing of some foods for adulteration

SEMESTER II (2022-2023)
LIFE SPAN DEVELOPMENT PRESCHOOL TO ADOLESCENCES
CORE COURSE - 201

MM-70
Pd/ wk- 4

Unit -1

1. Introduction to childhood
 - a. Characteristics and development milestones of childhood stage
 - b. Factors influencing on physical, motor, social, emotional, cognitive and language development, hazards of early childhood
 - c. Emotional development- development of positive and negative emotions, influencing factors.
 - d. Social and moral development- growth trends, antecedent influences- cultures and class
 - e. Childhood sexuality- masculinity, femininity and androgyny: effects of sex typing
 - f. Factors effecting growth and health in early childhood – heredity, environment, nutrition, emotional well being diseases & injuries
 - g. Peer relationship in early childhood

Unit – 2

1. Middle and late childhood
 - a. Developmental milestones of middle & late childhood
 - b. Personality development – self concept. Self esteem, factors influencing personality
 - c. School achievement, role of rewards and punishment
 - d. Information processing in middle childhood – attention, theory of mind, memory, self- regulation
 - e. Hazards/common problem of middle and late childhood
 - f. Sex typing in middle childhood
 - g. Functions of family, school and community in growth of children during childhood

Unit – 3

1. Adolescence
 - a. Physical & behavioral changes – menarche, spermarch, growth spurt and their psychological impacts
 - b. Social and emotional development – family, peers, parents, interpersonal relations, emotional competence, conflict with authority, fantasies obsession, infatuation, love, early sex, early marriage
 - c. Identity statuses, factors affecting identity formation

Unit – 4

- a. Gender differences, interests, sexuality, sex education, changes in social behavior, development of emotional maturity, obsession with body and physical appearance
- b. Problems of youth- education, career, home, parents, health, opportunities stress and conflicts

Unit – 5

1. Adolescent relationships
 - a. Family relationships: in nuclear, extended & joint families
 - b. Peer relationship: identity formation, knowing one's strengths & weaknesses
 - c. Relationship beyond the family and peers – dating scripts – proactive, reactive

- d. Attachment to parents – dismissing avoidant attachment, preoccupied ambivalent, unresolved disorganized

References

- L. Alan Sroufe, Robert, G. Cooper: Child Development- Its Nature and Course, 1st Ed. 1988
- Boston, Allyn & Bacon: Child Development, 1989
- Peter, K. Smith & Helen Kowie : Understanding Children's Development, Smikow 30077, New York, Basil Black, 1988
- Rober S. Feldman: Understanding Psychology, McGraw Hill Book co., New York, 1987
- Olds, S.W. and Papalia, D.E.: Human Development, McGraw Hill Book Co., New York, 1986

GUIDENCE AND COUNSELING- II CORE COURSE - 202

**MM-70
Pd/ wk- 4**

Unit1

1. Need for ethical standards
2. Ethical codes and guidelines
3. Rights of clients
4. Dimension of Confidentiality

Unit 2

1. Characteristics of an effective Counselor
2. Dual relationship in counseling practices
3. Value orientations
4. Acceptance, Understanding
5. Factors contributing to control relationship.

Unit3.

1. Physical setting: salient requirement of setting of child guidance and child counseling
2. Centers related to physical, Financial and personal.

Counselee:

1. Self image, Social image, motivation, awareness, causes of maladjustments growth

Unit 4

2. Adolescent and vocational Counseling
3. Meaning, key concepts.
4. The process of vocational Counseling
5. Educational counseling
6. The role of teacher in counseling
7. Evaluation

Unit 5

1. Marital counseling
2. Family Counseling
3. Counseling special group: Delinquents, destitute, Drop outs

REFERENCES

- Mehta, D.S.: Handbook of Disabled in India, Allied Publishers Private Ltd. Bombay, 1983
- Smith, M.S., Naisworti, J.T.: The Exceptional Child: A Functional Approach, McGraw Hill, 1975
- Encyclopedia of Social Work in India, 3 volumes, Director, Publication Division, Ministry of Information & Broadcasting, India, Planning Commission
- Chaudhary, P.D.: Child Welfare and Development, Atmaram and Sons, New Delhi, 1980

- Cruikshank, W.M. & Johanson, G. O.: Education of Exceptional Children, Oxford Publication Comp. 1970

THEORIES OF HUMAN DEVELOPMENT CORE COURSE - 203

**MM-70
Pd/ wk- 4**

Unit – 1

1. Historical perspective in the trends in theoretical and empirical approaches to child study
2. Basic concepts, implications, and critique analysis of the following theories.
Cognitive theory- Piaget, Gardeners, theory of multiple intelligence

Unit – 2

Basic concepts, implications, and critique analysis of the following theories

1. Theory – Hennery Murray
2. Psycho-analytic need theory – Freud, Anna Freud and Neo Freudians
3. Psycho-social theory- Erick H. Erickson

Unit – 3

Basic concepts, implications, and critique analysis of the following theories

1. Learning theories – Watson, Harlow, Bandura and Walter, Sears, Chomsky
2. Self actualization theory – Aliport, Abraham Maslow

Unit – 4

Basic concepts, implications, and critique analysis of the following theories

1. Pear relations theory – Selmans, theory of Warner’s
2. Sociocultural theory – Vygotsky
3. Moral development theory – Kohlberg

Unit – 5

Basic concepts, implications, and critique analysis of the following theories

1. Biological theories of aging – cellular clock theory, free radical theory, mitochondrial theory,
2. Theories of ageing – Kenkell, Howighurst

References:

- Baldwin, A.L.: Theories of Child Development, John Willey, 1980
- Maier, H.W.: Three Theories of Child Development, Harper and Row, 3rd Ed.
- Bandura, A.: Social Learning Theory, Englewood Cliff N.J. Prentice Hall, 1977
- Brontenbrenner, U.: The Ecology of Human development, Cambridge Harvard Univ. Press. 1979
- Hall & Londsey: Theories of Personality, N.Y. 1970
- Langer. J.: Theories of Development, Holt, Rinehart & Winston, New York, 1969

CHILD AND WOMEN WELFARE INSTITUTES AND TOURS CORE COURSE - 204

**MM-70
Pd/ wk- 4**

Unit – 1

1. Status of children in India as compared health. Education, nutrition and recreation rights of the child
2. Changing philosophy and concepts of programs and services for children, an integrated approach

Unit – 2

1. Functions, activities & programmes for children in: ANP, SNP, ICDS, Non Meal Program, CRY, CNI, Helpage India, PRERNA, SOS Villages, Palna Chetna, Nukkad, National Society For Children, Balbhawan Society

Unit – 3

2. Current national programs
3. Women – Self Help Groups, Swayam Siddha Program, Swa Shakti Program, Sathin Women Development Program (Rajasthan), Mahila Samakhya Program, DWCRA under SGSY, DWCUA under SJSRY, Balika Samridhi Yojna, Working Women's Shostel, Swadhar Program, ICDS (for Adolescent Girls, Pregnant and Lactating) Anchal Se Angan Tak, Rajasthan Janani Suraksha Yojna

Unit – 4

1. National and International organizations working for children UNICEF, HWO, FAO, CARI, CASA, DANIDA, ICCW, CSWB, NIPCCD, BGMS, NCERT, TNEP, FPAI, NAB, ICSW, CHEB, WVI world bank, parent education etc.

Unit – 5

1. Management of institution: Administration, organization and structure of various institutions of children
 - a. Crèches
 - b. Day care centers
 - c. Pre school
 - d. Orphanages, home for destitute
 - e. Balbhavans
 - f. Recreational centers
 - g. Hospital wards

**PRACTICAL – I
CORE COURSE – 205**

**CCA-30
ESE-70
Pd/ wk- 8**

1. Visit to a guidance and counseling center and evaluate
Organizational structure
Objectives/purpose
Competencies of personnel and process
Clients views about center
Financial management
Records and registers
2. Skill development through mock activity- rapport technique, questioning, listening, reflection, acceptance, silence, leading, reassurance, non-verbal cues, terminating skills

**PRACTICAL – II
CORE COURSE – 206**

**CCA-30
ESE-70
Pd/ wk- 8**

1. Visit to various institutes related to child and women welfare
2. Prepare reports and present in class.
3. Prepare a article/literature for adolescents
4. Program planning for institutions of women and children.

**GENDER STUDIES
SKILL COURSE - 207**

**MM-50
Pd/ wk- 2**

Unit – 1 Gender and Development:

2. Concept of gender, gender roles, changing trends, gender analysis matrix gender and development.

Unit – 2

2. National and international efforts for gender empowerment.

Unit – 3

3. Meaning of status of women A situational analysis - demographic, education, employment, political and health (general, occupational, and reproductive)
4. Violence against Women- Dowry, divorce, female feticide and infanticide, domestic violence.

Unit – 4

3. Sexual harassment and exploitation, trafficking, portrayal of women in mass media. Efforts for elimination of all forms of discrimination
4. Policies and Programmes for Women's Development:

Unit – 5

3. Economic empowerment- Poverty eradication, micro finance and self-help groups,
4. Introduction of laws for domestic violence against women (2005) and sexual harassment (2013)

PRACTICAL COURSE

**MM-50
Pd/ wk- 2**

1. Preparation of E-content for gender sensitization
2. Identification and assessment of gender issues in current print and electronic media
3. Collection and evaluation of Ten articles on gender issues

**POPULATION EDUCATION AND COMMUNITY HEALTH
SKILL COURSE - 207**

**MM-50
Pd/ wk- 2**

Unit – 1: Health and Health Care

3. Concepts of health and positive health, Health- disease continuum, factors affecting health, health as a human right.
4. Concept of community health, global health, health for all.

Unit – 2

4. Primary health care- definitions, principles components, comprehensive health care, levels of prevention, Concept of reproductive health for adolescent girls and boys.
5. Health and Development indices
6. Health indices and related indices in community health, fertility indicators, vital statistics, mortality, morbidity indicators, demographic indicators – sex ratio

Unit – 3

3. Indicators for social and mental health, Human Development index, Disability adjusted life years (DALY). Reproductive Health index. Major Health Problems in India

4. Health administrative set up, Peripheral, state, National, urban-rural(Introduction to National Rural Health Mission), National family Health surveys

Unit – 4

2. National Health Programmes- ICDS, AIDS prevention Programme, Reproductive Child Health (RCH) birth control methods, population education

Unit – 5

2. Concept of population education: Various definitions Significance and scope of population education, Family life education, Sex education, Causes and consequences of population Blast. Trends in population growth terms related to population dynamics

PRACTICAL COURSE

**MM-50
Pd/ wk- 2**

3. Preparation of teaching Aids on population dynamics
4. First Aid and home nursing
 - i. Bandages
 1. Roller-finger, arm, leg, elbow, knee, cap line
 2. Triangular head, palm/foot, sling
5. Bed making
6. Recording of temperature
7. Use of kidney tray, spittoon, eye glass, thermometer, hot water bag, ice cap, blood pressure estimations, blood sugar testing

NUTRITION SCIENCE: BASIC CONCEPTS

SKILL COURSE - 207

**MM-50
Pd/ wk- 2**

UNIT – I

Food and nutrition – meaning, functions, classification nutrition and health (Basic concepts)

UNIT – II

Food groups – Characteristics of food groups, classification of food groups, Balanced diet, nutrient requirements for various age groups

UNIT – II

Anthropometric assessment of nutritional status

UNIT – IV

- Therapeutic modification of normal diet and reasons for dietary changes in – Obesity, congestive heart disease, diabetes, hypertension.
- Dietary counseling

UNIT – V

Food adulteration – Introduction, common adulterants in foods

PRACTICAL COURSE

**MM-50
Pd/ wk- 2**

3. Assessment of nutritional status of individual and for community group using - weight, height MUAC waist and hip circumferences
4. Qualitative testing of some foods for adulteration

SEMESTER III (2023-2024)
LIFE SPAN DEVELOPMENT (ADULTHOOD TO OLD AGE)
CORE COURSE - 301

MM-70
Pd/ wk- 4

Unit – 1

1. Types of age – biological, economic, socio-psychological, functional
2. Biological theories of aging- cellular clock theory, free-radical theory, mitochondrial theory, hormonal stress
3. Development tasks
4. Adult stereotyping

Unit – 2

1. Early adulthood
 - a. Physical, social, personality development
 - b. Changing trends in interests, values and priorities
 - c. Roles and responsibilities towards marriage, parenthood and child rearing, occupation and economy in context of sex and culture
 - d. Smoking, alcohol and health – disease model of addiction, life process model of addiction

Unit – 3

1. Middle adulthood
 - a. Menopause/per menopause, psycho – social adjustment
 - b. Midlife crisis, climacteric and sarcopenia
 - c. Adult sexuality
 - d. Health and common diseases
 - e. Planning for retirement – companionship, finance, leisure time

Unit – 4

1. Late adulthood and old age
2. Theoretical perspectives of aging – disengagement theory, activity theory, human development theory, continuity theory, age stratification theory, labeling theory
3. Growth & diversity in older population
4. Impact of aging on biological/physiological aspects, psychological, economic, social and spiritual aspects
5. Health challenges and care – physical, psychological, social problems, factors influencing on health status and care required for a aged

Unit – 5

1. Family pattern, changing roles and the aging family-conjugal, husband-wife relations, sexual adjustment, marital adjustment, intergenerational family relation- grand parenthood, widowhood/singlehood: alternative life styles, remarriage in later years
2. Work, leisure and retirement patterns – work meaning of work, individual motivation, leisure, retirement- benefits, attitude towards retirement, poverty, poor health retirement and suicide, abandonment, liberation and diachronic solidarity
3. Attitude towards death in life span, bereavement, causes/stages of death
4. Hospice/palliative care

References

- L. Alan Sroufe, Robert, G. Cooper: Child Development- Its Nature and Course, 1st Ed. 1988
- Boston, Allyn & Bacon: Child Development, 1989
- Peter, K. Smith & Helen Kowie : Understanding Children’s Development, Smikow 30077, New York, Basil Block, 1988

**GUIDENCE AND COUNSELING-III
CORE COURSE - 302**

**MM-70
Pd/ wk- 4**

Techniques of Counseling

Unit1.

1. Basic Counseling skills
2. Observation Skills, types of observation advantage and limitation
3. Questionnaire: types of questionnaire , advantage and limitation
4. The interview : Characteristics, types and techniques

Unit 2

1. The case study: The formal and informal case study
2. Advantages and limitations of each

Unit3

1. Non Test Client Appraisal Techniques
2. Autobiography
3. Anecdotal Records
4. Rating Scale
5. Cumulative Records
6. Sociometric Techniques

Unit 4

1. Psychological testing
2. MMPI
3. WAIS
4. Personality and Aptitude test. .

Unit 5

1. Group and Individual counseling
2. Characteristics of group counseling
3. Advantages of group counseling
4. Characteristics of individual counseling
5. Advantages of individual counseling

References

- Encyclopedia of Social Work in India, 3 volumes, Director, Publication Division, Ministry of Information & Broadcasting, India, Planning Commission
- Chaudhary, P.D.: Child Welfare and Development, Atmaram and Sons, New Delhi, 1980
- Chapman: Management of Emotional Problem of Children and Adolescence
- Jessie Francis Williams: Children with Specific Living Difficulties, Pergamon Press, 2nd ed.
- Bumard, P. (1999). Counselling skills training. New Delhi: Viva Books.

**CHILDREN AT RISK-II
CORE COURSE - 303**

**MM-70
Pd/ wk- 4**

Unit - 1

1. Definition, causes, assessment, treatment, education and rehabilitation:
Children with autism
Children with ADHD
Psychological Disordered

Unit - 2

1. Definition, causes, assessment, treatment, education and rehabilitation:
 - a. Child Trafficking

- b. Child labor
- c. Street children

Unit - 3

1. Definition, causes, assessment, treatment, education and rehabilitation:
 - d. Child Maltreatment
 - e. Dropout Children
 - a. Juvenile delinquents

Unit - 4

1. Definition, causes, assessment, treatment, education and rehabilitation:
 - a. Child Abuse
 - b. Integrated Vs special schools
 - c. Creative children

Unit - 5

- a. child and the law:
- b. Intervention and relief programs

References

- Mehta, D.S.: Handbook of Disabled in India, Allied Publishers Private Ltd. Bombay, 1983
- Smith, M.S., Naisworti, J.T.: The Exceptional Child: A Functional Approach, McGraw Hill, 1975
- Cruikshank, W.M. & Johanson, G. O.: Education of Exceptional Children, Oxford Publication Comp. 1970
- Gajendragadkar, D.N.: Disabled in India, Somaiya Publishers, 1983
- Udia Shanker: Exceptional Children, Sterling Publishers Ltd. New Delhi
- Chapman: Management of Emotional Problem of Children and Adolescence
- Jessie Francis Williams: Children with Specific Living Difficulties, Pergamon Press, 2nd ed.
- Frussive, E.C. and Barbe, WE. (Edited); Educating Children with Living Disabilities, Appellatives Century Crofts Pub. New York, 1967
- State, D.H.: Helping Children with Learning Difficulties, World Locke Educationals
- Geraheart, B.R.: Learning Disabilities: Education strategies Mosby college publishing, 1985

EARLY CHILD HOOD EDUCATION AND INTERNSHIP CORE COURSE - 304

**MM-70
Pd/ wk- 4**

Unit – 1

1. Basic concepts – non formal and formal education, play way method
2. Goals of early childhood education
3. Significance of the first few years of childhood

Unit – 2

1. Contribution and philosophies of pestalozzi, commoneius, McMillan sisters, Froebel, Dewey, Rousseau, Montessori, Gandhi, Tagore, Giju Bhai Badeka, Tarabai-Modak

Unit – 3

1. Principles of program planning, long and short term planning (daily, weekly, monthly, annual) teaching strategies
2. Curriculum models in ECE National and International
3. Techniques of parent training – meeting, library, workshop, open house, text material

Unit – 4

1. Organizational stat up of institution of early childhood education
 - a. Physical infrastructure
 - b. Site and location

- c. Space allotment for indoor & outdoor activities
- d. Equipment for various development, principles of selection
- e. Pre-school staff and other personnel – Academic qualification, personality characteristics
- f. Records and registers – simple book keeping and accounting, working out balance sheet, calculation, profit and loss, values and types, using and maintaining records

Unit – 5

1. Cost and financial management – direct, indirect, fix, variables, break even analysis, source of finance
2. Home school relationship- need, methods, parent involvement and education
3. Evaluation, techniques and devices for evaluation of children and programmes
4. Human and technical skills, and management competencies required for successful administration

REFERENCES

- Peter, K. Smith & Helen Kowie : Understanding Children’s Development, Smikow 30077, New York, Basil Black, 1988

PRACTICAL – 1 CORE COURSE – 305

**CCA-30
ESE-70
Pd/ wk- 8**

1. Need based program planning organizing guidance and counseling session of a particular age group with specific problems
2. Participation in counseling process/assistance in preparation of case history. Study in the clinic (presentation) of case in classroom
3. Make a survey to observe life of elderly.
4. Prepare and execute activities for elderly

PRACTICAL –II CORE COURSE – 306

**CCA-30
ESE-70
Pd/ wk- 8**

1. In-service training in ECE center- observation and participation in the laboratory nursery school preschool crèche and day care centers
2. Preparing blue print of centers of early childhood education – curriculum, organizational structure, physical and human infrastructure
3. Planning and executing, monitoring and evaluation of daily/weekly/yearly plan and activities for children

GENDER STUDIES SKILL COURSE - 307

**MM-50
Pd/ wk- 2**

Unit – 1 Gender and Development:

3. Concept of gender, gender roles, changing trends, gender analysis matrix gender and development.

Unit – 2

3. National and international efforts for gender empowerment.

Unit – 3

5. Meaning of status of women A situational analysis - demographic, education, employment, political and health (general, occupational, and reproductive)
6. Violence against Women- Dowry, divorce, female feticide and infanticide, domestic violence.

Unit – 4

5. Sexual harassment and exploitation, trafficking, portrayal of women in mass media. Efforts for elimination of all forms of discrimination
6. Policies and Programmes for Women's Development:

Unit – 5

5. Economic empowerment- Poverty eradication, micro finance and self-help groups,
6. Introduction of laws for domestic violence against women (2005) and sexual harassment (2013)

PRACTICAL COURSE**MM-50
Pd/ wk- 2**

1. Preparation of E-content for gender sensitization
2. Identification and assessment of gender issues in current print and electronic media
3. Collection and evaluation of Ten articles on gender issues

**POPULATION EDUCATION AND COMMUNITY HEALTH
SKILL COURSE - 307****MM-50
Pd/ wk- 2****Unit – 1: Health and Health Care**

5. Concepts of health and positive health, Health- disease continuum, factors affecting health, health as a human right.
6. Concept of community health, global health, health for all.

Unit – 2

7. Primary health care- definitions, principles components, comprehensive health care, levels of prevention, Concept of reproductive health for adolescent girls and boys.
8. Health and Development indices
9. Health indices and related indices in community health, fertility indicators, vital statistics, mortality, morbidity indicators, demographic indicators – sex ratio

Unit – 3

5. Indicators for social and mental health, Human Development index, Disability adjusted life years (DALY). Reproductive Health index. Major Health Problems in India
6. Health administrative set up, Peripheral, state, National, urban-rural(Introduction to National Rural Health Mission), National family Health surveys

Unit – 4

3. National Health Programmes- ICDS, AIDS prevention Programme, Reproductive Child Health (RCH) birth control methods, population education

Unit – 5

3. Concept of population education: Various definitions Significance and scope of population education, Family life education, Sex education, Causes and consequences of population Blast. Trends in population growth terms related to population dynamics

PRACTICAL COURSE

MM-50
Pd/ wk- 2

5. Preparation of teaching Aids on population dynamics
6. First Aid and home nursing
 - i. Bandages
 1. Roller-finger, arm, leg, elbow, knee, cap line
 2. Triangular head, palm/foot, sling
8. Bed making
9. Recording of temperature
10. Use of kidney tray, spittoon, eye glass, thermometer, hot water bag, ice cap, blood pressure estimations, blood sugar testing

NUTRITION SCIENCE: BASIC CONCEPTS **SKILL COURSE - 307**

MM-50
Pd/ wk- 2

UNIT – I

Food and nutrition – meaning, functions, classification nutrition and health (Basic concepts)

UNIT – II

Food groups – Characteristics of food groups, classification of food groups, Balanced diet, nutrient requirements for various age groups

UNIT – II

Anthropometric assessment of nutritional status

UNIT – IV

- Therapeutic modification of normal diet and reasons for dietary changes in – Obesity, congestive heart disease, diabetes, hypertension.
- Dietary counseling

UNIT – V

Food adulteration – Introduction, common adulterants in foods

PRACTICAL COURSE

MM-50
Pd/ wk- 2

1. Assessment of nutritional status of individual and for community group using - weight, height MUAC waist and hip circumferences
2. Qualitative testing of some foods for adulteration

SEMESTER IV (2023-2024)
FAMILY DYNAMICS
CORE COURSE - 401

MM-70
Pd/ wk- 4

Unit – 1

1. Family
 - a. Definition of family form different perspectives
 - b. Approaches to family study
 - i. Development approach
 - ii. Interactional approach
 - iii. Institutional approach
 - iv. Structural functional approach
 - v. Systems approach
 - c. Changing structural and functional aspects of Indian family

Unit – 2

Family life cycle and their development task
Parenting: roles and responsibilities of parents
Parenting styles

Unit – 3

1. Marriage
 - a. Concept, need, importance of marriage for individual/family/society
 - b. Readiness for marriage- physiological, social, psychological, economical etc.
 - c. Adjustments in marriage- sexual, economical, in-laws, parenthood and problems in marriage desertion, separation, divorce, widowhood and remarriage

Unit – 4

1. Changing trends
 - a. Effect of modernization on marriage
 - b. Employment of women and family conflict & adjustment
 - c. Generation gap and adjustment

Unit – 5

- a. Alternatives to marriage – co-living, living single, child marriage, group marriage, lesbianism and gay culture
- b. Legal aspects of marriage, marital and pre marital counseling

REFERENCES

- Duvalh E.: Family development, J.B. Lippincott, New York, 3rd ed. 1967
- Foster: Marriage and Family Relations, Macmillan, 1950
- Hill R. and Waller: The Family, Holt Rinehart and Winstion, New York (Latest ed.)
- Kapadia, K.M.: Marriage and Family, Oxford, Calcutta Univ. Press, 3rd ed. 1972
- Prabhy: Hindar Social Organization, Popular Book Co. 1954
- Williamson, R.C.: Marriage and Family Relations, Collier Macmillan, London, 1969

**GUIDENCE AND COUNSELING- IV
CORE COURSE - 402**

**MM-70
Pd/ wk- 4**

Unit - 1

Historical context of various approaches

1. Humanistic approach
2. Behavior approach
3. Psychoanalytic approach
4. Cognitive Behavioral approach

Unit - 2

The Psychoanalytic Approach: Sigmund Freud: Relevance of Psychoanalysis to counselors

Humanistic approach: Carl Rogers (Client centered approach): Relevance of Rogers self theory to counselors

Unit - 3

1. Transactional Approach
2. Gestalt Approach

Unit - 4

1. Eclectic approach
2. Theory of Eric Berne of personality

Unit - 5

1. Cognitive Behavioral approach
2. Albert Ellis Contribution

REFERENCES

- Mehta, D.S.: Handbook of Disabled in India, Allied Publishers Private Ltd. Bombay, 1983
- Smith, M.S., Naisworti, J.T.: The Exceptional Child: A Functional Approach, McGraw Hill, 1975
- Encyclopedia of Social Work in India, 3 volumes, Director, Publication Division, Ministry of Information & Broadcasting, India, Planning Commission
- Chaudhary, P.D.: Child Welfare and Development, Atmaram and Sons, New Delhi, 1980
- Cruikshank, W.M. & Johanson, G. O.: Education of Exceptional Children, Oxford Publication Comp. 1970
- Gajendragadkar, D.N.: Disabled in India, Somaiya Publishers, 1983
- Udia Shanker: Exceptional Children, Sterling Publishers Ltd. New Delhi
- Chapman: Management of Emotional Problem of Children and Adolescence
- Jessie Francis Williams: Children with Specific Living Difficulties, Pergamon Press, 2nd ed.
- Frussive, E.C. and Barbe, WE. (Edited); Educating Children with Living Disabilities, Appellatives Century Crofts Pub. New York, 1967
- State, D.H.: Helping Children with Learning Difficulties, World Locke Educational
- Geraheart, B.R.: Learning Disabilities: Education strategies Mosby college publishing, 1985
- Bumard, P. (1999). Counselling skills training. New Delhi: Viva Books.

**TRENDS AND ISSUES IN HUMAN DEVELOPMENT
CORE COURSE - 403**

**MM-70
Pd/ wk- 4**

Unit I

Personality and society

- c. Kinship: types of kinship degree of kinship, range of kinship system, kinship descent, kinship usages, kinship and their influence on the child
- d. Society structure – rural & urban, modern society and its influence on the family
- e. Personality and society – inter-relation, cultural influences on human personality and social behavior
- f. Family life education

Unit II

- a. Burning issue affecting children's personality – orphan, adoption, divorce, single parenthood, remarriage, illegitimacy, battered mother/child, sexual abuse, violence, drugs, academic and career stress – problem and solutions
- b. Children's help lines – functions

Unit III

Risk in adolescence

- a. Risks in adolescence- suicide, depression, delinquency, violence, aggression, substance abuse, perverted sex, rape, sexual abuse, STD – prevention, intervention, treatment and rehabilitation
- b. Skills and techniques for self improvement and achievement
- c. Changing trends in behavior, attitude, aspiration, achievement, sensuality, career hazard of adolescence

Researches in childhood and adolescence – areas and future

Unit IV

Issues & interventions

- c. Status of women – demographic, political, social, educational, economic, legal,
- d. Factors influencing status, roles and responsibilities of men and women
- e. Problems of women – dowry, suicide, health, women and mass media, sexual exploitation, women criminals, prostitution, eve teasing, rape
- f. Women and the law: legislation pertaining to marriage, property, Hindu marriage act, Hindu succession act. Antidowry act.
- g. Intervention and relief programs – family violence, battered women, child maltreatment, sexual abuse, separation and divorce, mother employed outside
- h. Women's rights related to pregnancy and child birth

Unit V

Special education in India:

- d. Concept and provisions of special education
- e. Historical perspective in special education
- f. Organization and administration of special education in India.

REFERENCES

- Status of Women in India, A Synopsis of the Report of National Committee (1971-74) New Delhi, ICSSR 1974,2
- D'Souza, Alfred: Women in Contemporary India and South Asia, Macha publication, New Delhi, 1970
- Kapoor, Premilla: Marriage and Working Women in India, Vikas Publication, Delhi. 1970

**SCIENTIF WRITING AND DESSERTATION
CORE COURSE - 404**

**MM-70
Pd/ wk- 4**

Unit – 1

1. Basic concept of scientific writing:
2. Meaning, need and importance
3. Characteristics of good scientific writing

Unit - 2

Types of article:

1. Research proposal
2. Empirical or data based article
3. Review article

Unit - 3

1. National and international journals for article publication
2. Understanding of impact factor and ISSN number
3. Consideration for publication in reputed journals

Unit - 4

1. Ethics in research and writing article
2. Importance of citations and references & copy right

Unit - 5

1. Future of scientific writing
2. Report interpretation and support review
3. Dissertation on contemporary issues

**PRACTICAL – I
CORE COURSE – 405**

**CCA-30
ESE-70
Pd/ wk- 8**

1. Review, understand and critically evaluate a research article
2. Dissertation on contemporary issues in the field of human development
3. Researches in special needs and education – areas and future
4. Use of SPSS/Mandley and other software used in research.

**PRACTICAL – II
CORE COURSE – 405**

**CCA-30
ESE-70
Pd/ wk- 8**

1. Collect and Prepare an articles for parents
2. Planning / interviewing the client/family and conduct a counseling session.
3. Critical analysis of current issues through FGD's and debate with focus on child, women, elderly.
4. Attitude towards handidcapness need to change – raising community awareness and planning action programs

**GENDER STUDIES
SKILL COURSE - 407**

**MM-50
Pd/ wk- 2**

Unit – 1 Gender and Development:

4. Concept of gender, gender roles, changing trends, gender analysis matrix gender and development.

Unit – 2

4. National and international efforts for gender empowerment.

Unit – 3

7. Meaning of status of women A situational analysis - demographic, education, employment, political and health (general, occupational, and reproductive)
8. Violence against Women- Dowry, divorce, female feticide and infanticide, domestic violence.

Unit – 4

7. Sexual harassment and exploitation, trafficking, portrayal of women in mass media. Efforts for elimination of all forms of discrimination
8. Policies and Programmes for Women's Development:

Unit – 5

7. Economic empowerment- Poverty eradication, micro finance and self-help groups,
8. Introduction of laws for domestic violence against women (2005) and sexual harassment (2013)

PRACTICAL COURSE

**MM-50
Pd/ wk- 2**

1. Preparation of E-content for gender sensitization
2. Identification and assessment of gender issues in current print and electronic media
3. Collection and evaluation of Ten articles on gender issues

**POPULATION EDUCATION AND COMMUNITY HEALTH
SKILL COURSE - 407**

**MM-50
Pd/ wk- 2**

Unit – 1: Health and Health Care

1. Concepts of health and positive health, Health- disease continuum, factors affecting health, health as a human right.
2. Concept of community health, global health, health for all.

Unit – 2

1. Primary health care- definitions, principles components, comprehensive health care, levels of prevention, Concept of reproductive health for adolescent girls and boys.
2. Health and Development indices
3. Health indices and related indices in community health, fertility indicators, vital statistics, mortality, morbidity indicators, demographic indicators – sex ratio

Unit – 3

1. Indicators for social and mental health, Human Development index, Disability adjusted life years (DALY). Reproductive Health index. Major Health Problems in India
2. Health administrative set up, Peripheral, state, National, urban-rural(Introduction to National Rural Health Mission), National family Health surveys

Unit – 4

1. National Health Programmes- ICDS, AIDS prevention Programme, Reproductive Child Health (RCH) birth control methods, population education

Unit – 5

1. Concept of population education: Various definitions Significance and scope of population education, Family life education, Sex education, Causes and consequences of population Blast. Trends in population growth terms related to population dynamics

PRACTICAL COURSE**MM-50
Pd/ wk- 2**

1. Preparation of teaching Aids on population dynamics
2. First Aid and home nursing
3. Bandages
4. Roller-finger, arm, leg, elbow, knee, cap line
5. Triangular head, palm/foot, slingh
6. Bed making
7. Recording of temperature
8. Use of kidney tray, spittoon, eye glass, thermometer, hot water bag, ice cap, blood pressure estimations, blood sugar testing

**NUTRITION SCIENCE: BASIC CONCEPTS
SKILL COURSE - 407****MM-50
Pd/ wk- 2****UNIT – I**

Food and nutrition – meaning, functions, classification nutrition and health (Basic concepts)

UNIT – II

Food groups – Characteristics of food groups, classification of food groups, Balanced diet, nutrient requirements for various age groups

UNIT – II

Anthropometric assessment of nutritional status

UNIT – IV

- Therapeutic modification of normal diet and reasons for dietary changes in – Obesity, congestive heart disease, diabetes, hypertension.
- Dietary counseling

UNIT – V

Food adulteration – Introduction, common adulterants in foods

PRACTICAL COURSE**MM-50
Pd/ wk- 2**

3. Assessment of nutritional status of individual and for community group using - weight, height MUAC waist and hip circumferences
4. Qualitative testing of some foods for adulteration

SYLLABUS
M. Sc. Home Science (Nutrition Science and Dietetics)
Semester I, II 2022-2023
Semester III & IV 2023-2024
DEPARTMENT OF HOME SCIENCE, J. N. V UNIVERSITY, JODHPUR
Semester-wise Theory Papers/Practical/Skill component
Teaching and Examination scheme

Type of course	Course code	Title of the course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Semester I							
Core course – 101		Human Nutrition Requirements	4	4	30	70	100
Core course – 102		Advanced Nutrition	4	4	30	70	100
Core course - 103		Food Science	4	4	30	70	100
Core course - 104		Research Methodology and Statistics	4	4	30	70	100
Core course Practical - 105		Advanced Nutrition (Practical)	8	4	30	70	100
Core course Practical - 106		Standardization of Recipes (Practical)	8	4	30	70	100
Skill Course I 107		Gender Studies	2-0-2				
Skill Course II 107		Population Education and Community Health	2-0-2				
Skill Course III 107		Nutrition Science: Basic Concepts	2-0-2				
Total				24	180	420	600
Semester II							
Core course - 201		Menu Planning for Different Age Group	4	4	30	70	100
Core course - 202		Public Nutrition	4	4	30	70	100
Core course - 203		Food Microbiology and Food Safety	4	4	30	70	100
Core course - 204		Tours for Welfare Institutions	4	4	30	70	100
Core course Practical - 205		Menu Plans and Calculation (Practical)	8	4	30	70	100
Core course Practical - 206		Nutrition Programme for Vulnerable Groups (Practical)	8	4	30	70	100
Skill Course I 207		Gender Studies	2-0-2				
Skill Course II 207		Population Education and Community Health	2-0-2				

Skill Course III 207		Nutrition Science: Basic Concepts	2-0-2				
Total				24	180	420	600
Semester III							
Core course 301		Advanced Nutritional Biochemistry I	4	4	30	70	100
Core course 302		Clinical Nutrition I	4	4	30	70	100
Core course 303		Food Service Management	4	4	30	70	100
Core course 304		Medical Internship	4	4	30	70	100
Core course Practical 305		Diet Planning for Various Diseases (Practical)	8	4	30	70	100
Core course Practical – 306		Food Service Management (Practical)	8	4	30	70	100
Skill Course I 307		Gender Studies	2-0-2				
Skill Course II 307		Population Education and Community Health	2-0-2				
Skill Course III 307		Nutrition Science: Basic Concepts	2-0-2				
Total				24	180	420	600
Semester IV							
Core course – 401		Advanced Nutritional Biochemistry II	4	4	30	70	100
Core course – 402		Clinical Nutrition II	4	4	30	70	100
Core course – 403		Medical Nutrition	4	4	30	70	100
Core course – 404		Scientific Writing and Dissertation	4	4	30	70	100
Core course Practical – 405		Blood Analysis (Practical)	8	4	30	70	100
Core course Practical - 406		Food Analysis (Practical)	8	4	30	70	100
Skill Course I 407		Gender Studies	2-0-2				
Skill Course II 407		Population Education and Community Health	2-0-2				
Skill Course III 407		Nutrition Science: Basic Concepts	2-0-2				

(SEMESTER - I)
HUMAN NUTRITIONAL REQUIREMENTS
CORE COURSE - 101

MM-70
Pd/ wk- 4

Unit - 1

1. Understanding Human Nutrition
 - a. Nutritional requirements – Definition of concept, basic terminology, methods for studying the nutrition requirements.
 - b. National and International recommendations on nutrient requirement – for Indians by ICMR, FAO/WHO expert committee recommendations.
2. Energy
 - a. Basis of requirement, factors affecting total energy requirement and recommendation through life cycle. Requirement techniques of measuring intake and expenditure. Energy imbalance.

Unit - 2

1. Carbohydrates
 - a. Requirement and recommendation through the life cycle, in depth study of fiber in health and nutrition. Resistant starch (RS) factors influencing RS of foods, potential health benefits. Fructo oligosaccharides (FOS) glycemic index (GI)
2. Protein
 - a. Methods of determination of proteins and amino acids in foods
 - b. Improvement of the quality of protein in diet
 - c. Basis of requirement and recommendation through life cycle
 - d. Methods of assessing protein quality
 - e. Critical overview of amino acid requirement and imbalance

Unit - 3

1. Lipids
 - a. Basis of requirement and recommendation through the life cycle.
2. Water
 - a. Distribution, balance, requirements and disturbances in fluid balance

Unit - 4

1. Vitamins
Requirement and recommendation through the life cycle. Interaction with other nutrients
 - a. Fat soluble vitamins – A, D, E and K
 - b. Water-soluble vitamins – ascorbic acid, thiamine, riboflavin, niacin, biotin, pantothenic acid. Pyridoxine, folic acid, cyanocobalamin and choline

Unit - 5

1. Minerals
Requirement and recommendation through the life cycle
 - a. Macro minerals : calcium, phosphorus, magnesium, sulphur, sodium and potassium
 - b. Micro minerals : iron, copper, iodine, zinc, fluoride, manganese, cobalt and selenium

ADVANCED NUTRITION
CORE COURSE - 102

MM-70
Pd/ wk- 4

Unit - 1

1. Assessment of nutritional status using various methods
 - a. Clinical examination for signs and symptoms of nutritional deficiencies and excesses

- b. Biochemical estimation
- c. Anthropometry
- d. Dietary survey

Unit – 2

1. Body composition
 - a. Significance
 - b. Technique
 - c. Changes during life cycle
2. Nutrition and immune response

Unit – 3

1. Nutritional management in special conditions
 - a. Emergencies such as draught, famine, floods and earthquakes
 - b. Astronautics
 - c. High altitudes
 - d. Sports nutrition

Unit – 4

1. Nutritional interrelationships
 - a. Concept of nutritional relationship – proteins – energy, carbohydrates – fat, niacin – typtophane, pyridoxine relationships
 - b. Effect of protein quality and quantity on protein utilization
 - c. Effect of carbohydrates, fats and protein on vitamin requirements
 - d. Nuttient adaptation to low intake of energy protein, vitamin A, calcium and iron

Unit – 5

1. Food components other than essential nutrents with potential health effects. Functional food – classification, probiotics and prebiotics, polyhenols, tannins, phytate, phyotesrtogens, carcinogenic compounds, lectins and saponins

FOOD SCIENCE CORE COURSE - 103

**MM-70
Pd/ wk- 4**

Unit – 1

1. Carbohydrates
 - a. Carbohydrates in diet and classification
 - b. Sugars : chemistry, functionality and their role in foods
 - c. Food polysaccharides

Unit – 2

1. Lipids
 - a. Classification and composition
 - b. Functional properties
 - c. Deteriorative changes
 - d. Antioxidants

Unit – 3

1. Proteins
 - a. Classification and composition
 - b. Functional properties
 - c. Protein concentrates, isolates and hydrolysates

Unit – 4

1. Physical and chemical properties of foods
 - a. Sols, gels and emulsions
 - b. Rheology of food
 - c. Colour, texture and flavor

- d. pH, viscosity and oxidation reduction potential

Unit – 5

1. Product development and evaluation
 - a. Need and significance of product development
 - b. Different phases of product development
 - c. Selection of the product (shelf life study sensory evaluation – objective and subjective)

RESEARCHMETHODS AND SEMINAR CORE COURSE - 104

**MM-70
Pd/ wk- 4**

Unit – 1

1. Introduction to research methodology: definition and concept of research, objectives
2. Types of research
3. Research problem: selecting the problem, defining the research problem, hypothesis, basic assumption and limitations of a problem

Unit – 2

1. Research design: meaning need for research design, features of good research design, and types of research design
2. Data gathering instruments
3. Accuracy of measurements,
4. Technique of data collection

Unit – 3

1. Types of sample designs, methods of selecting a random sample, random sample from universe, concepts of sample size determination
2. Statistical analysis of data: editing coding, classification, tabulation of data, frequency distributions, diagrammatic: one dimensional (simple bar) and two dimensional (pie diagram)
3. Measures of central tendency-mean, median, measure of dispersion range, quartile deviation, mean deviation, standard deviation

Unit – 4

1. Sampling distribution and standard error: types of errors
2. Level of significance, large sample test for proportions, single mean and difference in two means

Unit – 5

1. Application of t-test for difference of means (independent and paired-t) chi-square test for population variance. Chi-square test (goodness of fit, independence of attributes using 2X2 and rxc contingency tables)

PRACTICAL – 1
ADVANCED NUTRITION
CORE COURSE - 105

CCA-30
ESE-70
Pd/ wk- 8

Contents:

1. Estimation of energy requirements-
 - a. BMR
 - b. Energy expenditure on physical activities
 - c. Factorial approach
2. Estimation of protein requirements
 - a. Factorial approach
3. Estimation of protein quality using NDP – cal% PER
4. Assessment of Nutritional status in community using various techniques
 - a. Interpretation of the data – anthropometry, clinical examination, study of biochemical parameters, dietary intake and life style
 - b. Repletion depletion studies for specific nutrients

PRACTICAL – 2
STANDARDIZATION OF RECIPES
CORE COURSE - 106

CCA-30
ESE-70
Pd/ wk- 8

1. Product Development: development of nutritious recipes using different techniques – supplementation, fermentation, sprouting etc.
2. Standardization of recipes covered in planning

GENDER STUDIES SKILL COURSE - 107

**MM-50
Pd/ wk- 2**

Unit – 1 Gender and Development:

1. Concept of gender, gender roles, changing trends, gender analysis matrix gender and development.

Unit – 2

1. National and international efforts for gender empowerment.

Unit – 3

1. Meaning of status of women A situational analysis - demographic, education, employment, political and health (general, occupational, and reproductive)
2. Violence against Women- Dowry, divorce, female feticide and infanticide, domestic violence.

Unit – 4

1. Sexual harassment and exploitation, trafficking, portrayal of women in mass media. Efforts for elimination of all forms of discrimination
2. Policies and Programmes for Women's Development:

Unit – 5

1. Economic empowerment- Poverty eradication, micro finance and self-help groups,
2. Introduction of laws for domestic violence against women (2005) and sexual harassment (2013)

PRACTICAL COURSE

**MM-50
Pd/ wk- 2**

1. Preparation of E-content for gender sensitization
2. Identification and assessment of gender issues in current print and electronic media
3. Collection and evaluation of Ten articles on gender issues

POPULATION EDUCATION AND COMMUNITY HEALTH SKILL COURSE - 107

**MM-50
Pd/ wk- 2**

Unit – 1: Health and Health Care

1. Concepts of health and positive health, Health- disease continuum, factors affecting health, health as a human right.
2. Concept of community health, global health, health for all.

Unit – 2

1. Primary health care- definitions, principles components, comprehensive health care, levels of prevention, Concept of reproductive health for adolescent girls and boys.
2. Health and Development indices
3. Health indices and related indices in community health, fertility indicators, vital statistics, mortality, morbidity indicators, demographic indicators – sex ratio

Unit – 3

1. Indicators for social and mental health, Human Development index, Disability adjusted life years (DALY). Reproductive Health index. Major Health Problems in India
2. Health administrative set up, Peripheral, state, National, urban-rural(Introduction to National Rural Health Mission), National family Health surveys

Unit – 4

1. National Health Programmes- ICDS, AIDS prevention Programme, Reproductive Child Health (RCH) birth control methods, population education

Unit – 5

1. Concept of population education: Various definitions Significance and scope of population education, Family life education, Sex education, Causes and consequences of population Blast. Trends in population growth terms related to population dynamics

PRACTICAL COURSE

MM-50
Pd/ wk- 2

1. Preparation of teaching Aids on population dynamics
2. First Aid and home nursing
 - i. Bandages
 1. Roller-finger, arm, leg, elbow, knee, cap line
 2. Triangular head, palm/foot, sling
2. Bed making
3. Recording of temperature
4. Use of kidney tray, spittoon, eye glass, thermometer, hot water bag, ice cap, blood pressure estimations, blood sugar testing

NUTRITION SCIENCE: BASIC CONCEPTS

SKILL COURSE - 107

MM-50
Pd/ wk- 2

Unit – I

Food and nutrition – meaning, functions, classification nutrition and health (Basic concepts)

Unit – II

Food groups – Characteristics of food groups, classification of food groups, Balanced diet, nutrient requirements for various age groups

Unit – II

Anthropometric assessment of nutritional status

Unit – IV

- Therapeutic modification of normal diet and reasons for dietary changes in – Obesity, congestive heart disease, diabetes, hypertension.
- Dietary counseling

Unit – V

Food adulteration – Introduction, common adulterants in foods

PRACTICAL COURSE

MM-50
Pd/ wk- 2

1. Assessment of nutritional status of individual and for community group using - weight, height MUAC waist and hip circumferences
2. Qualitative testing of some foods for adulteration

(SEMESTER - II)
MENU PLANNING FOR DIFFERENT AGE GROUP
CORE COURSE - 201

MM-70
Pd/ wk- 4

Unit – 1

Menu Planning

1. Menu planning
2. Factors affecting food choice
3. Planning for adults
 - a. Recommended dietary allowances
 - b. Planning for adults: some menu plans and dietary guidelines
4. Physiological change during pregnancy
 - a. Nutritional needs during pregnancy
 - b. Nutritional assessment and guidance in prenatal care
 - c. Common concerns during pregnancy
 - i. High risk pregnancies
 - ii. Management of high risk pregnancy
 - d. Lactation
 - i. Physiology of lactation
 - ii. Human milk composition and infant growth and development
 - iii. Malnutrition – effects on milk and effects on mothers
5. Maternal nutrition during lactation
 - a. Nutrient requirements during lactation
 - b. Dietary management

Unit – 2

1. Infants and preschool children
 - a. Introduction
 - b. Growth and development
 - i. Physiological changed
 - ii. Growth monitoring
 - iii. Health monitoring
 - c. Nutrient needs and recommended dietary allowances
 - d. Diet and feeding patterns
 - i. Feeding 0-6 months infant
 - ii. Feeding 6-12 months infant
 - iii. Feeding preschoolers
 - e. National programmes targeting infant and preschoolers
 - f. Problems of infants and preschoolers nutrition

Unit – 3

1. Older children and adolescents
 - a. Introduction
 - b. Older children and adolescents
 - i. Change in physical development and body composition
 - ii. Sexual maturity
 - iii. Psycho-socialc change

- c. Nutrient needs and recommended dietary intakes
- d. Diet and dietary patterns
- e. National programmes targeting children and adolescents
- f. Problem of other children and adolescent nutrition

Unit – 4

1. The elderly
 - a. Introduction
 - b. Definition of old age
 - c. Nutrition and ageing
 - d. Physiological changes associated with ageing
 - e. Changing body composition and techniques for measuring body composition
 - i. Changing body composition
 - ii. Techniques for measuring body composition
 - f. Nutritional requirements and dietary modification in the diet of the elderly
 - g. Guidelines for planning balanced diets for elderly

Unit – 5

1. Sports nutrition
 - a. Introduction
 - b. What is sports nutrition
 - c. Evolution and growth of sports nutrition as a discipline
 - d. Anthropometric and physiological measurement
 - i. Various techniques for measuring body composition
 - ii. Work capacity
 - e. Physical fitness
 - i. Parameters of fitness
 - ii. Fitness tests

PUBLIC NUTRITION CORE COURSE - 202

**MM-70
Pd/ wk- 4**

Unit – 1

- Concept of public nutrition
1. Introduction
 2. Understanding the terms: nutrition, health and public nutrition
 3. Public nutrition
 - a. Concept
 - b. Scope
 - c. Future projections
 4. Health care
 - a. Concept of health care
 - b. Levels of health care
 - c. Primary health care
 - d. Health care delivery
 5. Role of public nutritionists in health care delivery

Unit – 2

Public nutrition: multidisciplinary concept

1. Introduction
2. Multiple causes of public nutrition problems
3. Multidisciplinary approach to solving nutrition problems
4. Role of agriculture in nutrition
5. Distribution of food products
6. Storage of food products
7. Application of science and technology to improve food supply
8. Food and nutrition security
 - a. Understanding the concept of food nutrition security
 - b. Determinants of food security
 - c. India's food security system
9. Food behavior

Unit – 3

Nutritional problems – I

1. Introduction
2. Protein energy malnutrition (PEM)
 - a. Different forms of PEM
 - i. Kwashiorkor
 - ii. Marasmus
 - iii. Marasmic- kwashiorkor
 - iv. Sub-clinical PEM
 - b. What is the prevalence of PEM
 - c. What causes PEM
 - d. What are the consequences of PEM
 - e. How do we treat PEM
 - f. How to prevent and control PEM
3. Micronutrient deficiencies
 - a. Vitamin A deficiency
 - b. Iron deficiency anaemia (IDA)
 - c. Iodine deficiencies disorders (IDD)
 - d. Zinc deficiencies

Unit – 4

Nutritional problems – II

Introduction

1. Vitamin deficiencies
 - a. Beriberi
 - b. Ariboflavinosis (riboflanin deficiency)
 - c. Pellagra
 - d. Folic acid and B12/deficiency
 - e. Scurvy
 - f. Rickets and osteomalacia
2. Fluorosis
3. Lathyrism

Unit – 5

Assessment of nutritional status in community settings

Structure

1. Introduction
2. Nutritional assessment – goals and objectives
3. Methods of nutritional assessment
4. Indirect assessment of nutritional status
 - a. Age specific mortality rates

- b. Cause specific mortality rates
 - c. Cause specific nutritionally – relevant morbidity rate
 - d. Ecological factors
5. Direct assessment of nutritional status
6. Nutritional anthropometry
 - a. Uses of anthropometry
 - b. Common measurement used in nutritional anthropometry
7. Methods of assessing nutritional status in individuals
 - a. Determination of nutritional status using MUAC
 - b. Determination of nutritional status using weight and height
 - c. Methods of assessment of nutritional status of community

FOOD MICROBIOLOGY AND FOOD SAFETY CORE COURSE - 203

**MM-70
Pd/ wk- 4**

UNIT – I

Microbiology of foods – Introduction, basic concepts, role of micro organisms in fermented foods
microbiology of air, water and soil

UNIT - II

1. Food safety and importance of safe food
2. Factors effecting food safety – physical, chemical, biological hazards
3. Factors effecting the growth of micro organism in foods
4. Sources of food contamination

UNIT – III

- Food toxins – introduction, significance of food toxins and food safety
- Main groups of food toxins
 1. Naturally occurring toxicants inherently present in foods – Toxic amino acids, toxic alkaloids, siynogenic glycosides, trypsin inhibitors, haemagglutins, flatulence factors
 2. Naturally occurring toxicants due to activity of bacterial, algae and fungi- phycotoxins or algae toxins, mycotoxins, mycotoxicoes in humans, prevention and control.
 3. Environmental contaminants – Pesticide residue, veterinary drug residues, heavy metals, nitrates and nitrites, and adulterants
- Emerging problems of food safety

UNIT – IV

Food additives and safety issues- Introduction, classification, functional role and safety issues

UNIT – V

Food spoilage –

- Introduction, factors, chemical changes due to spoilage
- Control and destruction of micro organism in foods – physical and chemical methods

**TOURS FOR WELFARE INSTITUTIONS
CORE COURSE - 204**

**MM-70
Pd/ wk- 4**

Unit – 1

1. Status of children in India as compared health. Education, nutrition and recreation rights of the child
2. Changing philosophy and concepts of programs and services for children, an integrated approach

Unit – 2

1. Functions, activities & programmes related to children

Unit – 3

2. Current national programs

Unit – 4

1. National and International organizations working for children in the areas of nutrition

Unit – 5

1. Management of institution: Administration, organization and structure of various institutions of children
 - a. Orphanages, home for destitute
 - b. Balbhavans
 - c. Recreational centers
 - d. Hospital wards

**PRACTICAL – 1
MENU PLANS AND CALCULATION
CORE COURSE – 205**

1. Market survey of foods their nutritive value & cost
2. Menu plans – basic principles of menu planning for different age groups and calculation using NIN table/ex change lists (covered in theory)

**PRACTICAL – 2
NUTRITIONA PROGRAMME FOR VULNERABLE GROUPS
CORE COURSE – 206**

1. Preparing programme for vulnerable groups
 - a. Studying existing diet and nutrition practices
 - b. Planning
 - c. Conducting survey
 - d. Analyzing data
 - e. Evaluation and writing report

GENDER STUDIES SKILL COURSE - 207

**MM-50
Pd/ wk- 2**

Unit – 1 Gender and Development:

2. Concept of gender, gender roles, changing trends, gender analysis matrix gender and development.

Unit – 2

2. National and international efforts for gender empowerment.

Unit – 3

3. Meaning of status of women A situational analysis - demographic, education, employment, political and health (general, occupational, and reproductive)
4. Violence against Women- Dowry, divorce, female feticide and infanticide, domestic violence.

Unit – 4

3. Sexual harassment and exploitation, trafficking, portrayal of women in mass media. Efforts for elimination of all forms of discrimination
4. Policies and Programmes for Women's Development:

Unit – 5

3. Economic empowerment- Poverty eradication, micro finance and self-help groups,
4. Introduction of laws for domestic violence against women (2005) and sexual harassment (2013)

PRACTICAL COURSE

**MM-50
Pd/ wk- 2**

1. Preparation of E-content for gender sensitization
2. Identification and assessment of gender issues in current print and electronic media
3. Collection and evaluation of Ten articles on gender issues

POPULATION EDUCATION AND COMMUNITY HEALTH SKILL COURSE - 207

**MM-50
Pd/ wk- 2**

Unit – 1: Health and Health Care

3. Concepts of health and positive health, Health- disease continuum, factors affecting health, health as a human right.
4. Concept of community health, global health, health for all.

Unit – 2

4. Primary health care- definitions, principles components, comprehensive health care, levels of prevention, Concept of reproductive health for adolescent girls and boys.
5. Health and Development indices
6. Health indices and related indices in community health, fertility indicators, vital statistics, mortality, morbidity indicators, demographic indicators – sex ratio

Unit – 3

3. Indicators for social and mental health, Human Development index, Disability adjusted life years (DALY). Reproductive Health index. Major Health Problems in India

4. Health administrative set up, Peripheral, state, National, urban-rural(Introduction to National Rural Health Mission), National family Health surveys

Unit – 4

2. National Health Programmes- ICDS, AIDS prevention Programme, Reproductive Child Health (RCH) birth control methods, population education

Unit – 5

2. Concept of population education: Various definitions Significance and scope of population education, Family life education, Sex education, Causes and consequences of population Blast. Trends in population growth terms related to population dynamics

PRACTICAL COURSE

**MM-50
Pd/ wk- 2**

3. Preparation of teaching Aids on population dynamics
4. First Aid and home nursing
 - i. Bandages
 1. Roller-finger, arm, leg, elbow, knee, cap line
 2. Triangular head, palm/foot, sling
5. Bed making
6. Recording of temperature
7. Use of kidney tray, spittoon, eye glass, thermometer, hot water bag, ice cap, blood pressure estimations, blood sugar testing

NUTRITION SCIENCE: BASIC CONCEPTS SKILL COURSE - 207

**MM-50
Pd/ wk- 2**

UNIT – I

Food and nutrition – meaning, functions, classification nutrition and health (Basic concepts)

UNIT – II

Food groups – Characteristics of food groups, classification of food groups, Balanced diet, nutrient requirements for various age groups

UNIT – II

Anthropometric assessment of nutritional status

UNIT – IV

- Therapeutic modification of normal diet and reasons for dietary changes in – Obesity, congestive heart disease, diabetes, hypertension.
- Dietary counseling

UNIT – V

Food adulteration – Introduction, common adulterants in foods

PRACTICAL COURSE

**MM-50
Pd/ wk- 2**

3. Assessment of nutritional status of individual and for community group using - weight, height MUAC waist and hip circumferences
4. Qualitative testing of some foods for adulteration

(SEMESTER - III) 2023-2024
ADVANCED NUTRITIONAL BIOCHEMISTRY - I
CORE COURSE - 301

MM-70
Pd/ wk- 4

Unit 1

1. Enzyme – Distribution, Factors affecting enzyme activity, active site, mechanism of enzyme action, enzyme inhibition, specificity, Km value and its significance. Enzymes in clinical diagnosis.
2. Biological oxidation – High energy compounds. Biological oxidation. Electron transport chain. Oxidative phosphorylation

Unit 2

1. Introduction to metabolism. Citric acid cycle – Importance, reactions. Role of citric acid cycle in metabolism – gluconeogenesis, transamination, deamination and fatty acid synthesis.
2. Glycolysis and oxidation of pyruvate.

Unit 3

1. Metabolism of glycogen
2. Gluconeogenesis and control of blood glucose
3. Pentose phosphate pathway
4. Altered metabolism in diabetes mellitus

Unit -4

1. Biosynthesis of fatty acids
2. Oxidation of fatty acids
B- Oxidation, L- and W- oxidation, odd number carbon atoms FA
3. Metabolism of ketone bodies

Unit 5

1. Bio-synthesis of unsaturated fatty acids. Desaturase system, elongation of FA
2. Metabolism of acylglycerols-catabolism. Bio synthesis of triacylglycerol and phospholipids.
3. Cholesterol metabolism – biosynthesis, regulation, degradation of cholesterol synthesis of bile acids

CLINICAL NUTRITION - I
CORE COURSE - 302

MM-70
Pd/ wk- 4

Unit 1:

1. Nutritional and the gastrointestinal- tract malabsorption and patho physiology, carbohydrate intolerance
2. Parasitic infections
3. Diagnostic tests in gastrointestinal disease- Measurement of motility and gastric acidity. Influence of food on gastric acidity and motility

Unit 2:

1. Nutrition and liver diseases
2. Gall bladder diseases
3. Fevers and Nutrition- Acute and chronic
4. Food allergy

Unit 3:

1. Renal diseases- Previous diseases in brief. Acute and chronic renal failure dialysis
2. Surgery, burns and nutrition

Unit 4:

1. Nutrition and cardiovascular diseases, Role of lipid and other- Nutrients
2. Bile acid metabolism
3. Prostaglandins

Unit 5:

1. Nutrition and weight managements – Obesity, over weight underweight
2. Dietary counseling – dietitian code, ethics and responsibilities steps and follow up programme counseling for different diseases

REFERENCE

- K.M. Varghese Company, Bombay, Comparative Aspects of Nutrition and Metabolic Diseases- CRC Press VIIed. 1988 Joyar M.C and Keteroon: Nutrition and Disease

FOOD SERVICE MANAGEMENT CORE COURSE - 303

**MM-70
Pd/ wk- 4**

Unit – 1

1. Management
 - a. Approaches to food service management
 - i. Different approaches (traditional, classical, scientific)
 - ii. Management by objectives
 - iii. Systems approach to food services
 - iv. Quantitative approach
 - v. Total quality management of approach
 - b. Managing an organization
 - i. Process involved
 - ii. Principles of management
 - iii. Functions of management
 - c. Management of resources (capital, equipment, functions, space, staff etc.)

Unit – 2

1. Financial management
 - a. Records & controls: Basic concept
 - i. Types of budget
 - ii. Records (purchase, receiving, storage, production, service, income and expenditure)
 - iii. Reviewing actual performance records
 - b. Cost control
 - i. Factors affecting cost control
 - ii. Determining selling price of food
 - iii. Designing for profit

Unit – 3

1. Receiving and store room management, quality food production
 - a. Principles of food production
 - b. Food production system management (menu, ingredient control and production scheduling)
 - c. Production control (use of standardized recipes and developing a plan for recipe standardization)
 - d. Safeguard in food production (quality control)
2. Quantity food production
 - a. Kitchen production
 - b. General procedure used in institutional & commercial food production

- c. (collecting ingredients, selection of food weighing and measuring, preliminary treatment of food and food production to achieve consumer satisfaction)

Unit – 4

1. Menu Planning
 - a. Importance of menu planning
 - b. Methods of delivery service system (centralized and decentralized)
 - c. Types of menu and its application
 - d. Steps in menu planning
 - e. Types of food service system (conventional, commissary, ready prepared and assembly serve)
2. Food purchasing – A food management activity
 - a. The market and the buyer
 - b. Methods of purchasing
 - c. Identifying needs amounts to buy
 - d. Minimum and maximum stock level and quantities of food to be bought

Unit – 5

1. Plant and equipment maintenance
 - a. Plant and equipment in food services
 - i. Definition and classification
 - ii. Types of plant and equipment
 - iii. Maintenance of plant and equipment
 - iv. Safety concerns
 - v. Checks and inspections
 - vi. Equipment supplies
 - b. Plant sanitation and safety
 - c. Three E's of safety
 - i. Safety engineering
 - ii. Safety education
 - iii. Safety enforcement

MEDICAL INTERNSHIP CORE COURSE - 304

**MM-70
Pd/ wk- 4**

The practical includes block placement of the students in hospitals, medical wards or dietary department for 2 months

PRACTICAL – 1 DIET PLANNING FOR VARIOUDISEASES CORE COURSE – 305

**CCA-30
ESE-70
Pd/ wk- 8**

- Dietary Counseling
- Planning, calculation, preparation, services, evaluation of therapeutic diets, covered in theory the practical

PRACTICAL – 2
FOOD SERVICE MANAGEMENT
CORE COURSE –306

CCA-30
ESE-70
Pd/ wk- 8

1. Planning and organization of meals for institutional feeding
 - a. Mid day snack for pre school children
 - b. Meals for college canteen
 - c. Meals for college hostel mess
 - d. Meals for working women hostel
2. Table setting covered in restaurant, breakfast, lunch-dinner and tray service
3. Catering for special occasion and events, seminars/conferences

GENDER STUDIES
SKILL COURSE - 307

MM-50
Pd/ wk- 2

Unit – 1 Gender and Development:

3. Concept of gender, gender roles, changing trends, gender analysis matrix gender and development.

Unit – 2

3. National and international efforts for gender empowerment.

Unit – 3

5. Meaning of status of women A situational analysis - demographic, education, employment, political and health (general, occupational, and reproductive)
6. Violence against Women- Dowry, divorce, female feticide and infanticide, domestic violence.

Unit – 4

5. Sexual harassment and exploitation, trafficking, portrayal of women in mass media. Efforts for elimination of all forms of discrimination
6. Policies and Programmes for Women's Development:

Unit – 5

5. Economic empowerment- Poverty eradication, micro finance and self-help groups,
6. Introduction of laws for domestic violence against women (2005) and sexual harassment (2013)

PRACTICAL COURSE

MM-50
Pd/ wk- 2

1. Preparation of E-content for gender sensitization
2. Identification and assessment of gender issues in current print and electronic media
3. Collection and evaluation of Ten articles on gender issues

POPULATION EDUCATION AND COMMUNITY HEALTH SKILL COURSE - 307

**MM-50
Pd/ wk- 2**

Unit – 1: Health and Health Care

5. Concepts of health and positive health, Health- disease continuum, factors affecting health, health as a human right.
6. Concept of community health, global health, health for all.

Unit – 2

7. Primary health care- definitions, principles components, comprehensive health care, levels of prevention, Concept of reproductive health for adolescent girls and boys.
8. Health and Development indices
9. Health indices and related indices in community health, fertility indicators, vital statistics, mortality, morbidity indicators, demographic indicators – sex ratio

Unit – 3

5. Indicators for social and mental health, Human Development index, Disability adjusted life years (DALY). Reproductive Health index. Major Health Problems in India
6. Health administrative set up, Peripheral, state, National, urban-rural(Introduction to National Rural Health Mission), National family Health surveys

Unit – 4

3. National Health Programmes- ICDS, AIDS prevention Programme, Reproductive Child Health (RCH) birth control methods, population education

Unit – 5

3. Concept of population education: Various definitions Significance and scope of population education, Family life education, Sex education, Causes and consequences of population Blast. Trends in population growth terms related to population dynamics

PRACTICAL COURSE

**MM-50
Pd/ wk- 2**

5. Preparation of teaching Aids on population dynamics
6. First Aid and home nursing
 - i. Bandages
 1. Roller-finger, arm, leg, elbow, knee, cap line
 2. Triangular head, palm/foot, slingh
8. Bed making
9. Recording of temperature
10. Use of kidney tray, spittoon, eye glass, thermometer, hot water bag, ice cap, blood pressure estimations, blood sugar testing

NUTRITION SCIENCE: BASIC CONCEPTS SKILL COURSE - 307

**MM-50
Pd/ wk- 2**

UNIT – I

Food and nutrition – meaning, functions, classification nutrition and health (Basic concepts)

UNIT – II

Food groups – Characteristics of food groups, classification of food groups, Balanced diet, nutrient requirements for various age groups

UNIT – III

Anthropometric assessment of nutritional status

UNIT – IV

- Therapeutic modification of normal diet and reasons for dietary changes in – Obesity, congestive heart disease, diabetes, hypertension.
- Dietary counseling

UNIT – V

Food adulteration – Introduction, common adulterants in foods

PRACTICAL COURSE

MM-50

Pd/ wk- 2

5. Assessment of nutritional status of individual and for community group using - weight, height MUAC waist and hip circumferences
6. Qualitative testing of some foods for adulteration

(SEMESTER - IV)
ADVANCED NUTRITIONAL BIOCHEMISTRY - II
CORE COURSE - 401

MM-70
Pd/ wk- 4

Unit – 1

Metabolism of proteins and amino acids –

1. Amino acid pool, metabolism of AA transamination, deamination
2. Bio synthesis of nutritionally nonessential amino acids
3. Metabolism of ammonia, bio-synthesis of urea

Unit – 2

1. Catabolism of the carbon skeletons of amino acids, creatine and creatinine synthesis
2. Changes in blood picture in protein malnutrition

Unit – 3

1. Nucleic acid mechanics of DNA. Replication and transcription of DNA and translation
2. Protein bio-synthesis
3. Bio synthesis, regulation and breakdown of purine and pyrimidine nucleotides.

Unit – 4

Hormones – introduction, definition

1. Hypothalamic hormones
 - a. Regulation of release, bio-chemical functions and abnormalities of
2. Anterior pituitary hormones
 - a. The growth hormone – prolactin group
 - b. The glycoprotein hormones
 - c. The pre-opiomelanocortin peptide family
3. Posterior pituitary hormones
 - a. Oxytocin
 - b. Antidiuretic hormone (ADH)
4. Thyroid hormones – thyroxine (T4)
5. Triiodothyroxine (T3)

Unit – 5

Synthesis, biochemical functions, abnormalities of hormones of

1. Adrenal cortex – adrenocorticosteroids
2. Adrenal medulla – catecholamines epinephrine and norepinephrine
3. Hormones of gonads – Androgens Estrogens, Progesterone
4. The menstrual cycle
 - a. Follicular and luteal phase
 - b. menopause

CLINICAL NUTRITION - II
CORE COURSE - 402

MM-70
Pd/ wk- 4

Unit 1:

1. Disorders of the stomach- peptic ulcer. Disorders of small intestine and colon Diarrhea, constipation, irritable colon syndrome, Crohn's disease, diverticulosis ulcerative colitis
2. Nutrition and Dental health- Structure, development and maturation of dental caries, role of nutrients in dental health

Unit 2:

1. Nutrition and cancer- carcinogenesis and mutagenesis, types of cancer, metabolic effects of cancer- cancer cachexia, anorexia. Nutrition effects of cancer therapy- surgery, radiation therapy, Chemotherapy, Immune therapy, nutrients and their relationship with cancer

Unit 3:

1. Diabetes Mellitus- Nature, classification, high risk factors, metabolic effects, symptoms, diagnosis for diabetes treatment- diet, nutritional requirement, glyco-genic sweeteners, drugs, acute complication in diabetes

Unit 4:

1. Food nutrient and drug interaction- classes of drug, their gastrointestinal side effects, other nutritional effects and their dietary precautions
2. Drug metabolism
3. Effects of drugs on nutrition- Alteration in taste, appetite and food intake, alteration in nutrient absorption, alteration in nutrient metabolism, alteration in nutrient excretion

Unit 5:

1. Effects of food on drug utilization- Alteration in drug absorption, alteration in drug metabolism and drug excretion
2. Alcohol and metabolism, effects of alcohol and nutrition, wernicke and korsakoffs syndromes
3. Diet counseling, computer application in clinical nutrition

REFERENCE

- Anita, F.P.: Clinical Dietetics and Nutrition, Oxford Univ. Press UJ ed. 1989
- Shills, M.E. and Young, V.R.: Modern Nutrition in Health and Disease
- K.M. Varghese Company, Bombay, Comparative Aspects of Nutrition and Metabolic Diseases- CRC Press VIIed. 1988 Joyar M.C and Keteroon: Nutrition and Disease

**MEDICAL NUTRITION
CORE COURSE - 403****MM-70
Pd/ wk- 4****Unit – 1**

1. Dietetics
2. Role and types of dietitian in health care units
3. Nutrition assessment
4. Changing food habits

Unit – 2

1. Anthropometric measures
2. Nutrition diagnosis and intervention
3. Patient care and counseling
4. Nutrition monitoring and evaluation

Unit – 3

1. Rehabilitation services
2. Documentation in the nutrition care record
3. Management of critically ill patient
4. Special feeding methods of critically ill patient

Unit – 4

1. Nutritional interventions
2. Nutrition of the terminally ill patient
3. Nutrition supplements

4. Nutrition in neurological disorders

Unit – 5

1. Nutrition during stress
2. Stress response
3. Family support and counseling
4. Factors affecting the ability to change

SCIENTIF WRITING AND DESSERTATION CORE COURSE - 404

**MM-70
Pd/ wk- 4**

Unit – 1

1. Basic concept of scientific writing:
2. Meaning, need and importance
3. Characteristics of good scientific writing

Unit - 2

Types of article:

1. Research proposal
2. Empirical or data based article
3. Review article

Unit - 3

1. National and international journals for article publication
2. Understanding of impact factor and ISSN number
3. Consideration for publication in reputed journals

Unit - 4

1. Ethics in research and writing article
2. Importance of citations and references & copy right

Unit - 5

1. Future of scientific writing
2. Report interpretation and support review
3. Dissertation on contemporary issues

PRACTICAL – 1 BLOOD ANALYSIS CORE COURSE – 405

**CCA-30
ESE-70
Pd/ wk- 8**

Blood analysis:

- Blood count
 - DLC
 - Hemoglobin Estimation
 - Blood film
 - Urine: Glucose detection
 - Enzyme Assay: Alkaline Phosphates transaminase
 - Glucose, Iron, total and free cholesterol, creatinine, SGOT, SGPT
 - Review, understand and critically evaluate a research article
3. Dissertation on contemporary issues in the field of nutrition
 4. Researches in special needs and education – areas and future
 5. Use of SPSS/Mandley and other software used in research.

**PRACTICAL – 2
FOOD ANALYSIS
CORE COURSE –406**

**CCA-30
ESE-70
Pd/ wk- 8**

- Estimation of Calcium in food.
- Estimation of Protein by Biuret method.
- Colorimetric and flurometric Method: - Estimation Phosphorus of Vit. A , C & riboflavin in foods.
- Chromatography:

**GENDER STUDIES
SKILL COURSE - 407**

**MM-50
Pd/ wk- 2**

Unit – 1 Gender and Development:

4. Concept of gender, gender roles, changing trends, gender analysis matrix gender and development.

Unit – 2

4. National and international efforts for gender empowerment.

Unit – 3

7. Meaning of status of women A situational analysis - demographic, education, employment, political and health (general, occupational, and reproductive)
8. Violence against Women- Dowry, divorce, female feticide and infanticide, domestic violence.

Unit – 4

7. Sexual harassment and exploitation, trafficking, portrayal of women in mass media. Efforts for elimination of all forms of discrimination
8. Policies and Programmes for Women's Development:

Unit – 5

7. Economic empowerment- Poverty eradication, micro finance and self-help groups,
8. Introduction of laws for domestic violence against women (2005) and sexual harassment (2013)

PRACTICAL COURSE

**MM-50
Pd/ wk- 2**

1. Preparation of E-content for gender sensitization
2. Identification and assessment of gender issues in current print and electronic media
3. Collection and evaluation of Ten articles on gender issues

POPULATION EDUCATION AND COMMUNITY HEALTH SKILL COURSE - 407

**MM-50
Pd/ wk- 2**

Unit – 1: Health and Health Care

7. Concepts of health and positive health, Health- disease continuum, factors affecting health, health as a human right.
8. Concept of community health, global health, health for all.

Unit – 2

10. Primary health care- definitions, principles components, comprehensive health care, levels of prevention, Concept of reproductive health for adolescent girls and boys.
11. Health and Development indices
12. Health indices and related indices in community health, fertility indicators, vital statistics, mortality, morbidity indicators, demographic indicators – sex ratio

Unit – 3

7. Indicators for social and mental health, Human Development index, Disability adjusted life years (DALY). Reproductive Health index. Major Health Problems in India
8. Health administrative set up, Peripheral, state, National, urban-rural(Introduction to National Rural Health Mission), National family Health surveys

Unit – 4

4. National Health Programmes- ICDS, AIDS prevention Programme, Reproductive Child Health (RCH) birth control methods, population education

Unit – 5

4. Concept of population education: Various definitions Significance and scope of population education, Family life education, Sex education, Causes and consequences of population Blast. Trends in population growth terms related to population dynamics

PRACTICAL COURSE

**MM-50
Pd/ wk- 2**

7. Preparation of teaching Aids on population dynamics
8. First Aid and home nursing
 - i. Bandages
 1. Roller-finger, arm, leg, elbow, knee, cap line
 2. Triangular head, palm/foot, slingh
11. Bed making
12. Recording of temperature
13. Use of kidney tray, spittoon, eye glass, thermometer, hot water bag, ice cap, blood pressure estimations, blood sugar testing

NUTRITION SCIENCE: BASIC CONCEPTS SKILL COURSE - 407

**MM-50
Pd/ wk- 2**

UNIT – I

Food and nutrition – meaning, functions, classification nutrition and health (Basic concepts)

UNIT – II

Food groups – Characteristics of food groups, classification of food groups, Balanced diet, nutrient requirements for various age groups

UNIT – III

Anthropometric assessment of nutritional status

UNIT – IV

- Therapeutic modification of normal diet and reasons for dietary changes in – Obesity, congestive heart disease, diabetes, hypertension.
- Dietary counseling

UNIT – V

Food adulteration – Introduction, common adulterants in foods

PRACTICAL COURSE

MM-50

Pd/ wk- 2

7. Assessment of nutritional status of individual and for community group using - weight, height MUAC waist and hip circumferences
8. Qualitative testing of some foods for adulteration

SYLLABUS
M. Sc. Home Science Semester I, II 2017-18

P.G. DEPARTMENT OF HOME SCIENCE, J. N. V UNIVERSITY, JODHPUR
Semester-wise Theory Papers/Practical/Skill component
Teaching and Examination scheme

Type of course	Course code	Title of the course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Semester I							
Core course – 101	FRM - I	Ergonomics and Institutional Management	4	4	30	70	100
Core course – 102	HD - I	Child Psychology	4	4	30	70	100
Core course - 103	CT - I	Origin , Sociological and Psychological Aspects of Clothing	4	4	30	70	100
Core course - 104	FN - I	Human Nutrition and Problems	4	4	30	70	100
Core course Practical - 105	FN - I	Assessment of Nutritional Status and Food Science	8	4	30	70	100
Core course Practical - 106	HD - I	Methods of Studying Children	8	4	30	70	100
Skill Course I 107		Gender Studies	2-0-2				
Skill Course II 107		Population Education and Community Health	2-0-2				
Skill Course III 107		Nutrition Science: Basic Concepts	2-0-2				
Total				24	180	420	600
Semester II							
Core course - 201	Ext. Edu.- I	Communication and Extension in Home Science	4	4	30	70	100
Core course - 202	CT - II	Indian Textiles	4	4	30	70	100
Core course - 203	HD - II	Issues in Child Development and Psychology	4	4	30	70	100
Core course - 204	FN - II	Food Microbiology and food Safety	4	4	30	70	100
Core course Practical - 205	CT - I	Textile Designing and Fashion Illustration	8	4	30	70	100
Core course Practical - 206	Ext. - I	Extension Education and Communication	8	4	30	70	100
Skill Course I 207		Gender Studies	2-0-2				
Skill Course II 207		Population Education and Community Health	2-0-2				
Skill Course III 207		Nutrition Science: Basic Concepts	2-0-2				
Total				24	180	420	600

M. Sc. Home Science
(SEMESTER - I) 2017-18
ERGONOMICS AND INSTITUTIONAL MANAGEMENT
CORE COURSE - 101

MM-70
Pd/ wk- 4

Unit - 1

1. Definition – Ergonomics, Aim Scope/importance of ergonomics, areas of ergonomics
2. Work risk factors

Unit - 2 Ergonomics in work place -

1. Posture: its impact on health and output – Remedies
Varied work surface - height and posture
2. Anthropometry and some design issues: body shaped, anthropometry – Static and dynamic, consideration for sitting, work surfaces and areas, dimensions in different postures for design applications

Unit - 3

1. Introduction to food service industry with historical development (in Brief)
2. Food service planning
 - a. Layout (Kitchen and store)
 - b. Selection of Equipment
3. Food service operations
4. Food management
 - a. Menu planning
 - b. Quantity food production
 - c. Quantity and quality control
 - d. Kitchen production

Unit - 4

1. Financial management in catering
 - a. Principles of Accounting functions
 - b. Food cost control
 - c. Designing for profits
 - d. Pricing the product
2. Food purchasing
3. Manpower and Personnel Management
 - B. Staff planning and pay roll control
 - C. Administrative leadership

Unit – 5 Management of Dining Room

1. Layout and structural feature of dining room
2. Table service
3. Maintenance & care of linen and floor covering
4. Maintenance & care of furniture
5. Hostess training
 - a. Table laying in restaurant
 - i. For one person
 - ii. For family
 - iii. For parties
6. Manners and etiquette
7. Table ware for various occasions

REFERENCES

- Malhan & Sethi: Catering Management: An Integrated Approach, 1989
- Dessler, B.: Personal Management Modern Concept and Techniques, 1978
- Kotshevar, L.N. & Terrek, M.E.: Food Service Planning Layout and Equipment, 1967
- Anergy, A.C.: Modern Guide of food Service Equipment, C.B. Publishing, 1981

CHILD PSYCHOLOGY

CORE COURSE - 102

MM-70
Pd/ wk- 4

Unit – 1

Introduction to psychology

1. Historical perspective and emergence of child psychology as a scientific discipline (in brief).
2. Techniques of child study: time span approach (longitudinal, cross sectional and sequential)
3. Heredity and environment : influences on physical, psychological and intellectual characteristics and personality of children, nature Vs nurture issue.

Unit 2

1. Child Development Perspective: Focus on all round development, Individual needs vs Group's needs
2. Critical areas of child development: definition, importance and development of-creativity and concept formation.
3. definition, importance and development of gender roles

Unit- 3

1. Infancy: definition, importance and development of-
 - i. New born characteristics and assessment
 - ii. Reflex action
 - iii. Attachment
2. Early childhood: definition, importance and development of-
 - i. Play
 - ii. Socialization
 - iii. Self and identification

Unit 4

1. Middle childhood: definition, importance and development of-
 - i. Family
 - ii. Peers
 - iii. School
2. Adolescence: definition, importance and development of-
 - i. Physiological changes
 - ii. Issues related to- a) self and identity, b) career and sexuality, c) health and other issues

Unit 5

1. Early adulthood: definition, importance and development of-
 - i. Physical performance
 - ii. Sexuality
 - iii. Career and work
 - iv. Life style
 - v. Marriage and family
2. Middle adulthood: definition, importance and development of-
 - i. Nature of middle adulthood
 - ii. Midlife crisis and health
 - iii. Career/ work/ family

REFERENCES

- L. Alan Sroufe, Robert, G. Cooper: Child Development- Its Nature and Course, 1st Ed. 1988
- Boston, Allyn & Bacon: Child Development, 1989
- Peter, K. Smith & Helen Kowie : Understanding Children's Development, Smikow 30077, New York, Basil Black, 1988
- Rober S. Feldman: Understanding Psychology, McGraw Hill Book co., New York, 1987

**ORIGIN, SOCIOLOGICAL AND PSYCHOLOGICAL ASPECTS
OF CLOTHING
CORE COURSE - 103**

**MM-70
Pd/ wk- 4**

Unit – I

- Origin of Clothing
- Theories of Clothing: Theory of Modesty, immodesty, protection, adornment, combined need and other theories
- Role of clothing in psychological and personality development of human beings

Unit - II

- Psychological effect of clothing on children
- Self concept, personality expressed through clothing
- Values, interests and attitude in relation to clothing.
- Effect of clothing on behaviour & clothing choices.

Unit - III

Sociological aspect of clothes:

- Fashion, fads, role of uniforms, national costumes, occupational clothes, social importance of clothes, impact of society on clothing choices, Fashion Cycle
- Conformity, mobility, Class distinction family and social influences
- Factors influencing choice of clothes, physical, aesthetic, economic and social

Unit - IV

- Clothing and the age of the wearer (Infants, pre-school going children, School going children, adolescents, adults & elderly).
- Clothing and colour and importance of colour for different ceremonies, occasions, occupation, religion etc.
- Influence of culture and religion on clothing.

Unit - V

Contemporary Home Textiles:

Study with reference to fabrics, finishes, detailed design, selection, use and care

- Bedding and bed furnishings – bed spread, sheets, pillow and pillow covers, bed skirts, mattresses and mattress covers, quilts, quilts covers, blankets
- Kitchen and table furnishing – aprons, kitchen towels, napkins, mats, runners, dish cloths, table cloths, tea cosy covers
- Bathroom furnishing – shower curtain, bath, face and hand towels, bath mats
- Floor Coverings – mats, durries, rugs, carpets including wall to wall carpets
- Curtain, draperies, blinds, chucks and furnishing fabrics

REFERECES

- Ahury, G.S.: Indian Costumes, Popular Prakashan, Bombay
- Bhushan Brij, J.: Costumes and Textiles of India, D.B. Taraporewala & Co. Bmobay
- Moti Chandra: Costumes, Textiles, Cosmetics and Chiffons in Ancient and Medieval India, Orient Publisher, New Delhi, 1973
- Akazi Roahan; Ancient Indian Costumes. Art Heritage, New Delhi
- Mary Shawn Rayan: The study in Human Behavior
- Flugel, J.G.: Psychology of Clothes
- Horn, H.J.: Second Skin
- Mary, Rose & Cranz: Concepts of Clothing
- Doongaji Sherie & Deshpande, R.: Basic Processes and Clothing construction
- Bane, A.: Creative Sewing
- Tate, M.I. and Glisson, D.: Family Clothing
- Lewis, D. S. Brawes: Clothing Construction and Wardrobe Planning

HUMAN NUTRITION AND PROBLEMS

CORE COURSE - 104

MM – 70
Pd/WK – 4

Unit – I

1. Body Composition: Normal body composition, Changes through the life cycle, influence of nutritional status, Methods of assessing body composition
2. Public nutrition – definition, concept, scope
 - Role of public nutritionist in health care delivery
3. Food and nutrition security
 - Concept of food security and nutrition security
 - Determinants or approaches of food security – Availability, access, absorption and stability
 - Factors affecting food security
 - Effects of food insecurity
 - Food security in India

Unit – II

1. Nutritional problems – introduction
 - Protein energy malnutrition. Prevalence, etiology consequences
 - Bio-chemical and metabolic abnormalities – protein carbohydrate, fat, water and electrolyte metabolism
 - Clinical features of PEM forms – kwashiorkor, marasmus, marasmic- kwashiorkor, subclinical PEM
 - Haematological changes
 - Pathological changes
 - Complications, long term effects
 - Management or treatment of PE
 - Hospital based management
 - Community based management
 - Prevention and control of PEM

UNIT – III

1. Micronutrient deficiencies-
 - Vitamin A deficiency (VAD)
 - Iron deficiency anemia (IDA)
 - Iodine deficiency disorder (IDD)
 - Zinc deficiency
 - FluorosisTheir clinical features/signs and symptoms, prevalence, causes, consequences, treatment and prevention

Unit – IV

Assessment of nutrition status

1. Introduction, importance- purpose
 - Methods of nutritional assessment- indirect and direct methods
2. Nutritional anthropometry uses, measurements
 - Methods of assessing nutritional status using MUAC and using weight and height
3. Clinical assessment- training and standardization
 - Clinical signs of nutritional disorders- PEM, Vit A deficiency, Anamia, Goitre
 - Vit- B complex deficiency – riboflavin and niacin deficiency
 - Vit.- C deficiency
 - Active rickets, Essential fatty acids, fluorosis
4. Bio-chemical Assessment- over view
 - Bio chemical tests for nutritional deficiencies- PEM, VAD, Anamia, Iodine def. Vit – D def. and other nutrients like riboflavin, niacin, folic acid, B 12 and zinc
5. Dietary assessment – methods of diet survey, strengths and limitations

Unit – V

1. Strategies to combat public nutrition problems-Introduction
2. Strategies
3. Diet or food based strategies
 - Dietary diversification/modification
 - Horticulture intervention
 - Food fortification
 - Nutrition and health education
4. Nutrient based approach – The medicinal approach
 - Supplementation – A short term preventive strategy
5. Selecting/implementing on intervention strategy

PRACTICAL – 1
ASSESSMENT OF NUTRITIONAL STATUS AND FOOD SCIENCE
CORE COURSE - 105

CCA-30
ESE-70
Pd/ wk- 8

1. Assessment of Nutritional Status:
 - Nutritional anthropometry : Recording and interpretation of weight, height and chest, head and mid arm circumference and skin fold thickness data
 - Clinical assessment : Identifying the clinical manifestation of the various deficiency diseases and excesses
 - Biochemical assessment-Biochemical estimation to identify the deficiency diseases namely protein energy malnutrition and anemia
 - Dietary survey
2. Seminar on recent advances in Nutrition
3. Study of Stains and staining reactions-Gram staining, negative staining, Capsule staining, acid fast staining
4. Bacteriological analysis of different foods- MBRT curd, vegetables, fruits, ice-cream, cereals sugar, salt, spices soft drinks, pastries and canned foods
5. Standardization of recipes- Low cost recipes suitable for various vulnerable Sections of Population

PRACTICAL – 2
METHODS OF STUDYING CHILDREN
CORE COURSE 106

CCA-30
ESE-70
Pd/ wk- 8

1. Methods of Child Study
 - Interview method
 - Structured or standardized interview
 - Unstructured or free interview
 - Questionnaire method
 - Open – ended
 - Close ended
 - Observation method
 - Participant observation
 - Non participant observation
 - Anecdotal records
 - Rating scales
 - Case study method
2. Psychometric Testing
 - Intelligence testing
 - a. Wechsler's Intelligence scale for children (WISC)
 - Projective techniques
 - a. Children's apperception test (CAT)
3. Activities for fastening development (power point presentations)
 - Creativity
 - Physical & motor development
 - Social – emotional development
 - Language development
 - Cognitive development
 - Story telling techniques & aids
 - Role play
 - Program planning in balwadis

GENDER STUDIES SKILL COURSE - 107

**MM-50
Pd/ wk- 2**

Unit – 1 Gender and Development:

1. Concept of gender, gender roles, changing trends, gender analysis matrix gender and development.

Unit – 2

1. National and international efforts for gender empowerment.

Unit – 3

1. Meaning of status of women A situational analysis - demographic, education, employment, political and health (general, occupational, and reproductive)
2. Violence against Women- Dowry, divorce, female feticide and infanticide, domestic violence.

Unit – 4

1. Sexual harassment and exploitation, trafficking, portrayal of women in mass media. Efforts for elimination of all forms of discrimination
2. Policies and Programmes for Women's Development:

Unit – 5

1. Economic empowerment- Poverty eradication, micro finance and self-help groups,
2. Introduction of laws for domestic violence against women (2005) and sexual harassment (2013)

PRACTICAL COURSE

**MM-50
Pd/ wk- 2**

1. Preparation of E-content for gender sensitization
2. Identification and assessment of gender issues in current print and electronic media
3. Collection and evaluation of Ten articles on gender issues

POPULATION EDUCATION AND COMMUNITY HEALTH SKILL COURSE - 107

**MM-50
Pd/ wk- 2**

Unit – 1: Health and Health Care

1. Concepts of health and positive health, Health- disease continuum, factors affecting health, health as a human right.
2. Concept of community health, global health, health for all.

Unit – 2

1. Primary health care- definitions, principles components, comprehensive health care, levels of prevention, Concept of reproductive health for adolescent girls and boys.
2. Health and Development indices
3. Health indices and related indices in community health, fertility indicators, vital statistics, mortality, morbidity indicators, demographic indicators – sex ratio

Unit – 3

1. Indicators for social and mental health, Human Development index, Disability adjusted life years (DALY). Reproductive Health index. Major Health Problems in India
2. Health administrative set up, Peripheral, state, National, urban-rural(Introduction to National Rural Health Mission), National family Health surveys

Unit – 4

1. National Health Programmes- ICDS, AIDS prevention Programme, Reproductive Child Health (RCH) birth control methods, population education

Unit – 5

1. Concept of population education: Various definitions Significance and scope of population education, Family life education, Sex education, Causes and consequences of population Blast. Trends in population growth terms related to population dynamics

PRACTICAL COURSE

**MM-50
Pd/ wk- 2**

1. Preparation of teaching Aids on population dynamics
2. First Aid and home nursing
 - i. Bandages
 1. Roller-finger, arm, leg, elbow, knee, cap line
 2. Triangular head, palm/foot, sling
2. Bed making
3. Recording of temperature
4. Use of kidney tray, spittoon, eye glass, thermometer, hot water bag, ice cap, blood pressure estimations, blood sugar testing

**NUTRITION SCIENCE: BASIC CONCEPTS
SKILL COURSE - 107**

**MM-50
Pd/ wk- 2**

Unit – I

Food and nutrition – meaning, functions, classification nutrition and health (Basic concepts)

Unit – II

Food groups – Characteristics of food groups, classification of food groups, Balanced diet, nutrient requirements for various age groups

Unit – III

Anthropometric assessment of nutritional status

Unit – IV

- Therapeutic modification of normal diet and reasons for dietary changes in – Obesity, congestive heart disease, diabetes, hypertension.
- Dietary counseling

Unit – V

Food adulteration – Introduction, common adulterants in foods

PRACTICAL COURSE

**MM-50
Pd/ wk- 2**

1. Assessment of nutritional status of individual and for community group using - weight, height MUAC waist and hip circumferences
2. Qualitative testing of some foods for adulteration

(SEMESTER - II)
COMMUNICATION AND EXTENSION IN HOME SCIENCE
CORE COURSE - 201

MM-70
Pd/ wk- 4

Unit 1 : Introduction to communication

- Origin, Concept, definition, nature of communication
- Models of communication
- Levels of communication
- Effective communication- Frame of reference, perception, fidelity , communication gap, time lag, empathy, homophily, heterophily
- Functions of communication

Unit 2 : Communication media and Technology

- Classification of media
- Selection of appropriate media
- Production and use of selected media in Home Science
- Writing scripts for radio talk, television talk, puppet play, street play
- Writing for newspapers, magazine

Unit 3 : Developmental communication

- Problems in Development and grass root participation (need and participation)
- Development communication strategies for grass root mobilization
- Importance of leadership in developmental communication.
- Understanding the role of traditional and modern media in developmental communication
- Participatory approach in developmental communication

Unit -4 Communication process

- Elements of communication.
- Principle of effective communication
- Channels of communication
- Problems of communication (related to the communicator, message receiver and other factors)

Unit 5 : Appropriate technology for women

- Role and status of women in rural development
- Approach and methods of socio economic analysis- PRA and RRA
- Need of appropriate technology for women
- Transfer of technology and factors affecting TOT
- TOT process and improvement

REFERENCES

- Benjamin James : Communication Concepts and Contexts, 1986
- Berlo, D.K.: The Process of Communicating –An Introduction to Theory and Practical,1960, New York, Henry Holt and Company
- Chopra,K., Kaukodi, G.K., & Murty, M.N.: Participatory Development, 1990. Sagar Publication
- Dhama, O.P. & Bhatnagar, O.P. : Education and Communication for Development, 1987
- Dhama, O.P. & Bhatnagar, O.P. : Communication for Development, 1991
- Kumar Keval J.: Mass Communication in India: A Comprehensive and Critical Look at the Mass Media in India, 1987
- Ray, G.L., Extension Communication and management, 1999, Nays Prakashan, Calcutta
- Tiwari, LP : Communication, Technology and Development, 1987
- Indian Ministry of Information & Broad Casting : Mass Media in India, 1985

INDIAN TEXTILES
CORE COURSE – 202

MM-70
Pd/ wk- 4

Unit - I

Study of Historical textiles with special emphasis on traditional carpets, rugs and Durries of India

Unit - II

Woven Textile-Study of woven textiles with reference to construction techniques, colour and motif

- Jamdani of Bengal
- Baluchri of Bengal
- Brocade of Varanasi
- Paithani of Maharashtra
- Tanchoi of Gujrat
- Munga Silk of Assam
- Tassar of Bihar
- Chanderi of Madhya Pradesh
- Kota Doria of Rajasthan
- Shawls of Kashmir

Unit - III

Indian Embroidery –Study of Indian Embroidered textiles with special reference to stitches, colours and motifs

- Kashida of Kashmir
- Phulkari of Punjab
- Chamba Rumal of Himachal
- Chikankari of Uttar Pradesh
- Sindhi Embroidery of Kutch
- Kantha of Bengal
- Kasuti of Karnataka
- Appliqué work of Orissa
- Metal wire and leather embroidery

Printed and Painted Textiles-Study of printed and painted textiles in reference to historical significance, styles, colour and motif

- Fabric resist dyeing – Bandhani of Rajasthan
- Yarn resist dyeing – Gujarat, Orissa and Andhra Pradesh
- Printed textiles – Sanganer and Bagru
- Painted textiles – Kalamkari and Madhubani

Unit - IV

A) Indian costumes: Historic approach from ancient period to 20th Century:

- Dress in Harappa and Mohan Jodaro
- Dress of Aryans
- Dress of 600 BC -320 BC (Buddhist, Jains)
- Islamic influence
- British period

B) Study of regional costumes of India (Men/Women) Punjab, Himachal, Kashmir, U.P, M.P., Bengal, Tamilnadu, Rajasthan, Gujarat, and Maharashtra

Unit - V

1. Importance of textile conservation; Various methods for analysis of textiles -fibre content, yarn & fabric structure.
2. Damage to textiles – pests, micro organisms etc.; Condition assessment, repair, and stabilization of textile and apparel designing in museum collections; Dry, aqueous and solvent cleaning.
3. Principles of cleaning fragile textiles; Proper conditions for storing and display of various textiles.

**ISSUES IN CHILD DEVELOPMENT AND PSYCHOLOGY
CORE COURSE - 203**

**MM-70
Pd/ wk- 4**

Unit – 1

1. Methods of preschool education: a) play way method, b) Montessori method, c) kinder garten method.
2. Parental involvement: importance and methods
3. Behavioural problems of children: causes and management
 - a. Truancy, telling lies and stealing
 - b. Temper tantrum and aggression
 - c. Eating problem, nail biting and bedwetting

Unit –2

1. Importance of school: the physical environment, school philosophy, teacher pupil interaction, effective schools.
2. Psychological effects of pressure on children for academic achievement
3. Peer relation: the development of peer sociability, peer acceptance and popularity.

Unit –3

1. Ethnographical approach, correlational and experiment approach to studying human behavior
2. Qualitative research in human development: definition and importance
3. Types of qualitative methods: informal discussion, observation, social mapping, Focus group discussion

Unit –4

1. Survey : Questionnaire, interview case study, check list, rating scale and field studies (scope, meaning preparation, administration, advantages and limitations of each)
2. Psychometric: meaning, characteristics of a good test. Reliability, validity and discrimination power. Standardization of a psychological test
3. Report writing: general structure and formal of report

Unit –5

Aging:

1. Issues and concerns in aging:
 - i. Longevity
 - ii. Health
 - iii. Work and retirement
2. Socio emotional issues:
 - i. Self
 - ii. Family
 - iii. Society
3. Death and dying:
 - i. Preparation for death
 - ii. Stages of death.

REFERENCES

- Michael, Lam Marc Bornstein: Development an Introduction, 2nd, Random Hall, New York, 1987
- Grace, L. Craig: Human Development, 3rd ed. Prentice Hall, New Jersey, 1983
- Jindel, S.K.: Intellectual Development, Mittal Publication, Dehli, 1988
- Mutlidharan, N.: The systems of preschool education in India, Indian association for preschool education, 1968
- Kennedy, A.W.: Psychology, prentice Hall, New jersey, 1971 Thorpe, L. Child Psychology Development (Latest), the Ronald press Co. new York
- Berk. L.: Child Development, Boston Allyn & Bacon International edition, (Latest), 1994
- Olds, S.W. and Papalia, D.E.: Human Development, McGraw Hill Book Co., New York, 1986

**FOOD MICROBIOLOGY AND FOOD SAFETY
CORE COURSE - 204**

**MM-70
Pd/ wk- 4**

Unit – I

Microbiology of foods – Introduction, basic concepts, role of micro organisms in fermented foods
microbiology of air, water and soil

Unit - II

1. Food safety and importance of safe food
2. Factors effecting food safety – physical, chemical, biological hazards
3. Factors effecting the growth of micro organism in foods
4. Sources of food contamination

Unit – III

- Food toxins – introduction, significance of food toxins and food safety
- Main groups of food toxins
- 1. Naturally occurring toxicants inherently present in foods – Toxic amino acids, toxic alkaloids, siynogenic glycosides, trypsin inhibitors, haemagglutins, flatulence factors
- 2. Naturally occurring toxicants due to activity of bacterial, algae and fungi- phycotoxins or algae toxins, mycotoxins, mycotoxicoses in humans, prevention and control.
- 3. Environmental contaminants – Pesticide residue, veterinary drug residues, heavy metals, nitrates and nitrites, and adulterants
- Emerging problems of food safety

Unit – IV

Food additives and safety issues- Introduction, classification, functional role and safety issues

Unit – V

Food spoilage –

- Introduction, factors, chemical changes due to spoilage
- Control and destruction of micro organism in foods – physical and chemical methods

**PRACTICAL – 3
TEXTILE DESIGNING AND FASHION ILLUSTRATION
CORE COURSE - 205**

**CCA-30
ESE-70
Pd/ wk- 8**

1. Drawing a collection of traditional designs given on fabrics
2. Sketching designs for various textures and prints to suit the figures, sizes and type of fabrics
3. Adaptation by flat pattern using half scale bodice block making samples on fabric
 - Part – basic darts
 - Yokes
 - Fullness
 - Sleeves
 - Collars
 - Pockets
 - Neck lines
4. Focus on design details of style and rendering techniques using different medias
 - Sketching of different action croquet (front, back and side view)
 - Sketching of garments and accessories
 - Basic rendering techniques
 - Colour matching using different medias charcoal, brushes, colours and paper
 - Pattern and texture (checks, line)
5. Theme rendering – Developing a line of garments based on theme and fabric selected
 - Casual wear
 - Sports wear
 - Formal (Business wear)
6. Samples of Fancy embroidery stitches and applique work.
7. Illustration of Dresses depicting various textures, prints and drapes.

PRACTICAL – 4
EXTENSION EDUCATION AND COMMUNICATION
CORE COURSE - 206

CCA-30
ESE-70
Pd/ wk- 8

1. Writing script for one of the media referred in theory
2. Production of selected media in Home Science Extension education and communication
3. Pre testing of the selected media
4. Use of Selected media in the field
5. Developing skill in any of the folk media
6. News and report writing of programme for farm/ slum women

GENDER STUDIES
SKILL COURSE - 207

MM-50
Pd/ wk- 2

Unit – 1 Gender and Development:

1. Concept of gender, gender roles, changing trends, gender analysis matrix.
2. Shift from welfare to development and empowerment, gender in development, gender and development.

Unit – 2

1. National and international efforts for gender empowerment.

Unit – 3

1. Meaning of status of women A situational analysis - demographic, education, employment, political and health (general, occupational, and reproductive)
2. Violence against Women- Dowry, divorce, female feticide and infanticide, domestic violence.

Unit – 4

1. Sexual harassment and exploitation, trafficking, portrayal of women in mass media. Efforts for elimination of all forms of discrimination
2. Policies and Programmes for Women's Development:
3. National policy for Empowerment of women, policy perspectives, mainstreaming

Unit – 5

1. Economic empowerment- Poverty eradication, micro finance and self-help groups,
2. Introduction of laws for domestic violence against women (2005) and sexual harassment (2013)

PRACTICAL COURSE

MM-50
Pd/ wk- 2

1. Preparation of E-content for gender sensitization
2. Identification and assessment of gender issues in current print and electronic media
3. Collection and evaluation of Ten articles on gender issues

POPULATION EDUCATION AND COMMUNITY HEALTH SKILL COURSE - 207

**MM-50
Pd/ wk- 2**

Unit – 1: Health and Health Care

1. Concepts of health and positive health, Health- disease continuum, factors affecting health, health as a human right.
2. Concept of community health, global health, health for all.

Unit – 2

1. Primary health care- definitions, principles components, comprehensive health care, levels of prevention, Concept of reproductive health for adolescent girls and boys.
2. Health and Development indices
3. Health indices and related indices in community health, fertility indicators, vital statistics, mortality, morbidity indicators, demographic indicators – sex ratio

Unit – 3

1. Indicators for social and mental health, Human Development index, Disability adjusted life years (DALY). Reproductive Health index. Major Health Problems in India
2. Health administrative set up, Peripheral, state, National, urban-rural(Introduction to National Rural Health Mission), National family Health surveys

Unit – 4

1. National Health Programmes- ICDS, AIDS prevention Programme, Reproductive Child Health (RCH) birth control methods, population education

Unit – 5

1. Concept of population education: Various definitions Significance and scope of population education, Family life education, Sex education, Causes and consequences of population Blast. Trends in population growth terms related to population dynamics

PRACTICAL COURSE

**MM-50
Pd/ wk- 2**

1. Preparation of teaching Aids on population dynamics
2. First Aid and home nursing
 1. Bandages
 - Roller-finger, arm, leg, elbow, knee, cap line
 - Triangular head, palm/foot, sling
3. Bed making
4. Recording of temperature
5. Use of kidney tray, spittoon, eye glass, thermometer, hot water bag, ice cap, blood pressure estimations, blood sugar testing

NUTRITION SCIENCE: BASIC CONCEPTS SKILL COURSE - 207

**MM-50
Pd/ wk- 2**

UNIT – I

Food and nutrition – meaning, functions, classification nutrition and health (Basic concepts)

UNIT – II

Food groups – Characteristics of food groups, classification of food groups, Balanced diet, nutrient requirements for various age groups

UNIT – II

Anthropometric assessment of nutritional status

UNIT – IV

- Therapeutic modification of normal diet and reasons for dietary changes in – Obesity, congestive heart disease, diabetes, hypertension.
- Dietary counseling

UNIT – V

Food adulteration – Introduction, common adulterants in foods

PRACTICAL COURSE

**MM-50
Pd/ wk- 2**

1. Assessment of nutritional status of individual and for community group using - weight, height MUAC waist and hip circumferences
2. Qualitative testing of some foods for adulteration

SYLLABUS
M. Sc. Home Science Semester
Semester III & IV 2018-19

P.G. DEPARTMENT OF HOME SCIENCE, J. N. V UNIVERSITY, JODHPUR
Semester-wise Theory Papers/Practical/Skill component
Teaching and Examination scheme

Type of course	Course code	Title of the course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Semester III		Textile Group – A					
Core course A-301	1	Textile Chemistry and processing	4	4	30	70	100
Core course – A-302	2	Pattern Making and Construction Techniques	4	4	30	70	100
Core course – A-303	3	Quality Control for Textiles and Apparel Fabrics	4	4	30	70	100
Core course A-304	4	Knitting Technology, Knitwear Design and CAD	4	4	30	70	100
Core course Practical A-305	Pr. -1	Textile Chemistry	8	4	30	70	100
Core course Practical – A-306	Pr. – 2	Quality Control for Textiles and Apparel	8	4	30	70	100
Skill Course I A-307		Gender Studies	2-0-2				
Skill Course II A-307		Population Education and Community Health	2-0-2				
Skill Course III A-307		Nutrition Science: Basic Concepts	2-0-2				
Total				24	180	420	600
Semester IV							
Core course – A-401	1	Women Fabric Structure, analysis and Technical Textiles	4	4	30	70	100
Core course – A-402	2	History of Fashion and Fashion Design	4	4	30	70	100
Core course – A-403	3	Fashion marketing and Merchandising	4	4	30	70	100
Core course – A-404	4	Garment Production, Management and Entrepreneurship	4	4	30	70	100
Core course Practical – A-405	Pr. -1	Garment Construction and Commercial Production	8	4	30	70	100
Core course Practical - A-406	Pr. – 2	Woven Fabric Structures and Knitwear Design Development	8	4	30	70	100
Skill Course I A-407		Gender Studies	2-0-2				
Skill Course II A-407		Population Education and Community Health	2-0-2				
Skill Course III A-407		Nutrition Science: Basic Concepts	2-0-2				
Total				24	180	420	600
Semester III		Foods & Nutrition Group – B					
Core course – B-301	1	Advanced Nutritional Biochemistry - I	4	4	30	70	100
Core course – B-302	2	Clinical Nutrition – I	4	4	30	70	100

Core course – B-303	3	Advanced Nutrition - I	4	4	30	70	100
Core course – B-304	4	Medical Nutrition	4	4	30	70	100
Core course Practical - B-305	Pr. -1	Biochemistry - Blood Analysis	8	4	30	70	100
Core course Practical – B-306	Pr. – 2	Dietary counseling, Planning Calculation and Preparation of Therapeutic Diets	8	4	30	70	100
Skill Course I B-307		Gender Studies	2-0-2				
Skill Course II B-307		Population Education and Community Health	2-0-2				
Skill Course III B-307		Nutrition Science: Basic Concepts	2-0-2				
Total				24	180	420	600
<u>Semester IV</u>							
Core course – B-401	1	Advanced Nutritional Biochemistry - II	4	4	30	70	100
Core course – B-402	2	Clinical Nutrition – II	4	4	30	70	100
Core course – B-403	3	Advanced Nutrition - II	4	4	30	70	100
Core course – B-404	4	Nutrition in Critical Care	4	4	30	70	100
Core course Practical – B-405	Pr. -1	Biochemistry – Food Analysis	8	4	30	70	100
Core course Practical - B-406	Pr. – 2	Internship – Visit to Hospital and case study of patients	8	4	30	70	100
Skill Course I B-407		Gender Studies	2-0-2				
Skill Course II B-407		Population Education and Community Health	2-0-2				
Skill Course III B-407		Nutrition Science: Basic Concepts	2-0-2				
Total				24	180	420	600
<u>Semester III</u>		<u>Human Development Group – C</u>					
Core course – C-301	1	Parent and Community Education	4	4	30	70	100
Core course – C-302	2	Guidance and Counseling	4	4	30	70	100
Core course – C-303	3	Theories of Child Development and Personality	4	4	30	70	100
Core course – C-304	4	Early Childhood Care and Education	4	4	30	70	100
Core course Practical - C-305	Pr. -1	Planning, Preparation of Activities and Material for Children	8	4	30	70	100
Core course Practical – C-306	Pr. – 2	Educational Programme for Parent and Community	8	4	30	70	100
Skill Course I C-307		Gender Studies	2-0-2				
Skill Course II C-307		Population Education and Community Health	2-0-2				
Skill Course III C-307		Nutrition Science: Basic Concepts	2-0-2				
Total				24	180	420	600
<u>Semester IV</u>							
Core course – C-401	1	Advanced Family Studies	4	4	30	70	100
Core course – C-402	2	Family and Child welfare	4	4	30	70	100
Core course – C-403	3	Children with Special Need	4	4	30	70	100
Core course – C-404	4	Entrepreneurship in Women and Child Care Services	4	4	30	70	100
Core course	Pr. -1	Counseling and	8	4	30	70	100

Practical – C-405		Internship					
Core course Practical - C-406	Pr. – 2	Planning programmes for Parents and Community	8	4	30	70	100
Skill Course I C-407		Gender Studies	2-0-2				
Skill Course II C-407		Population Education and Community Health	2-0-2				
Skill Course III C-407		Nutrition Science: Basic Concepts	2-0-2				
Total				24	180	420	600

**(SEMESTER - III) 2018-19
(GROUP – A) CLOTHING TEXTILE
TEXTILE CHEMISTRY AND PROCESSING
CORE COURSE – A - 301**

**MM-70
Pd/ wk- 4**

Unit - I

1. Definition of Polymers, its types, degree and methods of polymerisation, polymerisation process, molecular weights of polymers and its determination.
2. Orientation and crystallinity of fibre molecules; their influence on the fibre properties
3. Molecular structure and Morphology of cellulose and protein fibres

Unit - II

1. History of dyestuffs, light, colour, dyestuffs, Structure & Use wise classification of dyes.
2. Colour – Colour mixing system, colour order system, CIE colour specification, Instruments for the measurement of colour, understanding Colour difference, Hue, Chroma, etc. Understanding the use of Colour Index Standards, dye shade cards and pantone colour coding.
3. Commercial dyes, their C.I. constitution number and their C.I generic number, nomenclature of commercial dyes.
4. Introduction on Banned dyes

Unit- III

1. Brief chemical composition and properties of wetting agent, softeners (anionic, cationic and non-ionic), detergents, levelling agents, carriers, bleaching agents, thickeners, binders, eco-friendly chemicals
2. Introduction to equipments and machineries used in processing
3. Brief introduction to Preparatory Processes - Singeing, Desizing, Scouring, Bleaching and Mercerization

Unit - IV

1. Dyeing – Principles of Dyeing and Mechanism of dyes like – like direct, reactive, vat, azoic, sulphur, basic, acid, disperse and natural dyes.
2. Printing – Principles of printing, printing using dyes and pigments on - (silk, cotton, Polyester, & blends)
3. Fixation of prints using various methods, Innovative Printing methods

Unit - V

1. Finishes – Classification of finishes, application and mechanism of mechanical (all routine finish),
2. Chemical & Specialty Finishes –like – (wrinkle free, durable press, flame retardant, water proof, soil & satin release, antibacterial).
3. Introduction to Post Treatment of dyed, printed and finished fabrics. (Soaping, rinsing, washing and fixation).

References:

1. Technology of Textile Processing - Shenai, V.A. (1984), Vol.- IX, Sevak Publication
2. Hand Book of Textile Fibers - Cook, J. Gordon, Merrow Publishing Co. Ltd, England
3. Manmade Fibers - Moncrief: R.W, John Wiley & Sons New York.
4. Dyeing and Chemical technology of Textile Fibers - Trotman, E.R. (1975), Charles Griffino Company Ltd, London.
5. An Introduction to Textile Finishing - Marsh, J.T. (1979), B. I. Publications.
6. Chemicals after Treatment of Textiles - Mark H., Wooding N.S. & Atlas Smeeds,(1970), John Wiley & Sons Inc., NY.

PATTERN MAKING AND CONSTRUCTION TECHNIQUES
CORE COURSE - A - 302

MM-70
Pd/ wk- 4

Unit - I

1. Study of Anthropometric measurements- Procedure for taking body measurements for men, women and children
2. Formation of standard size chart in relation to asymmetrical and ideal figure types, Evaluation of posture.
3. Difference between Drafting, Paper pattern & decoding a pattern.

Unit - II

1. Equipments used for measurements, drafting, cutting, stitching and finishing.
2. Sewing needles & sewing threads, manufacture fibre used, essential quality of sewing thread.
3. Types of machines and attachments used for garment manufacturing - domestic and industrial.

Unit - III

1. Scope and Importance of Paper Pattern, Different types of patterns.
2. Different methods of pattern making.
3. Draping and Commercial paper pattern.
4. Basic Terminology : Paper Pattern, Templates, Seamless pattern, Block, Grain Line, Working Pattern, Production Pattern, Design Specification Sheet, Cost Sheet, Land Marks, Bowing, Pattern Grading, Bust point, Balance, Notches, Draping, Ease, Pattern Plot, Pivotal point, Bias cut.
5. Layout for special fabrics for bold & unidirectional prints, stripes and checks

Unit - IV

1. Advanced techniques of pattern making - incorporating style lines & fullness.
2. Principles of contouring, surplice/off shoulder and halter designs; built-in necklines, cowls and collars.
3. Skirts, advanced sleeve variations, exaggerated armholes, pockets, bias cut dresses.
4. Jackets, types of pants; pattern adoption to knits.
5. Handling of special fabrics while cutting and stitching (Pile, lace, Sheers & Heavy weight, knits and leather)

Unit - V

1. Factors affecting good fit.
2. Basic pattern alterations in length, width, waist, hipline etc.
3. Common problems encountered in fitting & their remedies.
4. Grading - Terminology, Types of grade, Principles of Grading
5. Calculation of cost for different garments.

References:

1. Kallal, Marry, Jo., Clothing Construction, MacMillan Press Ltd. 1985.
2. Thomas, Anna. Jacob., The Art of Sewing, UBS PD Publishers Ltd., New Delhi.
3. Stamper, Sharp & Donell., Evaluating Apparel Quality, Fairchild Publications, New York.
4. Graff, J.L, Concepts in Clothing (1976), Mc Graw Hill, New York.
5. Readers Digest–A complete guide to sewing, The Readers Digest Association Ltd., London.
6. Dress Pattern Designing - Natalie Bray
7. Garment Technology for Fashion Designers - Gerry Cooklin.

**QUALITY CONTROL FOR TEXTILES AND APPAREL FABRIC
CORE COURSE – A - 303**

**MM-70
Pd/ wk- 4**

Unit- 1

1. Introduction to Quality standards – importance – benefits - levels & sources of quality standards
2. British standards & ISO standards for the apparel industry – ISO 9000 & 14000 standards & SA 8000 - Total Quality Management systems. Quality – Introduction – definition & importance
3. Quality inspection – raw material – product – online – final inspection

Unit- II

1. Garment defects: Cutting defects - Sewing defects - assembly defects – Pressing -Finishing &Packaging defects.
2. Concepts of TQM - tools used for quality assurance
3. Care labels - International care labelling system

Unit- III

1. Starting a quality control program
2. Implementation of quality system in production line
3. Product specification & analysis using analytical tools -
4. Quality management through inspection
5. Seven quality tools.

Unit-IV

1. Testing: Testing of fibre length – maturity.
2. Yarn Testing – testing of yarn strength- yarn count.
3. Fabric testing – Bursting strength testing - Abrasion testing – Pilling testing – Drapemeter – Crease recovery- stiffness testing.

Unit-V

1. Accessories testing -Inspecting garments using spec sheets - Inspecting garments using measuring tapes - without using measuring tapes
2. Button quality testing - Interlining quality testing
3. Packing a shirt and identifying faults.
4. Quality costs & customer returns
5. Inspection procedures - AQL & apparel quality controls.

References:

1. Pradeep V Mehta, Managing Quality in Apparel Industry, NIFT pub.
2. Mehta P V, An Introduction to quality control for the apparel industry, Marcel Dekker
3. Slater K, Physical Testing & Quality Control, Vol 23, No.1/2/3, Textile Inst. 1993.
4. John H Skinkle, Textile Testing, Brooklyn pub. NY
5. Sara J Kadolph, Quality Assurance for textiles & apparels, Fairchild pub, 1998.
6. Ruth Clock & Grace Kunz, Apparel Manufacture – Sewn Product Analysis, Upper Sadale River pub., NY, 2000.

KNITTING TECHNOLOGY, KNITWEAR DESIGN AND CAD
CORE COURSE – A- 304

MM-70
Pd/ wk- 4

Unit- 1

1. Introduction to knitted fabrics. Difference between knits and wovens, Indian knitting industry past, present and future.
2. Latest Knitting machines, weft –knitting machines- warp knitting machines – Knitted fabric defects.

Unit-II

1. Hand knitting, terms used in knitting, weft knitting & warp knitting – introduction and comparison.
2. Parts and functions of weft knitting and warp knitting machines.
3. Knitted garment manufacture: Cutting – stitching – quality control of knitted garments- knit wear garment designs and developments.

Unit- III

1. Wefts knit structures – single jersey or plain – rib – purl – interlock – Knit- float- tuck and stitch structures – designing of weft structures.
2. Warp Knit Fabrics –warp knit structures – underlap –overlap – closed lap and open lap stitches.

Unit-IV

1. Ideal workstation for CAD- Selection of suitable hardware & software; role of computers in Textile and Apparel Designing production.
2. Types of images and characteristics; saving of images; colour ways in computers, creation of new designs for textile surface - planning for various weave designs – stripes, checks etc; leading to application and change of fabric texture, print and colour.

Unit-V

1. Creation of designs in apparel; texture variation by using effects like embossing, blooming, transparency and translucent look on a garment.
2. Use of 3 D software for customisation of created designs as per end uses.

References:

1. David J Spencer, Knitting Technology, Pergeman press UK
2. Terry Brackenbury, Knitted Clothing Technology, Blackwell Science Publications.
3. Samuel Raz, Flat Knitting Technology, Germany.
4. Smirfitt, An Introduction to Weft Knitting, Merrow Publications.
5. Cegiela L, The knitting Industry: Present needs, future requirements, Vol 19, No. 1, The Textile Institute 1988.
6. Winfred Aldrich, CAD in Clothing & Textiles, Blackwell science, 1994 Annual World, Computers in the world of textiles, Textile Institute, UK, 1984. Taylor P,
7. Computers in Fashion Industry, Heinemann pub., 1990
8. The Textile Institute. Winning through Information Technology, UK. Berkstresser. Buhanan & Graddy, Automation in the Textile Industry: from Fibres to Apparels, The Textile institute, UK.1995
9. Veinsinet D O. Computer Aided Drafting & Design-Concept & Application, 1987

PRACTICAL – 5
TEXTILE CHEMISTRY
CORE COURSE – A - 305

CCA-30
ESE-70
Pd/ wk- 8

1. **Qualitative** – Identification of fibers – cotton, polyester, viscose, polyamide, silk, wool, jute, tencel and others. Use of burning, microscopic, chemical tests.
2. **Quantitative** - Analysis of binary blends
3. Desizing, scouring and bleaching of grey fabric using chemical and eco-friendly agents
4. Dyeing of cotton with direct dye by exhaust method
5. Dyeing of wool and silk with acid dye by exhaust method
6. Dyeing of polyester with disperse dye by HTHP method
7. Use of natural dyes and mordants (Synthetic & natural) to dye and print cotton, silk and wool
8. Printing on cotton fabric with reactive dyes and pigment dyes
9. Printing on silk with acid dyes, polyester with disperse dye and cotton/polyester blend with disperse and reactive dyes.
10. Finishing- Application of any 2 specialty finishes on cotton, polyester and cotton polyester blend (using pad-dry cure method)
11. Identification of dyes, direct, reactive, azo, vat, sulphur, acid and disperse dyes on fabrics.

PRACTICAL – 6
QUALITY CONTROL FOR TEXTILES AND APPAREL
CORE COURSE – A - 306

CCA-30
ESE-70
Pd/ wk- 8

Yarn Testing

1. Yarn Crimp in woven fabrics
2. Yarn twist – i) Single spun yarn and ply yarn,
3. Yarn strength test – i) Single strand test and ii) skein / lea strength test and CSP

Fabric and Garment Testing

1. Moisture Regain and moisture content of Textile materials
2. Strength Properties of Textile and Apparels –
 - a) Breaking force and Elongation of fabrics (Strip and grab test)
 - b) Tearing Strength of woven and non-woven fabrics.
 - c) Bursting Strength of knitted fabrics.

Objective Evaluation of fabric handle –

1. Fabric Stiffness (bending length)
2. Fabric Drape.
3. Crease recovery –

Fabric / Garment Serviceability –

1. Snag Test
2. Pilling Test
3. Abrasion Test

Wear Comfort of Clothing –

1. Air Permeability

Thickness Test –

1. Woven and Knit fabrics
2. Non woven fabrics

Fabric Count and Cover factor -

1. Woven Fabrics
2. Fabric Count (wales and courses / inch) and Stitch

Dimensional changes in Fabrics and apparels –

1. Due to automatic home laundering of woven and knit fabrics
2. Due to automatic home laundering of garments

Evaluation of Colourfastness of dyed fabrics / apparels to –

1. Artificial Light
2. Crocking
3. Perspiration
4. Washing in Launderometer
5. Heat : Hot Pressing

Sewing Threads – tests for –

1. Diameter
2. Thread Twist and Twist Balance
3. Yarn number / Count

GENDER STUDIES
SKILL COURSE - A - 307

MM-50
Pd/ wk- 2

Unit – 1 Gender and Development:

- Concept of gender, gender roles, changing trends, gender analysis matrix.
- Shift from welfare to development and empowerment, gender in development, gender and development.

Unit – 2

- National and international efforts for gender empowerment.

Unit – 3

1. Meaning of status of women A situational analysis - demographic, education, employment, political and health (general, occupational, and reproductive)
2. Violence against Women- Dowry, divorce, female feticide and infanticide, domestic violence.

Unit – 4

1. Sexual harassment and exploitation, trafficking, portrayal of women in mass media. Efforts for elimination of all forms of discrimination
2. Policies and Programmes for Women's Development:
3. National policy for Empowerment of women, policy perspectives, mainstreaming

Unit – 5

1. Economic empowerment- Poverty eradication, micro finance and self-help groups,
2. Introduction of laws for domestic violence against women (2005) and sexual harassment (2013)

PRACTICAL COURSE

MM-50
Pd/ wk- 2

1. Preparation of E-content for gender sensitization
2. Identification and assessment of gender issues in current print and electronic media
3. Collection and evaluation of Ten articles on gender issues

**POPULATION EDUCATION AND COMMUNITY HEALTH
SKILL COURSE - A - 307**

**MM-50
Pd/ wk- 2**

Unit – 1: Health and Health Care

1. Concepts of health and positive health, Health- disease continuum, factors affecting health, health as a human right.
2. Concept of community health, global health, health for all.

Unit – 2

1. Primary health care- definitions, principles components, comprehensive health care, levels of prevention, Concept of reproductive health for adolescent girls and boys.
2. Health and Development indices
3. Health indices and related indices in community health, fertility indicators, vital statistics, mortality, morbidity indicators, demographic indicators – sex ratio

Unit – 3

1. Indicators for social and mental health, Human Development index, Disability adjusted life years (DALY). Reproductive Health index. Major Health Problems in India
2. Health administrative set up, Peripheral, state, National, urban-rural(Introduction to National Rural Health Mission), National family Health surveys

Unit – 4

1. National Health Programmes- ICDS, AIDS prevention Programme, Reproductive Child Health (RCH) birth control methods, population education

Unit – 5

- Concept of population education: Various definitions Significance and scope of population education, Family life education, Sex education, Causes and consequences of population Blast. Trends in population growth terms related to population dynamics

PRACTICAL COURSE

**MM-50
Pd/ wk- 2**

1. Preparation of teaching Aids on population dynamics
2. First Aid and home nursing
 - I. Bandages
 - Roller-finger, arm, leg, elbow, knee, cap line
 - Triangular head, palm/foot, sling
2. Bed making
3. Recording of temperature
4. Use of kidney tray, spittoon, eye glass, thermometer, hot water bag, ice cap, blood pressure estimations, blood sugar testing

**NUTRITION SCIENCE: BASIC CONCEPTS
SKILL COURSE - 307**

**MM-50
Pd/ wk- 2**

UNIT – I

Food and nutrition – meaning, functions, classification nutrition and health (Basic concepts)

UNIT – II

Food groups – Characteristics of food groups, classification of food groups, Balanced diet, nutrient requirements for various age groups

UNIT – II

Anthropometric assessment of nutritional status

UNIT – IV

- Therapeutic modification of normal diet and reasons for dietary changes in – Obesity, congestive heart disease, diabetes, hypertension.
- Dietary counseling

UNIT – V

Food adulteration – Introduction, common adulterants in foods

PRACTICAL COURSE

**MM-50
Pd/ wk- 2**

1. Assessment of nutritional status of individual and for community group using - weight, height MUAC waist and hip circumferences
2. Qualitative testing of some foods for adulteration

(SEMESTER - IV)
(GROUP – A) CLOTHING & TEXTILE
WOVEN FABRIC STRUCTURE ANALYSIS AND TECHNICAL TEXTILES
CORE COURSE – A - 401

MM-70
Pd/ wk- 4

Unit-I

1. Yarn and their Characteristics – Continuous Filament and Spun Yarns, Uniformity, Smoothness and lustre, Resistance to flattening, Fibre and yarn strength, Fibre density shape and crimp, Bulked and textured yarns, Core spun and Stretch yarns
2. Yarn count (single and folded or ply yarns) – different numbering systems, resultant count, yarn diameter, yarn twist and its influence on woven structure

Unit - II

1. Brief study of Preparatory Machines – Cone and cheese winding machine, Pirn winding, Beam warping machine, Sizing machines and the different yarn packages with their characteristics
2. Weaving Looms – Brief introduction to working of the following looms – Tappet, Dobby, Jacquard, Shuttle less looms (projectile, rapier, water jet, air jet and circular loom) - Basic operations in weaving (Shedding, picking, beating, take up, let off), Drawing in knotting and denting plans

Unit - III

1. Elements of cloth structure – Weave and weave notation
2. Elementary Weaves
Plain Weave – Introduction, Classification of plain cloth,
Derivatives - Warp rib weave, weft rib weave, matt, Ornamentation of plain weave
Twill weave – Introduction, Balance and unbalance twill, angle of twill,
3. Sateen and satin weaves – General characteristics, regular and irregular sateens and satin
4. Other weaves – Diamonds and Diapers, Crepe, Honeycomb, Huckaback.
5. Warp, weft pile fabric and terry & Turkish towels
6. Gauze and net leno, Damask

Unit - IV

1. Simple colour and weave effects – General considerations, combining weave with colour, representation of colour and weave effect on graph paper
2. Classification of colour and weave effect, producing variety of effects using same weave and colour – continuous line effect , Hound's tooth effect, Bird's eye and spot, all over effect. Compound colour and weave effect - Stripe and checks, colour and weave effect

Unit - V

1. Technical Textiles - Introduction Definition & Scope, Development Processes, Applications, Globalizations, Future prospects of technical textile industry
2. Brief introduction to Technical fibres - Conventional and New developed fibres and their applications Application of Technical Textiles - Medical textiles, Geo textiles, Defence textiles, Transport textiles, Automotive textiles and others

References:

1. Watson Textile Design and Colour– Grosicki, Z.J, Newness Butter Worths.
2. Advance Textile Design –William Watson , Longmans Green and Co. Ltd.
3. Grammar of Textile Design- Nisbet H., Taraporewale Sons and Co., Bombay.
4. Weaving Mechanisms – K.T. Aswani Mahajan Book Distributors, Ahmedabad.
5. Weaving Calculations – R. Sengupta, Taraporewale Sons and Co., Bombay
6. Woven Cloth Construction – Robinson and Mark, Butter Worth and Co.Ltd, London.
7. Elements of Weaving – Thorpe, Azaba, Doubleday and Co. New York
8. Modern Weaving – Singh R. H., Mahanjan Book Distributors, Ahmedabad.
9. Weaving Technology – Kulkarni M.M., Virinda, Publication, Jalgaon.
10. Yarn and Cloth Calculation. – Amalsar D.M
11. Handloom Weaving –Amalsar D.M.
12. Fabric Structure and Cloth Analysis -Amalsar D.M.

**HISTORY OF FASHION AND FASHION DESIGN
CORE COURSE - A - 402**

**MM-70
Pd/ wk- 4**

Unit - I

1. Growth of the couture: The Beginning of Dress
2. Couture from Ancient Period (First Century B.C. to Fifth Century A.D.) Egyptian, Greek, Roman, French
3. Couture from Middle Age Period (Fifth Century A.D to 15th Century) Italian, French, England, Flemish & German

Unit - II

1. Couture from Renaissance Period (15th Century to 18th Century) Italian, German, French, Spain, England
2. Couture from 18th Century till date - France, Italy, England, American, Japanese
3. Costumes of India (Past to Present)

Unit - III

1. Introduction to Fashion terminologies, concepts, its creation and analysis
2. Elements used in creating a design.
3. Composition- -with one element-with more than one elements.
4. Color- Its sensitivity and composition in dress.
5. Harmony- in form of space coverage to design of the dress.

Unit - IV

1. Components of fashion: -Style-Silhouette- Details- Color-Texture-Trims
2. Fashion Designer and his role in Fashion Industry
3. Fashion Forecasting.
4. Understanding and sketching of theme based on fashion forecast
5. Sourcing of raw materials.

Unit - V

1. Developing line, based on fabric and then selected.
2. Spec sheet study, Sampling, Garment analysis
3. Costing – construction of garments, Line presentation, Use of sale promotion material.
4. Study of fashion markets and its segments.
5. Designers- International and National.

References:

1. Inside fashion design-Sharon Lee Tate, Harper and row, Publishers New York
2. Life Styles, Fashion Styles-Kathryn Samuel, Orbis, London
3. The Great Fashion Designers-Milbank, C.R. (1985) Couture, Thames and Hudson Publications
4. The Changing World of Fashion-Carter, E (1977), G.P. Putnam's Sons, New York
5. The World of Fashion-Rubin, L. G.(1976), Canfield Press, San Francisco
6. Fashion Kaleidoscope-Castelino, M. (1994), Rup & Co.
7. The Fashion Makers-Walz B. and Morris, B. (1978) , Random House
8. Lifestyle – Fashion styles-Samuel, K. (1986),Orbis Book Publishing Corporation Ltd, London
9. Fashion Design and Product Development-Carr, H. and Pomery, J. (1992), Blackwell Scientific Publications, London, Edinburgh, Boston, Abling Bina, Fashion Sketchbook, Fairchild Publishers, New York
10. The Concise History of Costume and Fashion-Laver. James , New York, Harry Abrahams, 1960
11. Costume through the ages-Laver. James , New York, Simon and Schuster, 1968
12. The Mode in Costume-Wilcox. Turner R, New York, Charles Scribner's Sons, 1958
13. Indian Costume Ghurey, G.S , Bombay, Popular Prakashan, 1951

**FASHION MARKETING AND MERCHANDISING
CORE COURSE - A - 403**

**MM-70
Pd/ wk- 4**

Unit - I

1. Fashion Business an introduction and its scope, forms of business organisation.
2. Fashion Merchandising - An introduction, role of merchandiser.
3. Calculation of material cost - Design specification sheet & cost sheet.

Unit - II

1. International and domestic fashion markets : Haute Couture, Pret-a-porter, mass production.
2. Understanding marketing and marketing process: Nature and scope, concept of market. Strategic planning in the markets - the fashion market and the marketing environment.

Unit - III

1. Selecting Target markets : Measuring and forecasting demand. Market segmentation, targeting and positioning for competitive advantage.
2. Marketing Research - Consumer market and behaviour of consumer.
3. Principles of Management :
4. Advertising - Media, Image, Advertisements.
5. Techniques of sales promotion, promotional stores.

Unit -IV

1. Consumer Decision Processes and Behaviour; Consumer Analysis & Marketing Strategy;
2. Consumer Trends; Market Segmentation; Diffusion of innovation.
3. Counterfeit textiles and consumer protection measures; Global Consumer Markets.

Unit- V

1. Retail Management :
2. Specialty Stores : Single line, stores, single Brand Stores or Private label retailers limited line and multiple line stores.
3. Departmental Stores.
4. Mass Merchants - Discounters, Off price retailers, out let stores.

References:

1. Fashion Marketing and Merchandising - Pooja Chatley
2. Fashion Marketing - Mike Essay
3. Fashion Buying - Halen Goworek Blackwell
4. Fashion Concept to Consumer - Dickerson, Person.
5. Inside Fashion Business - Jeanne Thee A.

**GARMENT PRODUCTION, MANAGEMENT AND ENTREPRENEURSHIP
CORE COURSE - A - 404**

**MM-70
Pd/ wk- 4**

Unit- I

1. Complexity of management in garment industries- Objective and expectations; status of garment industry in India
2. Production, marketing, distribution, consumption and export trends over last five years.

Unit - II

1. Personnel management in domestic and export apparel industry
2. Government policies in export and imports; effect of trade globalization;
3. Problems of apparel industry and remedial measures.

Unit - III

1. Supply chain management in Textiles & Apparel
2. Principles and role in branding; evaluation of key issues facing Textile and Apparel Designing businesses in global markets considering ethical, economic, political, social and professional implications.
3. Developments in textile & apparel industries before and after phasing out quota system.

Unit - IV

1. Recent trends in major exporting countries, trade policies; integrated strategies towards fair globalisation- improving competitiveness and social responsibility in the industry.
2. Actions, policies and shared responsibilities – role of governments, manufacturers, buyers, trade unions and Multinational enterprises.

Unit - V

1. Demographics related to textiles & apparel of various countries before and after phasing out quota system
2. Analysis of opportunities and extent of utilisation by the leading countries - sourcing options considering quality, production capabilities, workers' rights, investment risk, logistics, legal compliance, and trade policies
3. Study on supply chain management in textiles & apparel – preparation of flow diagrams describing the supply system in different countries and analysis.

References:

1. Easey Mike 2000. *Fashion Marketing*. Blackwell Science.
2. Jarnow J & Guessio M. 1991. *Inside the Fashion Business*. Prentice Hall.
3. Paola de Helena & Muellor Stewart Carol 1986. *Marketing Today's Fashion*. Prentice Hall.

PRACTICAL - 7
GARMENT CONSTRUCTION AND COMMERCIAL PRODUCTION
CORE COURSE - A - 405

CCA-30
ESE-70
Pd/ wk- 8

1. Procedures used in the development of slopers and patterns
2. Developing dart less slopers; Princess line variations ; Blouses; Halters and surplice; Vests and their types; Collars; Sleeves- kimono and raglan variations.
3. Construction of two children garments
4. Drafting and construction of the following : Blouse, Night Wear, Salwar Kameez.
5. Construction of Skirt and Blouse by draping method.
6. Designing and Construction of the following :
Night Wear, Salwar Kameez, Trouser, Jacket, Ethnic Dress (Lehnga Choli/ Evening Gown).
4. Preparing two dresses according to fashion on order.

References:

1. Bane A. 1996. *Creative Clothing Construction*. Mc Graw-Hill.
2. Connie Amaden-Crawford. 1989. *The Art of Fashion Draping*. Fair Child Publ.
3. Janine Mee & Michal Purdy. 1987. *Modelling on the Dress Stand*. BSP Professional Books.
4. Natalie Bray. 1994. *Dress Fitting*. Blackwell.

PRACTICAL - 8
WOVEN FABRIC STRUCTURES AND KNITWEAR DESIGN DEVELOPMENT
CORE COURSE - A - 406

CCA-30
ESE-70
Pd/ wk- 8

1. Weaving- Preparation of draft plans, peg plans etc. for all weaves ;Analysis of woven samples ; Weaving samples of various weaves
2. Developing designs for weaving- motif preparation and placement, colour and texture plans;
3. Documentation of traditional and modified textile designs and development of textile design library.
4. Revision and practice on CAD commands; Creating stripes and checks using various commands
5. Introduction to commands from different tool groups- file menu, freehand tools, geometric tool, selection tool, selection utility tool, colour utilities tool and general utilities tool; Developing motifs by scanning and drawing using the CAD commands;
6. Study & identification of different types of knitted fabrics; Practicing the knitting on flat knitting machines – Familiarisation of commands; making samples of different designs produces ;Making samples of different designs using multicoloured / and complex designing techniques;
7. Visit to a knitted garment unit. Visit to an apparel industry
8. Inspection of raw material – classification and analysis of fabric defects; Study of specification sheets - various garments; Analysis of sewing & fasteners quality; Study of quality auditing system in the industry; Quality analysis of selected garments available in the market.
9. Students are required to have industrial training in an export house/garment industry for three weeks. The students will prepare and submit a survey report on the industry based on observation and training obtained by them. The students are required to record the detailed information about the industry supported by photographs, samples, diagrams etc.

References:

1. Davis L Msrin. 1980. *Visual Design in Dress*. Prentice Hall.
2. Prakash K. 1994. *Impression – A Classic Collection of Textile Designs*. Design Points.
3. Prakash K. 1995. *Traditional Indian Motifs for Weaving & Textile Printing*. Design Points.
4. Rene Weiss Chase 1997. *CAD for Fashion Design*. Prentice Hall.
5. Winfred Aldrich 1992. *CAD in Clothing & Textiles*. BSP Professional Books.
6. Yates MP. 1996. *Textiles – A Handbook for Designers*. W.W. Norton.

GENDER STUDIES
SKILL COURSE - A - 407

MM-50
Pd/ wk- 2

Unit – 1 Gender and Development:

- Concept of gender, gender roles, changing trends, gender analysis matrix.
- Shift from welfare to development and empowerment, gender in development, gender and development.

Unit – 2

- National and international efforts for gender empowerment.

Unit – 3

- Meaning of status of women A situational analysis - demographic, education, employment, political and health (general, occupational, and reproductive)
- Violence against Women- Dowry, divorce, female feticide and infanticide, domestic violence.

Unit – 4

- Sexual harassment and exploitation, trafficking, portrayal of women in mass media. Efforts for elimination of all forms of discrimination
- Policies and Programmes for Women’s Development:
- National policy for Empowerment of women, policy perspectives, mainstreaming

Unit – 5

- Economic empowerment- Poverty eradication, micro finance and self-help groups,
- Introduction of laws for domestic violence against women (2005) and sexual harassment (2013)

PRACTICAL COURSE

MM-50
Pd/ wk- 2

- Preparation of E-content for gender sensitization
- Identification and assessment of gender issues in current print and electronic media
- Collection and evaluation of Ten articles on gender issues

POPULATION EDUCATION AND COMMUNITY HEALTH SKILL COURSE - A - 407

**MM-50
Pd/ wk- 2**

Unit – 1: Health and Health Care

- Concepts of health and positive health, Health- disease continuum, factors affecting health, health as a human right.
- Concept of community health, global health, health for all.

Unit – 2

- Primary health care- definitions, principles components, comprehensive health care, levels of prevention, Concept of reproductive health for adolescent girls and boys.
- Health and Development indices
- Health indices and related indices in community health, fertility indicators, vital statistics, mortality, morbidity indicators, demographic indicators – sex ratio

Unit – 3

- Indicators for social and mental health, Human Development index, Disability adjusted life years (DALY). Reproductive Health index. Major Health Problems in India
- Health administrative set up, Peripheral, state, National, urban-rural(Introduction to National Rural Health Mission), National family Health surveys

Unit – 4

- National Health Programmes- ICDS, AIDS prevention Programme, Reproductive Child Health (RCH) birth control methods, population education

Unit – 5

- Concept of population education: Various definitions Significance and scope of population education, Family life education, Sex education, Causes and consequences of population Blast. Trends in population growth terms related to population dynamics

PRACTICAL COURSE

**MM-50
Pd/ wk- 2**

- Preparation of teaching Aids on population dynamics
- First Aid and home nursing
 - II. Bandages
 - Roller-finger, arm, leg, elbow, knee, cap line
 - Triangular head, palm/foot, slingh
- Bed making
- Recording of temperature
- Use of kidney tray, spittoon, eye glass, thermometer, hot water bag, ice cap, blood pressure estimations, blood sugar testing

NUTRITION SCIENCE: BASIC CONCEPTS SKILL COURSE - A - 407

**MM-50
Pd/ wk- 2**

UNIT – I

Food and nutrition – meaning, functions, classification nutrition and health (Basic concepts)

UNIT – II

Food groups – Characteristics of food groups, classification of food groups, Balanced diet, nutrient requirements for various age groups

UNIT – II

Anthropometric assessment of nutritional status

UNIT – IV

- Therapeutic modification of normal diet and reasons for dietary changes in – Obesity, congestive heart disease, diabetes, hypertension.
- Dietary counseling

UNIT – V

Food adulteration – Introduction, common adulterants in foods

PRACTICAL COURSE

**MM-50
Pd/ wk- 2**

- Assessment of nutritional status of individual and for community group using - weight, height MUAC waist and hip circumferences
- Qualitative testing of some foods for adulteration

(SEMESTER - III)
(GROUP – B) FOODS & NUTRITION
ADVANCED NUTRITIONAL BIOCHEMISTRY - I
CORE COURSE – B - 301

MM-70
Pd/ wk- 4

Unit 1

1. Enzyme – Distribution, Factors affecting enzyme activity, active site, mechanism of enzyme action, enzyme inhibition, specificity, Km value and its significance. Enzymes in clinical diagnosis.
2. Biological oxidation – High energy compounds. Biological oxidation. Electron transport chain. Oxidative phosphorylation

Unit 2

1. Introduction to metabolism. Citric acid cycle – Importance, reactions. Role of citric acid cycle in metabolism – gluconeogenesis, transamination, deamination and fatty acid synthesis.
2. Glycolysis and oxidation of pyruvate.

Unit 3

1. Metabolism of glycogen
2. Gluconeogenesis and control of blood glucose
3. Pentose phosphate pathway
4. Altered metabolism in diabetes mellitus

Unit -4

1. Biosynthesis of fatty acids
2. Oxidation of fatty acids
B- Oxidation, L- and W- oxidation, odd number carbon atoms FA
3. Metabolism of ketone bodies

Unit 5

1. Bio-synthesis of unsaturated fatty acids. Desaturase system, elongation of FA
2. Metabolism of acylglycerols-catabolism. Bio synthesis of triacylglycerol and phospholipids.
3. Cholesterol metabolism – biosynthesis, regulation, degradation of cholesterol synthesis of bile acids

CLINICAL NUTRITION – I
CORE COURSE – B - 302

MM-70
Pd/ wk- 4

Unit 1:

1. Nutritional and the gastrointestinal- tract malabsorption and patho physiology, carbohydrate intolerance
2. Parasitic infections
3. Diagnostic tests in gastrointestinal disease- Measurement of motility and gastric acidity. Influence of food on gastric acidity and motility

Unit 2:

1. Nutrition and liver diseases
2. Gall bladder diseases
3. Fevers and Nutrition- Acute and chronic
4. Food allergy

Unit 3:

1. Renal diseases- Previous diseases in brief. Acute and chronic renal failure dialysis
2. Surgery, burns and nutrition

Unit 4:

1. Nutrition and cardiovascular diseases, Role of lipid and other- Nutrients
2. Bile acid metabolism
3. Prostaglandins

Unit 5:

1. Nutrition and weight managements – Obesity, over weight underweight
2. Dietary counseling – dietitian code, ethics and responsibilities steps and follow up programme counseling for different diseases

REFERENCE

- K.M. Varghese Company, Bombay, Comparative Aspects of Nutrition and Metabolic Diseases- CRC Press VIIed. 1988 Jayar M.C and Ketteroon: Nutrition and Disease

ADVANCED NUTRITION - I
CORE COURSE – B - 303

MM-70
Pd/ wk- 4

Unit - 1

1. Nutritional Requirements – Definition
 - a. Factors influencing the nutrient requirements for deriving RDA
 - i. Probability concept of requirement
 - ii. Age, sex and body weight
 - iii. Individual variability
 - iv. Bioavailability of nutrients
 - b. Basic terminology in nutritional requirement – minimum, maintenance, safe requirements, and subsistence allowance, RDA, RNI, dietary reference intakes (DRIs.)
 - c. Internationally used definitions – RDA, adequate intake (AI), upper level (UL), estimated average requirement (EAR)
 - d. Reference Indian adult man and woman
2. Human energy requirements
 - a. Introduction, units of energy, definition of energy requirement (ER), total energy expenditure (TEE)
 - b. Components of energy requirements basal metabolism, metabolic response to food, physical activity (PAL, PAR), growth, pregnancy, lactation.

Unit - 2

1. Factors affecting energy expenditure and requirements
 - a. Factors affecting BMR
 - b. Factors affecting the thermic effect of food
 - c. Factors affecting the energy expended in physical activity
2. Methods of estimation of energy expenditure and requirements
3. Energy requirements and recommendations – infants, children and adolescent, adults, pregnancy and lactation

Unit - 3

1. Energy imbalance – changes in body weight and body composition
2. Dietary fibre – components and classification, properties. Effects of DF, health benefits and intake of fibre
3. Resistant starch (RS)
4. Fructo – oligosaccharides (FOS)

Unit - 4

1. Protein- methods of determination of protein – PER, digestibility coefficient, biological value, NPU, NPR, protein energy ratio (NDP cal%)
2. Improvement of quality of protein in the diet – mutual supplementation, supplementation with individual amino acids
3. Factors influencing protein requirements at different stages of life – age, environment temperature, previous diet, physical activity
4. Nutritional requirements recommended allowances for proteins and amino acids

Unit - 5

1. Dietary fat – chemistry
2. Classification of fatty acids
 - a. Saturated and unsaturated
 - b. Short, medium and long chain
 - c. Essential fatty acids trans – fatty acids
3. Non-glycoside components and their nutritional and health promoting effects
4. Recommendation of FAO and WHO on dietary fats
5. RDA for Indians in 1990
6. Sources of fat in Indian diets- invisible and visible fats
7. Recommended intake of dietary fats for Indians
 - a. Quantity of visible fat
 - i. Minimum for adults, pregnant and lactating women, infants, children and adolescents
 - ii. Maximum levels
 1. Quality of fat
 2. Quality of total fat from diet other than visible fat
 3. Choice of cooking medium ie n-3 and n-6 fatty acid ratio in Indian diet
8. Role of dietary fatty acids in preventing CHD and other diet related non-communicable diseases (DR-NCD)
9. Excessive fat intake
 - a. Changing trends in dietary intake
 - b. Eating out
 - c. Diseases: Association and preventive measures

**MEDICAL NUTRITION
CORE COURSE – B - 304**

**MM-70
Pd/ wk- 4**

Unit – 1

1. Dietetics the science and art of human nutrition care
 - a. Role and types of dietitian in health care units

Unit – 2

1. Nutritional care process
 - a. Nutrition assessment
 - b. Changing food habits

Unit – 3

1. Anthropometric measures
2. Nutrition diagnosis
3. Nutritional intervention

Unit – 4

1. Patient care and counseling
2. Nutrition monitoring and evaluation
3. Rehabilitation services

Unit – 5

1. Documentation in the nutrition care record – medical record charting system and management in nutrition therapy through kitchen

**PRACTICAL – 5
BIOCHEMISTRY - BLOOD ANALYSIS
CORE COURSE – B - 305**

**CCA-30
ESE-70
Pd/ wk- 8**

Blood analysis:

- Blood count
- DLC
- Hemoglobin Estimation
- Blood film
- Urine: Glucose detection
- Enzyme Assay: Alkaline Phosphates transaminase
- Glucose, Iron, total and free cholesterol, creatinine, SGOT, SGPT

**PRACTICAL – 6
DIETARY COUNSELING. PLANNING CALCULATION AND PREPARATION
OF THERAPEUTIC DIETS
CORE COURSE – B - 306**

**CCA-30
ESE-70
Pd/ wk- 8**

- Dietary Counseling
- Planning, calculation, preparation, services, evaluation of therapeutic diets, covered in theory the practical

GENDER STUDIES
SKILL COURSE - B - 307

MM-50
Pd/ wk- 2

Unit – 1 Gender and Development:

- Concept of gender, gender roles, changing trends, gender analysis matrix.
- Shift from welfare to development and empowerment, gender in development, gender and development.

Unit – 2

- National and international efforts for gender empowerment.

Unit – 3

- Meaning of status of women A situational analysis - demographic, education, employment, political and health (general, occupational, and reproductive)
- Violence against Women- Dowry, divorce, female feticide and infanticide, domestic violence.

Unit – 4

- Sexual harassment and exploitation, trafficking, portrayal of women in mass media. Efforts for elimination of all forms of discrimination
- Policies and Programmes for Women's Development:
- National policy for Empowerment of women, policy perspectives, mainstreaming

Unit – 5

- Economic empowerment- Poverty eradication, micro finance and self-help groups,
- Introduction of laws for domestic violence against women (2005) and sexual harassment (2013)

PRACTICAL COURSE

MM-50
Pd/ wk- 2

- Preparation of E-content for gender sensitization
- Identification and assessment of gender issues in current print and electronic media
- Collection and evaluation of Ten articles on gender issues

POPULATION EDUCATION AND COMMUNITY HEALTH
SKILL COURSE - B - 307

MM-50
Pd/ wk- 2

Unit – 1: Health and Health Care

- Concepts of health and positive health, Health- disease continuum, factors affecting health, health as a human right.
- Concept of community health, global health, health for all.

Unit – 2

- Primary health care- definitions, principles components, comprehensive health care, levels of prevention, Concept of reproductive health for adolescent girls and boys.
- Health and Development indices
- Health indices and related indices in community health, fertility indicators, vital statistics, mortality, morbidity indicators, demographic indicators – sex ratio

Unit – 3

- Indicators for social and mental health, Human Development index, Disability adjusted life years (DALY). Reproductive Health index. Major Health Problems in India
- Health administrative set up, Peripheral, state, National, urban-rural(Introduction to National Rural Health Mission), National family Health surveys

Unit – 4

- National Health Programmes- ICDS, AIDS prevention Programme, Reproductive Child Health (RCH) birth control methods, population education

Unit – 5

- Concept of population education: Various definitions Significance and scope of population education, Family life education, Sex education, Causes and consequences of population Blast. Trends in population growth terms related to population dynamics

PRACTICAL COURSE

MM-50
Pd/ wk- 2

- Preparation of teaching Aids on population dynamics
- First Aid and home nursing
- III. Bandages
 - Roller-finger, arm, leg, elbow, knee, cap line
 - Triangular head, palm/foot, sling
- Bed making
- Recording of temperature
- Use of kidney tray, spittoon, eye glass, thermometer, hot water bag, ice cap, blood pressure estimations, blood sugar testing

NUTRITION SCIENCE: BASIC CONCEPTS SKILL COURSE - B - 307

MM-50
Pd/ wk- 2

UNIT – I

Food and nutrition – meaning, functions, classification nutrition and health (Basic concepts)

UNIT – II

Food groups – Characteristics of food groups, classification of food groups, Balanced diet, nutrient requirements for various age groups

UNIT – II

Anthropometric assessment of nutritional status

UNIT – IV

- Therapeutic modification of normal diet and reasons for dietary changes in – Obesity, congestive heart disease, diabetes, hypertension.
- Dietary counseling

UNIT – V

Food adulteration – Introduction, common adulterants in foods

PRACTICAL COURSE

MM-50
Pd/ wk- 2

- Assessment of nutritional status of individual and for community group using - weight, height MUAC waist and hip circumferences
- Qualitative testing of some foods for adulteration

(SEMESTER - IV)
(GROUP – B) (GROUP – B) FOODS & NUTRITION
ADVANCED NUTRITIONAL BIOCHEMISTRY - II
CORE COURSE – B - 401

MM-70
Pd/ wk- 4

Unit – 1

Metabolism of proteins and amino acids –

1. Amino acid pool, metabolism of AA transamination, deamination
2. Bio synthesis of nutritionally nonessential amino acids
3. Metabolism of ammonia, bio-synthesis of urea

Unit – 2

1. Catabolism of the carbon skeletons of amino acids, creatine and creatinine synthesis
2. Changes in blood picture in protein malnutrition

Unit – 3

1. Nucleic acid mechanics of DNA. Replication and transcription of DNA and translation
2. Protein bio-synthesis
3. Bio synthesis, regulation and breakdown of purine and pyrimidine nucleotides.

Unit – 4

Hormones – introduction, definition

1. Hypothalamic hormones
 - a. Regulation of release, bio-chemical functions and abnormalities of
2. Anterior pituitary hormones
 - a. The growth hormone – prolactin group
 - b. The glycoprotein hormones
 - c. The pre-opiomelanocortin peptide family
3. Posterior pituitary hormones
 - a. Oxytocin
 - b. Antidiuretic hormone (ADH)
4. Thyroid hormones – thyroxine (T4)
5. Triiodothyroxine (T3)

Unit – 5

Synthesis, biochemical functions, abnormalities of hormones of

1. Adrenal cortex – adrenocorticosteroids
2. Adrenal medulla – catecholamines epinephrine and norepinephrine
3. Hormones of gonads – Androgens Estrogens, Progesterone
4. The menstrual cycle
 - a. Follicular and luteal phase
 - b. menopause

CLINICAL NUTRITION – II
CORE COURSE – B - 402

MM-70
Pd/ wk- 4

Unit 1:

1. Disorders of the stomach- peptic ulcer. Disorders of small intestine and colon Diarrhea, constipation, irritable colon syndrome, crone's disease, diverticulosis ulcerative colitis
2. Nutrition and Dental health- Structure, development and maturation of dental caries, role of nutrients in dental health

Unit 2:

1. sNutrition and cancer- carcinogenesis and mutagenesis, types of cancer, metabolic effects of cancer- cancer cachexia, anorexia. Nutrition effects of cancer therapy- surgery, radiation therapy, Chemotherapy, Immune therapy, nutrients and their relationship with cancer

Unit 3:

1. Diabetes Mellitus- Nature, classification, high risk factors, metabolic effects, symptoms, diagnosis for diabetes treatment- diet, nutritional requirement, glycosidic sweeteners, drugs, acute complication in diabetes

Unit 4:

1. Food nutrient and drug interaction- classes of drug, their gastrointestinal side effects, other nutritional effects and their dietary precautions
2. Drug metabolism
3. Effects of drugs on nutrition- Alteration in taste, appetite and food intake, alteration in nutrient absorption, alteration in nutrient metabolism, alteration in nutrient excretion

Unit 5:

1. Effects of food on drug utilization- Alteration in drug absorption, alteration in drug metabolism and drug excretion
2. Alcohol and metabolism, effects of alcohol and nutrition, wernicke and korsakoffs syndromes
3. Diet counseling, computer application in clinical nutrition

REFERENCE

- Anita, F.P.: Clinical Dietetics and Nutrition, Oxford Univ. Press UJ ed. 1989
- Shills, M.E. and Young, V.R.: Modern Nutrition in Health and Disease
- K.M. Varghese Company, Bombay, Comparative Aspects of Nutrition and Metabolic Diseases- CRC Press VIIed. 1988 Joyar M.C and Keteroon: Nutrition and Disease

ADVANCED NUTRITION - II
CORE COURSE – B - 403

MM-70
Pd/ wk- 4

Unit – 1

1. Vitamins bioavailability, requirements and interaction with other nutrients. Preventive and therapeutic measures (inapplicable) fat soluble vitamins – A, D, E, K. water soluble vitamins B complex – Thiamin, Riboflavin, Niacin, Pyridoxine (B6) folate, cyanocobalamin (B12)
Ascorbic acid

Unit – 2

Mineral

1. The significance of interactions among the minerals and the dietary requirements of various minerals for different age groups
Macro minerals – calcium, phosphorus magnesium, sodium, potassium
Micro minerals – iron, iodine, zinc, copper, selenium, chromium, manganese and fluoride

Unit – 3

1. Inborn errors of metabolism
 - a. Carbohydrate metabolism
 - b. Amino acid metabolism
 - c. Lipid metabolism
 - d. Lipoproteins classification and composition
 - e. Hyper lipoproteinemia
 - f. Vitamin therapy

Unit – 4

1. The elderly – introduction
 - a. Definition of old age
 - b. Nutrition and ageing
 - c. Physiological changes
 - d. Changes in body composition and techniques for measuring
 - e. Nutritional requirements and dietary modification
 - f. Guidelines for planning diet for elderly

Unit – 5

Nutritional requirement for special conditions

1. Introduction
2. Calamity and emergency management
3. Information required for management of emergencies
4. Nutritional requirement for extreme environments
Hot, cold, high, altitude, space mission

**NUTRITION IN CRITICAL CARE
CORE COURSE – B - 404**

**MM-70
Pd/ wk- 4**

Unit – 1

1. Management of critically ill patient
2. Special feeding methods of critically ill patient

Unit – 2

1. Nutrition interventions
2. Nutrition for the terminally ill patient
3. Nutrition supplements

Unit – 3

1. Nutrition support in long term and home care
2. Factors affecting the ability to change
3. Action plan and evaluation of effectiveness

Unit – 4

1. Nutrition during stress
2. Stress response
3. Family support and counseling

Unit – 5

1. Nutrition in neurological disorders

REFERENCES

- Willick, M.: Nutrition in the 20th Century: Current Concepts in Nutrition Research Advances in Nutrition
- Solomans and Rosenberg: Absorption and Malabsorption on Mineral Elements

**PRACTICAL – 7
BIOCHEMISTRY – FOOD ANALYSIS
CORE COURSE – B - 405**

**CCA-30
ESE-70
Pd/ wk- 8**

- Estimation of Calcium in food.
- Estimation of Protein by Biuret method.
 - Colorimetric and flurometric Method: - Estimation Phosphorus of Vit. A , C & riboflavin in foods Chromatography:

**PRACTICAL – 8
INTERNSHIP – VISIT TO HOSPITAL AND CASE STUDY
CORE COURSE – B - 406**

**CCA-30
ESE-70
Pd/ wk- 8**

- Block placement of the students in the real work situations of hospitals: Medical ward, Dietary department for 6 to 8 wks .
- Planning, calculation and preparation of diets in Protein Energy malnutrition, Vitamin A deficiency

**GENDER STUDIES
SKILL COURSE - B - 407**

**MM-50
Pd/ wk- 2**

Unit – 1 Gender and Development:

- Concept of gender, gender roles, changing trends, gender analysis matrix.
- Shift from welfare to development and empowerment, gender in development, gender and development.

Unit – 2

- National and international efforts for gender empowerment.

Unit – 3

- Meaning of status of women A situational analysis - demographic, education, employment, political and health (general, occupational, and reproductive)
- Violence against Women- Dowry, divorce, female feticide and infanticide, domestic violence.

Unit – 4

- Sexual harassment and exploitation, trafficking, portrayal of women in mass media. Efforts for elimination of all forms of discrimination
- Policies and Programmes for Women's Development:
- National policy for Empowerment of women, policy perspectives, mainstreaming

Unit – 5

- Economic empowerment- Poverty eradication, micro finance and self-help groups,
- Introduction of laws for domestic violence against women (2005) and sexual harassment (2013)

PRACTICAL COURSE

**MM-50
Pd/ wk- 2**

- Preparation of E-content for gender sensitization
- Identification and assessment of gender issues in current print and electronic media
- Collection and evaluation of Ten articles on gender issues

**POPULATION EDUCATION AND COMMUNITY HEALTH
SKILL COURSE - B - 407**

**MM-50
Pd/ wk- 2**

Unit – 1: Health and Health Care

- Concepts of health and positive health, Health- disease continuum, factors affecting health, health as a human right.
- Concept of community health, global health, health for all.

Unit – 2

- Primary health care- definitions, principles components, comprehensive health care, levels of prevention, Concept of reproductive health for adolescent girls and boys.
- Health and Development indices
- Health indices and related indices in community health, fertility indicators, vital statistics, mortality, morbidity indicators, demographic indicators – sex ratio

Unit – 3

- Indicators for social and mental health, Human Development index, Disability adjusted life years (DALY). Reproductive Health index. Major Health Problems in India
- Health administrative set up, Peripheral, state, National, urban-rural(Introduction to National Rural Health Mission), National family Health surveys

Unit – 4

- National Health Programmes- ICDS, AIDS prevention Programme, Reproductive Child Health (RCH) birth control methods, population education

Unit – 5

- Concept of population education: Various definitions Significance and scope of population education, Family life education, Sex education, Causes and consequences of population Blast. Trends in population growth terms related to population dynamics

PRACTICAL COURSE

MM-50
Pd/ wk- 2

- Preparation of teaching Aids on population dynamics
- First Aid and home nursing
- IV. Bandages
 - Roller-finger, arm, leg, elbow, knee, cap line
 - Triangular head, palm/foot, sling
- Bed making
- Recording of temperature
- Use of kidney tray, spittoon, eye glass, thermometer, hot water bag, ice cap, blood pressure estimations, blood sugar testing

NUTRITION SCIENCE: BASIC CONCEPTS **SKILL COURSE - B - 407**

MM-50
Pd/ wk- 2

UNIT – I

Food and nutrition – meaning, functions, classification nutrition and health (Basic concepts)

UNIT – II

Food groups – Characteristics of food groups, classification of food groups, Balanced diet, nutrient requirements for various age groups

UNIT – II

Anthropometric assessment of nutritional status

UNIT – IV

- Therapeutic modification of normal diet and reasons for dietary changes in – Obesity, congestive heart disease, diabetes, hypertension.
- Dietary counseling

UNIT – V

Food adulteration – Introduction, common adulterants in foods

PRACTICAL COURSE

MM-50
Pd/ wk- 2

- Assessment of nutritional status of individual and for community group using - weight, height MUAC waist and hip circumferences
- Qualitative testing of some foods for adulteration

(SEMESTER - III)
(GROUP – C) HUMAN DEVELOPMENT
PARENT AND COMMUNITY EDUCATION
CORE COURSE – C -301

MM-70
Pd/ wk- 4

Unit 1

1. Parent education
2. Aims and objectives ,Purpose, Importance
3. Parent and community co-operation in planning programmes :
 - a. For community education and development
 - b. For parent education and development

Unit 2

1. Parenthood: The nature and characteristics of Parent-Child Relations, Concept of parenthood, parenting skills,
2. Role of parents: Mothering and Fathering – Characteristics and determinants. Grandparents as co-parents
3. Diversity of Contemporary Families: Changing concept of parenthood and childhood. Strategies for contemporary parenting.

Unit 3

1. Developmental Interaction in the Child-Rearing Years: Child birth and the transition to parenthood, evolving personal Concepts of parenthood, providing structure and nurturance for infants, supports for care giving in Infancy.
2. Developmental Interactions in Early Childhood: Parenting young children,providing nurturance for young children, beginning socialization experiences, refining parenting behaviors and styles.
3. Developmental Interactions in Middle Childhood: New models of parenting behavior, continuing socialization experiences, parenting school age children, discovering personal capacities and sense of responsibility.
4. Developmental Interactions in Adolescents and Early Adulthood: Parental role in development of a sense of personal identity and adjustment to puberty, developing healthy sexual relations. Establishing a sense of intimacy in Early Adulthood, preparation for independent living.

Unit 4

1. Challenging Issues of Contemporary Parenting: Parenting in the Single Parent Family System, Step Family System, High- Risk Families (Abusive families, Addiction, Violence affected).
2. Special Concerns of Parenting (in short): Adoption Issues, Parenting Child with special needs, Homosexuality and parenting, Maltreatment and parents.
3. Services for parents: Family Counselling, Parental Coaching, guidance services and forums for parents.

Unit 5

1. Community Education: objectives, targets & goals, techniques, components, sources of information, adoption of new ideas & practices, content & principles of community education, audio-visual aids in community education.
2. Parental and community awareness and perceptions about children and media
3. Impact of media on family dynamics

REFERENCES

- Burgers and Locke: The Family, American Book Co. New York 1953
- Duvalh E.: Family development, J.B. Lippincott, New York, 3rd ed. 1967
- Foster: Marriage and Family Relations, Macmillan, 1950
- Hill R. and Waller: The Family, Holt Rinehart and Winstion, New York (Latest ed.)

GUIDANCE AND COUNSELLING

CORE COURSE – C -302

MM-70
Pd/ wk- 4

Unit – 1

1. Meaning, concept, need, principles, philosophy and aims of guidance. Principles and techniques of group guidance.
2. The process of counseling:
 - Stages
 - Problem exploration and classification Stage
 - Developing new perspective and setting goals Stage
 - Implementation and evaluation

Unit – 2

1. Counseling Techniques and Practices: Rapport techniques and practices, Questioning, Listening, Reflecting, Acceptance, Silence, Leading, Reassurance, Non-verbal behavior, Terminating Skills-Special Consideration, Structuring the process, optimal concern. Recording counseling process

Unit – 3

1. Need of counseling
2. Counseling Theories: Key concepts and techniques, Cognitive behavior modification strategies like self-instruction
3. Gestalt approach

Unit – 4

1. Transactional approach, Behavior Therapy modification, rational emotive Therapy- Areas of guidance: Educational, vocational and personal concept.
2. Characteristics of an effective counselor: The Clients characteristics, Age, Sex, Cultural expectations

Unit - 5

Ethics in counselling

1. Type of Counseling- Individual, Group, Child Therapy, Marriage & Family, Vocational guidance and counseling, Ethics in counseling
2. Techniques of collecting information-testing and non-testing(brief description)

REFERENCES

- Mehta, D.S.: Handbook of Disabled in India, Allied Publishers Private Ltd. Bombay, 1983
- Smith, M.S., Naisworti, J.T.: The Exceptional Child: A Functional Approach, McGraw Hill, 1975
- Encyclopedia of Social Work in India, 3 volumes, Director, Publication Division, Ministry of Information & Broadcasting, India, Planning Commission
- Chaudhary, P.D.: Child Welfare and Development, Atmaram and Sons, New Delhi, 1980
- Cruikshank, W.M. & Johanson, G. O.: Education of Exceptional Children, Oxford Publication Comp. 1970
- Gajendragadkar, D.N.: Disabled in India, Somaiya Publishers, 1983
- Udia Shanker: Exceptional Children, Sterling Publishers Ltd. New Delhi
- Chapman: Management of Emotional Problem of Children and Adolescence
- Jessie Francis Williams: Children with Specific Living Difficulties, Pergamon Press, 2nd ed.
- Frussive, E.C. and Barbe, WE. (Edited); Educating Children with Living Disabilities, Appellatives Century Crofts Pub. New York, 1967
- State, D.H.: Helping Children with Learning Difficulties, World Locke Educational
- Geraheart, B.R.: Learning Disabilities: Education strategies Mosby college publishing, 1985
- Bumard, P. (1999). Counselling skills training. New Delhi: Viva Books.

**THEORIES OF CHILD DEVELOPMENT AND PERSONALITY
CORE COURSE – C -303**

**MM-70
Pd/ wk- 4**

Unit - 1

1. Theoretical perspectives in behavior and development: Introduction, Role of theory, Nature of behavior theory, Importance of theories in understanding behavior
2. Principles, basic concept, critique and implication of theories: Psychodynamic theories
 - Freud's Psychoanalytic theory and
 - Erickson's Psycho social theory

Unit - 2

1. Learning theories with reference to Pavlov, Watson, Skinner, Harlow and Sears
2. James Lange theory of emotion and Kohlberg's theory of morality

Unit – 3

1. Cognitive Organism theory of Piaget
2. Vygotsky of Cognition & Socio cultural theory

Unit – 4

1. Ecological theory of Bronfenbrenner's
2. Attachment theory of Bowlbey

Unit – 5

1. Kohlberg's theory or morality
2. Overall theory of child development

REFERENCES

- Baldwin, A.L.: Theories of Child Development, John Willey, 1980
- Maier, H.W.: Three Theories of Child Development, Harper and Row, 3rd Ed.
- Bandura, A.: Social Learning Theory, Englewood Cliff N.J. Prentice Hall, 1977
- Brontenbrenner, U.: The Ecology of Human development, Cambridge Harvard Univ. Press. 1979
- Hall & Londsey: Theories of Personality, N.Y. 1970
- Langer. J.: Theories of Development, Holt, Rinehart & Winston, New York, 1969

EARLY CHILDHOOD CARE AND EDUCATION

CORE COURSE – C -304

MM-70
Pd/ wk- 4

Unit 1

1. Introduction to Early Childhood Care and Education
2. Importance, need and scope of ECCE
3. Objectives of ECCE
4. Play way methods and its difference from formal and non-formal methods
5. Types of preschools/programs: Play centers, day care, Montessori, kindergarten, Balwadi, Anganwadi, Crèche, Nursery school etc.

Unit 2

1. Philosophical foundations of Early Childhood Care and Education
 - Western contributions: Pestalozzi, Rousseau, Frobel, Montessori and John Dewey
 - Indian Contributors: M.K. Gandhi, Rabindranath Tagore, Tarabai Modak, Gijubai Badheka

Unit 3

1. Development of ECCE in India
2. Evolution of ECCE in India
 - Pre Independence period
 - Post Independence: Contribution of Five Year Plans, Kothari Commission, Yashpal Committee, Maharashtra Preschool Center, Act to Right to Education Bill
3. Contribution of the following agencies/programmes to ECCE in India
 - ICCW, IAPE, NCERT, ICDS, UNICEF, NCTE, Mobile Crèches.

Unit 4

1. Concept of organization and administration of early childhood centers
2. Administrative set up and functions of personnel working at different levels. Staff/personnel service conditions. Role and responsibilities, essential qualities of a care giver/teacher, other personnel.
3. Building and equipment: Location and site, arrangement of rooms, different types and size of rooms, play ground, storage facilities, selection of different types of outdoor and indoor equipment, maintenance and display of equipment and material.
4. Record and Report: Types, aim and purpose/need, general characteristics e.g., anecdotal, cumulative, sample work, medical, Budget etc.

Unit 5

1. Programme Planning
 - Planning: Setting goals and objectives of plans- long term, short term, weekly and daily planning. Routine and schedules
 - Teaching and learning strategies
 - Need and use of Individual Education Plan (IEP)
2. Construction of early childhood curriculum
 - Teaching language, math's, science and cognitive concepts, Use of art, music, drama and literature in the classroom
 - Curriculum content, Pedagogical practices and Educational settings.
 - Principles of curriculum development • Text book content, syllabi and other learning resources • curriculum model • Processes in assessment and evaluation
3. Role of teacher in classroom processes • School discipline, reward and punishment
 - Adequacy of Facilities • Learning without burden • Practices in child focused education • Inclusion of children with disadvantage and disabilities • Dropout, retention and continuity in schooling. • De-schooling, home - schooling and out of school learning

REFERENCES

- Peter, K. Smith & Helen Kowie : Understanding Children's Development, Smikow 30077, New York, Basil Black, 1988

PRACTICAL -5
PLANNING, PREPARATION OF ACTIVITIES AND MATERIAL FOR
CHILDREN
CORE COURSE – C -305

CCA-30
ESE-70
Pd/ wk- 8

1. Preparing a book of story/rhymes for preschool child
2. visit to Nursery School/Anganwadi/ Day Care Centers/Crèches/Orphanages and prepare report
3. A educational kit/toy for a preschool child
4. Preparing a quiz for school going children based on their interest
5. Organizing FGD in schools for adolescents on issues of their interest
6. Participation in a nursery school to plan, execute, supervise and evaluate its activities -
Assessing administrative problem,

PRACTICAL -6
EDUCATIONAL PROGRAMME FOR PARENT AND COMMUNITY
CORE COURSE – C -306

CCA-30
ESE-70
Pd/ wk- 8

1. Visit to different community based centers and prepare reports.
2. Preparation of teaching aid for parents & community
3. Demonstration of teaching aids for
 - a. Parents
 - b. Community education
4. Preparing a handbook for parent education
5. plan, implement and evaluate the programme/workshop for parent and community, prepare report
6. conduct a counselling session for parents

GENDER STUDIES
SKILL COURSE - C -307

MM-50
Pd/ wk- 2

Unit – 1 Gender and Development:

- Concept of gender, gender roles, changing trends, gender analysis matrix.
- Shift from welfare to development and empowerment, gender in development, gender and development.

Unit – 2

- National and international efforts for gender empowerment.

Unit – 3

- Meaning of status of women A situational analysis - demographic, education, employment, political and health (general, occupational, and reproductive)
- Violence against Women- Dowry, divorce, female feticide and infanticide, domestic violence.

Unit – 4

- Sexual harassment and exploitation, trafficking, portrayal of women in mass media. Efforts for elimination of all forms of discrimination
- Policies and Programmes for Women's Development:
- National policy for Empowerment of women, policy perspectives, mainstreaming

Unit – 5

- Economic empowerment- Poverty eradication, micro finance and self-help groups,
- Introduction of laws for domestic violence against women (2005) and sexual harassment (2013)

PRACTICAL COURSE

MM-50
Pd/ wk- 2

- Preparation of E-content for gender sensitization
- Identification and assessment of gender issues in current print and electronic media
- Collection and evaluation of Ten articles on gender issues

POPULATION EDUCATION AND COMMUNITY HEALTH SKILL COURSE - C -307

MM-50
Pd/ wk- 2

Unit – 1: Health and Health Care

- Concepts of health and positive health, Health- disease continuum, factors affecting health, health as a human right.
- Concept of community health, global health, health for all.

Unit – 2

- Primary health care- definitions, principles components, comprehensive health care, levels of prevention, Concept of reproductive health for adolescent girls and boys.
- Health and Development indices
- Health indices and related indices in community health, fertility indicators, vital statistics, mortality, morbidity indicators, demographic indicators – sex ratio

Unit – 3

- Indicators for social and mental health, Human Development index, Disability adjusted life years (DALY). Reproductive Health index. Major Health Problems in India
- Health administrative set up, Peripheral, state, National, urban-rural(Introduction to National Rural Health Mission), National family Health surveys

Unit – 4

- National Health Programmes- ICDS, AIDS prevention Programme, Reproductive Child Health (RCH) birth control methods, population education

Unit – 5

- Concept of population education: Various definitions Significance and scope of population education, Family life education, Sex education, Causes and consequences of population Blast. Trends in population growth terms related to population dynamics

PRACTICAL COURSE

MM-50
Pd/ wk- 2

- Preparation of teaching Aids on population dynamics
- First Aid and home nursing
 - V. Bandages
 - Roller-finger, arm, leg, elbow, knee, cap line
 - Triangular head, palm/foot, slingh
 - Bed making
 - Recording of temperature
 - Use of kidney tray, spittoon, eye glass, thermometer, hot water bag, ice cap, blood pressure estimations, blood sugar testing

**NUTRITION SCIENCE: BASIC CONCEPTS
SKILL COURSE - C -307**

**MM-50
Pd/ wk- 2**

UNIT – I

Food and nutrition – meaning, functions, classification nutrition and health (Basic concepts)

UNIT – II

Food groups – Characteristics of food groups, classification of food groups, Balanced diet, nutrient requirements for various age groups

UNIT – II

Anthropometric assessment of nutritional status

UNIT – IV

- Therapeutic modification of normal diet and reasons for dietary changes in – Obesity, congestive heart disease, diabetes, hypertension.
- Dietary counseling

UNIT – V

Food adulteration – Introduction, common adulterants in foods

PRACTICAL COURSE

**MM-50
Pd/ wk- 2**

- Assessment of nutritional status of individual and for community group using - weight, height MUAC waist and hip circumferences
- Qualitative testing of some foods for adulteration

(SEMESTER – IV)
(GROUP – C) HUMAN DEVELOPMENT
ADVANCED FAMILY STUDIES
CORE COURSE – C - 401

MM-70
Pd/ wk- 4

Unit - 1

Marriage:

1. Concept, need, importance of marriage for individual/family/society
2. Preparation of marriage
3. Cultural aspects in marriage
4. Legal aspects of marriage
5. Marital counseling
6. Effect of modernization on marriage.
7. Kinship: Concept, Types, usages and roles

Unit – 2

1. Approaches to family studies
 - Development approach
 - Interactional approach
 - Institutional approach
 - Structural functional approach
 - Systems approach
 - Exchange Theory
2. The family in social context
 - Family and society
 - Changing sex-role and man women relationship
 - Functions of modern families: Urban, Rural, sociocultural background
 - Population problems and family

Unit 3

1. Conceptual overview of family life cycle
 - Stages in family life cycle and their developmental task
 - Problems of parenthood at different stages
 - Socialization of the child
 - Parental strategies in child rearing

Unit – 4

1. Pattern of marital adjustment, areas of adjustment (Money, in-law and sex)
2. Employment of women and family conflict & adjustment
3. Generation Gap and adjustment

Unit 5

1. Family Disorganization
 - Meaning, Types of Conflicts and resolving conflicts
2. Contemporary Issues: Dynamics, Intervention and Relief Programs
 - Family violence, battered women, child maltreatment and sexual abuse
 - Families in trouble separation and divorce, remarriage
 - Single parents family

REFERENCES

- Duvalh E.: Family development, J.B. Lippincott, New York, 3rd ed. 1967
- Foster: Marriage and Family Relations, Macmillan, 1950
- Hill R. and Waller: The Family, Holt Rinehart and Winstion, New York (Latest ed.)
- Kapadia, K.M.: Marriage and Family, Oxford, Calcutta Univ. Press, 3rd ed. 1972
- Prabhy: Hindar Social Organization, Popular Book Co. 1954
- Williamson, R.C.: Marriage and Family Relations, Collier Macmillan, London, 1969

**FAMILY AND CHILD WELFARE
CORE COURSE – C - 402**

**MM-70
Pd/ wk- 4**

Unit – 1

1. Concept, meaning, definition and scope of family and child welfare
2. Relationship of parent, child and society
3. Rights and responsibilities of society & parents: Convention on child rights

Unit – 2

1. Historical orientation of family and child welfare services in India
2. International and National agencies involved in family and child welfare (objectives and major services) – UNICAF, CARE, NIPCCD, CSWB, NCW

Unit – 3

1. Supportive and substitutive services for child and family (objectives and services)
 - a. Services for infants (crèche, mobile crèche, nutrition and health services etc.)
 - b. Services for children
 - i. Need for family focus in welfare programmes for children
 - ii. Nutrition services
 - iii. Health services
 - iv. Education services
 - v. Recreational services
 - vi. Protection services

Unit – 4

1. Services for women. Maternal, health and nutrition, protection (PCPNDT) domestic violence bill, education and empowerment services etc.
2. Services for family as a unit (economic, social and psychological)

Unit – 5

1. Problem of child trafficking, substance abuse: nature indeed need management
2. Monitoring and evaluation of family and child welfare programmes with special reference to ICDS

REFERENCES

- Encyclopedia of Social Work in India, 3 volumes, Director, Publication Division, Ministry of Information & Broadcasting, India, Planning Commission
- Chaudhary, P.D.: Child Welfare and Development, Atmaram and Sons, New Delhi, 1980
- D'Souza, Alfred: Women in Contemporary India and South Asia, Macha publication, New Delhi, 1970
- Kapoor, Premilla: Marriage and Working Women in India, Vikas Publication, Delhi. 1970
- Desai, N.: Women in Modern India, Vora and Company, Princess Street Bombay, 1977
- Women and the Law of inheritance, 1981-82
- Mitra, Ashok: The Status of Women, Literacy and Employment, Allied Publishers Pvt. Ltd., Bombay, 1979
- International Women's year book edited by Roy Kinkier, 1975, Bashodhary Publication, Bombay
- Research Unit on Women Studies, Women in India, SNDT Women University, April, 1981
- D'SWza, Alfred: Women in contemporary India, Traditional Images and Changing Rules
- Jain Devaki: Women's Quest for Power Five Indian Case Studies, Vikash Publication House Pvt., Sahibabad, India, 1980
- Govt. of India. Ministry of Health & Family Welfare (1982). National Mental health program for India.
- Grahamm, P.J., Jegede, R.O., Kapur, M. Minde, C., Nikapota. A.P. & Sell, H.L. (1983). A manual on child mental health and psychosocial development Part II, for primary health workers, New Delhi WHO

CHILDREN WITH SPECIAL NEED
CORE COURSE – C - 403

MM-70
Pd/ wk- 4

Unit -1

Disabilities and Disability Studies

1. Introduction to Disability Studies.
2. Various approaches to defining and understanding disability: the biomedical, social, rehabilitation, legal and education model.
3. The role of context in the meaning of normality and disability

Unit -2

1. Disability: Major Types and their Understanding
2. Nature, classification, causes, assessment, treatment, training and rehabilitation of the following:
 - Physical and Loco motor impairments
 - Intellectual impairments: Mental Retardation
 - Sensory Impairments: Visual and Hearing Impairment

Unit -3

1. Nature, Causes and Assessment of the following (Briefly)
 - Learning Disabilities
 - Giftedness
 - Communication Disorders

Unit -4

1. Autistic Spectrum Disorders and Pervasive Developmental Disorders:
 - Psychoneurosis
 - anxiety
 - phobia
 - obsessive compulsive neurosis
 - autism
 - Psychosis Schizophrenia
 - Paranoid disorder and affective reaction

Unit -5

1. Disability Policy and Legislation: Legislative approaches in the provision of services to people with disorders and disabilities.
2. Physical and social barriers in the development of persons with disabilities.

REFERENCES

- Mehta, D.S.: Handbook of Disabled in India, Allied Publishers Private Ltd. Bombay, 1983
- Smith, M.S., Naisworti, J.T.: The Exceptional Child: A Functional Approach, McGraw Hill, 1975
- Encyclopedia of Social Work in India, 3 volumes, Director, Publication Division, Ministry of Information & Broadcasting, India, Planning Commission
- Chaudhary, P.D.: Child Welfare and Development, Atmaram and Sons, New Delhi, 1980
- Cruikshank, W.M. & Johanson, G. O.: Education of Exceptional Children, Oxford Publication Comp. 1970
- Gajendragadkar, D.N.: Disabled in India, Somaiya Publishers, 1983
- Udia Shanker: Exceptional Children, Sterling Publishers Ltd. New Delhi
- Chapman: Management of Emotional Problem of Children and Adolescence
- Jessie Francis Williams: Children with Specific Living Difficulties, Pergamon Press, 2nd ed.
- Frussive, E.C. and Barbe, WE. (Edited); Educating Children with Living Disabilities, Appellatives Century Crofts Pub. New York, 1967
- State, D.H.: Helping Children with Learning Difficulties, World Locke Educational
- Geraheart, B.R.: Learning Disabilities: Education strategies Mosby college publishing, 1985

ENTERPREUNERSHIP IN WOMEN AND CHILD CARE SERVICES
CORE COURSE – C - 404

MM-70
Pd/ wk- 4

Unit-1

1. Child care centers
2. Requirement for running child care centers
3. Demand for child care centers
4. Entrepreneur:
 - Concept and Requirement of staff, furniture, equipment and building for entrepreneurship
 - Growth of the entrepreneurship and its factor affecting

Unit -2

1. Importance. Scope and major areas of entrepreneurship in child care
2. Personal and professional characteristics of entrepreneur
3. Qualities of person working with children
4. Essential qualities for an entrepreneur
5. Consideration in entrepreneurship: financial consideration, social consideration, ethical consideration
6. Benefit for developing entrepreneurship for: country, state, society, youth, children, women etc

Unit -3

1. Strategies and constraints of project implementation
 - Project proposal
 - Project registration
 - Project objectives
 - Evaluation report
 - Proposal format

Unit -4

1. Steps in developing project for child
 - Objectives
 - Funding
 - Meaning of feasibility
 - Legal processing

Unit -5

1. Development of innovative curriculum
2. Budget : Cost benefit analysis
3. Human resources
4. Regulatory process
5. Network analysis
6. Recurring expenditure
7. Financial input for a project

REFERENCES

- Status of Women in India, A Synopsis of the Report of National Committee (1971-74) New Delhi, ICSSR 1974,2
- D'Souza , Alfred: Women in Contemporary India and South Asia, Macha publication, New Delhi, 1970
- Kapoor, Premilla: Marriage and Working Women in India, Vikas Publication, Delhi. 1970
- Mitra, Ashok: The Status of Women, Literacy and Employment, Allied Publishers Pvt. Ltd., Bombay, 1979
- International Women's year book edited by Roy Kinkier, 1975, Bashodhary Publication, Bombay
- Research Unit on Women Studies, Women in India, SNDT Women University, April, 1981
- D'SWza, Alfred: Women in contemporary India , Traditional Images and Changing Rules
- Baker. H.A. Bertheide. G.W. and Others (Eds)(1980). Women Today: A multi

PRACTICAL – 7
COUNSELLING AND INTERNSHIP
CORE COURSE – C - 405

CCA-30
ESE-70
Pd/ wk- 8

- Block placement of the students in the real work situations of nursery schools, child welfare institute, guidance and counseling centers women and family welfare organization etc.
- Planning, implementation, evaluation of program course content in placement centers.
- Prepare and present the internship report.

PRACTICAL – 8
PLANNING PROGRAMMES FOR PARENTS AND COMMUNITY
CORE COURSE – C - 406

CCA-30
ESE-70
Pd/ wk- 8

1. Planning & execution and evaluation with reports on
 - a. Parent teacher meeting
 - b. Parent education programme
 - c. Bal mela
 - d. Presenting seminar on current issues in human development
2. Visit to various rehabilitation centers for :
 - a. Women
 - b. Old age
 - c. Exceptional children
 - d. Juvenile delinquent children
3. Report writing of case profiles of children with special needs
4. Preparation and use of teaching aids for child, women, parents, and community education
5. Counseling for parents of children with special needs

GENDER STUDIES
SKILL COURSE – C - 407

MM-50
Pd/ wk- 2

Unit – 1 Gender and Development:

- Concept of gender, gender roles, changing trends, gender analysis matrix.
- Shift from welfare to development and empowerment, gender in development, gender and development.

Unit – 2

- National and international efforts for gender empowerment.

Unit – 3

- Meaning of status of women A situational analysis - demographic, education, employment, political and health (general, occupational, and reproductive)
- Violence against Women- Dowry, divorce, female feticide and infanticide, domestic violence.

Unit – 4

- Sexual harassment and exploitation, trafficking, portrayal of women in mass media. Efforts for elimination of all forms of discrimination
- Policies and Programmes for Women's Development:
- National policy for Empowerment of women, policy perspectives, mainstreaming

Unit – 5

- Economic empowerment- Poverty eradication, micro finance and self-help groups,
- Introduction of laws for domestic violence against women (2005) and sexual harassment (2013)

PRACTICAL COURSE

MM-50
Pd/ wk- 2

- Preparation of E-content for gender sensitization
- Identification and assessment of gender issues in current print and electronic media
- Collection and evaluation of Ten articles on gender issues

POPULATION EDUCATION AND COMMUNITY HEALTH SKILL COURSE – C - 407

MM-50
Pd/ wk- 2

Unit – 1: Health and Health Care

- Concepts of health and positive health, Health- disease continuum, factors affecting health, health as a human right.
- Concept of community health, global health, health for all.

Unit – 2

- Primary health care- definitions, principles components, comprehensive health care, levels of prevention, Concept of reproductive health for adolescent girls and boys.
- Health and Development indices
- Health indices and related indices in community health, fertility indicators, vital statistics, mortality, morbidity indicators, demographic indicators – sex ratio

Unit – 3

- Indicators for social and mental health, Human Development index, Disability adjusted life years (DALY). Reproductive Health index. Major Health Problems in India
- Health administrative set up, Peripheral, state, National, urban-rural(Introduction to National Rural Health Mission), National family Health surveys

Unit – 4

- National Health Programmes- ICDS, AIDS prevention Programme, Reproductive Child Health (RCH) birth control methods, population education

Unit – 5

- Concept of population education: Various definitions Significance and scope of population education, Family life education, Sex education, Causes and consequences of population Blast. Trends in population growth terms related to population dynamics

PRACTICAL COURSE

MM-50
Pd/ wk- 2

- Preparation of teaching Aids on population dynamics
- First Aid and home nursing
- VI. Bandages
 - Roller-finger, arm, leg, elbow, knee, cap line
 - Triangular head, palm/foot, sling
- Bed making
- Recording of temperature
- Use of kidney tray, spittoon, eye glass, thermometer, hot water bag, ice cap, blood pressure estimations, blood sugar testing

NUTRITION SCIENCE: BASIC CONCEPTS SKILL COURSE – C - 407

MM-50
Pd/ wk- 2

UNIT – I

Food and nutrition – meaning, functions, classification nutrition and health (Basic concepts)

UNIT – II

Food groups – Characteristics of food groups, classification of food groups, Balanced diet, nutrient requirements for various age groups

UNIT – II

Anthropometric assessment of nutritional status

UNIT – IV

- Therapeutic modification of normal diet and reasons for dietary changes in – Obesity, congestive heart disease, diabetes, hypertension.
- Dietary counseling

UNIT – V

Food adulteration – Introduction, common adulterants in foods

PRACTICAL COURSE

MM-50
Pd/ wk- 2

- Assessment of nutritional status of individual and for community group using - weight, height MUAC waist and hip circumferences
- Qualitative testing of some foods for adulteration

DEPARTMENT OF MATHEMATICS AND STATISTICS
SYLLABUS BASED ON CHOICE BASED CREDIT SYSTEM
(CBCS)

FOR

M.Sc. (Semester –I & II) MATHEMATICS 2017

M.Sc. (Semester-III & IV) MATHEMATICS 2018



JAI NARAIN VYAS UNIVERSITY
JODHPUR

DEPARTMENT OF MATHEMATICS AND STATISTICS

JAI NARAIN VYAS UNIVERSITY:JODHPUR

AN OVERVIEW:

The Department of Mathematics of the Jai Narain Vyas University (formally known as University of Jodhpur) was established in 1962 with the inception of the University in the same year. The Department has been engaged in teaching undergraduate and post-graduate course in Mathematics since then. The graduate teaching in Statistics started in 1989 and the teaching of post graduate courses in Statistics began in 1989. The Department has also run M.Phil. Programme in Mathematics since 1988 and, M.A./M.Sc. under UGC's COSIST Programme during 1990-1995. The Department has been provided with grants for establishing the Computer Laboratory under the COSIST Programme. This Laboratory has been set up in the Department which is well equipped with a PC/AT 80386 computer with 8 terminals, 7 PC/ST Plotter and a digitizer.

The Department has been engaged in research in both Pure and Applied Mathematics and in Statistics. The Department has produced 5 D.Sc.'s, and more than 120 Ph.D.'s. The Department in National and International journals has published more than 1500 research papers. At present 11 Research Scholars are working for Ph.D. Degree in Mathematics.

Thrust areas of research are Fractional Calculus, Generalized Functions, Integrals Transforms, Differential and Integral Equations, Operations Research, Fluid Mechanics, Magneto hydrodynamics, and Plasma Dynamics. In Statistics, the research being carried out in the are of Sample Surveys, Statistical Distributions, Applications of Distributions in Demographic Studies, and Educational Statistics.

The First Professor and Head of the Department, Prof. R.K. Kushwaha, Ph.D. (Princeton), D.Phil. (Allahabad), F.N.A.Sc., F.N.A., has served the University from 1963 to 1982. An eminent Astrophysicist and reputed Mathematician, he was the President, Section of Mathematics, Indian Science Congress during 1973-74 and was General Secretary, National Academy of Science of India, Allahabad for 4 years during 1973-77.

Professor R.K. Saxena, Ph.D., D.Sc., F.N.A.Sc., chaired the Department of Mathematics and Statistics during March 1982-Sept. 1982; March 1983-July 1988, July 1991-July 1994. He was the first President of Rajasthan Ganita Parishad in 1987-88, and has published more than 300 research papers in reputed journals. He is the first D.Sc. in Rajasthan and was appointed National Lecturer by the UGC in 1984-85. Prof. Saxena has had several assignments abroad, including fellowship of National Research Council of McGill University, Canada.

Professor P.K. Bhatia, Ph.D., D.Sc., F.N.A.Sc., F.I.M.A. (U.K), FRAS (London), has been engaged in research in Applied Mathematics, particularly in Fluid Mechanics and MHD. He was the President, Section of Mathematics of Indian Science Congress during 1990-91. He has published more than 150 research papers in reputed journals. Prof. Bhatia Chaired the Department during July 1988-July 1991 and January 1996-November 1997.

Several Members of the Department has visited foreign countries on teaching and other assignments. Professor R.K. Saxena has visited Canada, Iraq, Libya and U.S.A. Professor Bhatia has visited Australia, Nigeria and U.S.A. Dr. R.C. Bhatt has spent four years in Iraq, Dr. P.K. Banerji was in Nigeria, Dr. S.K. Agarwal was in Kenya for about three years, Dr. G.C. Tikkiwal was in Nigeria and U.S.A. for about five years, and Dr. B.S. Bhadauria visited Eritrea (N.E. Africa) on teaching assignment during 2003-04 under United Nations Development Programme. Dr. Banerji visited Italy to attend an International Conference in 1988 and went to Hungary in 1990 under the UGC's Cultural Exchange Programme and visited Switzerland to participate in an International Conference. In October 2003, Dr. Bhadauria visited USA to attend an International Conference in the University of Southern Maine, Portland,. Dr. R.K. Yadav visited Spain to attend the 25th Conference of International Congress of Mathematicians in Madrid during August 22-30, 2006. Recently Prof. R.K.Kumbhat, Dr.S.S.Tak, and Dr. Aiyub Khan have visited Switzerland to attend the International Congress on Industrial and Applied Mathematics organized between July 16-20, 2007 at Zurich. The members of the Department have, thus had interaction with scientists in other countries. The above teachers also attended and presented their research work at the 26th International Congress of Mathematicians held at Hyderabad during August 2010.

The Department is proud of recalling Mathematicians Prof. S. Saran, Prof. H.M. Srivastava, Prof. K.M. Srivastava, Prof. B.R.K. Kashyap, Prof. S.C. Rajvanshi, Prof. C.M.Joshi, Prof. J.P. Singhal, Prof. R.C. Sharma, Prof. B.L. Sharma, Prof. J.L. Bansal, Prof. P.N. Rathie. Prof. P.C. Munot, Prof. S.L. Kalla, Prof. K.N. Gaur and many others who had initiated research in various fields of Mathematics in this Department and brought the name of the Department in the Academic Map of India and abroad.

M.A./M.Sc. (Mathematics) Semester-wise course description:

The academic program at M.Sc. level is through a semester examination scheme. The course work includes lectures, seminars and quiz/laboratory activities.

The full course is of **FOUR SEMESTERS** spread for **TWO YEARS** duration. A semester-wise list of courses to be offered is given below:

SEMESTER- I

- Math – 101: Algebra – I
- Math – 102: Advanced Real Analysis
- Math – 103: Differential Equations
- Math – 104: Special Functions
- Math – 105: Analytical Dynamics and Numerical Analysis - I

SEMESTER – II

- Math – 201: Algebra – II
- Math – 202: Measure Theory and Integration
- Math – 203: Hydrodynamics
- Math – 204: Classical Polynomials and Integral Transforms
- Math – 205: Analytical Dynamics and Numerical Analysis - II

SEMESTER - III

- Math – 301: Complex Analysis
- Math – 302: Tensor Analysis
- Math – 303: Functional Analysis – I
- Math – 304: Any one from Elective Course from **Group – A***
- Math – 305: Any one from Elective Courses from **Group – B***

SEMESTER – IV

- Math – 401: Topology
- Math – 402: Differential Geometry
- Math – 403: Functional Analysis – II
- Math – 404: Any one from Elective Courses from **Group – A***
- Math – 405: Any one from Elective Courses from **Group – B***

List of Skill Courses (SC) in Mathematics

Math – SC – 1 : Knowledge of Mathematical typing software- I

Math – SC – 2: Knowledge of Mathematical typing software –II

Math – SC – 3 : Knowledge of SPSS – I

Math – SC – 4 : Knowledge of SPSS – II

Math – SC – 5 : Sampling and test of Significance – I

Math – SC – 6 : Sampling and test of Significance – II

*List of Elective Papers (for Semester – III)

Group – A

- 1.Magnetofluid Dynamics - I
- 2.Linear Operators in Hilbert Space-I
- 3.Laminar Viscous Flow Theory-I
- 4.Probability and Statistical Distributions-I

Group – B

1. Generalized Functions - I
2. Fundamental of Operations Research-I
3. Integral Equations and Boundary Value Problems-I
4. Advanced Numerical Analysis – I

*List of Elective Papers (for Semester – IV)

Group – A

- 1.Magnetofluid Dynamics - II
- 2.Linear Operators in Hilbert Space-II
- 3.Laminar Viscous Flow Theory-II
- 4.Probability and Statistical Distributions-II

Group – B

1. Generalized Functions - II
2. Fundamental of Operations Research-II
3. Integral Equations and Boundary Value Problems-II
4. Advanced Numerical Analysis - II

Not more than 33% of the total admitted students of M.A./M.Sc. (Final) Mathematics will be allowed in any elective paper.

Selection of these elective papers will be strictly on merit, obtained in M.A./M.Sc. (Previous) Mathematics Examinations.

GUIDELINES FOR CHOICE BASED CREDIT SYSTEM:

Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. **Each student has to complete four skill courses: two within the Department and two from other Department within JNV University or the Universities approved by JNV University.**
3. **Course:** Usually referred to, as 'papers' is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of **number of credits to be completed by the students.**
5. **Credit Point:** It is the **product of grade point and number of credits for a course.**
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. **One credit is equivalent to one period of teaching** (lecture or tutorial) or two periods of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.

11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. **It is ratio of total credit points secured by a student** in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.
12. **Semester:** Each semester will consist of 15-18 weeks of academic work **equivalent to 90 actual teaching days**. The odd semester may be scheduled from **July to November/ December and even semester from December/January to May**.
Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May. The Department shall conduct the Practical examinations of odd and even semesters as per the Panel of Examiners approved by the University. Each Board of examiners shall consist of one external Examiner from other University/Institute and another from the Department.
13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the **registered students after every semester**. This statement will display the course details (**code, title, number of credits, grade secured**) along with SGPA of that semester and **CGPA earned** till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Science resolves the following:

- a. **All internal assessments shall be open assessment system only and that are based on Quizzes, term test and seminar.**
- b. Attendance shall carry the prescribed marks in all papers and Practical examination CCA (Continuous Comprehensive Assessment).
- c. In each semester **three out of four theoretical component University examinations shall be undertaken by external examiners from outside the university** conducting examination, who may be appointed by the competent authority.

Grievances and Redressal Mechanism

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head/Principal of the College or the Chairperson of the University Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.
- b) The appeal will be assessed by the Chairman and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Dean, Faculty of

Science comprising all HODs of the Faculty and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.

- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	'O'	Outstanding	10
2	'A+'	Excellent	9
3	'A'	Very Good	8
4	'B+'	Good	7
5	'B'	Above Average	6
6	'C'	Average	5
7	'P'	Pass	4
8	'F'	Fail	0
9	'Ab'	Absent	0

- i. A student obtaining Grade F in a paper shall be **considered failed and will be required to reappear in the University End Semester examination.**
- ii. For **noncredit courses** (Skill Courses) **'Satisfactory'** or **"Unsatisfactory"** shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

- = and > 95 % marks Grade Point 10.0
- 90 to less than 95 % marks Grade Point 9.5
- 85 to less than 90 % marks Grade Point 9.0
- 80 to less than 85 % marks Grade Point 8.5
- 75 to less than 80 % marks Grade Point 8.0
- 70 to less than 75 % marks Grade Point 7.5
- 65 to less than 70 % marks Grade Point 7.0
- 60 to less than 65 % marks Grade Point 6.5
- 55 to less than 60 % marks Grade Point 6.0
- 50 to less than 55 % marks Grade Point 5.5
- 45 to less than 50 % marks Grade Point 5.0
- 40 to less than 45 % marks Grade Point 4.5
- 35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,

i.e.

$$\text{SGPA (Si)} = \frac{\sum (C_i \times G_i)}{\sum C_i}$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme, i.e.

$$\text{CGPA} = \frac{\sum (C_i \times S_i)}{\sum C_i}$$

where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.

- iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	6	B	6	6 x 6 = 36
2	Course 2	6	B+	7	6 X 7 = 42
3	Course 3	6	B	6	6 X 6 = 36
4	Course 4	6	O	10	6 X 10 = 60
5	Course 5	6	C	5	6 X 5 = 30
	Total	30			204

Thus, $\text{SGPA} = 204 / 30 = 6.8$

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	30	30	30	30
SGPA	6.67	7.25	7	6.25

$$\text{CGPA} = \frac{(30 \times 6.67 + 30 \times 7.25 + 30 \times 7 + 30 \times 6.25)}{120}$$

$$815.1/120 = 6.79$$

SEMESTER-WISE THEORY PAPERS / SKILL COMPONENT:

Core Courses	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Semester I							
Course- 1	Math - 101	Algebra – I	6-0-0	6	30	70	100
Course- 2	Math – 102	Advanced Real Analysis	6-0-0	6	30	70	100
Course- 3	Math – 103	Differential Equations	6-0-0	6	30	70	100
Course- 4	Math – 104	Special Functions	6-0-0	6	30	70	100
Course- 5	Math – 105	Analytical Dynamics and Numerical Analysis- I	6-0-0	6	30	70	100
Skill Course I*	As per the list		2-0-2				
Total				30	150	350	500
Semester II							
Course- 6	Math - 201	Algebra - II	6-0-0	6	30	70	100
Course- 7	Math – 202	Measure Theory and Integration	6-0-0	6	30	70	100
Course- 8	Math – 203	Hydrodynamics	6-0-0	6	30	70	100
Course- 9	Math – 204	Classical Polynomials and Integral Transforms	6-0-0	6	30	70	100
Course- 10	Math - 205	Analytical Dynamics and Numerical Analysis- II	6-0-0	6	30	70	100
Skill course II*	As per the list		2-0-2				
Total				30	150	350	500
Semester III							
Course- 11	Math -301	Complex Analysis	6-0-0	6	30	70	100
Course- 12	Math -302	Tensor Analysis	6-0-0	6	30	70	100
Course- 13	Math -303	Functional Analysis – I	6-0-0	6	30	70	100
Course- 14	Math -304	Any one from Elective Courses from Group – A**	6-0-0	6	30	70	100
Course- 15	Math -305	Any one from Elective Courses from Group – B**	6-0-0	6	30	70	100
Skill course –III*	As per the list		2-0-2				
Total				30	150	350	500

Semester IV							
Course- 16	Math -401	Topology	6-0-0	6	30	70	100
Course- 17	Math -402	Differential Geometry	6-0-0	6	30	70	100
Course- 18	Math -403	Functional Analysis – II	6-0-0	6	30	70	100
Course- 19	Math -404	Any one from Elective Courses from Group – A**	6-0-0	6	30	70	100
Course- 20	Math -405	Any one from Elective Courses from Group – B**	6-0-0	6	30	70	100
Skill course –IV*	As per the list		2-0-2				
Total				30	150	350	500

*** The Department shall offer two skill courses per semester from the list of skill courses approved for the Department.**

****The course 19 and course 20 shall be in accordance to the allocation of the courses during the Counselling for the Semester – III (for the course 14 and course 15).**

In view of the course content, the Department of Mathematics and Statistics distributed the Periods between Theory/Tutorial/Practical as under per paper

- 4 : 0 : 0 (four lectures only (no tutorial and no practical) per week) – For Theory.
- 2+0+2 (two lectures, no tutorial and two practical/field experimentations) – For Skill courses.

The Duration of the Period shall be forty five minutes. In each of these combinations, the first value stands for the same number of lecture instructions per week, whereas the last two values stand for double the number of tutorial / practical instructions per week.

In each practical group the number of students that can be accommodated will be fifteen.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective) involve an evaluation system of students that has the following two components:-

- Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
 - End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.
- (i) **Continuous Comprehensive Assessment (CCA):** This would have the following components:

- a. **Quizzes:** Two Quiz examinations of 45 minutes duration each having a maximum of 25 marks shall be arranged for each theory paper during the semester course period
- b. **Term Test:** One term test shall be arranged for each theory paper prior to End-Semester Examination; examination duration shall be of three hours; maximum marks shall be 70
- c. **Seminar:** Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 15. The seminar shall commence after first quiz examination and shall be completed prior to term test for all the papers.
- d. **Classroom Attendance** – Each student will have to attend a minimum of 75% Lectures / Tutorials / Practicals. **A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE).** Attendance shall have 15 marks and will be awarded by following the system proposed below:

Those having greater than 75% attendance (for those participating in Co-curricular activities, 25% will be added to per cent attendance) will be awarded CCA marks as follows:-

75% to 80%	=	3 marks
80% to 85%	=	6 marks
85 to 90%	=	9 marks
90% to 95%	=	12 marks
> 95%	=	15 marks

Each student's cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Science.

- e. CCA are based on open evaluation system without any bias to any student
- f. Any grievance received in the Department from student shall be placed before the **Grievance Redressal Committee** with adjudicated comments

Each component marks will be added without rounding and the total thus obtained is ratio by a factor of six. This value shall be rounded.

Illustration: Quiz 1 – Marks obtained = 20
 Quiz 2 – Marks obtained = 18
 Term Test Marks obtained = 50.5
 Seminar Marks obtained = 14
 Attendance Marks obtained = 9
 Total = 111.5
 Conversion = $111.5/5 = 22.3$
Award (Rounded off to next integer) = 23.00

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective Department shall declare the result as “Satisfactory” or “Non-Satisfactory”;

each student need to get a minimum of three “Satisfactory” declaration for the course completion

In laboratory courses (having only practical (P) component), the CCA will be based on students attendance (50%); collection of plant material (25%) and hands on Practical, records, etc. (25%)

For QUIZ (2 quizzes per semester), 25 marks per Quiz and total of 50 marks, 45 minutes duration for each quiz:

Types of question	Number of Questions	Marks per question	Total marks per type
1. Multiple choice	10	1	10
2. Fill in the blanks	10	1	10
3. Short answer (15 words)	5	1	05
Total	25		25

For the Term test and ESE:

Part A

Ten short type questions (Definitions, illustrations, functions, short explanations, etc; 25-50 words) for two marks each. $10 \times 2 = 20$ marks; two questions from each Unit; no choice in this part

Part B

Five short answer (250 words) type questions for four marks each. $5 \times 4 = 20$ marks; one question from each Unit with internal choice

Part C

Five questions of long/explanatory answer (500 words) type, one drawn from each Unit; student need to answer any three; ten marks each; $3 \times 10 = 30$ marks

20+20+30 = 70 marks

Qualifying for Next semester

	1. A student acquiring minimum of 40% in total of the CCA is eligible to join next semester.
	2. A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as ‘Fail’), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.
	3. A student who fails in one or more papers in a semester shall get three more chances to complete the same; if

he/she fails to complete the same within the prescribed time, i.e. three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted, for additional chances examination fee shall be on additive basis.

Improvement Option:

Every student shall have the opportunity to improve Credit thorough University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final. There shall be no improvement opportunity in Practical examinations.

Result Declaration:

The ESE (End Semester Examination/University Examination) results shall be declared within twenty days of the last examination. The Theory/ Practical Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation.

ADMISSION

The minimum qualification for admission to M.Sc. Course is B.Sc. (10+2+3) degree with Mathematics as a major subject. The details of eligibility conditions and admission procedure are given in the admission form. The admission will be done on the basis of merit calculated by the aggregate marks obtained at the B.Sc. level including the marks award under the category (a) and (b) mentioned in the admission from [i.e. (a) benefit to the candidates who are resident of Rajasthan, and (b) benefit for candidates of J. N. Vyas University, Jodhpur]. Reservation of Scheduled Caste/Scheduled Tribes/Disabled/OBC/SBC and Teacher candidates will be as per university rules. The candidates are required to attend minimum of a 75% of classes in both theory and practical.

TEACHING AND EXAMINATION SCHEME

Per Semester

Course	Periods/Week	Examination hours	CCA	ESE	Total
Theory Papers					
Course - I	6	3	30	70	100
Course - II	6	3	30	70	100
Course - III	6	3	30	70	100
Course - IV	6	3	30	70	100
Course - V	6	3	30	70	100

Students are required to pass in each theory papers in every semester.

Skill Courses are to be passed (with satisfactory grade) in each Semester (Odd Semester from Department and Even Semester from outside Department).

UNIVERSITY EXAMINATION

Each course paper shall be of three hours duration.

The model examination schedule for odd semester shall be:

Day	Morning session	Next session
1	Paper I Semester I	Paper I semester II
2	Paper I Semester III	Paper I semester IV
3	Paper II Semester I	Paper II semester II
4	Paper II Semester III	Paper II semester IV
5	Paper III Semester I	Paper III semester II
6	Paper III Semester III	Paper III semester IV
7.	Paper IV Semester I	Paper IV semester II
8	Paper IV Semester III	Paper IV semester IV
9	Paper V Semester I	Paper V Semester II
10	Paper V Semester III	Paper V Semester IV

The model examination schedule for Even semester shall be:

Day	Morning session	Next session
1	Paper I Semester II	Paper I semester I
2	Paper I Semester IV	Paper I semester III
3	Paper II Semester II	Paper II semester I
4	Paper II Semester IV	Paper II semester III
5	Paper III Semester II	Paper III semester I
6	Paper III Semester IV	Paper III semester III
7.	Paper IV Semester II	Paper IV semester I
8	Paper IV Semester IV	Paper IV semester III
9	Paper V Semester II	Paper V Semester I
10	Paper V Semester IV	Paper V Semester III

Students are required to pass in each theory papers in every semester.

Skill Courses are to be passed (with satisfactory grade) in each Semester (Odd Semester from Department and Even Semester from outside Department).

UNIVERSITY EXAMINATION

Each course paper shall be of three hours duration.

The model examination schedule for odd semester shall be:

Day	Morning session	Next session
1	Paper I Semester I	Paper I semester II
2	Paper I Semester III	Paper I semester IV
3	Paper II Semester I	Paper II semester II
4	Paper II Semester III	Paper II semester IV
5	Paper III Semester I	Paper III semester II
6	Paper III Semester III	Paper III semester IV
7.	Paper IV Semester I	Paper IV semester II
8	Paper IV Semester III	Paper IV semester IV
9	Paper V Semester I	Paper V Semester II
10	Paper V Semester III	Paper V Semester IV

The model examination schedule for Even semester shall be:

Day	Morning session	Next session
1	Paper I Semester II	Paper I semester I
2	Paper I Semester IV	Paper I semester III
3	Paper II Semester II	Paper II semester I
4	Paper II Semester IV	Paper II semester III
5	Paper III Semester II	Paper III semester I
6	Paper III Semester IV	Paper III semester III
7.	Paper IV Semester II	Paper IV semester I
8	Paper IV Semester IV	Paper IV semester III
9	Paper V Semester II	Paper V Semester I
10	Paper V Semester IV	Paper V Semester III

Detailed Syllabus for M.A./M.Sc. (Previous) Mathematics Examination 2017

SEMESTER – I

Math-101: ALGEBRA-I

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1: Groups: Law of isomorphism. Direct products of groups. Theorems related to composition series. Jordan-Holder theorem.

Unit 2: Groups :Definition of P-Group H-Conjugate Cauchy's theorems for finite Abelian and finite group. Sylow's theorems for abelian groups, solvable groups.

Unit 3: Rings and Fields of Extension: Theorems on endomorphism of an abelian group. Direct product of rings. Polynomials rings, Factorisation in integral domain.

Unit 4: Rings and Fields of Extension : Theorems related to finite and infinite extension of field. Minimal, Polynomials, Splitting field. Theorems on roots and coefficients of polynomial separable and inseparable extensions.

Unit 5: Canonical Forms: Jordan Matrix, Jordan canonical form, Some decomposition theorems. Jordan normal forms. Definition and examples of linear algebra. Linear transformations.

BOOKS RECOMMENDED

Surjeet Singh and Qazi Zammeruddin: Modern Algebra

Aggarwal, R.S.: Modern Algebra

Shanti Narain: Abstract Algebra; S. Chand & Co., New Delhi

Raisinghania, N.D. : Modern Algebra

Kofman, Kunj, Linear Algebra

Math-102: ADVANCED REAL ANALYSIS

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1: Real Sequences and convergence: Definition, limit point, bounds and properties of real sequences. Limit inferior and limit superior of sequences. Bolzano – Weierstrass theorem for sequences, convergent and non-convergent sequences.

Unit 2: Cauchy's general principle of convergence. Cauchy sequence, various theorems on limit of sequences. Monotonic sequence and its convergence.

Unit 3: Cantor's set, Continuity and Discontinuity of functions of two and more variables, types of discontinuity. Jacobians.

Unit 4: Uniform Convergence of sequences and series of functions. Various tests for uniform convergence. Weierstrass's M – Test.

Unit 5: Uniform convergence and continuity. Uniform convergence and integration. Uniform convergence and differentiation.

BOOKS RECOMMENDED

Shanti Narayan: Mathematical Analysis; S. Chand & Co., New Delhi.

Royden, H.L.: Real Analysis; MacMillan Publishing Co., New York

H.K. Pathak: Real Analysis; Shiksha Sahitya Prakashan; Meerut.

Malik, S.C. and Arora, S.: Mathematical Analysis. New Age India Int. (P) Ltd., New Delhi.

Math-103: DIFFERENTIAL EQUATIONS

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1: Non-linear ordinary differential equations of particular forms. Riccati's equation –General solution and the solution when one, two or three particular solutions are known.

Unit 2: Classification of linear partial differential equation of second order, Canonical forms.

Unit 3: Solutions of Laplace, Wave and Heat conduction equations, Fourier series with application to simple boundary value problems on wave and heat conduction equations.

Unit 4: Linear homogeneous boundary value problem, Eigen values and eigen functions, Sturm-Liouville boundary value problems, Lagrange's identity, properties of eigen functions, Periodic functions.

Unit 5: Non-homogeneous boundary value problems, Non-homogeneous Sturm-Liouville boundary value problems (method of eigen function expansion).

BOOKS RECOMMENDED

Chaturvedi, J.C. and Ray, M.: Differential Equations; Ram nath Kedar Nath & Co. Agra.

Bansal, J.L. and Dharmi, H.S.: Differential Equations Vol. II, An Elementary Treatise Differential Equations; Jaipur Publishing House, Jaipur

Arnold, V.I.: Ordinary Differential Equations, MIT Press, Cambridge, 1981

Math-104: SPECIAL FUNCTIONS

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1: Hypergeometric functions: Definition of the Hypergeometric series and function. Properties of hypergeometric functions. Integral formula for hypergeometric series, Linear transformations.

Unit 2: Contiguous function relations. Linear relations between the solutions of hypergeometric differential equation. Kummer's confluent hypergeometric function.

Unit 3 : Elementary properties of generalized hypergeometric function ${}_pF_q$.

Unit 4 : Legendre Polynomials : Legendre's differential equation and its series solution, Generating Function of Legendre's polynomials $P_n(x)$, Orthogonality, Laplace's First and Second Integral for $P_n(x)$, Rodrigue's formula, Recurrence Relations.

Unit 5 : Bessel's equation and its solution; Bessel function of the first kind, Generating function for $J_n(x)$, Recurrence relations, Integral representations for $J_n(x)$, Addition formula for the Bessel functions.

BOOKS RECOMMENDED

Rainville, E.D.: Special Functions, Macmillan and Co., New York 1960.

Sneddon, I.N.: Special Functions of Mathematical Physics and Chemistry, Oliver and Byod, 1961.

Watson, G.N.: A Treatise on the Theory of Bessel Functions, Cambridge University Press, 1931

Labedye, N.N.: Special Functions and their Applications, Dover, 1972.

Saxena, R.K. and Gokhroo, D.C.; Special Functions, Jaipur Publishing House.

Math-105: ANALYTICAL DYNAMICS AND NUMERICAL ANALYSIS - I

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit-1:- Motion in Two Dimensions under Impulsive forces. Elastic Sphere Impinging on a fixed Plan. Work done by Impulse Force

Unit-2:-Conservation law of Linear and Angular Momentum under Finite and Impulsive Forces. Kinetic Energy as a Sum of Kinetic Energy due to Translation and Rotation.

Unit-3 :-Calculus of variations: - linear functional, minimal functional theorem, general variation of a functional equation, another form of Euler-Lagrange equation, functional dependent on higher-order derivatives and several dependent variables.

Unit-4:- Various fundamental problems viz.- Shortest Distance, Shortest Time, Minimum Surface of Revolution and Isoperimetric Problem. Rayleigh-Ritz Method for Boundary Value Problem.

Unit-5:-Numerical solution of ordinary differential equation: - Euler method, modified Euler method Taylor series, Picard method Runge-Kutta method Milne method

BOOKS RECOMMENDED

Loney, S.L.: An Elementary Treatise on the Dynamics of a Particle and Rigid Bodies, Cambridge University Press.

Ray,M.: Dynamics of Rigid Bodies, Students Friends and Co.

Gupta, P.P.: Rigid Bodies analytic Dynamics I, II, Krishna prakashan media (P)Ltd.

Soarborough, James, B.: Numerical Analysis

Freeman, H.: Finite Differences and Mathematics for Actuarial Students

Richardson,H.C.: Calculus of Finite Differences

Elsogotts, L.E.: Calculus of Variations

Bansal, J.L.: Dynamics of a Rigid Body, Jaipur Publishing Co.,

SEMESTER – II

Math-201: ALGEBRA-II

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1: Cononical Forms: Kernel and range space of a linear mapping, Rank and nullity, Singular and non-singular mapping or transformations. Invariance and Reducibility.

Unit 2: Galois Theory: Monomorphism and their Linear Independence. Arten theorem on automorphism, Normal extensions and Fundamental theorem of Galois theory.

Unit 3: Galois Theory: Radical extensions and solvability by Radicals. Constructions by Ruler and Compass Ring with Chain conditions. Hilbert's Bases theorem. Artinian rings.

Unit 4: Linear transformations and system of linear equations. Quotient transformations. Inner product. Inner product spaces. Algebra of linear operators.

Unit 5: Matrix representation of linear operators. Dual spaces. Unitary and normal operators. Matrices of linear transformations with respect of different bases.

BOOKS RECOMMENDED

Surjeet Singh and Qazi Zammeruddin: Modern Algebra

Aggarwal, R.S.: Modern Algebra

Shanti Narain: Abstract Algebra; S. Chand & Co., New Delhi

Raisinghania, N.D. : Modern Algebra

Kofman, Kunj, Linear Algebra

Math-202: MEASURE THEORY AND INTEGRATION

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1: Definitions of measure, Lebesgue outer measure, Measure of sets, Non-measurable sets, Exterior and interior measure of sets and their simple properties, Measurable functions.

Unit 2: Definition of Lebesgue Integral of a bounded measurable function, Comparison of Lebesgue and Riemann Integral. Lebesgue theorem of bounded convergence, Egoroff's theorem.

Unit 3: Lebesgue Integral of unbounded function, Elementary properties of Integrals, Definition and simple properties of function of bounded variation.

Unit 4: Absolutely continuous functions. The Lebesgue set, Integration by parts, The second mean value theorem, The Lebesgue class L^p , Schwarz's inequality.

Unit 5: Holder's inequality, Holder's inequality for sums, Minkowski's inequality. Integration of a function of L^p , mean convergence for the function of the class L^p .

BOOKS RECOMMENDED

Malik, S.C. and Arora, S.: Mathematical Analysis. New Age India Int. (P) Ltd., New Delhi.

Jain, P.K. and Gupta, V.P. Lebesgue Measure and Integration, New Age Int. (P) Ltd., New Delhi.

Math-204: CLASSICAL POLYNOMIALS AND INTEGRAL TRANSFORMS

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1: Generating function and other properties associated with Hermite Polynomials.

Unit 2: Generating function and other properties associated with Laguerre Polynomials.

Unit 3: Fourier transforms and its properties. Fourier sine and cosine transforms. Convolution theorem for fourier transforms. Parseval's identity for fourier transforms.

Unit 4: Mellin transform and their properties.

Unit 5: Elementary properties of Hankel transforms, relation between Hankels and laplace transform. Parseval's theorem for Hankel transforms.

BOOKS RECOMMENDED

Sneddon, I.N.: Use of Integral Transforms; Tata MacGraw-Hill, New Delhi.

Rainville, E.D.: Special Functions, Macmillan and Co., New York 1960.

Sneddon, I.N.: Special Functions of Mathematical Physics and Chemistry, Oliver and Byod, 1961.

Watson, G.N.: A Treatise on the Theory of Bessel Functions, Cambridge University Press, 1931

Labeledye, N.N.: Special Functions and their Applications, Dover, 1972.

Saxena, R.K. and Gokhroo, D.C.; Special Functions, Jaipur Publishing House.

Math-205: ANALYTICAL DYNAMICS AND NUMERICAL ANALYSIS – II

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit-1:-Lagrange's equations for finite as well as impulsive forces. Generalized coordinates, Generalized Velocity, Generalized forces and small Oscillations.

Unit-2:-Motion in three dimensions. Euler's dynamical equation for the motion of a rigid body and problems related to no external forces. Deduction of Euler equation from Lagrange's equation.

Unit-3:-Hamilton's canonical equations of motion. Hamilton's principle and principle of least action. Deduction of Euler equation from Hamilton's canonical equations.

Unit-4:-Canonical Transformations, Poisson's brackets and their properties. General equations of motion in terms of Poisson brackets. Lagrange's brackets and their properties.

Unit-5:-Finite Difference Scheme for Partial Difference Equation: - Difference Quotients, SFPP and DFPP. Iteration Method, Jacobi Method, Gauss-Seidel Method, Successive over Relaxation Method, Bender-Schmidt Method.

BOOKS RECOMMENDED

Loney, S.L.: An Elementary Treatise on the Dynamics of a Particle and Rigid Bodies, Cambridge University Press.

Ray, M.: Dynamics of Rigid Bodies, Students Friends and Co.

Gupta, P.P.: Rigid Bodies analytic Dynamics I, II, Krishna prakashan media (P)Ltd.

Soarborough, James, B.: Numerical Analysis

Freeman, H.: Finite Differences and Mathematics for Actuarial Students

Richardson, H.C.: Calculus of Finite Differences

Elsogotts, L.E.: Calculus of Variations

Bansal, J.L.: Dynamics of a Rigid Body, Jaipur Publishing Co.,

Semester – III

Math-301: COMPLEX ANALYSIS

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1 : Conformal transformations, bilinear transformation, cross ratios and some special transformations. Taylor's and Laurent's theorem.

Unit 2: Poles and Singularities. Theory of residues. Contour integration.

Unit 3: Principle of maximum and minimum modulus; principle of argument, Schwarz's lemma, Rouché's theorem, Fundamental theorem of Algebra.

Unit 4: Meromorphic function, Mittag-Leffler's theorem, Analytic continuation, definition and illustrations.

Unit 5 : Harmonic Functions: Definition, Basic Properties, Maximum Principle (First Version), and (second Version). Harnack's inequality, subharmonic and superharmonic functions.

Books Recommended

1. Shanti Narayan: Theory of Functions of Complex Variable; S. Chand & Co., New Delhi.
2. Mathews, J.H.: Howell, R.W. Complex analysis, Jones and Bartlet, India (2011).
3. Chouhan, J.P. Complex Analysis, (2006), Kedar Nath Ram Nath.
4. H.K. Pathak: Complex Analysis; Shiksha Sahitya, Prakashan, Meerut (2011).

Math-302: TENSOR ANALYSIS

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1: Notations and definitions of contravariant and covariant tensors of first and second order. Mixed tensors, higher order tensors. Contraction and Quotient law for tensors. Symmetric and skew symmetric tensors.

Unit 2: Metric [Fundamental] tensor, conjugate metric tensors. Definitions and properties of first and second kind of Christoffel's symbols. Laws of transformation of Christoffel's symbols.

Unit 3: Covariant derivatives of contravariant and covariant tensors of first and second orders. Laws of covariant differentiation. Ricci's Theorem.

Unit 4: Definition and properties of Riemann-Christoffel's tensor. Definition and properties of covariant curvature tensor.

Unit 5: Contraction of Riemann-Christoffel Tensor-Ricci tensor.

BOOKS RECOMMENDED:

Bansal, J.L.: Tensor Analysis, Jaipur Publishing House, (2004).

Math-303: FUNCTIONAL ANALYSIS - I

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1: Metric Spaces: Definitions and examples of the metric space, Open and Closed sets, Neighbourhood, Interior, Limit points and Isolated points, Subspace of a metric space, Product spaces. Completeness: Convergent sequence, Complete spaces, Dense sets and Separable spaces, Baire's Category theorem.

Unit 2: Compactness: Compact spaces and sets, Sequential compactness, Heine-Borel theorem, Equivalence of compactness and sequential compactness, Continuous mapping.

Unit 3: Normed spaces and their Properties: Banach space, Quotient space of a Banach space, Finite dimensional normed spaces and subspaces. Linear Operators, Linear operators and functionals on finite dimensional spaces. Normed spaces of operators.

Unit 4: Dual space : Space $B(x,y)$, completeness theorem. Fundamental theorem for normed spaces and Banach space: Zorn's lemma, Hahn-Banach theorem, Hahn-Banach theorem for complex vector spaces and normed spaces.

Unit 5: Reflexive operator, Definitions of strong convergence and weak convergence, Lemma for weak convergence, Lemma for weak convergence for the space l^p , Strong and weak convergence theorem, Open mapping theorem, Closed graph theorem.s

BOOKS RECOMMENDED

1. Kreyszig, E. Introductory Functional Analysis with Applications, John Wiley & Sons (1978).
2. Somasundaram, D.A. First Course in Functional Analysis, Narosa Publishing House, Delhi (2006).
3. Taylor, A.E. Introduction to Functional; Analysis, John Wiley & Sons (1958).
4. Choudhary, B. and Nanda, S. Functional Analysis with Applications, Wiley Eastern Limited, Delhi (1989).
5. Rudin, W. Functional Analysis, Tata McGraw-Hill Publ. Co. Ltd., Delhi (1977).
6. Jain, P.K. and Ahmad, Khalil, Metric Spaces, Narosa Publishing House (1996).
7. Copson, E.T. Metric Spaces, Universal Book Stal, Delhi (1989).
8. Berberian, S. Introduction to Hilbert Space, Oxford University Press, Oxford (1961).
9. Edwards, R.E. Functional Analysis Theory and Applications, Dover Publications, Inc. (1995).

Elective Papers Group – A (Any One)

Math-304: Magneto Fluid Dynamics - I

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1: Definition of MFD and MFD Phenomenon. Charge conservation equation, Maxwell's equations, constitutive equations, Generalized Ohm's law. Equation of State, Equation of continuity, Equations of motion, Equation of energy.

Unit 2: MFD approximations, Magnetic field equation, Magnetic Reynolds number, Alfven's theorem, Magnetic energy, Electromagnetic stresses, force-free magnetic fields.

Unit 3: Basic equations for MHD flow, MHD boundary conditions, MHD flow between parallel plates. Velocity distribution in Hartmann flow and Hydromagnetic Couette flow.

Unit 4: MHD flow in a tube of rectangular cross-section, MHD pipe flow.

Unit 5: MHD flow in an annular channel, MHD flow between two rotating coaxial cylinders, MHD boundary layer approximations.

BOOKS RECOMMENDED

Bansal, J.L.: Magnetofluidynamics of Viscous fluids, Jaipur Publishing House, Jaipur, India
Farraro, V.C.A. and Plumpton, C.: Magnetofluidmechanics
Jeffereys, A.; Magnetohydrodynamics

Cowing, T.G.: Magnetohydrodynamics

Cramer, K.R. and Pai S.I.: Magnetofluidynamics for Engineers and Physicists, Scripta Publishing Company, Washington, D.C., 1973.

Pai, S.I.: Magneto Geodynamics & Plasma Dynamics, Springer-Verlag, New York, 1962.

Shereliff, J.A.: Magnetohydrodynamics, Pergamon Press, London, 1965.

Charlton, P.: Text Book on Fluid Dynamics, CBS Publications, Delhi, 1985.

Rathy, R.K.: An Introduction to fluid dynamics Oxford & IBH Publishing Company, New Delhi, 1976.

Elective Papers Group – A (Any One)

Math-304: LINEAR OPERATORS IN HILBERT SPACE - I

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1: Linear spaces. The scalar product, Hilbert space, Linear manifolds and subspaces. The distance from a point to a subspace. Projection of a vector on a subspace.

Unit 2: Orthogonalization of a sequence of vectors Complete orthonormal systems. The space L^2 and complete orthonormal system in L^2 .

Unit 3: Linear functionals. The theories of F Riesz. A criterion for the closure in H of given system of vectors. A Lemma concerning convex functionals Bounded linear operators.

Unit 4: Bilinear functions. The general form of a Bilinear functional adjoint operators. Weak convergence in H weak compactness.

Unit 5: A criterion for the boundedness of an operator, Linear operators in a separable space. Complete continuous operators. A criterion for complete continuity of an operator. Sequence of bounded Linear Operators.

BOOKS RECOMMENDED

Akhiezer, N.I. and Glazman, I.M.: Theory of Linear Operation in Hilberts Space.

Translated from the Russian by Merlyind Nestell, Vingar Pub. Co., New York.

Math-304: LAMINAR VISCOUS FLOW THEORY - I

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1: Fluid, Continuum hypothesis. Constitutive equation for Newtonian fluids, Navier-stoke's equations for viscous compressible flow. Vorticity and Circulation.

Unit 2: Some exact Solutions; Flow between two concentric rotating cylinders, stagnation in two dimensional flow. Flow due to a plane wall suddenly set in motion (Stoke's first problem). Flow due to an oscillating plane wall (Stoke's first problem).

Unit 3: Equation to energy, Temperature distributions in Couette flow, Plane Poissuille flow and Haigen-Poissuille flow in a circular pipe.

Unit 4: Theory of very slow motion: Stoke's equation of very slow motion. Stoke's flow past a sphere, stoke's stream function. Oseen equations. Lubrication theory.

Unit 5: Laminar Boundary layers. Two dimensional incompressible boundary layer equations. The boundary layer on a flat plate (Blasius-Topfer-solution), boundary layer parameters.

BOOKS RECOMMENDED

Schlichting H.: Boundary Layer Theory, McGraw Hill.

Pai, S.I.: Viscous Flow Theory, Vol.I, Laminar Flow, D.Van Nostrand Company, New York, 1956.

Bamal, J.L.: Viscous Fluid Dynamics, Oxford and IBH, 2004.

Elective Papers Group – A (Any One)

Math-304: PROBABILITY AND STATISTICAL DISTRIBUTIONS - I

(Only for Non-Statistics students of B.Sc.Final)

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1: Probability, Random Variables & their probability distribution: Probability: Random Experiment, Statistical Regularity, Algebra of events. Classical, relative frequency and axiomatic approaches of probability. Additive law and Bool's inequalities. Conditional probability. Stochastic independence of events. Multiplicative law of probability and Baye's Theorem.

Unit 2: : Random Variable (R.V.): Discrete RV. Probability mass function (p.m.f). continuous r.v. probability density functions (p.d.f). Cumulative distribution function (c.d.f). and its properties. Two dimensional Random Variable. Joint, marginal and conditional, p.m.f., p.d.f. and c.d.f. Independence of random variable

Unit 3: Expectation of Random Variable and function of r.v. Theorems on Expectation and inequalities, Moments: Factorial moments, Moments about a point A, Raw moments and Central moments. Measures of Central tendency, Measures of Dispersion, Measures of Skewness and Kurtosis.

Unit 4: Moment generating function (m.g.f.), Cumulant generating function (c.g.f.) and characteristic function (c.f.) of random variables. Product moments and Joint m.g.f. of random variables. Convergence of sequence of random variables; Convergence in law (or in distribution), convergence in probability. Convergence in rth moment

Unit 5: Discrete Distribution. Discrete Uniform distribution. Bernoulli distribution Binomial distribution. Hypergeometric distribution.

BOOKS RECOMMENDED

01. Mathematical Statistics By Parimal Mukhopadhyay (Books and Allied (P.) Ltd.,
02. An Introduction to Probability and Statistics By Vijay K. Rophtgi & A.K. Mod. Ehsanes Saleh.
03. Fundamental of Mathematical Statistics By S.C.Gupta and V.K. Kapoor (Sultan Chand & Sons).

Elective Papers Group – B (Any One)

Math-305: GENERALIZED FUNCTIONS - I

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1: Definition and simple properties of generalized functions, Functional and generalized functions.

Unit 2: Differentiation and integration of generalized functions, Regularization of functions of algebraic singularities.

Unit 3: Associated functions, Convolution of generalized functions, Elementary solutions of differential equations with constant coefficient.

Unit 4: Fourier Transforms of generalized functions. Fourier transform of test function, Fourier transforms of generalized functions of one and several variables. Fourier transform and differential equations.

Unit 5: Particular type of generalized functions: Generalized functions concentrated on smooth manifolds of lower dimension. Generalized functions associated with Quadratic form. Homogeneous functions Arbitrary functions raised to a power.

BOOKS RECOMMENDED

Gellifand, I.M. and Shilvo, G.C.: Generalized functions, Vol. I. Acad. Press. 1964.

Fredman, A.: Generalized Functions and Partial Differential Equations,

Prentice Hall. Inc., Englewood Cliffs, N.J., U.S.A., 1963.

Elective Papers Group – B (Any One)

Math-305: FUNDAMENTALS OF OPERATIONS RESEARCH - I

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1: Basic concepts of probability. Conditional probability, Bayes' theorem; Basic concepts of Poisson, exponential distributions.

Unit 2: Definition, scope and objectives of O.R., Different types of O.R. Models, basic ideas of convex sets. Linear programming problems-Simplex Method, two phase method.

Unit 3: Duality of L.P.P., Transportation and assignment problems.

Unit 4: Theory of games: Competitive strategies, minimax and maximin criteria, two person zero-sum games with and without saddle point, dominance, fundamental theorem of game.

Unit 5: Inventories: Single item deterministic inventory models with finite and infinite rates of replenishment,

BOOKS RECOMMENDED

Kanti Swaroop, Gupta, Man Mohan: Operations Research, Sultan Chand and Sons.

Goel and Mittal: Operations Research, Pragati Prakashan

Mittal, K.V.: Optimizadon Methods in O.R. and S. Analysis

Sharma, S.D.: Operations Research

Loomba, N.P.: Linear Programming

Satty, T.L.: Mathematical Methods of Operations Research.

Elective Papers Group – B (Any One)

Math-305: INTEGRAL EQUATIONS AND BOUNDARY VALUE PROBLEMS - I

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1: General concepts of integral equation. Linear integral equations of the first and second kind of Fredholm and Volterra types. Solution by successive substitution and successive approximations.

Unit 2: Solution of integral equation by Resolvent Kernel. Singular Integral equation. Solution of Abel's integral equation. General form of Abel Singular integral equation. Weakly Singular Kernel.

Unit 3: Hilbert – Schmidt theory by symmetric kernels. Riesz – Fischer theorem. Hilbert – Schmidt theorem. Hilbert's theorem.

Unit 4: Schmidt's solution of the non-homogeneous fredholm integral equation of second kind.

Unit 5 Homogeneous Fredholm integral equations. Eigen values and Eigen functions.

Books Recommended:

W.V.Lovaitt: Linear Integral Equation, Dover Publications, 1950.

Krasnov, Kiselev and MakrankoL Problem and Exercises in Integral Equations, Translated by G. Yankovsky, Mir Publishers, Moscow, 1971.

Mikhlim, S.G.: Integral Equations, Pergamon, Oxford, 1957

Triconi, F.D.: Integral Equations, Interscience, New York, 1957.

Pundir, S.K. and Pundir, R. Integral equations and Boundary Value Problems, Pragati Prakashan, Meerut (U.P.)

Chandramouli, A.B.: Integral Equations with Boundary Value Problems, Shiksha Sahitya Prakashan, Meerut (U.P.)

Elective Papers Group – B (Any One)

Math-305: ADVANCED NUMERICAL ANALYSIS - I

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1 : Solution of Algebraic and Transcendental Equations: Newton-Raphson method for real multiple roots, Newton-Raphson method for complex roots and Newton-Raphson method for system of non-linear equations.

Unit 2: Synthetic Division, Birge-Vieta, Bairstow and Graefre's root squaring methods for Numerical solution of polynomial equations.

Unit 3 : Solution of simultaneous Linear Equations: Direct methods: Gauss-elimination, Gauss-Jordan, Cholesky and Partition method. Iterative Methods: Jacobi iteration, Gauss-seidel iteration and Successive Relaxation method.

Unit 4: Eigen value Problems: power method, Jacobi Method and Givin's Method for finding Eigen values of a matrix.

Unit 5 : Curve fitting and Function Approximation: Least square Method, Fitting a straight line, Second Degree Polynomials, Exponential Curves and Logarithmic Curves.

Books Recommended:

Jain, M.K.,Iyenger, SRK, Jain R.K.: Numerical Methods for Scientists & Engineering Computations, Wiley Eastern Ltd.,

Shastry, S.S.: Introductory Methods of Numerical Analysis, Prentice Hall India Pvt., Ltd.,

Grewal, B.S. : Numerical Methods in Engineering & Science, Khanna Publishers.

Collatz, L.: Numerical Solution of Differential Equations, Tata McGraw-Hill.

D.S. Chouhan: Numerical Methods, JPH.

Semester – IV

Math-401: TOPOLOGY

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1 : Definition of topological spaces by using open sets, Characterization in terms of closed sets. Interior, closure and neighborhood operators.

Unit 2: Frontier of a set, Sub-space. Bases and sub-bases, dense subsets. Connected spaces.

Unit 3 : Continuous functions, closed and open functions. Homomorphism, First and Second axioms of countability.

Unit 4: Separable spaces. Lindeloff spaces. T_0 , T_1 and T_2 spaces. Regular and normal spaces.

Unit 5: Compactness.

Books Recommended:

1. B.D. Gupta: Topology; Kedar Nath Ram Nath; Delhi; Meerut.
2. Colin Adams and Robert Franzosa: Introduction to Topology; Dorling Kindersley India Pvt. Ltd., Pearson Prentice Hall (2009), Delhi.
3. K.P. Gupta: Topology: Pragati Prakashan, Meerut.

Math-402: DIFFERENTIAL GEOMETRY

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1: Curves in Space: Definition of unit tangent vector, tangent line, Normal line and Normal plane. Contact of a curve and a surface. Equation of osculating plane. Fundamental unit vectors, equations of fundamental planes.

Unit 2: Curvature, Torsion and skew curvature vectors. Serret-Frenet formulae and their applications. Definition and properties of the osculating circle and osculating spheres. Bertrand curves and their properties. Involute and evolute of space curves.

Unit 3: Envelope of family of surfaces. Ruled surfaces: Definition and properties of developable and skew surfaces. Parametric representation of a surface. First and Second fundamental forms and magnitudes of various surfaces.

Unit 4: Definition and Differential equation of lines of curvature (Excluding theorems). Definition and equation of curvature and torsion of asymptotic lines. Beltrami-Enneper Theorem.

Unit 5: Fundamental equations of Surface Theory: Gauss equations, Gauss Characteristic equations, Weingarten equations and Mainardi-Codazzi equations.

BOOKS RECOMMENDED:

Bansal, J.I. and Sharma, P.R.: Differential Geometry: Jaipur Publishing House (2004).

Thorpe, J.A.: Introduction to Differential Geometry, Springer-verlag.

Slemberg, S.: Lectures on Differential Geometry, P.H.I. (1964).

Docarmo, M.: Differential Geometry of Curves and surfaces, P.H.I. (1976).

Gupta, P.P. and Malik, G.S.: Three Dimensional Differential Geometry, Pragati Prakashan, Meerut.

Math-403: FUNCTIONAL ANALYSIS - II

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1: Convergence of sequences of operators and functional. Inner spaces: Hilbert spaces: Orthogonality, Euclidean space \mathbb{R}^n , Unitary space C^n , Space $L^2 [a,b]$.

Unit 2: Hilbert sequence space l^2 . Space l^p and space $C [a,b]$, Properties of inner product spaces, Orthogonal sets and sequences, Representation of functional on Hilbert spaces, Hilbert adjoint operator.

Unit 3: Spectral theory of linear Operators in Normed Spaces: Bounded self-adjoint linear operator, Definitions : Eigenvalues, Eigenvectors, Eigenspaces and Spectrum, Resolvent set of a matrix.

Unit 4: Theorems: Eigenvalues of an operator, Adjoint operator, Closed spectrum theorem, Representation theorem. Hilbert adjoint operator.

Unit 5: Eigenvalue and Eigenvector Theorems, Norm theorem, Theorem on product of positive operators, monotone sequence, positive square root, Projection, Product of projection.

BOOKS RECOMMENDED

1. Kreyszig, E. Introductory Functional Analysis with Applications, John Wiley & Sons (1978).
2. Somasundaram, D.A. First Course in Functional Analysis, Narosa Publishing House, Delhi (2006).
3. Taylor, A.E. Introduction to Functional; Analysis, John Wiley & Sons (1958).
4. Choudhary, B. and Nanda, S. Functional Analysis with Applications, Wiley Eastern Limited, Delhi (1989).
5. Rudin, W. Functional Analysis, Tata McGraw-Hill Publ. Co. Ltd., Delhi (1977).
6. Jain, P.K. and Ahmad, Khalil, Metric Spaces, Narosa Publishing House (1996).
7. Copson, E.T. Metric Spaces, Universal Book Stal, Delhi (1989).
8. Berberian, S. Introduction to Hilbert Space, Oxford University Press, Oxford (1961).
9. Edwards, R.E. Functional Analysis Theory and Applications, Dover Publications, Inc. (1995).

Elective Papers Group – A (Any One)

Math-404: MAGNETO FLUID DYNAMICS - II

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1: Two dimensional MHD boundary layer equations for flow over a plane surface for fluids of large electrical conductivity. MHD boundary layer flow past a semi infinite rigid flat plate in an aligned and Transverse magnetic field. Two-dimensional thermal boundary layer equations for flow over a plane surface.

Unit 2: MHD waves, waves in an infinite fluid of infinite electrical conductivity, Alfvén waves. Reflection and Refraction of Alfvén waves. MHD waves in a compressible fluid.

Unit 3: MHD waves in the presence of dissipative effects. Hydromagnetic shock waves, stationary plane shock waves in the absence of a magnetic field.

Unit 4: plane hydromagnetic shock waves, plane shock waves advancing into a stationary gas. MFD Applications: MFD ejectors, MFD accelerators, MFD Lubrication, MFD thin Airfoil, MFD Power generation.

Unit 5: Motion of a charged particle in uniform static electric and magnetic fields. Motion of a charged particle in crossed electric and magnetic fields. Magnetic moment, Particle drifts in an inhomogeneous magnetic field. Drifts produced by a field of force.

BOOKS RECOMMENDED

- Bansal, J.L.: Magnetofluidynamics of Viscous fluids, Jaipur Publishing House, Jaipur, India
Farraro, V.C.A. and Plumpton, C.: Magnetofluidmechanics Jeffereys, A.; Magnetohydrodynamics
Cowing, T.G.: Magnetohydrodynamics
Cramer, K.R. and Pai S.I.: Magnetofluidynamics for Engineers and Physicists, Scripta Publishing Company, Washington, D.C., 1973.
Pai, S.I.: Magneto Geodynamics & Plasma Dynamics, Springer-Verlag, New York, 1962.
Shereliff, J.A.: Magnetohydrodynamics, Pergamon Press, London, 1965.
Charlton, P.: Text Book on Fluid Dynamics, CBS Publications, Delhi, 1985.
Rathy, R.K.: An Introduction to fluid dynamics Oxford & IBH Publishing Company, New Delhi, 1976.

Elective Papers Group – A (Any One)

Math-404: LINEAR OPERATORS IN HILBERT SPACE - II

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1: Definition of a projection operator. Properties of projection operators. Operations involving projection operators, Monotone sequences of projection operators.

Unit 2: The aperture of two linear manifolds. Unitary operators, Isometric operators. The Fourier-Plan-Cherel operator. Closed operators.

Unit 3: The general definition of an adjoint operator. Eigen vectors. Invariant subspaces and reducibility of linear operators. Symmetric operators. Isometric and unitary operators.

Unit 4: : The concept of the spectrum. The resolvent conjugation operators. The graph of an operator.

Unit 5: Matrix representation of unbounded symmetric operators. The operation of multiplication by the independent variable

BOOKS RECOMMENDED

Akhiezer, N.I. and Glazman, I.M.: Theory of Linear Operation in Hilberts Space.

Translated from the Russian by Merlyind Nestell, Vingar Pub. Co., New York.

Elective Papers Group – A (Any One)

Math-404: LAMINAR VISCOUS FLOW THEORY - II

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1: Similar Solutions of boundary layer equations. Wedge flow, Flow in a convergent channel. Flow in the wake of flat plate. Two dimensional Plane jet flow. Prandtl-Mises transformation and its application to plane jet flow.

Unit 2: Boundary layer separation. Boundary layer on a symmetrically placed cylinder (Blasius series solution) Gortler new series method. Axially symmetrical boundary layer. Mangler's transformation.

Unit 3: Three dimensional boundary layers; boundary layer on yawed cylinder. Non-steady boundary layer formation (i) after impulsive start of motion (two dimensional case) and (ii) in accelerated motion.

Unit 4: Thermal boundary layers in two dimensional incompressible flow, Crocco's integrals. Forced convection in a laminar boundary layer on a flat plate. Free convection from a heated vertical plate.

Unit 5: Karman momentum and kinetic energy integral equations. The Von karman and K Pohlhausen's approximate method for boundary layer over a flat plate. Thermal energy integral equation.

BOOKS RECOMMENDED

Schlichting H.: Boundary Layer Theory, McGraw Hill.

Pai, S.I.: Viscous Flow Theory, Vol.I, Laminar Flow, D.Van Nostrand Company, New York, 1956.

Bamal, J.L.: Viscous Fluid Dynamics, Oxford and IBH, 2004.

Elective Papers Group – A (Any One)

Math-404: PROBABILITY AND STATISTICAL DISTRIBUTION-II

(Only for Non-Statistics students of B.Sc.Final)

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1 : Poisson distribution. Geometrical distribution. Negative Binomial Distribution, the Power series distribution. The properties and interrelation of these distribution.

Unit 2: Continuous distributions: Continuous uniform distribution, exponential distribution, Gamma distribution, Beta I and II kind distributions, Cauchy distribution, Normal distribution and Double exponential distribution.

Unit 3: Probability distribution of functions of random variables: Moment generating, cumulative distribution and transformation techniques to find distribution of function of random variables.

Unit 4: Truncated distributions, Compound (or composite) distributions and Sampling distributions:

Truncated distribution: Definition of Truncated distribution, Truncated Binomial, Poisson and Normal distributions.

Compound distributions: Definition, practical situation and applications of compound distributions.

Unit 5: Sampling distributions: Random sample, parameter and statistic, standard error, Sampling Distribution of sample mean \bar{x} and variance s^2 from normal population. Chi-square, t and F distributions.

Methods of estimation of parameters: Method of Maximum Likelihood, Method of Moments and Method of Least squares.

BOOKS RECOMMENDED

01. Mathematical Statistics By Parimal Mukhopadhyay (Books and Allied (P.) Ltd.,
02. An Introduction to Probability and Statistics By Vijay K. Rophtgi & A.K. Mod. Ehsanes Saleh.
03. Fundamental of Mathematical Statistics By S.C.Gupta and V.K. Kapoor (Sultan Chand & Sons).

Elective Papers Group – B (Any One)

Math-405: GENERALIZED FUNCTIONS - II

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1: Elementary solutions of differential equations with constant coefficients.

Unit 2: Fourier Transforms of generalized functions. Fourier transform of test function,

Unit 3: . Fourier transforms of generalized functions of several variables. Fourier transform and Differential Equations.

Unit 4: Generalized functions concentrated on smooth manifolds of lower dimension. Generalized functions associated with Quadratic form.

Unit 5: Generalized Homogeneous functions, Arbitrary functions raised to a power.

BOOKS RECOMMENDED

Gellifand, I.M. and Shilvo, G.C.: Generalized functions, Vol. I. Acad. Press. 1964.

Fredman, A.: Generalized Functions and Partial Differential Equations,

Prentice Hall. Inc., Englewood Cliffs, N.J., U.S.A., 1963.

Elective Papers Group – B (Any One)

Math-405: FUNDAMENTALS OF OPERATIONS RESEARCH - II

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .
Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.
Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.
Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1: Inventories: Economic lot-size model with known demand and its extension allowing backlogging of demand concept of price break, simple probabilistic models.

Unit 2: Replacement problems: Replacement of item that deteriorate, replacement of items that fail completely.

Unit 3: Replacement Problems: Group replacement policy, individual replacement policy, mortality tables, staffing problems.

Unit 4: Queing theory- Ques with Poisson input and exponential service time, the queue length, waiting time and busy period in steady state case.

Unit 5: Queing theory: Model with service in phase, multiserver queueing models.

BOOKS RECOMMENDED:

Kanti Swaroop, Gupta, Man Mohan: Operations Research, Sultan Chand and Sons.

Goel and Mittal: Operations Research, Pragati Prakashan

Mittal, K.V.: Optimizadon Methods in O.R. and S. Analysis

Sharma, S.D.: Operations Research

Loomba, N.P.: Linear Programming

Satty, T.L.: Mathematical Methods of Operations Research.

Elective Papers Group – B (Any One)

Math-405: INTEGRAL EQUATIONS AND BOUNDARY VALUE PROBLEMS - II

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1: . Fredholm integral equations with degenerate kernels.

Unit 2: Fredholm's equation as limit of a finite system of linear equations. Fredholm's two fundamental relations. Hadamard's theorem. Fredholm Fundamental theorems.

Unit 3: Green's function for Ordinary differential equation. Application of Integral transform in Boundary Value Problems. Applications of Integral Equation.

Unit 4: Some special types of integral equations. Application of Laplace Transform to determine the solution of Volterra integral equation with convolution type kernels.

Unit 5: Application of Fourier transform to determine the solutions of singular integral equations. Integro-differential equation.

Books Recommended:

W.V.Lovaitt: Linear Integral Equation, Dover Publications, 1950.

Krasnov, Kiselev and MakrankoL Problem and Exercises in Integral Equations, Translated by G. Yankovsky, Mir Publishers, Moscow, 1971.

Mikhlim, S.G.: Integral Equations, Pergamon, Oxford, 1957

Triconi, F.D.: Integral Equations, Interscience, New York, 1957.

Pundir, S.K. and Pundir, R. Integral equations and Boundary Value Problems, Pragati Prakashan, Meerut (U.P.)

Chandramouli, A.B.: Integral Equations with Boundary Value Problems, Shiksha Sahitya Prakashan, Meerut (U.P.)

Elective Papers Group – B (Any One)

Math-405: ADVANCED NUMERICAL ANALYSIS - II

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1 : Uniform minimax polynomial approximation, Chebyshev approximations, Chebyshev Expansion, Chebyshev Polynomials. Economization of Power Series.

Unit 2 : : Solution of Boundary Value Problem: Finite Difference method. Finite Difference scheme for Linear and Non-Linear Boundary Value Problems. Numerical Solution of boundary value problems of the type $y'' = f(x, y')$, $y'' = f(x, y, y')$ and $y'' = f(x, y)$.

Unit 3: Numerical Solution of Partial Differential Equations: Finite difference Approximation to partial derivatives. Numerical solution of linear Partial Differential Equations.

Unit 4: Solution of Laplace, poisson, one dimensional heat and wave equation by the method of separation of variables.

Unit 5 : ..Shooting method for numerical solution of boundary value problems.

Books Recommended:

Jain, M.K.,Iyenger, SRK, Jain R.K.: Numerical Methods for Scientists & Engineering Computations, Wiley Eastern Ltd.,

Jain, M.K. : Numerical Solution of Differential Equations, New Age International.

Shastry, S.S.: Introductory Methods of Numerical Analysis, Prentice Hall India Pvt., Ltd.,

Grewal, B.S. : Numerical Methods in Engineering & Science, Khanna Publishers.

Collatz, L.: Numerical Solution of Differential Equations, Tata McGraw-Hill.

D.S. Chouhan: Numerical Methods, JPH.

SKILL DEVELOPMENT COURSE

Sampling and Test of Significance

Types of Sampling: Random and non Random sampling.

Test of significance: Null hypothesis, Alternate hypothesis, level of significance, Degree of freedom, test calculation, critical values and conclusion.

Large sample test: Z Test, Standard error, critical values.

Small sample test: Student's t test and X^2 test.

SYLLABUS

M.Sc. MICROBIOLOGY

(Under SFS)

Under Choice Based Credit System (CBCS)

M.Sc. (PREVIOUS) EXAMINATION, 2020-21

M.Sc. (FINAL) EXAMINATION, 2021-2022



JAI NARAIN VYAS UNIVERSITY

JODHPUR

POST-GRADUATE STUDIES IN MICROBIOLOGY (2020 to 2022)

General Information for Students

Jai Narain Vyas University (erstwhile University of Jodhpur), Jodhpur (established in July, 1962), had been a residential University operating within the Municipal limits of Jodhpur city. As per notification of Govt. of Rajasthan dated September 26th, 2012 all colleges situated in Barmer, Jaisalmer, Jalore and Pali districts shall be affiliated to Jai Narain Vyas University, Jodhpur. The Department of Botany, Jai Narain Vyas University, Jodhpur was at Jaswant Campus on inception during 1948 and is now at the New Campus since 1962. The Department of Botany is situated in the New Campus of the University, near the Bhagat-ki-Kothi Railway Station along Pali Road. This Department has a strong foundation laid by the stalwarts: Prof. UN Chatterjee (Physiology), Prof. HC Arya (Tissue culture and Pathology), Prof. M.M. Bhardari (Taxonomy) Prof. Narendra Sankhla (Physiology), Prof. David N. Sen (Ecology), Prof. BD Sharma (Palaeobotany) and continuously nurtured by their disciples.

The Department of Botany imparts post-graduate education in the fields of Plant Sciences and allied subjects. This department has made impressive progress in research and teaching activities during the last 50 years. Students and Researchers work for their Ph.D. and D.Sc. degrees in the Department of Botany. About eight laboratories are actively engaged in different areas of plant research. The research and development activities attract national and international attention. Research and Development projects are funded by national and international agencies. These include, The European Economic Community, FAO, UNDP/UNIDO, US-PL-480, CSIR, UGC, DST, DBT, DRDO, DOEn, ICAR, ICFRE, CSB, Ministry of Health, State DST, etc. Since 1980 this department has been receiving grants under Special Assistance Program (SAP) of the University Grants Commission of India. UGC Sponsored SAP-DSA Phase III Program has been successfully completed and after review by the UGC team during 2014, the Department is upgraded to **Center of Advanced Study in Botany**. Since 1980 grants worth Rs. 650 lakhs have been received for development of infrastructure and for implementation of R&D Projects.

In 1983, on the recommendation of the Science Advisory Committee to the Cabinet (SACC), the University Grants Commission of India launched the COSIST (Committee on Strengthening of Infrastructure in Science and Technology). The basic objective of COSIST is to assist selected Science and Technology departments in the Indian Universities; which has already exhibited and achieved high quality performance to attain excellence in the post-graduate education and research. The department of Botany has been selected for implementation of COSIST program by the UGC from April 1999 for raising the standard of post-graduate education and research to international level. The M.Sc. (COSIST) Botany course under this new scheme was started from July 1999. With the implementation of COSIST programme, on an average six students of this Department qualify CSIR-NET examination every year. This department is selected by the Department of Science and Technology, Government of India for support under FIST (Funds for Improvement of S & T Infrastructure). FIST program-I and FIST program-II was successfully completed. DST has evaluated the Department Progress as “VERY GOOD” for both the phases and accordingly awarded FIST-III with a financial outlay of 74 lakhs for next five years 2017-22.

ACADEMIC AND RESEARCH PROGRAMMES IN PLANT SCIENCES

Under the COSIST programme, the Department of Botany offers a two years integrated program leading to Masters (M.Sc.) degree in Botany. From the academic year 2015-16, the Department offers to students Choice Based Credit System (CBCS) with semesterization of the examination pattern under COSIST programme.

Students are admitted on an all India basis. The basic specializations offered are in the areas of Stress Physiology and Biochemistry, Physiology of Plant Growth, Ecology and Environmental Biology, Plant Microbe-Interactions, Mycology and Plant Pathology, Biological Nitrogen Fixation, Molecular characterization of Bacteria/rhizobia, Bacterial genomics, Microbiology, Genetics and Plant Breeding, Plant Resources, Systematics and Biodiversity, Plant Molecular Biology, Biotechnology, Plant Prospecting and Plant genomics. The Department has facilities for advance research in major areas of plant biology leading to Ph.D. and D.Sc. degree.

FACILITIES

The Department possesses modern equipments required for teaching and research. Major equipments available in the department of Botany are:

M.Sc. Microbiology (SFS) Syllabus as approved by Department Council Meeting held on 20.9.19 (2020-2022)

- Agarose Electrophoresis System(s)
- Chlorophyll Fluorescence Meter
- Cold Room
- Computer Networking System
- Deep Freezers
- Electrophoresis Systems: 1-D and 2-D
- Electroporation cum Protoplast Fusion System
- Fluorescence Microscope
- Gel Documentation Systems
- HPLC system
- Humidifiers and Fog Systems
- Ice making machine
- Incubator(s) and Incubator Shaker
- Industrial Oven
- Laminar Air Flow Benches
- Master Thermal Cycler (PCR Machines)
- Microbial storage facility
- Micropropagation/Green House Facilities
- Microscopes with photo-micrographic and image merging facilities
- Microtome
- Millipore Water Purification System
- Nat Steel Autoclave(s)
- Osmometer
- Plant Canopy Analyzer
- Portable Photosynthetic system Li-6400
- Portable Photosynthetic Systems (CID, USA)
- Real Time-PCR
- Spectrofluorimeter-JASCO
- Steady State Porometer
- Submerged Electrophoresis System
- Super Speed Refrigerated Centrifuge
- Ultra Freezers
- UV-VIS-Spectrophotometers
- Slide/Overhead Projectors/Multimedia System/ Smart Board

In addition, there are other facilities to work with certain instruments available with U.S.I.C. The Departmental library caters to the needs of post-graduate students, research scholars and the faculty members.

GUIDELINES FOR CHOICE BASED CREDIT SYSTEM:

Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete **four skill courses:** two within the Department and two from other Department within JNV University or the Universities approved by JNV University
3. **Course:** Usually referred to, as 'papers' is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period of teaching (lecture or tutorial) or two periods of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a

semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.

12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/ December and even semester from December/January to May.

Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May. The Department shall conduct the Practical examinations of odd and even semesters as per the Panel of Examiners approved by the University. Each Board of examiners shall consist of one external Examiner from other University/Institute and another from the Department.

13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Science resolves the following:

- All internal assessments shall be open assessment system only and that are based on Quizzes, term test and seminar
- Attendance shall carry the prescribed marks in all papers and Practical examination CCA
- In each semester three out of four theoretical component University examination shall be undertaken by external examiners from outside the university conducting examination, who may be appointed by the competent authority

Grievances and Redressal Mechanism

- The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head/Principal of the College or the Chairperson of the University Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.
- The appeal will be assessed by the Chairman and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Dean, Faculty of Science comprising all HODs of the Faculty and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	'O'	Outstanding	10
2	'A+'	Excellent	9
3	'A'	Very Good	8
4	'B+'	Good	7
5	'B'	Above Average	6
6	'C'	Average	5
7	'P'	Pass	4
8	'F'	Fail	0
9	'Ab'	Absent	0

- A student obtaining Grade F in a paper shall be considered failed and will be required to reappear in the University End Semester examination.

- ii. For noncredit courses (Skill Courses) ‘Satisfactory’ or ‘Unsatisfactory’ shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

- = and > 95 % marks Grade Point 10.0
- 90 to less than 95 % marks Grade Point 9.5
- 85 to less than 90 % marks Grade Point 9.0
- 80 to less than 85 % marks Grade Point 8.5
- 75 to less than 80 % marks Grade Point 8.0
- 70 to less than 75 % marks Grade Point 7.5
- 65 to less than 70 % marks Grade Point 7.0
- 60 to less than 65 % marks Grade Point 6.5
- 55 to less than 60 % marks Grade Point 6.0
- 50 to less than 55 % marks Grade Point 5.5
- 45 to less than 50 % marks Grade Point 5.0
- 40 to less than 45 % marks Grade Point 4.5
- 35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,
i.e.

$$SGPA (S_i) = \frac{\sum (C_i \times G_i)}{\sum C_i}$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,
i.e.

$$CGPA = \frac{\sum (C_i \times S_i)}{\sum C_i}$$

Where, S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.

- iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	4	B	6	4 x 6 =24
2	Course 2	4	B+	7	4 X 7 =28
3	Course 3	4	B	6	4X 6 = 24
4	Course 4	4	O	10	4 X 10 =40
5	Course 5- Practical I	4	C	5	4 X 5 =20
6	Course 6 – Practical II	4	B	6	4 X 6 = 24
	Total	24			24+28+24+40+20+24 =160

Thus, SGPA = $160/24 = 6.67$

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	6.67	7.25	7	6.25

$$\text{CGPA} = (24 \times 6.67 + 24 \times 7.25 + 24 \times 7 + 24 \times 6.25) / 96$$

$$652.08/96 = 6.79$$

Semester-wise Theory Papers/Practical / Skill component

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Semester I							
Core course 1	MB 101	General Microbiology	4-0-0	4	30	70	100
Core course 2	MB 102	Biochemistry	4-0-0	4	30	70	100
Core course 3	MB 103	Cell Biology	4-0-0	4	30	70	100
Core course 4	MB 104	Analytical Techniques	4-0-0	4	30	70	100
Core course practical 1	MB 105	Board I consisting of first two theory papers	0-0-8	4	30	70	100
Core course practical 2	MB 106	Board II consisting of next two theory papers	0-0-8	4	30	70	100
Skill Course I	As per the list		2-0-2				
Total				24	180	420	600
Semester II							
Core course 5	MB 201	Virology	4-0-0	4	30	70	100
Core course 6	MB 202	Molecular Biology	4-0-0	4	30	70	100
Core course 7	MB 203	Enzymology	4-0-0	4	30	70	100
Core course 8	MB 204	Microbial Genetics	4-0-0	4	30	70	100
Core course practical 3	MB 205	Board I consisting of first two theory papers	0-0-8	4	30	70	100
Core course practical 4	MB 206	Board II consisting of next two theory papers	0-0-8	4	30	70	100
Skill course II	As per the list		2-0-2				
Total				24	180	420	600
Semester III							
Core course 9	MB 301	Microbial Physiology and Metabolism	4-0-0	4	30	70	100
Core course 10	MB 302	Industrial Microbiology	4-0-0	4	30	70	100

M.Sc. Microbiology (SFS) Syllabus as approved by Department Council Meeting held on 20.9.19 (2020-2022)

Core course 11	MB 303	Immunology	4-0-0	4	30	70	100
Core course 12	MB 304	Biostatistics	4-0-0	4	30	70	100
Core course practical 5	MB 305	Board I consisting of first two theory papers	0-0-8	4	30	70	100
Core course practical 6	MB 306	Board II consisting of next two elective theory papers	0-0-8	4	30	70	100
Skill course III	As per the list		2-0-2				
Total				24	180	420	600
Semester IV							
Core course 13	MB 401	Environmental Microbiology	4-0-0	4	30	70	100
Core course 14	MB 402	Food Microbiology and Toxicology	4-0-0	4	30	70	100
Core course 15	MB 403	Medical Bacteriology	4-0-0	4	30	70	100
Core course 16	MB 404	Microbial Biotechnology	4-0-0	4	30	70	100
Core course practical 7	MB 405	Board I consisting of first two theory papers	0-0-8	4	30	70	100
Core course practical 8	MB 406	Board II consisting of next two elective theory papers	0-0-8	4	30	70	100
Skill course IV	As per the list		2-0-2				
Total				24	180	420	600

*** The Department shall offer two skill courses per semester from the list of skill courses approved for the Department.**

In view of the course content, the Department of Microbiology distributed the Periods between Theory/Tutorial/Practical as under per paper

- 4 : 0 : 0 (four lectures only (no tutorial and no practical) per week) – For Theory
- 0 : 0 : 4 (no lecture, no tutorial, and four practical only per week) – For Practical per paper
- 2+0+2 (two lectures, no tutorial and two practical/field experimentations) – For Skill course

The Duration of the Period shall be forty-five minutes. In each of these combinations, the first value stands for the same number of lecture instructions per week, whereas the last two values stand for double the number of tutorial / practical instructions per week.

In each practical group the number of students that can be accommodated will be fifteen.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective) involve an evaluation system of students that has the following two components: -

- (i) **Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
 - (ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.
- (i) **Continuous Comprehensive Assessment (CCA):** This would have the following components:
 - a. **Quizzes:** Two Quiz examinations of 45 minutes duration each having a maximum of 40 marks shall be arranged for theory paper during the semester course period

M.Sc. Microbiology (SFS) Syllabus as approved by Department Council Meeting held on 20.9.19 (2020-2022)

- b. **Term Test:** One term test shall be arranged for each theory paper prior to End-Semester Examination; examination duration shall be of three hours; maximum marks shall be 70
- c. **Seminar:** Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 15. The seminar shall commence after first quiz examination and shall be completed prior to term test for all the papers.
- d. **Classroom Attendance** – Each student will have to attend a minimum of 75% Lectures / Tutorials / Practicals. A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE). Attendance shall have 15 marks and will be awarded by following the system proposed below:

Those having greater than 75% attendance (for those participating in Co-curricular activities, 25% will be added to per cent attendance) will be awarded CCA marks as follows: -

75% to 80%	=	3 marks
80% to 85%	=	6 marks
85 to 90%	=	9 marks
90% to 95%	=	12 marks
> 95%	=	15 marks

Each student’s cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Science.

Condonation of Shortage of attendance shall be governed in accordance with the provisions in the Act and Statute of the University vide Ordinance 78 to Ordinance 80 as amended from time to time

- e. CCA are based on open evaluation system without any bias to any student
- f. Any grievance received in the Department from student shall be placed before the **Grievance Redressal Committee** with adjudicated comments

Each component marks will be added without rounding and the total thus obtained is ratio by a factor of six. This value shall be rounded.

Illustration: Quiz 1 – Marks obtained = 30
 Quiz 2 – Marks obtained = 35.5
 Term Test Marks obtained = 50.5
 Seminar Marks obtained = 14
 Attendance Marks obtained = 9
 Total = 139.00
 Conversion = $139/6 = 21.16666$
 Award = 22.00

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective Department shall declare the result as “Satisfactory” or “Non-Satisfactory”; each student need to get a minimum of three “Satisfactory” declaration for the course completion

In laboratory courses (having only practical (P) component), the CCA will be based on students attendance (50%); collection of plant material (25%) and hands on Practical, records, etc. (25%)

For QUIZ (2 quizzes per semester), 40 marks per Quiz and total of 80 marks, 45 minutes duration for each quiz:

Types of question	Number of Questions	Marks per question	Total marks per type
1. Multiple choice	10	1	10
2. Fill in the blanks	10	2	20
3. Short answer (15 words)	5	2	10
Total	25		40

For the Term test and ESE:

Part A

Ten short type questions (Definitions, illustrations, functions, short explanations, etc; 25-50 words) for two marks each. $10 \times 2 = 20$ marks; two questions from each Unit; no choice in this part

Part B

Five short answer (250 words) type questions for four marks each. $5 \times 4 = 20$ marks; one question from each Unit with internal choice

Part C

Five questions of long/explanatory answer (500 words) type, one drawn from each Unit; student need to answer any three; ten marks each; $3 \times 10 = 30$ marks

20+20+30 = 70 marks

Qualifying for Next semester

1. **A student acquiring minimum of 40% in total of the CCA is eligible to join next semester.**
2. A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as 'Fail'), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.
3. A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time, i.e. three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted, for additional chances examination fee shall be on additive basis.

Improvement Option:

Every student shall have the opportunity to improve Credit thorough University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final. There shall be no improvement opportunity in Practical examinations.

Result Declaration:

The ESE (End Semester Examination/University Examination) results shall be declared within twenty days of the last examination. The Theory/ Practical Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation.

Students Failed in CCA:

Any student declared "Not Eligible" by the Department based on CCA in Semester I, II, III or IV and accordingly did not appear in ESE; can be readmitted as an additional student in that Semester in the **following year only**. Such student need to deposit the annual university fee as prescribed for that academic year.

POST -GRADUTE COURSE: A DESCRIPTION

M.Sc. Microbiology (SFS) Syllabus as approved by Department Council Meeting held on 20.9.19 (2020-2022)

The academic program at M.Sc. level is through a semester examination scheme. The course work includes lectures, seminars and laboratory works. It shall be compulsory for all students to attend at least one long distance excursion either to a hill station or to seashore or to desert area for field study and for collection of plant materials for class work in addition to 3 to 4 local excursions. For every 15 students or part thereof, one teacher shall accompany the party.

The full course is of FOUR SEMESTERS spread for TWO YEARS duration. A semester-wise list of courses to be offered is given below:

SEMESTER I

- MB 101: General Microbiology
- MB 102: Biochemistry
- MB 103: Cell Biology
- MB 104: Analytical Techniques

SC I Skill course I (for students of Microbiology Department only)

SEMESTER II

- MB 201: Virology
- MB 202: Molecular Biology
- MB 203: Enzymology
- MB 204: Microbial Genetics

SC II Skill course II (for students of other Departments)

SEMESTER III

- MB 301: Microbial Physiology and Metabolism
- MB 302: Industrial Microbiology
- MB 303: Immunology
- MB 304: Biostatistics

SC III Skill course III (for students of Microbiology Department only)

SEMESTER IV

- MB 401: Environmental Microbiology
- MB 402: Food Microbiology and Toxicology
- MB 403: Medical Bacteriology
- MB 404: Microbial Biotechnology

SC IV Skill course IV (for students of other Departments)

Skill Courses in Microbiology

- MB -SC-1 Intellectual Property Rights
- MB -SC- 2 Agrotechniques for Desert Plants
- MB -SC- 3-Data Analysis and Presentation
- MB -SC- 4-Bioinformatics
- MB -SC- 5-Micropropagation
- MB -SC- 6-Value Addition for Bioresources
- MB -SC- 7-Chromosome Analysis
- MB -SC- 8-Mushroom Cultivation
- MB -SC- 9-Molecular Techniques
- MB -SC- 10-Nutrient Management

ADMISSION

The minimum qualification for admission to M.Sc. Course is B.Sc. (10+2+3) degree with **Botany/ Biotechnology/ Zoology/Microbiology as a major subject with Chemistry as compulsory subject**. The details of eligibility conditions and admission procedure are given in the admission form. The admission will be done on the basis of merit calculated by the aggregate marks obtained at the B.Sc. level including the marks award under the category (a) and (b) mentioned in the admission form [i.e. (a) benefit to the candidates who are resident of Rajasthan, and (b) benefit for candidates of J. N. Vyas University, Jodhpur]. Reservation of Scheduled Caste/Scheduled Tribes/Disabled/OBC and Teacher candidates will be as per university rules. The candidates are required to attend minimum of a 75% of classes in both theory and practical.

TEACHING AND EXAMINATION SCHEME

Per Semester

Course	Periods/Week	Examination hours	CCA	ESE	Total
Theory Papers					
Course I	4	3	30	70	100
Course II	4	3	30	70	100
Course III	4	3	30	70	100
Course IV	4	3	30	70	100
Practical Courses					
Board I	8 per paper	6	30	70	100
Board II	8 per paper	6	30	70	100

Students are required to pass in theory and Practical Board individually in each semester.

UNIVERSITY EXAMINATION

Each course paper shall be of three hours duration.

The model examination schedule for odd semester shall be:

Day	Morning session	Next session
1	Paper I Semester I	Paper I semester II
2	Paper I Semester III	Paper I semester IV
3	Paper II Semester I	Paper II semester II
4	Paper II Semester III	Paper II semester IV
5	Paper III Semester I	Paper III semester II
6	Paper III Semester III	Paper III semester IV
7.	Paper IV Semester I	Paper IV semester II
8	Paper IV Semester III	Paper IV semester IV

The model examination schedule for Even semester shall be:

Day	Morning session	Next session
1	Paper I Semester II	Paper I semester I
2	Paper I Semester IV	Paper I semester III
3	Paper II Semester II	Paper II semester I
4	Paper II Semester IV	Paper II semester III
5	Paper III Semester II	Paper III semester I
6	Paper III Semester IV	Paper III semester III
7.	Paper IV Semester II	Paper IV semester I
8	Paper IV Semester IV	Paper IV semester III

PRACTICALS

The practical examination in M.Sc. (Prev.) and M.Sc. (Final) shall consist of Two Parts- Board I and Board II for all the four semesters

BOARD I: Maximum Marks: 100 (including 30% CCA). It includes course work of two theory papers. Duration: Six hours in a single day.

M.Sc. Microbiology (SFS) Syllabus as approved by Department Council Meeting held on 20.9.19 (2020-2022)

BOARD II: Maximum Marks: 100 (including 30% CCA). It includes course work of next two theory papers.
Duration: Six hours in a single day.

In the fourth Semester, Board II shall also evaluate the dissertation submitted by the student that is the part of Practical examination. Each student shall submit one dissertation allotted by lottery between two special papers.

Note: Number of elective to be taught from each group in a particular year shall be decided by the Department. Elective offered will be announced at the beginning of the academic session. Each student shall be assigned one Elective paper from Group ONE and the second from Group TWO. Elective papers will be allotted on merit-cum-choice basis with equal number of students in each paper.

SEMESTER I

MB 101: GENERAL MICROBIOLOGY

Unit I

Fundamental microbiology: Origin and evolution of microorganisms. Pioneers in microbiology, Branches in microbiology, different groups of microorganisms. An overview on the importance of microorganisms in plants, animal and human welfare.

Morphology and structure of bacteria - Morphological types - cell walls of Gram negative -Gram positive bacteria - cell wall, antigenic properties - capsule - cell membranes - structure -composition - properties. Structure and function of flagella - cilia - pili. Nucleoid - cell division- endospores, structure, formation and germination

Unit II

Microbiological media: Types of media- natural and synthetic; basal, defined, complex, enrichment, selective, differential, maintenance and transport media.

Isolation, cultivation and enumeration methods of microorganisms: Isolation /enumeration methods from different natural samples. Streak plate, pour plate, spread plate and hanging drop methods, Pure cultures techniques for microorganism.

Unit III

Microbial growth: Definition, Microbial growth curve, Batch culturing, Continuous, synchronous, Biphasic culturing, generation time, factors influencing the growth, physical chemical and biological, Microbial growth measurement methods.

Maintenance and preservation of microbial cultures: Short term and long term preservation methods: Repeated sub-culturing, oil overlay, sterile soil/sand, glycerol-deep freezing, drying methods, freeze-drying. Revival of bacterial cultures.

Unit III

Microbial Taxonomy: General criteria for microbial classification- Hackel's three kingdom concept - Whittaker's five kingdom concept - three domain concept of Carl Woese. General characteristics of Archaea evolutionary significance. General characteristics of Spirochetes, Rickettsias, Actinomycetes, Cyanobacteria,

Transport of nutrients in microbes- structural organization of plasma membrane in relation to transport, types and mechanisms of transport (passive, simple, facilitated, active) chemical modification methods for studying of transport, coupling of transport of ions and metabolites to ATP/proton gradient.

Unit IV

Control of Microorganism: Physical agents :Heat, radiation, pH, Surface tension, osmotic pressure, filters, Chemical agents, Acids, Bases, Alcohols, Aldehydes, Ketones, Phenols, Soaps, Antibiotics, secondary metabolites, Antiseptics

Unit V

Eukaryotic microorganisms (Fungi, Algae and Protozoan parasites):

Fungi: General characteristics structure and reproduction and importance of fungi Algae: General characteristics, structure, reproduction of algae. Economic importance of algae.

Protozoan parasites: General characteristics, morphology and structure, reproduction of pathogenic protozoan parasites *Entamoeba*, *Plasmodium*, *Leishmania*

Practicals

1. Handling of microscopes, Calibration and measurement of microscopic objects
2. Staining techniques for bacteria – simple, differential and special stainings
3. Preparation of media and reagents/stains
4. Sterilization procedures/methods
5. Isolation and cultivation of pure cultures
6. Identification methods of bacteria
7. Isolation and culturing of fungi (yeasts and molds) and algae
8. Observation of specimen and permanent slides

Suggested readings

1. Microbiology. 1999. 3rd ed. Prescott et al. Wm. C. Brown Publ.
2. Principles of Microbiology. 1997. 2nd ed. R.M. Atlas. Wm.C. Brown. Publ.
3. Foundations in Microbiology. 1996. 2nd ed. K. Talaro and A. Talaro. Wm.C. Brown Publ.
4. Microbiology. 1996. 5th ed. Pelczar et al. Tata McGraw-Hill Publ. Company Ltd.
5. General Microbiology, 1999 by S.B. Sullia, Oxford and IBH Publishers.
6. General Microbiology, 1999 by Stainer et al., Macmillan Educational Ltd.
7. Instant Notes in Microbiology. 1999. J. Nicklin et al. Viva Books Pvt. Ltd.
8. Microorganisms, Biotechnology and Disease : Students Book. 1997 by Pauline Lourie and Susanwells. Cambridge University Press.
9. Introductory Mycology. 1996. 4th ed. Alexopoulos et al., John Wiley and Sons.
10. Introductory Phycology by H.D. Kumar. 2nd ed. 1999. East-West Press.
11. Biology of the prokaryotes. 1998. By J.L. Lengeler et al., Blackwell Science Publ.
12. Microbiology, 8th Edition International Student Version Jacquelyn G. Black (Marymount University) April 2012, ©2011, Wiley publication.
13. Understanding Microbes: An Introduction to a Small World Jeremy W. Dale December 2012, Wiley-Blackwell

MB 102: BIOCHEMISTRY

Unit I

Basic Biochemistry: Bonds: ionic bonding, covalent, H-bonds, Van der Waal's interaction, Hydrophobic and hydrophilic interactions. Important biochemical reactions in metabolism (Substitution, Addition, Elimination, Rearrangement, Oxidation, Reduction, Ring closure, Transamination, Isomerisation, Epimerization, Adenylation and Phosphorylation Methylation, Hydrolysis, Dehydrase reaction, Tautomerisation). Concept of weak and strong acids and bases, pH, Henderson-Hasselbalch equation, concept of buffer, strength of buffer, range of buffer, important biological buffers. Properties of Water.

Unit II

Carbohydrate Chemistry: Mono, oligosaccharides and polysaccharides, with examples, asymmetric centre in sugars, D-series, L-series, dextro, levo-rotatory, reducing and non-reducing sugars, sugar anomers, sugar epimers, sugar derivatives such as sugar alcohols, amino sugars, sugar acids, deoxy sugars.

Unit III

Protein Chemistry: Structural features of amino acids, classification of amino acids, amino acids as buffers, chemical reactions of amino acids, peptide linkage: partial double bond nature, determination of primary structure of polypeptide (N-terminal, C-terminal determination, method of sequencing of peptides), structural classification of proteins, primary, secondary, tertiary, quaternary structures of proteins.

Unit IV

Lipid Chemistry: Classification of lipids according to chemical structure, fatty acids, saturated, unsaturated, branched, nomenclature, system structure and function of triglycerides, phospholipids, sphingolipids, terpenes, prostaglandins, waxes, steroids, detection and estimation of lipids.

M.Sc. Microbiology (SFS) Syllabus as approved by Department Council Meeting held on 20.9.19 (2020-2022)

Unit IV

Unit V

Vitamin Chemistry: Water and fat soluble vitamins: structure and function of Thiamine, Riboflavin, Nicotinic acid, Pantothenic acid, Pyridoxine, Biotin, Folic acid, Lipoic acid, Cyanocobalamin, Ascorbic acid. Structure and function of fat soluble vitamins as vitamins A, D, E and K, Cofactors.

Practicals

1. Preparation of buffers and adjustment of pH
2. Qualitative tests for carbohydrates and analysis of unknowns
3. Qualitative tests for amino acids and analysis of unknowns
4. Quantitative estimation of inorganic and organic phosphate
5. Tests for lipids (qualitative)
6. Quantitative estimation of glucose and fructose
7. Determination of saponification value and iodine number of fats

Suggested readings

1. Biochemistry by Lehninger
2. Outlines of Biochemistry by Cohn and Stumph
3. Biochemistry of Nucleic acids by Davidson
4. Biological Chemistry by Muller and Cards
5. Biochemistry by White, Handler and Smith
6. Methods in Enzymology series
7. The Cell – Bratchand Mirsky series
8. Biochemistry lab manual by Jayaraman
9. Voet D., Voet J.G, Biochemistry 4th Edition., John Wiley and Sons, 2011.
10. Nelson, D. C. and Cox, M.M., Lehninger Principles of Biochemistry, 5th Edition, W. H. Freeman, 2010.
11. Berg J.M., Tymoczko J.L. and Stryer L., Biochemistry. 7th edition, W.H. Freeman and Co. New York, 2011.

MB 103: Cell Biology

Unit I

Basic concept of cell and cell theory. Biomembranes: Membrane structure, molecular composition, organization and synthesis, membrane transport and transporters, Fick's law, artificial membrane and transport studies. Cytoskeleton: Microfilaments, intermediate filaments and microtubules – structure and dynamics. Microtubules and mitosis; cell movements. Intracellular transport and the role of kinesin and dynein.

Unit II

Cell wall of bacteria and fungi: Definition, important chemical features of the cell wall, structure, function and assembly in bacteria and archae, typical model of cell wall of bacteria and archae, chemical differentiation of fungal cell wall.

Unit III

Nucleus, nuclear envelope, nuclear pore complex, nucleolus, mitochondria, plastids, organellar genome: organization and function, ER, Golgi bodies, peroxisomes, glyoxysomes, ribosomes, vacuoles.

Unit IV

Intracellular Protein Traffic: Protein sorting and vesicle traffic, concept of signal peptides, transport of soluble and membrane bound protein in ER, ER chaperone proteins and their functions, targeting to nucleus. Cell Signaling: Cell surface receptors; second messenger system; MAP kinase pathways. Signaling from plasma membrane to nucleus. Quorum sensing.

Unit V

Cell Cycle and Cell Division: Cell cycle, role of cyclins and cyclin dependent kinases, regulation of Cdk – Cyclin activity, mitosis and meiosis, induction of cancer with respect to cell cycle.

Practicals

1. Cytochemical staining of cell wall constituents
2. Study of mitosis
3. Study of meiosis
4. Study of morphology of bacteria, phytoplasm and cyanobacteria

Suggested readings

1. Pollard, T. D., and Earnshaw, W. C., Cell Biology, 2nd Edition, Saunders Elsevier, 2008.
2. Gerald K., Cell and Molecular Biology, Concept and Experiment, 5th Edition, Wiley, 2007.
3. Lodish, H., Berk A., Kaiser C. A., Krieger M., Scott M.P., Bretscher A., Ploegh H., and Matsudaira P., Molecular Cell Biology, 6th Edition, Freeman, W. H. and Co., 2008.
4. Roberts, K., Lewis J., Alberts B., Walter P., Johnson A., and Raff. M., Molecular Biology of the Cell, 5th Edition, Garland Publishing Inc., 2008.
5. James Darnell, Molecular Cell Biology, 6th Edition, W. H. Freeman & Co, 2007.

MB 104: Analytical techniques

Unit I

Laboratory Instruments: Theory, Principle, Working and applications of: pH meter, Laminar air flow, Centrifuge machine types and Centrifugation: Differential, Rate Zonal, Isopycnic, Density gradient, Rotor types and Ultra centrifugation. Phase Contrast Microscope; Fluorescent Microscope; Scanning and Transmission Electron Microscopy. Cytophotometry and flow cytometry.

Unit II

Chromatography Techniques: Theory, Principle and Applications of Paper Chromatography, TLC, HPTLC, Gel Filtration Chromatography, Ion Exchange Chromatography, Affinity Chromatography, Gas Chromatography, and HPLC.

Unit III

Electrophoretic Techniques: Theory, Principle and Applications of Paper Electrophoresis, Poly Acrylamide Gel Electrophoresis (PAGE), Agarose Gel Electrophoresis. Principle and Applications of: Iso-electric Focusing, Immuno Electrophoresis, Enzyme-Linked Immunosorbant Assay (ELISA), Southern, Northern and Western Blotting.

Unit IV

Radio-isotopic Techniques : Introduction to Radioisotopes and their Biological Applications, Radioactive Decay–Types and Measurement, Principles and Applications of GM (Geiger Muller) Counter, Solid and Liquid Scintillation Counter, Autoradiography, Radioimmunoassay (RIA), Radiation Dosimeters.

Unit V

Methods of sterilization: Physical methods – Dry heat, moist heat, radiation methods, filtration methods, chemical methods and their application. Concept of containment facility, sterilization at industrial level.

Microbial cultures: Concept of pure culture, Methods of pure culture isolation, Enrichment culturing techniques, single cell isolation and pure culture development.

Preservation and Maintenance of Microbial Cultures: Repeated subculturing, preservation at low temperature, sterile soil preservation, mineral oil preservation, deep freezing and liquid nitrogen preservation, freeze-drying (lyophilization). Advantages and disadvantages of each method.

Practicals

1. Biochemistry calculations and statistics
2. Differential centrifugation
3. Paper chromatography: sugars
4. Dialysis
5. Demonstration of Gel filtration technique
6. Demonstration of electrophoresis
7. Partial purification of enzymes (β -amylase, urease and catalase, alkaline phosphatase)

M.Sc. Microbiology (SFS) Syllabus as approved by Department Council Meeting held on 20.9.19 (2020-2022)

8. Effect of substrate concentration, pH, time and temperature on enzyme activity
9. Calculation of Km for partially purified enzyme
10. Study for inhibition of enzyme activity

Suggested readings

1. Biochemistry. 6th Edition by Berg, J. M., Tymoczko, J. L. and Stryer, L. (2006). Freeman, New York.
2. Biophysics: An Introduction by Cotterill, R. M. J. (2002). John Wiley & Sons, England.
3. Principles of protein X-ray crystallography by Drenth, J. (2007). 3rd Ed. Springer, Germany.
4. Biochemistry. 3rd edition by Garrett, R. H. and Grisham, C. M. (2004). Brooks/Cole, Publishing Company, California.
5. Understanding NMR Spectroscopy by Keeler, J. (2002). John Wiley & Sons, England.
6. Bioinformatics: sequence and genome analysis by Mount, D. W. (2001). Cold Spring Harbor Laboratory Press, New York.
7. Methods in Modern Biophysics. Second Edition by Nölting, B. (2006). Springer, Germany.
8. Biophysics by Pattabhi, V. and Gautham, N. (2002). Kluwer Academic Publishers, New York and Narosa Publishing House, Delhi.
9. Principles and Techniques of Biochemistry and Molecular Biology by Wilson Keith and Walker John (2005), 6th Ed. Cambridge University Press, New York.
10. Proteins NMR Spectroscopy: Principles and Practice by Cavanagh John et.al. (1995), Academic Press
11. Molecular Biophysics: Structures in Motion by Daune M. and W. J. Duffin (1999), Oxford University Press.
12. Methods in Modern Biophysics by Nalting B. and B. Nalting (2003) Springer Verlag
13. Computational Analysis of Biochemical Systems by Voit E. O. (2000) Cambridge University Press.
14. Physical Biochemistry: Applications to Biochemistry and Molecular Biology by Freilder, D. Freeman, San. Francisco, 1976
15. Biochemical Techniques: Theory and Practice by Robyt, John F.; White, Bernard J. Waveland Press, Inc., U.S.A. Published: 1990.
16. Principles of Instrumental Analysis by Douglas A. Skoog, F. James Holler, Timothy A. Nieman: (Saunders Golden Sunburst Series) published by Wadsworth Pub Co. 2007
17. Biophysical chemistry. Principles and techniques by Upadhyay A, Upadhyay K, Nath N.: Himalaya Publishing House, Mumbai. 1997.
18. Introduction to Radiological Physics and Radiation Dosimetry by Attix, F.H., Wiley, New York (1986).
19. An Introduction to Centrifugation, by TC. Ford and J.M. Graham (1991). 118 pages. BIOS Scientific Publishers, Ltd. ISBN 1 872748 40 6
20. Biological Centrifugation by D. Rickwood, J.M. Graham (2001), Springer Verlag; ISBN: 0387915761
21. Paper Electrophoresis as a Quantitative Method for serum proteins by W. P. Jencks, Mera r. Jetton and E. L. Durrum. Biochemistry (Journal) 1955 Vol:60pp 205-215
22. Electrophoresis of proteins on filter paper by Henry G. Kunkel and Arne Tiselius. The Journ. of Gen. Physiol. (1951) pp 89-118.
23. Brocks Biology of Microorganisms (Eleventh Edition) by Michael T. Madigan, John M. Martinko (2006), Pearson Prentice Hall.
24. Christian, G. D., Analytical Chemistry, John Wiley & Sons (Asia) Pvt. Ltd., 2004.
25. Ahuja, S. and Jespersen, N. (Editors), Comprehensive Analytical Chemistry: Modern Instrumental Analysis, Vol 47, Elsevier Science, New York, 2006.
26. Van Holde, K. E., Principles of Physical Biochemistry, 2nd edition, Prentice Hall, 2006.
27. Wilson, K. and Walker, J., Principles and Techniques of Practical Biochemistry and Molecular Biology, 7th Edition, Cambridge Univ. Press, 2010.
28. David Freifelder, Physical Biochemistry, 2nd edition, John Wiley and Sons 2005.

SEMESTER II

MB 201: Virology

Unit I

History: Discovery of viruses and development of Virology (contributions of pioneers). Nature, origin and evolution of viruses.

Properties of viruses : Physical- morphology and structure, sedimentation, electrophoretic mobility, buoyant density. Biochemical - chemical composition, nucleic acids, proteins, enzymes, lipids, carbohydrates,

M.Sc. Microbiology (SFS) Syllabus as approved by Department Council Meeting held on 20.9.19 (2020-2022)

polyamines, cations. Antigenic nature of viruses. Biological- host range, transmission (vector and non-vector), virus stability.

Nomenclature and classification of viruses: Criteria used for naming and classification. Current ICTV classification of viruses of bacteria, plants and animals and humans.

Unit II

Isolation, cultivation, assay and maintenance of bacterial, plant and animal viruses :

Experimental plants and tissue cultures. Experimental animals, embryonated eggs, organocultures, primary and secondary cell cultures, suspension and monolayer cell cultures, cell strains, cell lines.

Purification of viruses: Need for virus purification. Extraction of viruses from tissues, clarification, concentration of viruses in clarified extracts by physical and chemical methods, further purification of viruses by rate zonal / equilibrium density gradient centrifugation. Criteria of virus purity. Quantitation and preservation of purified virus preparations.

Unit III

Quantitation of viruses: Infectivity assay methods (plaque, pock, end point, local / systemic assay of plant viruses), physical (EM), serological (HA, HI, immunofluorescence, ELISA) and chemical (viral protein and nucleic acid based) approaches.

Unit IV

Major characteristics of the following virus families / genera / groups :

Adenoviridae, Bromoviridae, Bunyaviridae, Caulimoviridae, Flaviviridae, Geminiviridae, Hepadnaviridae, Herpesviridae, Orthomyxoviridae, Paramyxoviridae, Parvoviridae, Picornaviridae, Potyviridae, Poxviridae, Reoviridae, Retroviridae, Rhabdoviridae, Tobamovirus,

Insect Viruses: Biology of major RNA and DNA viruses of insects

Unit V

Bacteriophages: Biology of major RNA (MS2, Q β , ϕ 6) and DNA (T-even and T-odd, lambda, Mu, ϕ x174, M13) bacteriophages. Biology of Cyanophages.

Algal and fungal viruses : Biology of viruses of Phycodnaviridae, Partitiviridae and Totiviridae.

Biology of sub-viral agents: Satellite viruses, sat-RNAs, viroids virusoids and prions. Concept of molecular parasitism.

Importance of viruses in human welfare with suitable examples.

Practicals

1. Isolation of phage from soil/sewage.
2. Cultivation and preservation of phages
3. Quantization of phages
4. Plaque neutralization
5. Growth phages of phage and burst size
6. Isolation of plaque type and host range mutants
7. Phage induction
8. Lysogeny-Transduction
9. Cultivation of animal viruses in egg allantoic, amniotic and CAM
10. Demonstration of cytopathological changes (slides/pictures)
11. Symptomatic observations of plant viral infections

Suggested Readings

1. Virology: Principles and Applications: John B Carter Reviews, John Wiley & Sons, Limited, 2013
2. Virology : 1994. 3rd ed. Frankel-Conrat et al, Prentice- Hall.
3. Principles of Virology : 2000. by S.J. Flint et al., ASM Press.
4. Introduction to Modern Virology. 2001. 5th ed. Dimmock et al., Blackwell Sci. Publ.
5. Principles of Molecular Virology. 1997. 2nd ed. A. Cann. Academic Press.
6. Basic Virology, 1999. By Waginer and Hewelett, Black Well Science Publ.
7. Medical Virology. 1994. 4thedition. D.O. White and F.J. Fenner. Academic Press. Plant Virology. 2001. 4thedi. By R. Hull. Academic Press.
8. Fundamental Virology, 4th ed. 2001. D.M. Knipe and P.M. Howley.
9. Veterinary Virology. 3rd ed. 1999. Murphy et al., Academic Press.

MB 202: Molecular Biology

Unit I

Structure of DNA and RNA- Physical Properties of DNA- Cot Plot, Kinetic and Chemical Complexity, Satellite DNA. Inverted Repeat Sequences, Highly Repetitive and Middle Repetitive Sequences. Organization of the Chromosome, Structure of Chromatin - Nucleosomes, Chromatin Domains and Isochores, Structure and Functional Organization of Centromeres and Telomeres.

Unit II

DNA Replication- Prokaryotic DNA Polymerase I, II and III, Eukaryotic DNA Polymerases, Fidelity and Catalytic Efficiency of DNA Polymerases, Okazaki Fragments, Replication Origin, Primosomes, Concurrent Replication Mechanism Involving Leading and Lagging Strands of DNA; Problems associated with linear replicons. Molecular basis of Recombination, Mutations and Repair.

Unit III

Transcription- Prokaryotic RNA polymerase and sigma factors, Prokaryotic and eukaryotic promoters, Eukaryotic RNA Polymerases, Class I, II and III gene promoters, Enhancers and control regions of genes; Mechanism of transcription - Prokaryotic and eukaryotic, Transcription of protein coding genes. Chromatin structure and remodeling, Histone code and histone modifications.

RNA Processing- Processing, Capping, Polyadenylation, Splicing. Processing of Poly A- mRNA, Group I and II Introns, Alternate Splicing, RNA editing. Non-coding RNAs.

Unit IV

Translation- Genetic Code, Ribosome Structure, tRNAs, Aminoacyl tRNA synthetase, Initiation, Elongation, Termination; Translational Control.

Unit V

Regulation of Gene Expression: Prokaryotes- Operon Concept, Positive and Negative Regulation, Attenuation, Catabolite Repression, Riboswitches. Eukaryotes - Generalized and specialized transcription factors, Transcriptional Activators and regulators.

Practicals

1. Isolation of genomic DNA from E.coli and Yeast.
2. Estimation of DNA, RNA and Protein (colorimetry)
3. Determination of molecular weight of DNA, resolved on agarose gel electrophoresis
4. Induction of enzymes – Lac operon
5. Determination of molecular weight of protein by PAGE
6. Induction of mutations by physical/chemical mutagens, screening and isolation of mutants,
7. Replica plating technique
8. Transformation in bacteria
9. Conjugation in bacteria
10. Protoplast preparation, Fusion and regeneration

Suggested readings

1. Jocelyn E. Krebs, Elliott S. Goldstein and Stephen T. Kilpatrick, Lewins Genes X, 9th Edition, Jones and Barlett Pub., USA, 2011.
2. Watson, J. D. Tania A. Baker, Stephen P. Bell, Alexander Gann, Michael Levine, Richard Losick, Molecular Biology of the Gene, Benjamin Cummings; 6th Edition, 2007.
3. Robert F. Weaver. Molecular Biology, 4th Edition, McGraw-Hill.
4. Molecular biology by Robert Weiver
5. Molecular biology by David and Freifelder
6. Microbial genetics by David and Freifelder
7. Genetics of bacteria and their viruses by William Hayes
8. Molecular biology of thee gene by Watson et al
9. The Lehninger Biochemistry
10. Molecular biotechnology by Primerose
11. Molecular Biotechnology by Bernard R. Glick and Jack J Pasternak
12. Molecular Genetics of Bacteria by Larry Snyder and Wendy Champness

M.Sc. Microbiology (SFS) Syllabus as approved by Department Council Meeting held on 20.9.19 (2020-2022)

MB 203: Enzymology

Unit I

Extraction and Purification of Microbial Enzyme. Importance of enzyme purification, different sources of enzyme. Extracellular and Intracellular enzyme. Physical and chemical methods used for cell disintegration, enzyme fractionation by precipitation (using temperature, salt, solvent, pH etc.), liquid-liquid extraction, ionic exchange, gel electrophoresis, affinity chromatography and other special purification methods. Enzyme crystallization technique. Criteria of purity of enzyme. Pitfalls in working with pure enzyme.

Unit II

Enzyme Kinetics and Enzyme Inhibition. Enzyme kinetics- Steady state kinetics, Briggs Haldane equation, Michaelis Menten equation, Irreversible, Reversible, competitive, Noncompetitive and Uncompetitive Inhibition with suitable examples and their kinetics studies. Allosteric regulation, types of allosteric regulation and their significance in metabolic regulation and their kinetics study (Hills equation).

Unit III

Immobilization of Microbial enzymes. Methods viz. adsorption, covalent bonding, entrapment and membrane confinement, Analytical, therapeutic and industrial application. Properties of Immobilization enzyme.

Unit IV

Enzyme as a biocatalyst and Enzyme Engineering ;Structure of active sites, Role of Ionizable group in catalysts, study on vitamins and coenzymes:- Structure and functions with suitable examples. Metallo enzymes and metal ions as co-factors and enzyme activators. Chemical modification and site directed mutagenesis to study structure –function relationship of industrially important enzyme.

Unit V

Application of Microbial enzymes. Microbial enzymes in textiles, leather, wood industries and detergent. Enzymes in clinical diagnosis. Enzyme sensors for clinical processes and environment analysis. Enzymes as therapeutic agents. Extremozymes, Solventogenic enzymes.

Practicals

1. Purification of enzyme from natural source
2. Isolation of Enzymes such as alkaline phosphatase from plant tissue
3. Enzymatic Assays (Amylase): Determination of optimum pH
4. Determination of K_m & V_{max}
5. Effect of temperature and substrate concentration
6. Effect of inhibitors

Suggested readings

1. P. F. Cook and W. W. Cleland, Enzyme Kinetics and Mechanism. 3rd Edition, Garland Science, 2007.
2. A. Carnish Bowden, Fundamental of Enzyme Kinetics, 3rd Edition, Portland Press, 2004.
3. Price, N. C. & L. Stevens, Fundamentals of Enzymology, 3rd Edition., Oxford University Press, 1999.
4. Berg Jeremy, Tymoczko John, Stryer Lubert (2001) *Biochemistry* 4th Ed, W. H. Freeman, New York.
5. Conn Eric, Stumpf Paul K., Bruening George, Doi Roy H., (1987) *Outlines of Biochemistry* 5th Ed., John Wiley and Sons, New Delhi.
6. Dawes Edwin A. (1972) *Quantitative Problems in Biochemistry*, Churchill Livingstone, Edinburgh.
7. Hall D. D. & Rao K. K. (1996) *Photosynthesis* 5th Ed., Cambridge University Press.
8. Mandelstam Joel and McQuillen Kenneth (1976) *Biochemistry of Bacterial Growth*, Blackwell Scientific Publication London.
9. Metzler David (2001) *Biochemistry: The chemical Reactions of Living Cells*, Vol 1&2, Academic Press California.
10. Moat Albert G. & Foster John W. (1988) *Microbial Physiology* 2nd Ed. John Wiley and Sons New York.
11. Nelson D. L. & Cox M. M. (2005) *Lehninger's Principles of Biochemistry*, 4th edition, W. H. Freeman & Co. NY
12. Palmer Trevor (2001) *Enzymes: Biochemistry, Biotechnology & Clinical chemistry*, Horwood Pub. Co., England.
13. Segel Irvin H. (1997) *Biochemical Calculations* 2nd Ed., John Wiley and Sons, New York.

M.Sc. Microbiology (SFS) Syllabus as approved by Department Council Meeting held on 20.9.19 (2020-2022)

14. Voet Donald & Voet Judith G. (1995) *Biochemistry*, 2nd Ed.. John Wiley & sons New York.
15. White Abraham, Handler Philip, Smith Emil, Hill Rober, Lehman J. (1983) *Principles of Biochemistry*, Edn 6, Tata Mc-Graw Hill Companies, Inc.
16. White David (2000) *Physiology and Biochemistry of Prokaryotes*. 2nd Ed. Oxford University Press, NY.
17. Zubay Geoffrey (1998) *Biochemistry*, 4th Ed., W.C. Brown, New York.

MB 204: Microbial genetics

Unit I

Genes and Chromosomes- Introduction and scope of genetics; DNA as genetic material; Structure of nucleic acids; Basic principles of Mendelian genetics- Segregation and Independent assortment, alleles and multiple alleles; human pedigrees and inheritance;

Unit II

Cell division - Mitosis and meiosis, cell cycle; Chromosomal basis of inheritance; Gene interactions; Chromosome and its structure; sex determination and sex-linked inheritance; Dosage compensation.

Unit III

Linkage analysis and gene mapping in eukaryotes- Molecular markers; Fine structure of the gene and gene concept

Extra chromosomal inheritance - mitochondrial and chloroplast inheritance

Bacterial genetics - Conjugation, transduction and transformation; Plasmids; Transposable elements - transposons and retrotransposons; Genome organization.

Unit IV

Mutations - Spontaneous and induced; Mechanisms of mutagenesis; Assay of mutagenic agents (Ames test); Chromosomal mutations - numerical (trisomy, polyploidy and aneuploidy) and structural changes and detection methods.

Unit V

Mechanism of chromosome mutations; genetic and cytological features of deletions, duplications, inversions, translocations; somatic and germ line mutations.

Population genetics - Hardy-Weinberg equilibrium; Calculation of allele frequency; Molecular Evolution - evolutionary changes of nucleotide sequences and DNA polymorphism; Genes in early development; Maternal effect genes; Pattern formation genes; Homeotic genes.

Practicals

1. Isolation of genomic DNA from E.coli and Yeast.
2. Estimation of DNA, RNA and Protein (colorimetry)
3. Determination of molecular weight of DNA, resolved on agarose gel electrophoresis
4. Induction of enzymes – Lac operon
5. Determination of molecular weight of protein by PAGE
6. Induction of mutations by physical/chemical mutagens, screening and isolation of mutants,
7. Replica plating technique
8. Transformation in bacteria
9. Conjugation in bacteria
10. Protoplast preparation, Fusion and regeneration

Suggested readings

1. Anthony J.F. Griffiths, Susan R. Wessler, Sean B. Carroll, John Doebley , Introduction to Genetic Analysis, 10th edition, W. H. Freeman and Co. Ltd., 2012.
2. Snustad, D.R. and Simmons, M.J., Principles of Genetics, 5th edition by, John Wiley and Sons, 2010.
3. William S. Klug, Michael R. Cummings, Charlotte A. Spencer and Michael A. Palladino, Concepts of Genetics, 9th Edition, Benjamin-Cummings Pub Co. 2008.
4. Molecular biology by Robert Weiver
5. Molbio By Upadyaya

M.Sc. Microbiology (SFS) Syllabus as approved by Department Council Meeting held on 20.9.19 (2020-2022)

6. Molecular biology by David and Freifelder
7. Microbial genetics by David and Freifelder
8. Genetics of bacteria and their viruses by William Hayes
9. Molecular biology of the gene by Watson et al
10. The Lehninger Biochemistry
11. Molecular biotechnology by Primerose
12. Molecular Biotechnology by Bernard R. Glick and Jack J Pasternak
13. Molecular Genetics of Bacteria by Larry Snyder and Wendy Champness

Semester III

MB 301: Microbial physiology and metabolism

Unit I

Microbial nutrition – Elemental nutrient requirements of microbes, nutritional groups of bacteria. The autotrophy – Photoautotrophy and bacterial photosynthesis. Chemoautotrophy and autotrophic metabolism. Concept of heterotrophy – Photoheterotrophy and chemoheterotrophy. Heterotrophic metabolism in bacteria..

Unit II

Microbiological media and cultivation of microorganisms - Autotrophic media, defined synthetic mineral media, heterotrophic media. The concept of prototrophs and auxotrophs, prototrophic (minimal) media (defined media), complex media (undefined media), Basal medium, enriched media, enrichment media, selective media, biochemical media differential media, maintenance media, transport media. Media for cultivation of fungi, and algae

Cultivation methods of bacteria, slant culturing, stab culturing, agar plate culturing, rolled tube/bottle culturing, tube cultures, flask culturing.

Aerobic culturing methods, anaerobic culturing methods Environmental requirements of growth.

Unit III

Microbial growth: The concept of growth and definition, formation of protoplasm, building of macromolecules from elemental nutrients, supramolecules, organelles of cell and cellular components.

Growth phases of bacteria – Lag phase, exponential (logarithmic) phase, stationary (ideo) phase, decline and survival of microbial cells. Importance of each growth phase.

Synchronous cultures – methods of synchronous culturing, Continuous culturing methods, factors effecting growth. Methods of growth measurement.

Unit IV

Bacterial Photosynthesis; Photosynthetic microorganisms, photosynthetic pigments and generation of reducing power by cyclic and non cyclic photophosphorylation, electron transport chain in photosynthetic Bacteria.

Unit V

Bacterial respiration; Bacterial aerobic respiration, components of electron transport chain free energy changes and electron transport, Oxidative phosphorylation and theories of ATP formation, inhibition of electron transport chain. Electron transport chain in some heterotrophic and chemolithotrophic bacteria. Bacterial anaerobes respiration: Introduction. Nitrate, carbonate and sulfate as electron acceptors. Electron transport chain in some anaerobic bacteria. Catalase, super oxide dismutase, mechanism of oxygen toxicity.

Practicals

1. Preparation of microbiological media. Autotrophic media, minimal media, basic media, enriched media, enrichment media, differential media.
2. Isolation and cultivation of autotrophic microbes
3. Culturing methods of microbes – slant and stab cultures, tube culture, flask cultures, shake flask cultures
4. Anaerobic culturing methods – anaerobic jar and its use, pyrogallol method, thioglycollate media culturing, anaerobic glove box and its application
5. Microbial growth experiments – Viable count of growing cultures and generation time determination
6. Determination of microbial growth by turbidometric methods
7. Study of bacterial growth curve
8. Factors effecting the microbial growth
9. Study of microbial respiration

M.Sc. Microbiology (SFS) Syllabus as approved by Department Council Meeting held on 20.9.19 (2020-2022)

Suggested readings

1. Text book of Microbiology by M. Burrows; General Microbiology by Stainier, Deudroff and Adelberg;
2. Review of medical microbiology by Jawitz, melnick and Adelberg; Bacterial and Mycotic infections of man. Ed. Dubos and Hirst Lipincott; Principles of Microbiology and Immunology by Davis,
3. Dulbecco ,Eison, Ginsberg and Wood.; Text book of Microbiology by Ananthanarayanan;
4. Microbiology by Pelczar M.J., Ried, RD and Chan, ECS.
5. Microbial Physiology by Moat, ; Brock's Biology of microorganisms by Madigan, MT et al
6. Biochemistry of bacterial growth by Mandelstum, Mc Quillon and Dawes; Bacterial Metabolism by Dwellely
7. Photosynthesis by Dewlin and Barker; Laboratory Experiments in Microbiology by Gopal Reddy
8. Microbes in Action by Seoley HW and Van-Demark, PJ
9. Biochemistry by Lehninger
10. Outlines of Biochemistry by Cohn and Stumph
11. Biochemistry of Nucleic acids by Davidson
12. Biological Chemistry by Mullar and Cards
13. Biochemistry by White, Handler and Smith
14. Methods in Enzymology series
15. The Cell – Bratchamd Mirsky series
16. Laboratory experiments in Microbiology by Gopal Reddy et al
17. Biochemistry lab manual by Jayaraman

MB 302: Industrial microbiology

Unit I

Introduction to fermentation processes, history of fermentation process.

Bioreactors: Design and components- vessel materials, baffles, impellers, inoculation and sampling devices, biosensorsetc., biohazard and containment. Types of bioreactors: airlift, fluidized bed, micro carrier, photo bioreactor, stirred bioreactor. Immobilization of cells and its industrial application (Pharmaceutical, food and chemical industries).

Unit II

Isolation, selection, screening, preservation and maintenance of industrially important microorganisms. Types of fermentation processes with kinetics: Batch, continuous and fed batch. Downstream processing: foam separation, cell disruption, industrial scale centrifugation, liquid-liquid extraction, solvent recovery, chromatography, two phase aqueous extraction, drying and crystallization.

Unit III

Food & Dairy Fermentations ; Starter cultures & biochemical activities production and preservation of 1) Soy Sauce 2) Saurkraut 3) Sausages 4) Vinegar 5) Beer 6) Wine 7) Cheese 8) Fermented milk products. 9) Tea and coffee 10) Pickles 11) Indian fermented foods.

Unit IV

Quality Assurance in foods ; Quality assurance: Microbiological quality standards of food Government regulatory practices and policies. FDA, EPA, HACCP, ISI. Food borne infections and intoxications: Bacterial with type of infection and toxicity- 1) Clostridium 2) Salmonella 3) Shigella,4) Staphylococcus 5) Campylobacter 6) Listeria -Mycotoxin- Rubratoxin and Alfa Toxins - Phycotoxins in foods.

Unit V

Food Preservation & Advanced Food Microbiology ; Radiations- UV, Gamma & Microwave. -Temperature - Chemical and naturally occurring antimicrobials. -Biosensors in food -Microbial enzymes in food & dairy industry (Proteases, Lipases, Amylases, Pectinase) -Probiotics and their applications, genetically modified foods -Mushroom and spirulina -Utilization of Byproduct .1) Dairy Industry - Whey 2) Sugar Industry - Molasses.

Practicals

1. Screening for amylase producing organisms
2. Screening for organic acid producing microorganisms
3. Isolation of antibiotic producing microorganisms by crowded plate technique
4. Isolation and culturing of yeasts

M.Sc. Microbiology (SFS) Syllabus as approved by Department Council Meeting held on 20.9.19 (2020-2022)

5. Separation of amino acids by chromatography
6. Estimation of glucose by DNS method
7. Estimation of ethanol by dichromate method
8. Estimation of maltose
9. Immobilization of microbial cells by entrapment method

Suggested readings

1. Industrial Microbiology by Casida, LE
2. Industrial Microbiology by Patel, AH
3. Industrial Microbiology by Miller, BM and Litsky
4. Industrial Microbiology by Prescott and Dunn
5. Microbial Technology by Pepler, JH and Perlman, D.
6. Biochemistry of Industrial Microorganisms, by Rainbow and Rose
7. Economic Microbiology by Rose Vol I – V
8. Microbial Enzymes and Biotechnology by Fogarty WM and Kelly, CT
9. Comprehensive Biotechnology, All volumes Ed. Murray Moo-Yong
10. Biotechnology (A text book of industrial Microbiology) Ed. Cruger&Cruger
11. Advances in Applied Microbiology Ed. Perlman Series of volumes

MB 303: Immunology

Unit I

Introduction to Immunology -History of Development of Immunological Ideas: From Classical observations of Edward Jenner and Louis Pasteur to present day Immunology, Evolution of the Immune system: From invertebrates to vertebrates, The Cellular and humoral basis of immune response, Clonal selection and expansion of antigen specific cells, Principle of Innate and adaptive Immunity, Other cells and molecules involved in the Immune response, Lymphoid Organs and Cellular Traffic.

Unit II

Innate Immunity- The front line of defense against pathogens, Recognition of Pathogen associated molecular patterns by Toll like receptors, Discovery of Toll like receptors from drosophila to human, Innate Immune system of worms, flies, plants and vertebrates. The nature of Toll like receptors, Signalling through Toll like receptors, Cells and molecules involved in mounting innate Immunity, The Complement system as a part of the Innate Immunity.

Antigens - Antigen recognition by B and T cell receptors, Nature of the antigen molecule Antigenicity, Immunogenicity, haptens, B cell and T cell epitopes, Adjuvants and routes of Immunization, Clonal expansion of B and T cells in response to antigen, T independent and dependent antigen.

Unit III

Antibody molecule-The antibody molecule on B cell surface and its structure and function, Generation of diversity in Immunoglobulin, Isotypes, Allotypes and Idiotypes. Isotype switch and affinity maturation, Monoclonal antibodies, their generation and use in diagnosis and therapy, Engineering antibody molecules for better applications.

MHC molecules - MHC molecules, their structure and role in antigen presentation to T cells, Antigen processing and presentation, Non-classical MHC molecules, MHC molecules and disease susceptibility, Superantigens.

Unit IV

Development and Survival of B and T cells - Generation of B and T cells in the bone marrow and thymus, Rearrangement of antigen specific receptor gene segments and control of lymphocyte development, Signaling through antigen specific receptors, Other signaling pathways, Maturation of T and B cells, their migration to lymphoid organs, their spatial distribution and survival in the lymphoid organ.

T cell Immunity - Antigen recognition by T cells, The antigen receptors on T cell surface, T cell receptor gene rearrangement, Antigen presentation and the role of macrophages, dendritic cells and cell surface as well as soluble mediators in activation of T cells, Activation of non classical T cells.

Soluble Mediators - Chemokines, Cytokines, Lipid mediators.

Unit V

Allergy and Hypersensitivity Reactions - Allergens, sensitization and production of IgE. Effect or mechanisms in allergic reactions, Types of Hypersensitivity reactions and diseases arising out of them.

M.Sc. Microbiology (SFS) Syllabus as approved by Department Council Meeting held on 20.9.19 (2020-2022)

Practicals

1. Agglutination reactions – Widal, VDRL, HA, Blood typing – tube method
2. Precipitation test: Ring interphase, single radial diffusion, Ouchterlony,
3. immunoelectrophoresis
4. Neutralization test – Plaque neutralization, HAI, Haeme adsorption test
5. Separation of serum, WBC, RBC, Plasma, CBP and differential blood picture.
6. Separation of serum proteins
7. Blot transfer and detection of protein on blot by staining
8. ELISA
9. Indirect agglutination (a) Hepatitis (b) Pregnancy hCG Ag

Suggested readings

1. Immunology by Herman N. Eosen
2. Test book of Immunology by Barret
3. Molecular basis of immunology by Constantin Bena
4. Immunology – The science of self-non self discrimination by Jan Klein
5. Essential Immunology by Roitt, IM
6. Immunology by Kubly, J.
7. Murphy, Kenneth M., Travers, Paul and Walport, Mark, Janeway's Immuno Biology, 7th Edition, Garland Science, Taylor & Francis Group, 2008.
8. Kindt, T. J., Osborne, B. A. and Goldsby, R. A. Kuby Immunology, 6th Edition, W. H. Freeman, 2006.
9. Paul, W. E., Fundamental Immunology, 6th Edition, Lippincott Williams and Wilkins, 2008.
10. Abbas, A. K., Lichtman, A. H. and Pillai, S., Cellular and Molecular Immunology, 6th Edition, Saunders, 2007.
11. Immunology and immunopathology by Stewart Sell

MB 304: Biostatistics

Unit I

Introduction : Definition of statistics: population and universe, the sample and population, statistical inference; parameter and statistics. Construction of a histogram; Interpretation of histogram, the normal distribution, the mean, mode, median and standard deviation. Uncertainties in estimation of mean, comparison of means and variances-t, F, and Z tests.

Unit II

Proportion data: examples of proportion data; (MPN, sterility testing of medicines, animal toxicity, therapeutic trial of drugs and vaccines, animal toxicity, infection and immunization studies) statistical treatment to proportion data. Chi-square test, goodness of fit.

Count data: examples of count data (bacterial cell count, radioactivity count, colony and plaque counts) statistical treatment to count data: Poisson distribution, standard error, confidence limits of counts.

Unit III

Analysis of variance :Analysis of variance: Introduction, procedure and tests for one-way and two-way classified data. Multiple comparisons. Analysis of CRD, RBD and LSD. Factorial experiments -main effects and interaction.

Correlation and regression, formulae and application. Fitting the best straight line through a series of points. Fitting of different curves. Standard curves and interpolation of unknown Y-values. Multiple linear regression.

Unit IV

Statistical basis of biological assays: Response-Dose metameter. Delusion Assays, Direct and indirect assays. Quantal Responses, Probit, logit, LD₅₀, ED₅₀, PD₅₀-Standard line interpolation assay.

Unit V

Databases and Tools: Primary information resources-Protein and genomic information resources- Biological databases; primary, secondary and composite protein sequence databases, structure classification databases, DNA sequence databases, specialized genomic resources; DDBJ, Gen Bank and EMBL public DNA sequence databases; SWISSPROT Database, information retrieval from biological databases; the NCBI data model. Submitting DNA sequences to the Database and updating.

Sequence analysis: packages for nucleotide sequence analysis; sequence alignment and database searching; practical aspects of multiple sequence alignment. Phylogenetic analysis: Phylogenetic models; multiple alignment procedures (CLUSTAL, ALIGN, PHYLIP); tree building methods and trees evaluation; rooting trees, phylogenetic software.

Practicals

1. Calculate mean, mode and median.
2. Calculate standard deviation and standard error
3. Calculate coefficient of variance and use t-test to compare two mean related to microbiological data
4. Prepare histogram from the given data
5. Prepare box plot from the given data
6. Find out the relationship between two microbial variables using correlation and regression analysis
7. Find open reading frame in the given segment of DNA
8. Perform multiple sequence alignments for the given nucleotide sequences
9. Construct phylogenetic tree with the given nucleotide sequences

Suggested Readings

1. Biostatistics by Daniel.
2. Campbell R.C. (1974 : Statistics for Biologists, Cambridge University Press, Cambridge.
3. Statistics made simple-Do it yourself on PC. 2001. By K.V.S. Sarma. Printice Hall of India Publ.
4. An introduction to Biostatistics. 1997. Third Edition. P.S.S. Sundar Rao and J. Richard, Prentice-Hall of India Pvt. Ltd., New Delhi.
5. Fundamentals of Biostatistics. 1994. First Edition. Irfan A. Khan and Atiya Khanum, Ukaaz Publications.
6. Biostatistics. 1996. First Edition. P.N. Arora and P.K. Malhan, Himalaya Publishing House.
7. Statistics for Biologists. 1980. D.J. Finney.
8. Statistics and Experimental design: An Introduction for Biologists and Biochemists. 1994. 3rd edition. G.M. Clarke. Edward Arnold Publications.
9. Statistical methods. 1967. 6th edition. Snedecor and Cochran, Oxford Press. 1967.
10. Elements of Computer Science, 1998. S.K. Sarkar, A.K. Gupta. S. Chand & Company (Chapters- 1,2,9,12,14).
11. The Internet : Complete Reference, Harley Hahn. 1996. Second Edition. Tata Mc Graw-Hill Publication.
12. Introduction to Bioinformatics, 2001 by T.A. Attwood & D.J. Parry-Smith, Pearson Education Asia Publ.
13. Bioinformatics : Methods and Protocols, Edited by Stephen Misener and Stephen A. Krawetz. 2000. Methods in Molecular Biology Series. Humana Press.

Semester IV

MB 401: Environmental microbiology

Unit I

Development and dynamics of microbial communities. Population selection within communities (r and k strategies). Succession within microbial communities (during degradation of organic matter, nutrient cycling, and in biofilms)

Unit II

Microbial genome diversity: Structure, diversity, stability of microbial communities. Species diversity indices, genetic/molecular diversity indices.
Genetic exchange in microbial communities, the breadth and significance of LGT on the process of evolution of microorganisms.

Unit III

Microbial populations and communities: Population interactions; Interactions among single and diverse microbial populations. Populations within biofilms; biofilm lifestyle and quorum sensing, neutralism, commensalism, synergism, mutualism, competition, amensalism, parasitism, predation.

Unit IV

Microorganisms in atmo-ecosphere, hydro-ecosphere and freshwater habitats.

Detection of microbial populations: Phenotypic detection, lipid profile analysis, molecular detection. Detection of non culturable bacteria. Determination of microbial numbers (direct count and viable count procedures) and biomass (biochemical assays and physiological approaches).

Unit V

Microbial role in nutrient cycling and remediation of pollutants: Carbon cycle, Nitrogen cycle, Sulfur cycle and Phosphorus cycle.

Biodeterioration and its control. Microbial interaction with xenobiotic and inorganic pollutants, persistence and biomagnification of xenobiotic molecules.

Biodegradability: Biodegradation and heterotrophic production in aquatic environments. Biodegradability and biomagnifications.

Bioremediation: Approaches to bioremediation.

Practical exercises

1. Enumeration of the nutrient requirements of microorganisms
2. Isolation of microorganism with specific capabilities or those adapted to specific habitats
 - a. Isolation of temperature resistant microorganisms
 - b. Isolation of anaerobes
 - c. Isolation of extremely halophilic bacteria
 - d. Isolation of cellulolytic microorganisms
 - e. Isolation of chitin decomposing bacteria
 - f. Enrichment of methane utilizing bacteria
 - g. Isolation of phosphatase active microorganisms
 - h. Enrichment and isolation of photosynthetic bacteria
 - i. Enrichment for nitrifying bacteria
 - j. Isolation and culture of blue green algae
3. Study of enzyme activities of microorganisms
 - a. Dehydrogenase
 - b. Urease
 - c. B-glucosidase
 - d. Acid and alkaline phosphatase

Suggested readings

1. Aronson, S. 1970. *Experimental microbial ecology*. Academic Press.
2. Burlage, Robert S. 1998. *Techniques in Microbial Ecology*. Oxford University Press.
3. Atlas, R. M. and Bartha. 1998. *Microbial Ecology: Fundamentals and Applications*. The Benjamin/Cummings Science Publishing.
4. Bernhard, S. 2000. *Advances in Microbial Ecology*. Springer.
5. Singer, S. 2001. *Experiments in Applied Microbiology*. Academic Press.
6. Kirchman, D.L. 2012. *Processes in microbial ecology*. Oxford University Press.

MB 402: Food microbiology and toxicology

Unit I

Introduction to fermented foods, Microbial products of milk. Microbiology of cheese, butter, yogurt, Microbiology of bread, sauerkraut, idly Bacteriological examination of fresh and canned foods Spoilage of foods and factors governing the spoilage Food preservation methods.

Unit II

Dairy Microbiology - Types of microorganisms in milk, significance of microorganisms in milk, microbiological examination of milk, control of microbial flora of milk Microbes and animal interactions – Rumen Microbiology Termite microbial communities, Silage.

Unit III

Probiotics, Prebiotics and their significance in human beings and animals, Genetically Modified Probiotics, Prebiotics and the Infant Microbiota. Microbial Food poisoning, Bacterial toxins: Types of toxins, exotoxins, endotoxins and enterotoxins- mechanism of action, Toxoids.

Unit IV

Mycotoxins: Groups of mycotoxins, effects on human and animal health, Detoxification methods (Physical, Chemical and biological).

Unit V

Mechanism of toxicity, Microbial threats and Bioterrorism, Test procedures to detect disturbances of microbial communities. Current and future implications concerning food safety, hazards and risks.

Practicals

1. Microbiological examination of fresh and canned foods and mushrooms
2. Microbiological examination of spoiled foods and fruits
3. Microbiological examination of milk and milk products
4. Microbiological quality testing of milk (MBRT test)
5. Isolation and cultivation of anaerobic microbes from rumen and termites
6. Isolation of toxin producing organisms and estimation of their toxins in different foods
7. Extraction of Mycotoxins from contaminated food.
8. Detoxification of mycotoxins.
9. Isolation of bacterial and fungal probiotics
10. Development of probiotics in vitro
11. Test procedures to detect disturbances of microbial communities

Suggested readings

1. Food Microbiology by Frazier
2. Microbial Ecology – A conceptual approach by Lynch and Poole
3. Basic food microbiology (Abridged edition) by George J. Banwart
4. Laboratory experiments in microbiology by Gopal Reddy et al
5. Probiotics 3 by R. Fuller, G. Perdigon, Kluwer Academic Publishers
6. Probiotics and Prebiotics: Scientific Aspects by Gerald W. Tannock University of Otago, Dunedin, New Zealand, Caister Academic Press
7. Biotoxicology by Kamal narayan and Vohra.

MB 403: Medical Bacteriology

Unit I

Principles of Medical Microbiology: Classification of medically important microorganisms. Normal flora of human body – Origin of normal flora, factors that influence normal flora, role of the resident flora, effect of antimicrobial agents on normal flora, characteristics of normal flora Distribution and occurrence of normal flora (Skin, conjunctiva, nose, nasopharynx, sinuses, mouth, upper respiratory tract, intestinal tract, urogenital tract) Bacteria in the blood and tissues.

Unit II

Properties of pathogenic microorganisms. Factors that influence pathogenicity Type of infections, source of infections, different modes/means of infections Diagnostic microbiology – Types of specimen, specimen collection, transportation of specimen, processing, laboratory investigations, specific lab. Tests, non-specific lab tests, diagnosis and report. Use of lab animals in diagnostic microbiology.

Unit III

Systematic bacteriology – Detailed study of morphology, cultural characteristics, antigenic structure, pathogenesis, diagnostic lab tests (conventional and molecular), epidemiology, prevention and treatment of the following bacterial pathogens. Bacterial air borne infections – B-Haemolytic streptococcus, Pneumococci, Corynebacterium diphtheriae, Mycobacterium tuberculosis, Mycobacterium leprae, Neisseria meningitidis, haemophilus influenzae. Sexually transmitted diseases caused by bacteria, Treponema pallidum, Neisseria gonorrhoea.

Unit IV

Systematic bacteriology – Detailed study of morphology, cultural characteristics, antigenic structure, pathogenesis, diagnostic lab tests (conventional and molecular), epidemiology

Unit V

Prevention and treatment of pathogenic bacteria: Water borne infections –E.coli, Salmonella typhi, Shigella dysenteriae, Vibrio cholerae. Wound infections –Staphylococcus aureus, Clostridium tetani, Clostridium welchi, Pseudomonas.

Practicals

1. Preparation of different types of culture media/observation. Blood Agar, Chocolate Agar,
2. Mannitol salt agar, Blair Parker medium, MacConkey agar, Lowenstein-Jensen medium,
3. Wilson Blair Bismuth sulphite medium, Biochemical media.
4. Staining techniques – Gram's staining, AFB staining, Albert Staining, Capsular staining
5. Isolation and identification of various pathogenic bacteria by microscopic, macroscopic,
6. biochemical, enzymatic and serological tests (Coagulase, catalase, WIDAL, VDRL tests.)
7. Examination of pathogenic bacteria /permanent slides.
8. Bacteriological examination of urine, pus, throat swab etc from patients for diagnosis.
9. PCR based diagnosis.

Suggested readings

1. Review of Medical Microbiology by Jawitz, Melnick and Adelberg
2. Diagnostic Microbiology by Bailey and Scott
3. Medical Microbiology by Cruickshank et al Vol I & II
4. Text book of Microbiology by Ananthanarayanan and Jayaram Paniker

MB 404: Microbial Biotechnology

Unit I

Fermentative production of industrial alcohol, uses, raw materials, microorganisms, inoculum preparation, preparation of wort, fermentation and recovery. Fermentative production of beer – Medium components, malt, malt adjuncts, hops, water. Preparation of wort, mashing, wort boiling, microorganism, inoculum preparation, fermentation, cold storage maturation, carbonation, packing and preservation. Principles of wine making – Fruit selection, picking, crushing, sulphite addition, processing, fermentation, aging and bottling.

Unit II

Fermentative production of citric acid, uses, microorganism, inoculum preparation, medium preparation, fermentation, recovery and mechanism of citric acid production. Fermentative production of vitamin B12 – Uses, structure of vit-B12, microorganisms, inoculum preparation, medium preparation, fermentation and recovery. Fermentative production of glutamic acid – Uses, microorganism, inoculum preparation, production medium, fermentation and downstream processing.

Unit III

Antibiotics – Commercial production of benzyl penicillin, uses, microorganism, inoculum preparation, production medium, fermentation, recovery and semi-synthetic penicillins. Fermentative production of tetracyclines – uses, chlortetracycline, oxy-tetracycline, tetracycline and semisynthetic tetracyclines, structures, microorganisms, inoculum preparation, production medium, fermentation and recovery methods.

Unit IV

Production and application of microbial enzymes. – Amylases and proteases, uses, microorganisms, inoculum preparation, production medium, fermentation and recovery Steroid transformations – Substrates, typical structures, microorganisms, inoculum preparation, 11-hydroxylation, process and recovery.

M.Sc. Microbiology (SFS) Syllabus as approved by Department Council Meeting held on 20.9.19 (2020-2022)

Unit V

Principles of vaccine production and types of vaccines Microbial biopesticides Microbial products from genetically modified (cloned) organisms eg. Insulin.

Practicals

1. Production of ethanol by flask fermentation, recovery of ethanol by distillation and
2. calculation of fermentation efficiency
3. Preparation of wine from grapes/fruits by fermentation
4. Production of citric acid by fungal fermentation, recovery and estimation
5. Production of amino acid (Glutamic acid/lysine) by fermentation
6. Production of amylase by fermentation, recovery and estimation
7. Production and estimation of penicillin by flask fermentation
8. Immobilized bacteria/yeast/enzyme in fermentation
9. Scale up of fermentation.

Suggested readings

1. Industrial Microbiology by Casida, LE
2. Industrial Microbiology by Patel, AH
3. Industrial Microbiology by Miller, BM and Litsky
4. Industrial Microbiology by Prescott and Dunn
5. Microbial Technology by Pepler, JH and Perlman, D.
6. Biochemistry of Industrial Microorganisms, by Rainbow and Rose
7. Economic Microbiology by Rose Vol I – V
8. Microbial Enzymes and Biotechnology by Fogarty WM and Kelly, CT
9. Comprehensive Biotechnology, All volumes Ed. Murray Moo-Yong
10. Biotechnology (A text book of industrial Microbiology) Ed. Cruger & Cruger
11. Advances in Applied Microbiology Ed. Perlman Series of volumes

Skill Courses in Microbiology

MB -SC-1 Intellectual Property Rights

1. Introduction, Historical perspectives and Forms of IPR.
2. Concept related to Patent: Requirements, procedure, duration.
3. Revocation of patent, Infringement and Litigation with case studies on patent.
4. Fundamentals of Copy Rights, Trade Marks and Industrial Designs.
5. Basics of Geographical Indications; Trade Secrets and Traditional Knowledge.
6. Protection of Plant Varieties (Plant Breeders Rights and Farmer's Right).
7. IPR and Biodiversity (CBD; Protection in biotechnology, protection of other biological materials).
8. Introduction to the leading International Agreements concerning Intellectual Property Rights: WTO (GATT, TRIPS), WIPO, Madrid Protocol, Berne Convention, Paris Convention.
9. Indian Legislations for the protection of various types of Intellectual Properties.
10. Management and Valuation of Intellectual Property.

Suggested Readings:

- Acharya, NK. 2001. Text book on Intellectual Property Rights. Asia Law House.
- Arthur RP and Micheal HD. 2000. Intellectual Property: Patents, Trademarks and Copyright in a nutshell. West Group Publishers.
- Das, HK. 2010. Text book of Biotechnology 4th edition. Willey India.
- Erbisch FH & Maredia K. 1998. Intellectual Property Rights in Agricultural Biotechnology. CABI.
- Ganguli P. 2001. Intellectual Property Rights: Unleashing Knowledge Economy. McGraw-Hill.
- Intellectual Property Rights: Key to New Wealth Generation. 2001. NRDC & Aesthetic Technologies.
- Saha R. (Ed.). 2006. Intellectual Property Rights in NAM and Other Developing Countries: A Compendium on Law and Policies. Daya Publ. House.
- Singh, BD. 2010. Biotechnology: Expanding horizons. Kalyani Publishers.
- Wadhwa BL. 2007. Law Relating to Intellectual Property. Universal Law Publishing.
- Wattal, J. 1997. Intellectual Property Right. Oxford Publication House.

MB -SC- 2 Agrotechniques for Desert Plants

1. Introduction and WHO guidelines on Good Agricultural and Collection Practices (GACPs)
2. Propagation material(s) and techniques
3. Seed biology and germination behaviour
4. Nursery and field techniques of important desert medicinal plants
5. Harvest management
6. Storage techniques
7. Disease management

Laboratory/Field Exercises

1. Morphological features of desert plant seeds
2. To estimate viability and germination behavior of medicinal plant germplasms
3. Techniques for raising of nursery and transplanting in field conditions
4. To demonstrate techniques for storage of germplasm
5. To evaluate important symptoms of disease causing pathogens.

Suggested Readings

Agro-techniques of selected medicinal plants, Vol. I, Department of AYUSH, New Delhi, 2008
Chadha, K.L. and Gupta, R. Advances in Horticulture, Vol. 11, Medicinal and Aromatic Plants, Malhotra Publishing House, New Delhi, 1995.
50 Years of Crop Research in India, ICAR, New Delhi, 1996.
Prospects of Medicinal Plants, NBPGR, New Delhi, 1998.
The Wealth of India. A Dictionary of Indian Raw Materials and Industrial Products, New Delhi. Raw Materials I-XII, Revised Vol. I-III (1985-1992) Supplement (2000), CSIR, New Delhi.

MB -SC- 3-Data Analysis and Presentation

1. Sampling techniques
2. Central tendency – Mean, Median, Mode, Variance, Normalized Variance, Standard Error, Coefficient of Variance
3. Analysis of Variance
4. Correlation
5. Regression
6. Tables and Graphs
7. Preparation of Power Point Presentation

Laboratory/Field Exercises

1. Basic operations in MS-Excel
2. Computation of Central tendency quantifiers in MS-Excel
3. Computational techniques for ANOVA in MS-Excel
4. Computational techniques for Correlation in MS-Excel
5. Computational techniques for regression in MS-Excel
6. Techniques for table preparation in MS-Excel
7. Hands on exercises for Power point presentation

Suggested Readings

Gomez, A. Kwanchai and Gomez, A. Arturo. 1984. Statistical Procedures for Agricultural Research (second Edition) , John Wiley & Sons, New York
Mishra, B.N. and Mishra M.K. 1989. Introductory Practical Biostatistics. NayaPrakash Publication, Calcutta.
Panse, V.G. and Sukhatme, P.V. 1989. Statistical Methods for Agricultural Workers. Indian Council of Agricultural Research, New Delhi.
Quinn, P. Gerry and Keough, J. Michael. 2002. *Experimental Design and Data Analysis for Biologists*. Cambridge University Press Cambridge, UK .
Rao, Sundar P.S.S. and Richard, J. 2011. *Introduction to Biostatistics and Research Methods*. (4th Ed), PHI Learning Pvt. Ltd., New Delhi.
Williams, Brain. 1993. Biostatistics- Concepts and Applications for Biologist. Chapman & Hall, London

MB -SC- 4-Bioinformatics

M.Sc. Microbiology (SFS) Syllabus as approved by Department Council Meeting held on 20.9.19 (2020-2022)

1. Introduction to Bioinformatics and its applications
2. Bioinformatics databases
3. Database searching
4. Sequence Alignments and Visualization
5. Structural Bioinformatics
6. Genomics: Genome Annotation, Genome Assembly, Structural and Functional Genomics.
7. Comparative Genomics
8. Metabolomics
9. Chemoinformatics
10. Molecular phylogeny and evolution
11. Biodiversity informatics

Laboratory Exercises

1. Demonstration of Molecular Biology Laboratory equipments
2. Demonstration of various Next-generation sequencing technologies
3. Introduction of National Center for Biotechnology Information (NCBI) and biological databases
4. Analysis of sequences using BIOEDIT software.
5. Assembly of sequences using GENETOOL software
6. Similarity search using the Blast and interpretation of the results.
7. Multiple Sequence alignment using ClustalW
8. Phylogenetic analysis using MEGA.
9. Submission of nucleotide sequences at NCBI-GenBank using Sequin

MB -SC- 5-Micropropagation

1. Basic layout of Micropropagation laboratory and Green House
2. Basic Concepts of Micropropagation
3. Tools and Techniques of Micropropagation: LAFB, Autoclave, Filter Sterilization
4. Medium composition and Preparation
5. Basic concept of Aseptic Culture establishment
6. Hardening and Acclimatization

Laboratory Exercises

1. Selection of explants, surface sterilization and inoculation to initiate cultures of tobacco/cereals/legumes.
2. Studies on effects of plant growth regulators on cell, tissue and organ culture.
3. Experiments on rejuvenation and multiple shoot induction from mature nodal shoot segments of trees/horticultural/floricultural crops.
4. Encapsulation of somatic embryos/buds using alginate.
5. Experiments on root induction from cultured shoots.

Suggested Reading

- Bhojwani, S. S. 1990. *Plant Tissue Culture: Applications and Limitations*. Elsevier Science Publishers, New York, USA.
- Bhojwani, S. S. and Razdan, M. K. 1996. *Plant Tissue Culture: Theory and Practice* (a revised edition). Elsevier Science Publishers, New York, USA.
- Vasil, I. K. and Thorpe, T. A. 1994. *Plant Cell and Tissue Culture*. Kluwer Academic Publishers, The Netherlands
- Woung-Young, S. and Bhojwani, S. S. 1999. *Morphogenesis in Tissue Cultures* (ed.). Kluwer Academic Publishers.

MB -SC- 6-Value Addition for Bioresources

1. Introduction and bioresource profile
2. Need for identifying real/true value of the bio-resources
3. Wild and domestic bioresources

4. Thar desert resources with special reference to forest, energy (solar and wind) and minerals
5. Energy and petro plants
6. Air-layering technique
7. Concept of Harvest Index
8. Economics (Benefit: Cost ratio)

Laboratory/Field Exercises

1. Methods for bio-resources valuation
2. General idea for desert bioresources with special reference to solar and wind energy plantation
3. Identification of petro plants of desert
4. To perform air layering experiment
5. To calculate Harvest Index
6. To calculate economics of desert plants

Suggested Readings

Agro-techniques of selected medicinal plants, Vol. I, Department of AYUSH, New Delhi, 2008
 Handbook of Horticulture, ICAR, 2001
 50 Years of Crop Research in India, ICAR, New Delhi, 1996.
 Prospects of Medicinal Plants, NBPGR, New Delhi, 1998.
 The Wealth of India. A Dictionary of Indian Raw Materials and Industrial Products, New Delhi. Raw Materials I-XII, Revised Vol. I-III (1985-1992) Supplement (2000), CSIR, New Delhi.
 Recent Progress in Medicinal Plants, Volume 9 : Plant Bioactives in Traditional Medicine, (eds.) D.K. Majumdar, J.N. Govil, V.K. Singh & R.K. Sharma, Studium Press, LLC, USA, 2005

MB -SC- 7-Chromosome Analysis

1. Survey and collection of germplasm
2. Propagation/Maintenance of plant materials
3. Collection and preservation of plant samples
4. Preparation of solutions for chromosome staining
5. Preparation of meiotic and mitotic spreads
6. Observation of various stages for cell division
7. Data analysis

Laboratory Exercises

1. Counting the Number of chromosomes & Observing somatic chromosomes in root tips
2. Analyzing size and morphology of chromosome
3. Observing somatic chromosome in young leaves
4. Gametic chromosome observation in young flower
5. Gametic or meiotic chromosome observation in young frond of fern during sporogenesis
6. Preparation of solutions

Suggested Readings

Setterfield, G., Schreiber, R., and Woodard, J., *Stain Technology*, **29**, 113 (1954).
 Pathways, Mechanisms, and Rates of Polyploid Formation in Flowering Plants Justin Ramsey and Douglas W. Schemske *Annual Review of Ecology and Systematics* Vol. 29 (1998), pp467-501
 Grubb, Chandra. "Practical Cytology." *Proceedings of the Royal Society of Medicine* 61.5 (1968): 537. Print.
 Grubb, C. (1968). Practical Cytology. *Proceedings of the Royal Society of Medicine*, 61(5), 537.

MB -SC- 8-Mushroom Cultivation

1. General Introduction of mushroom.
2. Taxonomy and Biology of Mushroom.
3. Nutraceutical (nutritional) values of mushroom.
4. Pharmaceutical (medicinal) values of mushroom.
5. Mushroom laboratory/ farm design.
6. Mushroom production technology.

7. Spawn production technology.
8. Compost (natural and synthetic).
9. Management of mushroom disease.
10. Post harvest technology of mushroom.
11. Economics of mushroom cultivation.
12. Mushroom producers, Exporters, consultants, literature and sources of inputs.

Laboratory Exercises

1. Survey and collection of local edible mushrooms.
2. Visit to mushroom cultivation Laboratory.
3. General studies on laboratory rules, equipments, tools and Precaution.
4. Principles and demonstration of Laboratory Instruments.
5. Preparation of culture media.
6. Isolation and culture of Spawn (mushroom seed/spore)
7. Preparation of composting.
8. Cultivation of white button mushroom.
9. Post harvest technique.
10. Preservation of mushroom.

Suggested Reading

- Bahl, N. 1984. Handbook on mushroom, Oxford and IBH, New Delhi
- Chandra, K. L. and Sharma, S. R. 1995. Mushroom, Advances in horticulture, Volume XIII Malhotra Publishing House, New Delhi, India
- Kannaiyan, S. and Ramasamy, K. 1980. A handbook of edible mushroom. Today and tomorrows printers and publishers New Delhi
- Kapoor, J. N. 1989. Mushroom cultivation, ICAR Publishers, Coimbatore
- Purkayastha, R.P. and Chandra, A. 1985. Manual of Indian edible mushrooms. Today and Tomorrows printers and publishers, New Delhi
- Saini, L.C. and Prashar, R.D. 1992 KhumbUtpadan. HAU Publication Hissar
- Sharma, S.R. and Mehta, K.B. 1991. Bibliography of mushroom Research of India. NCMRT Publication, Solan
- Singh, H. 1991. Mushroom- The art of cultivation. Sterling Publishers Pvt. Ltd. New Delhi
- Singh, R.P. 1986 Bulletins of Successful mushroom production. GB pant University, Pantnagar.
- Tewari, S.C. and Kapoor, P. 1988. Mushroom Cultivation: An Economics analysis. Oxford and IBH New Delhi
- Journals: Indian Journal of mushroom and Mushroom research (for update information)

MB -SC- 9-Molecular Techniques

1. Methods of isolation and purification of nucleic acids.
2. Quantitative and Qualitative analysis of nucleic acid: Principle and applications of electrophoresis.
3. Nucleic acid hybridization, PCR and Quantitative RT-PCR.
4. Principle and methods of Recombinant DNA technology and Genetic Engineering.
5. Methods of isolation and purification of proteins. Protein purification techniques: size-exclusion, ion-exchange and affinity chromatography.
6. Quantitative and Qualitative analysis of Proteins: Dye-binding methods, native and denaturing SDS-PAGE, Western immunoblotting, ELISA.
7. Tools and techniques used in proteomics: 2-DE, Mass spectrometry, peptide mass fingerprinting.
8. Recombinant protein expression and purification from *E.coli*.
9. Recombinant protein expression and purification from plants.
10. Molecular characterization of transgenic plants.

LABORATORY EXERCISES

1. Preparation of different reagents, buffers and media.
2. Isolation of genomic DNA from plants.
3. Isolation of proteins from plants.
4. Demonstration of DNA/RNA and protein quantitation using Nanodrop.
5. Agarose gel electrophoresis and Gel documentation.
6. Demonstration of PCR, RT-PCR and Southern/Northern Blotting

7. One-dimensional SDS-PAGE protein profiling
8. Demonstration of 2-DE and Western immunoblotting

SUGGESTED READINGS

Sambrook, J. and Russell, D.W. 2001. *Molecular Cloning – A Laboratory Manual, Vols I – III*, Cold Spring Harbor Laboratory, USA.

Gelvin, S.B. and Schilperoort, R.A. (eds) 1994. *Plant Molecular Biology Manual*, 2nd edition, Kluwer Academic Publishers, Dordrecht, The Netherlands.

Glick, B. R. and Thompson, J.E. 1993. *Methods in Plant Molecular Biology and Biotechnology*. CRC Press, Boca Raton, Florida.

MB -SC- 10-Nutrient Management

1. Soil Analysis: Physical, chemical and Biological properties of soil
2. Nutritional requirement of Plant: Macro and micro nutrients
3. Forms and Sources of nutrients in Soils
4. Uptake, transport and roles of nutrients in plants
5. Symptoms of Deficiency and Excess of nutrients in plants
6. Tissue Testing for nutrient status in plants , recommendation of Fertilizers
7. Types of nutrient media
8. Soil preparation, Soil amendments, bed preparation, transplantation techniques
9. Soil less culture: hydroponic, Nutrient Film Technique (NFT), cocopeat and Airoponics
10. Greenhouse Technology: Importance, types and operation techniques

Laboratory/Field Exercises

1. Assessment of Deficiency and Excess of nutrients on the basis of Visual Symptoms .
2. Soil Analysis(Physical): moisture, temperature and soil texture.
3. Soil analysis (chemical): EC and pH, carbon, phosphorus,.
4. Biological properties: microbial diversity of soil analysis.
5. Tissue Tests for nutrients: (N,P, K & Na)
6. Estimation of photosynthetic pigments in plant leaves.
7. Assay of nitrate reductase activity from plant tissues.
8. Techniques for Soil less culture: hydroponic and Airoponics.

SUGGESTED READINGS

Ahmad P. and Wani M.R. 2014. *Physiological Mechanisms and Adaptation Strategies in Plants Under Changing Environment*(eds). Springer New York

BassiriRad H.2005. *Nutrient Acquisition by Plants - An Ecological Perspective*. Springer .

Barker A.V.andPilbeam D.J. 2007. *Handbook of Plant Nutrition* (eds.). Taylor & Francis

Hopkins W.G. and Norman P. A. HunerN.P.A . 2009. *Introduction to Plant Physiology* (4th Edition) John Wiley & Sons, Inc. New York, USA

Konrad M. and Ernest A. K.2001. *Principles of Plant Nutrition* (eds.). SpringerMaathuis, F. J.M 2013.*Plant Mineral Nutrients :Methods and Protocols* (ed.). Springer

Pansu M. and Gautheyrou J. 2006 .*Handbook of Soil Analysis - Mineralogical, Organic and Inorganic Methods*. Springer

Pessarakli, M.2014. *Handbook of Plant Crop Physiology* (ed.). CRC Press

Resh M. H .2012. *Hydroponic Food Production: A Definitive Guidebook for the Advanced Home Gardener and the Commercial Hydroponic Grower* (7th edition).CRC Press Taylor & Francis Group

Taiz, L. and Ziegler, E. 2003. *Plant Physiology* (3rd edition), Panima Publishing Corporation,New Delhi.



JAI NARAIN VYAS UNIVERSITY, JODHPUR
FACULTY OF SCIENCE
DEPARTMENT OF PHYSICS

The Department of Physics was established in the year 1962 in Science Faculty, New Campus. Since then the Department has flourished under the guidance of renowned physicist and researchers. The department is equipped with modern laboratories and library. Sixteen devoted faculty members are making continuous efforts to further enhance the teaching and research activities in the department. Presently, the department is strengthened by three Professors, five Associate Professors and eight Assistant Professors, having expertise in different branches of Physics.

The department is conducting B. Sc. Regular Course, M. Sc. Physics Semester Course with CBCS and Ph. D. Course.

The major research areas in which the department has contributed remarkably are: Dielectric Spectroscopy, Polymer Physics, Solid Polymer Electrolytes, Nanodielectrics, Organic Semiconductors, Mossbauer Spectroscopy, Atomic and Molecular Spectroscopy, Multiferroic, Superconductors, Quantum Optics, Atomic Physics, Computational Physics, Theoretical Solid State Physics and X-Ray Spectroscopy. The department is equipped with XRD, High Energy Planetary Ball Mill, Computational Facilities, Mossbauer Spectroscopy, Dielectric Spectroscopy.

The department has been continuously receiving grants from the government funding agencies for development of infrastructure and research facilities. The recent funds received are DST-FIST grant, UGC-SAP DRS level-I and level-II grant, Major projects from UGC and DST granted to individual researchers and research fellowship to the students under UGC-BSR scheme.

The department has published more than 200 research papers in various International and National research journals of high impact factor during last one decade. The faculty members have been nominated as member of the editorial board of various International Journals. Post doctoral students from our department have been awarded Young Scientist project of SERB-DST and Research Associateship of CSIR.

MASTER OF SCIENCE (M. Sc.) PHYSICS

M. Sc. Physics is a two years Post Graduate Degree Course, comprising of four Semesters, for regular students. There are two Semesters in each year (Academic Session). M. Sc. I Year comprised of Semester I and Semester II. Similarly, M. Sc. II year comprised of Semester III and Semester IV.

FACULTY MEMBERS

S.No.	Name of Teacher	Area of Specialization
1.	Prof. D.K. Sharma	Atomic Physics, Computational Physics
2.	Prof. R.J. Sengwa (Head)	Electronics, Dielectric Relaxation Spectroscopy, Materials Science, Polymeric Nanodielectric, Solid Polymer Electrolytes
3.	Prof. S.K. Sharma	Solid State Physics, Electronics
4.	Dr. (Mrs.) Beena Bhatia	Molecular Spectroscopy, Glasses
5.	Dr. R.S. Singh	Solid State Physics, Condensed Matter Physics
6.	Dr. H.S. Singh	Mössbauer Spectroscopy, Superconductor, Ferrites
7.	Dr. A.K. Gupta	Molecular Spectroscopy
8.	Dr. K.R. Patel	Mössbauer Spectroscopy, X-Ray
9.	Dr. K. Dhoot	X-Ray, Mossbauer Spectroscopy
10.	Dr. Sahi Ram	Mössbauer Spectroscopy, X-Ray Physics
11.	Mr. Giriraj Chayal	Solid State Physics
12.	Mr. S. S. Meena	Molecular Spectroscopy
13.	Mr. S. L. Meena	Molecular Spectroscopy
14.	Dr. Manu Smrity	Semiconductor Electronics
15.	Dr. Uttam Paliwal	Condensed Matter Physics, Computational Materials Science
16.	Dr. Shiv Kumar Barwar	Condensed Matter Physics

GUIDELINES FOR CHOICE BASED CREDIT SYSTEM IN M. Sc. PHYSICS

DEFINITIONS OF KEY WORDS:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course. This shall be part of core programme during third and fourth semester. Each student has to complete **four skill courses**; two within the Department and two from other Department within JNV University or the Universities approved by JNV University.
3. **Course:** Usually referred to, as ‘papers’ is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement forwarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period of teaching (lecture or tutorial) or two periods of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.

9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.
12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/ December and even semester from December/January to May.
Odd semester University examination shall be during second/ third week of December and even semester University examination shall be during second/ third week of May. The Department shall conduct the Practical examinations with a board of internal and external examiners prior to commencement of End semester theory examination.
13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment:

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Departments of the Faculty of Science resolves the following:

- a. All internal assessments shall be open assessment system only and that are based on Quizzes, term test and seminar.
- b. Attendance shall carry the prescribed marks in all papers and Practical examination internal assessment.
- c. In each semester as far as possible, two out of four theoretical component University examination shall be undertaken by external examiners from outside the university conducting examination, who may be appointed by the competent authority

Grievances and Redressal Mechanism

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head/Principal of the College or the Chairperson of the University Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.
- b) The appeal will be assessed by the Chairman and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Dean, Faculty of Science, comprising all HODs of the Faculty and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	'O'	Outstanding	10
2	'A+'	Excellent	9
3	'A'	Very Good	8
4	'B+'	Good	7
5	'B'	Above Average	6
6	'C'	Average	5
7	'P'	Pass	4
8	'F'	Fail	0
9	'Ab'	Absent	0

- i. A student obtaining Grade F shall be considered failed and will be required to reappear in the examination.
- ii. For noncredit courses (Skill Courses) 'Satisfactory' or "Unsatisfactory" shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

= and > 95 % marks Grade Point 10.0
90 to less than 95 % marks Grade Point 9.5
85 to less than 90 % marks Grade Point 9.0
80 to less than 85 % marks Grade Point 8.5
75 to less than 80 % marks Grade Point 8.0
70 to less than 75 % marks Grade Point 7.5
65 to less than 70 % marks Grade Point 7.0
60 to less than 65 % marks Grade Point 6.5
55 to less than 60 % marks Grade Point 6.0
50 to less than 55 % marks Grade Point 5.5
45 to less than 50 % marks Grade Point 5.0
40 to less than 45 % marks Grade Point 4.5
35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,

i.e.

$$\text{SGPA } (S_i) = \Sigma(C_i \times G_i) / \Sigma C_i$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,

i.e.

$$\text{CGPA} = \Sigma(C_i \times S_i) / \Sigma C_i$$

where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.

- iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	4	B	6	4 x 6 =24
2	Course 2	4	B+	7	4 X 7 =28
3	Course 3	4	B	6	4X 6 = 24
4	Course 4	4	O	10	4 X 10 =40
5	Course 5- Practical I	4	C	5	4 X 5 =20
6	Course 6 – Practical II	4	B	6	4 X 6 = 24
	Total	24			24+28+24+40+20+24 =160

Thus, $\text{SGPA} = 160/24 = 6.67$

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	6.67	7.25	7	6.25

$$\text{CGPA} = (24 \times 6.67 + 24 \times 7.25 + 24 \times 7 + 24 \times 6.25) / 96$$

$$652.08 / 96 = 6.79$$

SEMESTER-WISE THEORY PAPERS/ PRACTICALS/ SKILL COMPONENTS

Type of course	Course code	Title of the Course	Lecture-Tutorial Practical/ Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
SEMESTER I							
Core course 1	PH-101	Statistical Physics	4-0-0	4	30	70	100
Core course 2	PH-102	Electronic Circuits and Instrumentation	4-0-0	4	30	70	100
Core course 3	PH-103	Quantum Mechanics	4-0-0	4	30	70	100
Core course 4	PH-104	Computational Physics	4-0-0	4	30	70	100
Core course practical 1	PH-105	Electronics Laboratory	0-0-8	4	30	70	100
Core course practical 2	PH-106	Computational Physics Laboratory I	0-0-8	4	30	70	100
Skill Course I	PH-107	Materials Science I	2-0-2				
				24	180	420	600
SEMESTER II							
Core course 5	PH-201	Numerical Methods	4-0-0	4	30	70	100
Core course 6	PH-202	Atomic and Laser Physics	4-0-0	4	30	70	100
Core course 7	PH-203	Advanced Quantum Mechanics	4-0-0	4	30	70	100
Core course 8	PH-204	Classical Mechanics and Mathematical Physics	4-0-0	4	30	70	100
Core course practical 3	PH-205	General Physics and Laser Laboratory	0-0-8	4	30	70	100

Core course practical 4	PH-206	Computational Physics Laboratory II	0-0-8	4	30	70	100
Skill course II	PH-207	Application of Software Packages	2-0-2				
				24	180	420	600
SEMESTER III							
Core course 9	PH-301	Electrodynamics and Plasma Physics	4-0-0	4	30	70	100
Core course 10	PH-302	Digital Electronics and Microprocessor	4-0-0	4	30	70	100
Discipline Specific Elective 1	PH-303	Nuclear Physics I	4-0-0	4	30	70	100
Discipline Specific Elective 2	PH-304	Condensed Matter Physics	4-0-0	4	30	70	100
Core course practical 5	PH-305	Digital Electronics and Microprocessor Laboratory	0-0-8	4	30	70	100
Discipline Specific Elective practical 1	PH-306	Nuclear and Condensed Matter Physics Laboratory	0-0-8	4	30	70	100
Skill course III	PH-307	Materials Science II	2-0-2				
				24	180	420	600
SEMESTER IV							
Core course 11	PH-401	Communication and Microwave Electronics	4-0-0	4	30	70	100
Core course 12	PH-402	Nuclear Physics II	4-0-0	4	30	70	100
Discipline Specific Elective 3	PH-403	Molecular and Resonance Spectroscopy	4-0-0	4	30	70	100
Discipline Specific Elective 4	PH-404	Solid State Physics	4-0-0	4	30	70	100
Core course practical 6	PH-405	Communication and Microwave Electronics	0-0-8	4	30	70	100

		Laboratory					
Discipline Specific Elective practical 2	PH-406	Atomic and Molecular Spectroscopy Laboratory	0-0-8	4	30	70	100
Skill course IV	PH-407	Electronics Instrumentation	2-0-2				
				24	180	420	600

*** Each Department shall offer two skill courses per semester from the list of skill courses approved for the Department.**

The Department is free to distribute the Periods between Theory/Tutorial/Practical as per the Course content and the need of the course. However the selection shall be from any one of the following pattern

- 4 : 0 : 0 (four lectures only (no tutorial and no practical) per week).
- 2 : 1 : 1 (two lectures, one tutorial, and one practical per week).
- 0 : 2 : 2 (no lecture, two tutorials, and two practicals per week).
- 1 : 2 : 1 (one lecture, two tutorials, and one practical per week).
- 2 : 2 : 0 (two lectures, two tutorials, and no practical per week).
- 0 : 4 : 0 (no lecture, four tutorials only, and no practical per week).
- 1 : 1 : 2 (one lecture, one tutorial, and two practicals per week).
- 2 : 0 : 2 (two lectures, no tutorial, and two practicals per week).
- 0 : 0 : 4 (no lecture, no tutorial, and four practicals only per week).
- 1 : 0 : 3 (one lecture, no tutorial, and three practicals per week).
- 3 : 1 : 0 (three lectures, one tutorial, and no practical per week).
- 0 : 1 : 3 (no lecture, one tutorial, and three practicals per week).
- 1 : 3 : 0 (one lecture, three tutorials, and no practical per week).
- 3 : 0 : 1 (three lectures, no tutorial, and one practical per week).
- 0 : 3 : 1 (no lecture, three tutorials, and one practical per week).

The Duration of the Period shall be forty five minutes. In each of these combinations, the first value stands for the same number of lecture instructions per week, whereas the last two values stand for double the number of tutorial / practical instructions per week.

In each practical group the maximum number of students that can be accommodated will be 15 as decided by the Department Council. The workload is to be computed accordingly.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective) involve an evaluation system of students that has the following two components:-

- (i) **Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
- (ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.

- (i) **Continuous Comprehensive Assessment (CCA):** This would have the following components:
- Quizzes:** Two Quiz examinations of 45 minutes duration each having a maximum of 40 marks shall be arranged for theory paper during the semester course period.
 - Term Test:** One term test shall be arranged for each theory paper prior to University End Semester Examination (ESE); examination duration shall be of three hours; maximum marks is 70
 - Seminar:** Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 15. The seminar shall commence after first quiz examination and shall be completed prior to term test for all the papers.
 - Classroom Attendance:** Each student will have to attend a minimum of 75% Lectures / Tutorials / Practicals. A student having less than 75% attendance will not be allowed to appear in the End Semester Examination (ESE). Attendance shall have 15 marks and will be awarded by following the system proposed below:
Those having greater than 75% attendance (for those participating in Co-curricular activities, 25% will be added to percent attendance) will be awarded CCA marks as follows:

75% to 80%	=	3 marks
80% to 85%	=	6 marks
85 to 90%	=	9 marks
90% to 95%	=	12 marks
> 95%	=	15 marks

All students' cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Science.
 - CCA are based on open evaluation system without any bias to any student
 - Any grievance received in the Department from student shall be placed before the **Grievance Redressal Committee** with adjudicated comments

Each component marks will be added without rounding and the total thus obtained is ratio by a factor of six. This value shall be rounded.

Illustration: Quiz 1 – Marks obtained = 30
 Quiz 2 – Marks obtained = 35.5
 Term Test Marks obtained = 50.5
 Seminar Marks obtained = 14
 Attendance Marks obtained = 9
 Total = 139.00
 Conversion = $139/6 = 21.16666$
 Award = 22.00

Skill Course Evaluation: Based on student performance and hands on practice, the respective Department shall declare the result as “Satisfactory” or “Non-Satisfactory”; each student need to get a minimum of three “Satisfactory” declaration for the course completion

In laboratory courses (having only practical (P) component), the CCA will be based on students attendance (50%); hands on Practical in physical science stream (50%) and collection of biological material (25%) and hands on Practical (25%) in biological and earth science stream.

For QUIZ (2 quizzes per semester), 40 marks per Quiz and total of 80 marks, 45 minutes

duration for each quiz:

Types of question	Number of Questions	Marks Per question	Total marks per type
1. Multiple choice	10	1	10
2. Fill in the blanks	10	2	20
3. Short answer (15 words)	5	2	10
Total	25		40

For the Term test and End Semester Examination (ESE):

Part A

Ten short type questions including definitions, functions, short explanations, etc. (answer upto 30 words) for two marks each. Total $10 \times 2 = 20$ marks; two questions from each Unit; no choice in this part.

Part B

Five questions (answers upto 250 words) for four marks each. Total $5 \times 4 = 20$ marks; one question from each Unit with internal choice.

Part C

Five questions of long/explanatory Answer (500 words) type, one drawn from each Unit; student need to answer any three; ten marks each; Total $3 \times 10 = 30$ marks

Each core/ elective course total marks $20+20+30 = 70$ marks

Qualifying for Next semester

- 1. A student acquiring minimum of 40% in total of the CCA of each course separately is eligible to join next semester.**
- A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as 'Fail'), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.
- A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time i.e. three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted. Additional chances examination fee shall be on additive basis.

Improvement Option:

Every student shall have the opportunity to improve Credit through University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final. There shall be no improvement opportunity in Practical examinations.

Result Declaration:

The ESE (End Semester Examination i.e. University Examination) results shall be declared within twenty days of the last examination. The Theory/ Practical Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation.

UNIT-1

DC power supply: Full wave bridge rectifier circuit with various filters and their working, regulated dc power supply, transistor series and shunt regulator circuit, IC voltage regulators (78XX, 79XX and LM317), switching action of PN junction diode and transistor, diode reverse recovery time and its measurement methods.

UNIT-2

Oscillators: Block diagram of electronic oscillator and required oscillatory conditions, RC phase shift oscillator, Wein bridge oscillator, Hartley and Colpitt's oscillators, astable multivibrator, UJT relaxation oscillator, voltage and current sweep generators.

UNIT-3

Op Amp applications: Op Amp basics, virtual ground concept, inverting and non-inverting Op Amp voltage gain, circuits of Op Amp sign changer, constant multiplier, adder, subtractor, integrator, differentiator, log and antilog amplifier, comparator and waveform generator.

UNIT-4

Instrumentation I: Block diagram of standard signal generator and its characteristic, FETVM, digital multimeter, frequency counter, harmonic distortion analyser, block diagram of CRO and its uses in amplitude, frequency, phase and bandwidth measurements.

UNIT-5

Instrumentation II: Transducers, block diagram of analog and digital data acquisition system, multiplexers, IC555 and its use in square and triangular waveform generator, Fourier analysis of square wave, origin of bio-electrical signals, ECG and Sonography.

Books suggested

Allen Mottershead, Electronic Devices and Circuits, PHI

A. D. Helfrick and W. D. Cooper, Modern Electronic Instrumentation and Measurement Techniques, PHI

Jacob Millman and Herbert Taub, Pulse, Digital and Switching Waveforms, TMH

Robert Boylestad and Louis Nashelsky, Electronic Devices and Circuits, PHI

R. A. Gayakwad, Op-Amps and Linear Integrated Circuits, PHI

Abraham Pallas, Electronic devices and circuit Analysis, CBS

N. N. Bhargava, DC Kulshreshtha and S. C. Gupta, Basic Electronics and Linear Circuits, TMH

UNIT-1

Complex linear vector space, states, amplitude and operators: Complex linear vector space, linearly independent basis vectors, dimension of vector space, scalar product of two vectors, Bra and Ket vectors, resolution of unit operators using Bra and Ket vectors and completeness relation. Operators in quantum mechanics, observables, Hermitian, Unitary and Projection operators. Commutation relations, process of measurement and central concepts of quantum mechanics.

Matrix representation of operators, Unitary transformations, Diagonalization of Observable operators, Illustration using two state systems.

Coordinate and momentum representation, Gaussian wave packets, Compatible and incompatible observables, simultaneous eigenkets of maximum set of compatible observables, Heisenberg uncertainty principle.

UNIT-2

One dimensional simple harmonic oscillator, eigenkets and eigenvalues by operator method, creation and annihilation operators, eigenkets in coordinate representation

Schrodinger picture, Heisenberg picture and Interaction picture.

Identical particles: The identity of particles, the indistinguishability principle, symmetry of wave function, spin and statistics, the Pauli's exclusion principle.

Variation Method: Principle and application to linear harmonic oscillator and Helium atom.

UNIT-3

Time independent perturbation theory: Non degenerate case, simple applications including anharmonic oscillator and linear harmonic oscillator. Degenerate case- applications to linear stark effect and Zeeman effect in Hydrogen atom

Time independent perturbation theory: Constant perturbation, Transition to continuum, Fermi's golden rule, harmonic perturbation.

UNIT-4

Symmetries and Angular Momentum: Symmetry transformation and conservation laws, invariance under space translation, space rotation and time translation. Conservation of momentum, energy and angular momentum.

Angular momentum operators and their Eigenvalues and their eigenstates (angular momentum states), matrix representations of the angular momentum operators and their eigenstates, coordinate representations of the orbital angular momentum operators and their eigenstate (Spherical Harmonics).

Solution of Schrodinger equation for hydrogen atom, energy levels and stationary wave functions.

UNIT-5

Addition of angular momenta, Clebsch-Gordon (C.G) Coefficients, C.G coefficients for addition of $j_1=1/2$ and $j_2=1/2$. Tensor operators and Wigner Eckart theorem, Tensor operators for Electric dipole, electric quadrupole, and magnetic dipole operators. Expectation values of these operators for angular momentum states and selection rules for electric dipole, electric quadrupole and magnetic dipole transitions.

Books Suggested

Ashok Das and A.C.Melissions, Quantum Mechanics-A modern approach, Gordon & Breach Science Publication.

Ghatak and Loknathan, Quantum Mechanics-Theory and Applications, Macmillan (2010),

V.K. Thankappam, Quantum Mechanics, New Age International (1985).

J.J. Sakurai, Modern quantum Mechanics, Addison Wesley (1999).

L.I. Schiff, Quantum Mechanics, McGraw-Hill (1988).

UNIT-1

Problem solving through computers, algorithms, flow charts, programming languages, low level and high level language, interpreter and compilers, program development procedures. Errors in numerical calculations: Fixed and floating point representation, consequences of floating point arithmetic, rounding off of numbers, absolute and relative errors. Errors in computation: syntax error, logical error, error due to finite storage and approximation of infinite processes.

UNIT-2

Programming language C: Data types, qualifiers, constants, identifiers, variables, variable declaration, arithmetic operators: binary and unary operators, expressions. Preprocessor directives, including header files, library functions. Data input and output: getchar and putchar, scanf, control string, conversion characters, formatting input, field width, printf, conversion character and escape sequence, formatting output, field width and precision parameters, use of flags, string input/ output, gets and puts.

UNIT-3

Relational operators, relational expressions, logical operators transfer of control: if – else and switch-case statements. Repetitive statements: for loop, while and do- while statements, nesting of loops, continue and break statements. Arrays in C: one dimensional and multidimensional arrays, defining, declaring and initializing arrays.

UNIT-4

Functions in C program: Storage classes, static and external variable declaration, main function, return statement, defining a function, function declaration, function call, function prototype, passing arguments to a function, local and global parameters, call by value and call by reference, passing arrays to a function, recursion, static and external function definition.

UNIT-5

Pointers in C: pointer data type, declaration of pointers, indirection, operation on pointer variables, pointers and arrays, dynamic memory allocation , malloc function, pointer to array and array of pointers, pointer to a function. Files in C: opening and closing a data file, creating a data file, processing a data file.

Books Suggested

Rajaraman, Computer Programming in C, Prentice Hall of India.

B. Gottfried, Programming with C, Schaum's Outline Series, Tata McGraw Hill.

E. Balguruswamy, Programming in ANSI C, Tata McGraw Hill.

E. V. Krishnamurthy and S. K. Sen, Numerical Algorithms, Affiliated East-West Press Pvt. Ltd., New Delhi.

1. Design and study of dc power supply with various filters and IC regulator
2. Design and study of Op Amp differentiator, integrator and log amplifier circuit
3. Design and study of different voltage gain inverting Op Amps and determination of frequency response using CRO
4. Waveform study of an astable multivibrator
5. Frequency response and input and output impedance study of current series negative feedback amplifier
6. Fourier analysis of a square wave, triangular wave and half rectified wave
7. Design and study of UJT saw tooth waveform generator
8. Carriers life time measurements by reverse recovery method
9. Carriers life time measurements by open circuit method
10. Design and study of diode and transistor switching behavior and their operating point
11. Design and study of RC phase shift oscillator/ Wein bridge oscillator
12. Design and study of Hartley oscillator
13. Design and study of Colpitt oscillator
14. Design and study of digital timing circuit using IC555

Note: Students are required to perform following experiments using programming language C.

1. Calculate Legendre polynomial of different orders
2. Calculate Hermite Polynomial of different orders
3. Calculate and plot Plank's distribution function
4. Calculate and plot Maxwell's distribution function
5. Calculate an infinite series up to desired accuracy
6. Calculate standard deviation of given data
7. Calculate frequency distribution of given data and plot histogram
8. Calculate some periodic functions using Fourier Series
9. Calculate cross sections of some physical processes using given formula
10. Calculate the wave function of Harmonic oscillator and plot it for one period
11. Calculate and plot energies and radial wave functions for a square well potential for a few lower l-values
12. Find product of two square matrices

Glasses: Definitions, properties; Structural features: Atomic arrangement, chemical composition; Optical features: Transparency, linear and non-linear refractive index and dispersion, Classification of glasses by preparation method, Glass by melt-quenching technique, Glass by chemical vapor deposition, Glass by sol-gel process. Important glass systems: oxide glasses, Halide and chalcogenide glasses.

Solid Polymer Electrolytes (SPEs): Applications of SPEs, importance of SPEs over ion conducting glass and liquid electrolytes, polymer-alkali metal salt interactions, salt dissociation and formation of ion dipolar complexes, conductivity requirement of SPE films for lithium ion batteries, preparation methods of solid polymer electrolytes, structural characterization, electrical characterization, ac and dc ionic conductivity, concept of ion transportation, importance of inorganic nanofiller in SPE films, electrolytes with nano fillers.

Multiferroic materials: Types of ferroic materials, Magneto electric effect, Thermodynamic theory of magnetostatic effect, single phase and composite multiferroic materials, different synthesis and characterization techniques, recent trends and future prospectus of magneto electric multiferroic materials.

Practicals

1. Measurement of refractive index and density of glass sample and computation of physical parameters
2. Assignment of various transitions in the absorption spectrum of glass specimen
3. Computation of energy interaction parameters
4. Computation of Judd Ofelt intensity parameters
5. Preparation of solid polymer electrolyte (SPE) film with lithium ion
6. Structural study of SPE film by various techniques
7. Dielectric and electrical study of SPE film
8. Thermal study of SPE film
9. Synthesis of Multi Ferroic Materials
10. Structural Study of Multi Ferroic Materials
11. Dielectric Study of Multi Ferroic Materials

Books Suggested

Masayuki Yamane and Yoshiyuki Asahara, Glasses for photonics, Cambridge University Press 2000
Sujit Jain, Spectral Studies of Rare Earth Doped Borax Glasses Paperback, Scholars' Press
F. M. Gray, Polymer Electrolytes: Fundamentals and Technological Applications, VCH
T. Minami et al, Solid State Ionics for Batteries, Springer
C. Brechijnac, P. Houdy and M. Lahmani, Nano Materials and Nano Chemistry, European Materials Research Society, Springer
Gustaaf Can Tendeloo, Drk Van Dyck and Stephan J. Pennycook, Hand book of Nano Scopy, Volume I & II, Editors, Wiley - VCH
Satishchandra and Ballkrishana Ogale, Functional Matal Oxides, New Science and Novel applications, Wiley - VCH
B. D. Cullity and C. D. Graham, Introduction to Magnetic Materials 2nd edition, IEEE Press, John Wiley & Sons

SEMESTER II

PH-201

NUMERICAL METHODS

UNIT- 1

Errors in numerical calculations, definition of root or zero of a function, Numerical solution of transcendental equations, concept of iterative methods. Bisection method, False position method, Newton-Raphson method, Secant method, Successive iteration, Comparison of different root methods, Properties of roots of polynomial.

UNIT- 2

Elimination method for solution of simultaneous equations, Gauss elimination, Pivoting, Gauss-Jordan method, Gauss-Seidal, Jacobi method, Solution of Eigen equations, Concept of Eigen system, Polynomial method, Eigen values & Eigen vectors of matrices.

UNIT- 3

Interpolation: Polynomial interpolation, Newton formula for interpolation, Forward differences, Differences of polynomial, Backward differences, Lagrange's interpolation, Divided differences interpolation and inverse interpolation, Finite difference operators, Spline interpolation, Least square curve fitting, Linear regression.

UNIT- 4

Numerical differentiation, First order derivative by a two point formula, Numerical Integration, Trapezoidal rule of integration, Simpson's 1/3 rule, Simpson's 3/8 rule of integration, Double integration, Newton-Cotes formulae of integration, Gaussian integration formula, Gaussian two point formula.

UNIT- 5

Solution of first order ordinary differential equations, Taylor series method and Euler's method, Modified Euler's method, Runge-Kutta method, Higher order Runge-Kutta formulas, Predictor-corrector methods, Finite difference methods, Optimization, Single variable optimization Algorithm.

Books Suggested

E. V. Krishnamurthy and S. K. Sen, Numerical Algorithms, Affiliated East-West Press Pvt. Ltd., New Delhi.

P. B. Patil and U. P. Verma, Numerical computational methods, Narosa Publishing House Pvt. Ltd., New Delhi.

UNIT-1

Sommerfeld's Theory and space quantization: Gross structure of energy spectrum of hydrogen atom. The radial quantum number, The total energy, General characteristics of sommerfeld's elliptic orbits, space quantization, Larmors theorem , Magnetic moment and the Bohr magneton. Stern Gerlach experiment. Spectroscopic terms and their notation.

Pauli's principle and its mathematical formulation, angular momentum, parity and their selection rules.

UNIT-2

Atoms in external magnetic and electric fields: The normal and anomalous Zeeman Effect, Weak fields-Russel Saunders terms and general case, The intensities of lines in weak fields and quadrupole lines, Paschen Back effect and illustrative example.

Stark effect, Linear Stark effect, illustration for hydrogen atom and its series limit. General theory for non-hydrogenic atoms-Helium and Alkali metals.

UNIT-3

X-ray spectra: Salient features of x-ray emission spectra, K, L and M series spectra and their origin, energy level diagram, selection rules, relative intensities of lines, regular and Irregular doublets and doublet laws, Sommerfield screening constants, Gamma sum and permanence rule.

Non-diagram lines: Origin of non-diagram lines, Wentzel, Richtmyer and Coster Kronig theories, Auger effect, origin of low frequency satellites.

UNIT-4

X-ray diffraction: Diffraction from a crystal -the structure factor in terms of indices of reflection. Convolution, Diffraction by a periodic distribution, The electron density equation.

X-Ray spectrographs: Construction, working and focussing action of (i) Oscillating Plane crystal spectrograph (ii) Bent crystal spectrograph of Cauchois, Johann and Johansson type, Resolving and Dispersive Powers for all the spectrographs.

UNIT-5

Basic elements of a laser: Threshold condition; Four-level laser system, CW operation of laser; Critical pumping rate; Population inversion and photon number in the cavity around threshold; Output coupling of laser power.

Optical resonators; Cavity modes; Mode selection; Pulsed operation of laser: Q-switching and Mode locking; Experimental technique of Q-switching and mode locking

Different laser systems: Ruby, CO₂, Dye and Semiconductor diode laser.

Books Suggested

I. I. Sobel'man, Introduction to the Theory of Atomic Spectra, Pergamon Press.

E. U. Condon and G. H. Shortley, The Theory of Atomic Spectra, Cambridge University Press.

A. H. Compton and S. K. Allison, X-Rays in Theory and Experiment, D Van Nostrand Company, INC

B. K. Agarwal, X-Ray Spectroscopy, Springer Verlag Berlin, Heiderberg, New York.

Raj Kumar, Atomic and Molecular Spectra, Kedarnath Ramnath, Meerut.

Gupta Kumar Sharma, Elements of spectroscopy, Pragati Prakashan (2012)

K. Thyagarajan and A. K. Ghatak, Lasers, Theory and Applications.

O. Svelto, Principles of Laser.

UNIT-1

Scattering (non-relativistic) : Differential and total scattering cross section, transformation from CM frame to Lab frame, solution of scattering problem by the method of partial wave analysis, expansion of a plane wave into a spherical wave and scattering amplitude, the optical theorem, Applications- scattering from a delta potential, square well potential and the hard sphere. Scattering of identical particles, energy dependence an resonance scattering. Breit-Wigner formula, quasi stationary states. The Lippman-Schwinger equation and the Green's functions approach for scattering problem, Born approximation and its validity for scattering problem, Coulomb scattering problem under first Born approximation in elastic scattering.

UNIT-2

Relativistic Formulation ad Dirac Equation: Attempt for relativistic formulation of quantum theory, The Klein-Gordon equation, Probability density and probability current density, solution for free particle K.G. equation in momentum representation, Interpretation of negative probability density and negative energy solutions.

Dirac equation for a free particle, properties of Dirac matrices and algebra of gamma matrices, non-relativistic correspondence of the Pauli equation (inclusive of electromagnetic interaction). Solution of the free particle Dirac equation, orthogonality and completeness relations for Dirac spinors, interpretation of negative energy solution and hole theory.

UNIT-3

Symmetries of Dirac Equation : Lorentz covariance of Dirac equation, proof of covariance and derivation of Lorentz boost and rotation matrices for Dirac spinors, Projection operators energy and spin, Parity (P), charge conjugation (C), time reversal (T) and CPT operators for Dirac spinors.

UNIT-4

Bilinear covariants, and their transformations, behaviour under Lorentz transformation, P,C,Tand CPT, expectation values of coordinate and velocity involving only positive energy solutions and the associated problems, inclusion of negative energy solution, Zitterbewegung, Klein paradox.

UNIT-5

The Quantum Theory of Radiation: Classical radiation field, transversality condition, Fourier decomposition and radiation oscillators, Quantization of radiation oscillator, creation, annihilation and number operators, photon states, photon as a quantum mechanical excitations of the radiation field, fluctuations and the uncertainty relation, validity of the classical description, matrix element for emission and absorption, spontaneous emission in the dipole approximation, Rayleigh scattering. Thomson scattering and the Raman effect, Radiation damping and Resonance fluorescence.

Books Suggested

Ashok Das and A.C. Milissiones, Quantum mechanics - A Modern Approach, Garden and Breach Science Publishers.

Eugen Merzbacher, Quantum Mechanics, Second Edition, John Wiley and Sons, (1970).

Bjorken and Drell, Relativistic Quantum Mechanics, McGraw Hill, (1964).

J. J. Sakurai, Advanced Quantum Mechanics, John Wiley.

PH-204 CLASSICAL MECHANICS AND MATHEMATICAL PHYSICS

UNIT-1:

Constraints, Generalised coordinates, D'Alembert's principle and Lagrange's equations, Velocity dependant potentials and dissipative function, Simple applications of Lagrangian formulation. Calculus of variations, Hamilton's variational principle, Derivation of Lagrange's equations from Hamilton's principle, Conservation theorems and symmetry properties

UNIT-2:

Generalized momentum, Legendre's transformation and the Hamilton's canonical equations of motion, simple applications of Hamiltonian formulation, Cyclic coordinates, Canonical transformation, Different forms of generating function, Examples of canonical transformation, Poisson and Lagrange's brackets, Equation of motion in Poisson bracket formulation, Angular momentum Poisson Bracket relations.

UNIT-3:

Hamilton-Jacobi Method, Hamilton's principal and characteristic functions, The Harmonic oscillator problem using Hamilton-Jacobi Method.

Angular momentum and kinetic energy of motion about a point, The inertia tensor and moment of inertia, eigen value of inertia tensor and principal axis transformation, Euler equations of motion for rigid body, Force- free motion of a rigid body.

UNIT-4:

Fourier Transforms: Development of the Fourier integral from the Fourier Series, Fourier and inverse Fourier transform: Simple Applications: Finite wave train, Wave train with Gaussian amplitude, Fourier transform of derivatives, solution of wave equation as an application. Convolution theorem, Application of Fourier transform to diffraction theory: diffraction pattern of one and two slits

UNIT-5:

Curvilinear coordinates: Orthogonal coordinate systems, Gradient, Curl, Divergence and Laplacian in orthogonal coordinate systems, Spherical, Polar and Cylindrical coordinates, Poisson's and Laplace Equations, Solution of Laplace differential equations, two dimensional steady flow of heat (Cartesian coordinates), Solution of two dimensional Laplace's equation in the cylindrical coordinates, Green's theorem.

Books Suggested

H. Goldstein, C. Poole and J. Safko : Classical Mechanics, Addison-Wesley, 3rd Edition.

L. D. Landau and E. M. Lifshitz: Mechanics, Pergamon Press.

R. G. Takwale & P. Purnanik : Introduction to Classical Mechanics, Tata McGraw-Hill.

G. Arfken and H.J. Weber, Mathematical Physics, Academic Press, (2005).

A. K. Mukhopadhyay, Mathematical Methods for Engineers & Physicists, (2010).

B. S. Rajput, Mathematical Physics, Pragti Prakashan, Meerut, (1997).

L. A. Pipes, Applied Mathematics for Engineers & Physicists, McGraw Hill, (1970).

M. C. Potter and J.L Goldberg, Mathematical Methods, Prentice Hall of India, (1978).

Tulsi Dass and S. K. Sharma, Mathematical Methods in Classical and Quantum Physics, Orient Longman.

B. D. Gupta, Mathematical Physics , Vikas Publication House, (1986).

H. K. Das, Advanced Engineering Mathematics, S. Chand Pub, (2008).

Merle C. Potter and Jack Goldberg, Mathematical Methods, Prentice Hall of India.

1. To determine Planck's constant by photocell (using prism)
2. To determine laser beam parameters
3. To study magneto optic effect and to determine Verdet constant
4. To determine Young's modulus of glass by Cornu's method
5. To measure Brewster angle and determine refractive index of given material
6. To determine Planck's constant by photocell (using filters)
7. To determine slit width from the study of Fraunhofer diffraction pattern
8. To study electro optic effect and to determine Kerr constant of a given material
9. To determine paramagnetic susceptibility of given material (solution)
10. To study Zeeman effect and to determine the splitting of spectral lines
11. To determine critical potentials with the help of Franck-Hertz's experiment
12. To determine the coherence length and coherence time by diffraction grating method of Laser
13. Design a combinational circuit that represents the full adder or full subtractor for binary inputs

Note: Students are required to perform following experiments using programming language C.

1. Using the method of least square fit, find the equation of regression line for the given data
2. Using Gauss Siedel method find solution of given set of simultaneous equations
3. Using Gauss Quadrature method of numerical integration calculate integral of given function
4. Using Runge-Kutta second order method find numerical solution of the given first order ordinary differential equation
5. Using Runge-Kutta fourth order method find numerical solution of the given first order ordinary differential equation
6. To calculate the roots of an algebraic or transcendental equation by using Newton Raphson Method
7. To calculate the roots of an algebraic or transcendental equation by using Successive Bisection Method
8. To calculate the roots of an algebraic or transcendental equation by using False position Method
9. To calculate the roots of an algebraic or transcendental equation by using Successive substitution Method
10. Interpolation using Lagrange's interpolation formula
11. Numerical integration by using Simpson's
12. Using Monte-Carlo method integrate numerically the given function in one variable

Software packages, system software and application software packages, general purpose application software packages, MS office Package, components of MS office, MS word: word documents, editing tools, font types, font size, other editing tools, inserting tables, figures, graphs, symbols and equations, equation editor, page layout, review tools: spelling, grammar and thesaurus

MS Excel: Excel worksheet, data types and range, calculation using Excel, inserting formulas, using common mathematical functions: Log, Exp, factorial, Random Numbers and sum; analysis of data using statistical functions such as: AVERAGE, MEDIAN, MODE, Standard Deviation, Normal distribution; linear regression, slope and intercept functions, graphs using Excel

Origin Software Package: Origin Worksheet, different type of graphs in Origin, drawing multiple graphs on single page, style, color and size, formatting axis and scales, tick labels and borders, graph labels and captions, adding error bars to the graphs, saving and printing graphs

Mathematica Software Package: Introduction to Mathematica Software package, numerical computation using Mathematica, symbolic computation, solution of equations in one variable and simultaneous equations, solution of differential equation, graphs using Mathematica.

Practicals

1. Exercise based on use of formatting tools in MS Word
2. Exercise based on inserting figures, graphs and tables in Word document
3. Exercise based on use of Equation Editor
4. Exercise based on use of formulas in MS Excel including mathematical functions
5. Exercise based on use of Statistical functions in MS Excel
6. Exercise based on creating graphs in MS Excel
7. Exercise based on creating graphs in ORIGIN
8. Exercise based on formatting graphs in ORIGIN
9. Exercise based on showing error bars on experimental data points in ORIGIN
10. Exercise based on numerical calculations using Mathematica
11. Exercise based on symbolic computation using Mathematica
12. Exercise based on Solution of differential Equations using Mathematica
13. Exercise based on Solution of equations in one variable using Mathematica
14. Exercise based on creating 2-D graphs in Mathematica
15. Exercise based on creating 3-D graphs in Mathematica

Books Suggested

Alexander Mamishev and Murray Sargent, Creating Research and Scientific Documents Using Microsoft Word, Microsoft Press (2013).

Les Kirkup, Data Analysis with Excel: An introduction for Physical Scientists, Cambridge University Press, Cambridge U.K. (2002).

Origin: Data analysis and Graphing Software, OriginLab Corporation (2009).

Burce F. Torrence and Eve A. Torrence, The Students Introduction to Mathematica (2nd Ed.), Cambridge University Press, Cambridge U.K. (2009).

M. Sc. Physics Syllabus
(CBCS and CBSS based)

M. Sc. Physics II Year (2016 - 2017)

SEMESTER III

PH-301

ELECTRODYNAMICS AND PLASMA PHYSICS

UNIT-1

Electrostatics and Magnetostatics: Poisson and Laplace equations, Green's theorem, formal solutions of electrostatic boundary value problem with Green's function, method of electrostatic images: point charge in the presence of a grounded conducting sphere, point charge in the presence of a charged and insulated conducting sphere, conducting sphere in a uniform electric field.

Magnetic field of a current loop, boundary conditions on B and H, uniformly magnetized sphere in an external magnetic field.

UNIT-2

Time varying fields: Maxwell's displacement current, Maxwell's equations, vector and scalar potentials, gauge transformation, Lorentz gauge, Coulomb gauge, Green function for the wave equation, Poynting's theorem and conservation of energy and momentum for a system of charged particles and electromagnetic fields.

UNIT-3

Radiation by moving charges: Lienard-Wiechert potentials and fields for a moving point charge, electromagnetic fields of a uniformly moving point charge, total power radiated by an accelerated charge: Larmor's formula and its relativistic generalization, angular distribution of radiation emitted by an accelerated charge.

UNIT-4

Dynamics of relativistic charged particle: Motion of charged particle in non-uniform static magnetic fields. Adiabatic invariance of flux through the orbit of particle, magnetic mirror. Lagrangian and Hamiltonian for a relativistic charged particle in external electromagnetic fields.

UNIT-5

Magnetohydrodynamics and Plasma Physics: Basic properties of plasma, Magnetohydrodynamic equations, Magnetic diffusion, viscosity and pressure, pinch effect. Qualitative aspects of instability in a pinched plasma column, High frequency plasma oscillations, short wave length limit of plasma oscillations and Debye screening distance.

Books Suggested

J. D. Jackson, Classical Electrodynamics, John Wiley.

L. D. Landau and E. M. Lifshitz, Electrodynamics of continuous media, Pergamon Press.

J. R. Reitz and F. J. Milford, Foundation of Electromagnetic Theory, Addison Wesley.

D. J. Griffith, Introduction to Electrodynamics, PHI.

UNIT-1

Digital Logic Circuits: Logic gates and logic families: DTL, TTL, Boolean algebra, development of Boolean expressions: SOP, Minimization techniques: using laws of Boolean algebra, Karnaugh map.

Number Systems and their inter conversion, data representation: fixed-point representation, floating point representation, error detection and correction: parity generator-checker, Hamming codes (1-bit detection-correction).

UNIT-2

Combinational and Sequential logic circuits: binary adder, 4-bit adder-subtractor, flip-flops: RS flip-flop, JK flip-flop, T-flip-flop, D-flip-flop, master-slave JK flip-flop, Registers: controlled buffer register, shift registers, ring counter, Counters: asynchronous counter, synchronous counter, modulus counter.

UNIT-3

Architecture of 8085 microprocessor: register organization, bus organization, ALU and controls, classification of 8085 instructions, addressing modes, fetch and execution of instructions, data transfer: memory-mapped I/O and peripheral mapped I/O, interrupted driven data transfer, programmable interrupt controller, DMA data transfer, DMA controller, assembly language programming.

UNIT-4

Architecture of simple I/O devices: Hex keyboard, LED display, VDU and their interfacing, 8279 keyboard-display interface, CRT controller, Interfacing devices: I/O ports, programmable peripheral interface - 8255 A.

D/A and A/D conversion: Basics of operational amplifier, D/A conversion: R-2R ladder network, DAC, A/D conversion: counter method, successive approximation method, sample and hold circuits. ADC.

UNIT-5

Applications of 8085: Designing of a microcomputer system: Hardware design, software design, Transfer of data between two microcomputers in distributed processing, Temperature monitoring system, data acquisition system: 8085 based temperature monitoring system. Introduction to 16-bit microprocessors: Intel 8086: architecture, addressing modes and instruction set.

Books Suggested

A. P. Malvino, Digital Computer Electronics, Tata McGraw Hill.

A. P. Malvino and D. Leach, Digital Principle and applications, Tata McGraw Hill.

Morris-Mano, Computer System Architecture, PHI.

R. S. Gaonkar, Microprocessor Architecture, Programming and Applications. Wiley Eastern Ltd.

M. Raffiquzzaman, Microprocessor: Theory and Application, Prentice Hall Of India.

Ghosh and Sridhar, Introduction to Microprocessor for Engineers and Scientists, Prentice Hall Of India.

D. V. Hall, Microprocessor and Interfacing, Tata McGraw Hill.

UNIT-1

Nuclear Decays: Alpha decay: Barrier Penetration theory of alpha decay, theoretical expression of Geiger-Nuttal law. Beta decay: Fermi theory of beta decay, Kurie plot, uses of Kurie plot, ft-values, Fermi and Gamow –Teller transitions, allowed and forbidden transitions, electron capture, Inverse beta decay.

Neutrino Physics: Pauli's neutrino hypotheses, properties of neutrino, detection of neutrino and experimental existence of neutrino.

UNIT-2

Elementary particle Physics: Fundamental interactions in nature, intrinsic parity of pions, Strange particles associated production–strange quantum number, Gellmann–Nishijima formula, Weak interactions: General properties, Parity violation in weak interaction, tau-theta puzzle. CPT theorem (statement only), the quark model- quark model of particles, quark structures of mesons and baryons, elementary idea of colour quantum number.

UNIT-3

Nuclear Models: Classification of nuclear model, Fermi gas model, Motion in mean potential, energy level according to harmonic oscillator potential and infinite square well potential–effect of spin orbit interaction. Predictions of ground state spin of odd–A nuclei, failure of shell model and liquid drop model.

Collective model: facts in support of nuclear collective model, collective vibrations and rotations, nuclear quadrupole moments, Nilson model-calculation of energy levels –prediction of ground state spin.

UNIT-4

Interaction of Charge Particles with Matter: Interaction of charged particles with matter: Energy loss of heavy charge particles and stopping power, Range energy relations, Qualitative description of energy loss of electrons passing through matter. Interaction of neutrons: Properties of neutron, classification of neutrons according to energy, slowing down of neutrons in matter.

UNIT-5

Experimental Techniques: Scintillation counters, Cherenkov counters; Semi-conductor detectors, Nuclear Emulsion techniques, Solid state nuclear track detectors, Proton synchrotron.

Books Suggested

R. D. Evans, The Atomic Nucleus, McGraw Hill Book Company Inc., New York.

W. E. Burcham and M. Jobes, Nuclear and particle physics, Addison Wesley

S. N. Ghoshal, Nuclear Physics, S. Chand & Co. Ltd., New Delhi

R. R. Roy and B. P. Nigam, Nuclear Physics, New Age Int.(P) Ltd.

J. Singh: Fundamentals of Nuclear Physics, Pragati Prakashan

B. K. Agarwal, Nuclear Physics Lokbharti Publication, Allahabad

R. M. Singru, Introductory Experimental Nuclear Physics

B. L. Cohen, Concept of Nuclear Phsyics, Tata McGraw Hills

Jagdish Varma, R. C.Bhandari and D. R. S. Somayajulu, Fundamentals of Nuclear Physics, CBS Publishers & Distributors Pvt. Ltd.

UNIT-1

Synthesis and preparation of materials: Gas to solid synthesis and preparation- vapour deposition, chemical vapour deposition. Liquid to solid synthesis and preparation- crystal growth from the melt, liquid quenching, crystallization from solution, sol-gel method, ion exchange and intercalation. Solid to solid synthesis and preparation-solid state reaction, high pressure preparation and synthesis, glass ceramics.

UNIT-2

Electrons in solids and surface states: Interacting electron gas; Hartree and Hartree-Fock approximations, correlation energy, plasma oscillations, Friedel oscillation, Landau's quasi-particle theory of a Fermi liquid, elementary idea regarding surface states.

UNIT-3

Imperfections in Crystals: Mechanism of plastic deformations in solids, stress and strain fields of screw and edge dislocations. Forces between dislocations stress needed to operate Frank - Read source, dislocations in bcc and fcc lattices. Experimental methods of observing dislocations and stacking faults, Electron microscopy.

UNIT-4

Film composition determination, spatial variation of film composition, film thickness, measurement by multiple beam interferometry and mechanism of film formation. Study of surface topography by multiple beam interferometry. Electrical conductivity of thin film and its expression. Boltzmann transport equation for thin film and thermal conductivity of thin films.

UNIT-5

Reduced Dimensionality: Basic concepts underlying 0D, 1D system and their applications, Fullerenes and quantum dots. One dimensional system: One dimensional metal, Peierls distortion, conjugated polymers, Nano-tubes, quantum wires. Two dimensional systems: Layered crystals, quantum wells, quantum Hall effect.

Books Suggested

Elliot, The Physics and chemistry of solids, John Wiley & sons, New York.

Thomas, Transmission Electron Microscopy,

Tolansky, Multiple Beam Interferometry.

Heavens, Thin Films.

Chopra, Physics of Thin Films.

Aschroft and Mermin, Solid State Physics, New York.

Mott and Davis, Electronic Processes in Non crystalline Materials, Oxford Univ. Press.

**PH-305 DIGITAL ELECTRONICS AND MICROPROCESSOR
LABORATORY**

1. To study Boolean algebraic expressions
2. To construct and study R-S flip-flop and clocked R-S flip-flop using logic gates
3. To construct and study J-K flip-flop using logic gates
4. To construct and study 4 bit buffer register using flip-flop ICs
5. To construct and study 4 bit shift left and shift right registers using flip-flop ICs and hence convert them into ring counter
6. To construct and study 4 bit Asynchronous counter using flip-flop ICs
7. To construct and study 4 bit Synchronous counter using flip-flop ICs
8. Design and study of ADC and DAC circuits
9. Write an assembly language program to find the sum of a series of 8 bit numbers
10. Write an assembly language program to find the smallest of the series of 8 bit numbers
11. Write an assembly language program to find the largest of the series of 8 bit numbers
12. Write an assembly language program to arrange a series of 8 bit numbers into ascending order
13. Write an assembly language program to arrange a series of 8 bit numbers into descending order
14. Write an assembly language program to find the product of two 8-bit numbers
15. Write an assembly language program to divide an 8-bit number by an 8-bit number
16. Write an assembly language program to find square root of a perfect/imperfect 8-bit number
17. Write an assembly language program to find the sum of a series of 16-bit numbers

PH-306 NUCLEAR AND CONDENSED MATTER PHYSICS LABORATORY

1. To study the random nature of radioactive decay and to find the standard deviation
2. Find the efficiency of G. M. detector for gamma source also verify Inverse square law for gamma rays
3. To determine Linear and mass attenuation coefficient for gamma source, also estimate efficiency of GM detector for gamma Source
4. Determination of Range and End point energy of Beta Source by half-thickness method, also estimate efficiency of GM detector for Beta Source
5. Measurement of voltage and current of wind energy based D.C. supply with change in
 - i. Direction of wind
 - ii. Speed of wind imposed on the blades
6. Study of voltage and current of the solar cells in series and parallel combination also study the Power Curve to find the maximum power point
7. Preparation and study of nano TiO₂ solar cell in presence of Sun light and hydrogen lamp
8. Determination of Curie temperature of given Ferromagnetic material
9. Study of dielectric function and determination of A.C. electrical conductivity of given dielectric material
10. Study of dispersion relations of mono and di-atomic basis using Lattice dynamic Kit
11. Study of Hall Effect in Semiconductor (Si/ Ge)
12. Determination of Electrical resistivity of semiconductor by four probe method
13. Study of Electron Spin Resonance in crystals and determination of 'g' factor

Solar Cell Materials: Need for sustainable energy sources, sun's energy & its advantages, fundamentals of solar cells, p-n junction under illumination, generation of photovoltage, light generated current, I-V equation of solar cell, solar cell characteristics, upper limits of cell parameters, short circuit current, open circuit voltage, fill factor, efficiency, losses in solar cells, types of solar cells: inorganic, organic and hybrid solar cells.

Nanomaterials: A general introduction of nanotechnology, Synthesis of Nanomaterials: mechanical method, sputter deposition, electric arc deposition, synthesis of metal and semiconductor nanoparticle by colloidal route.

Investigating nanomaterials: scanning electron microscopy, scanning probe microscopy, photoelectron spectroscopy.

Carbon nanotubes: Introduction, synthesis, properties and applications.

Semiconductor quantum dots: Introduction, synthesis, size dependent properties and applications.

Superconductors: Idea of superconductors, thermodynamic and electromagnetic properties of superconductors, high temperature superconductors (HTS), rare earth cuprates: Bi-based and Ti-based cuprates structural aspects and properties of cuprates HTS and application.

Practicals

1. Preparation of bulk hetero-junction or Dye-Sensitized Solar Cells (DSSC)
2. Current-voltage characteristics (I-V) of the solar cell in dark and under illumination conditions
3. Measurement of photovoltaic parameters of a solar cell: open circuit voltage (V_{oc}), short circuit current (J_{sc}), fill factor (FF) and power conversion efficiency (η)
4. Synthesis of nanomaterials (Al_2O_3) by ball mill method
5. Synthesis of CdSe and InP quantum dots
6. Synthesis of MWCNT
7. Synthesis of rare earth cuprates by ball mill
8. Synthesis of Bi-based cuprates by ball mill
9. Synthesis of Ti-based cuprates by ball mill
10. Study of temperature dependent of Hall coefficient of superconductors
11. Measurement of H_c and T_C of superconductors

Books Suggested

M. Ratner and D. Ratner, Nanotechnology, Pearson 2003.

T. Pradeep, Nano: The Essentials, Tata McGraw Hill, 2007.

S. K. Kulkarni, Nanotechnology: Principles and Practices

C. S. Solanki, Solar Photovoltaics; fundamentals, technologies & applications, PHI Learning Pvt. Ltd.

P. J. Reddy: Science & technology of photovoltaics, BS publications.

C. Kittel, Introduction to Solid State Physics, John Wiley & Sons, Inc., Singapore, New York.

J. P. Shrivastava, Elements of Solid State Physics, PHI, Learning Pvt. Ltd. New Delhi

Semester IV

PH-401 COMMUNICATION AND MICROWAVE ELECTRONICS

UNIT-1

Modulation and demodulation: Amplitude and frequency modulation (mathematical expressions and wave shapes), Transistor collector AM circuit, Square law detector, Transistor reactance variation frequency modulator circuit, Foster–Seeley discriminator, superhetrodyne receiver, SSB generation circuit, PAM, PWM, PPM, ASK, FSK BPSK and DBPSK.

UNIT-2

Television and satellite: Block diagram of black & white and colour television transmitter and receiver, TV channels, interlace scanning and bandwidth of a channel, TV cameras, Basics of satellite communication, orbital and geostationary satellites and their applications.

UNIT-3

Transmission line: Equivalent circuit of a transmission line and its voltage and current equations, characteristic impedance and propagation constant of a transmission line, impedance properties, reflection coefficient and VSWR; Vector wave equation, rectangular waveguide and field equations for TE mode, Micro-strip lines and their characteristics, optical fibers and its parameters.

UNIT-4

Microwave devices: Structure and working of two cavity klystron, reflex klystron and its working, Magnetron, Gunn diode and its characteristics, PIN diode and its use as microwave modulator, Read diode, IMPATT and TRAPATT.

UNIT-5

Microwave measurements: horn antenna characteristics, VSWR, unknown impedance and complex permittivity; block diagram of RADAR and its working, radar range equation, pulse radar.

Books suggested

George Kennedy, Electronic Communication Systems, Tata McGraw Hill

S. P. Sharma, Basic Radio and Television, TMH

H. Taub and D. L. Schilling, Principle of Communication Systems, TMH

H. A. Atwater, Introduction to Microwave Theory, McGraw-Hill.

S. Y. Liao, Microwave Devices and Circuits, PHI

M. L. Sisodia and G. S. Raghvanshi, Basic Microwave Techniques and Laboratory Manual, Wiley

J. Gower, Optical Communication Systems, PHI

B. P. Lathi, Modern Digital and Analog Communication Systems, Oxford University Press

B. R. Vishvakarma, Electromagnetic Fields and Applications, NBC International

UNIT-1

Interaction of gamma rays with matter: Gamma ray attenuation, Law of absorption, Linear & mass absorption coefficient, half thickness and radiation length, Interaction mechanism, photoelectric absorption, Compton scattering and pair production, qualitative description of photoelectric, Compton and pair production cross sections.

UNIT-2

Gamma decay: Width of decaying states, selection rules and transition probability for gamma emission. Internal electron conversion, Angular correlation studies, resonant scattering and absorption of gamma radiation, Mössbauer effect, Mössbauer Parameters and Applications of Mössbauer Spectroscopy

UNIT-3

Nuclear Forces and Two Nucleon Problem: saturation of nuclear forces, charge independence and spin dependence, exchange forces, Ground state of the deuteron using square well potential, relation between range and depth of potential, radius of the deuteron, mixing of orbitals in deuteron.

UNIT-4

Nuclear Reactions: Theories of Nuclear Reactions; Partial wave analysis of reaction Cross section; Compound nucleus formation and breakup. Resonance scattering and reaction-Breit-Wigner dispersion formula for s-waves ($\ell = 0$), direct reactions: stripping and pick-up reactions, the optical model

UNIT-5

Nucleon-Nucleon Scattering: Partial wave analysis of the low energy neutron-proton scattering, scattering length, effective range theory, scattering of neutrons by protons in ortho and para hydrogen, A qualitative discussion of proton-proton scattering at low energy, Main features of the One Boson Exchange Potentials (OBEP) no derivation.

Books Suggested

R. D Evans, The Atomic Nucleus, McGraw Hill Book Company Inc., New York.

W. E. Burcham and M. Jobes, Nuclear and particle physics, Addison Wesley

S. N. Ghoshal, Nuclear Physics, S. Chand & Co. Ltd., New Delhi

R. R. Roy and B. P. Nigam, Nuclear Physics, New Age Int.(P) Ltd., Publishers

J. Singh, Fundamentals of Nuclear Physics, Pragati Prakashan

B. K. Agarwal, Nuclear Physics Lokbharti Publication Allahabad

R. M. Singru, Introductory Experimental Nuclear Physics

B. L. Cohen, Concept of Nuclear Physics, Tata McGraw Hills

Jagdish Varma, R.C.Bhandari and D. R. S. Somayajulu, Fundamentals of Nuclear Physics, CBS Publishers & Distributors Pvt. Ltd.

UNIT-1

Group Theory: Symmetry elements, symmetry operations and point groups, symmetry operations on molecular motions, symmetry species and character tables, nature of a group. Symmetry operations and representation of a group, reducible and irreducible representation, characteristics of irreducible representation, characters of representations, classes, analysis of a reducible representations, the characters for the reducible representation of molecular motion.

UNIT-2

Types of Molecular Energy States and Molecular Spectra: Concept of molecular potential, Separation of electronic and nuclear wave functions, Born-Oppenheimer approximation, Types of spectra, Regions of spectra.

Pure rotational spectra (Microwave or Far Infra Red spectroscopy): Salient features of rotational Spectra, Rotation spectra of Polyatomic molecules, Linear, symmetric top, spherical top and Asymmetric top molecules.

UNIT-3

Vibrational Rotational Spectra (Near Infra Red spectroscopy): Salient features of Vibrational rotational spectra, Vibrating diatomic molecules as anharmonic oscillator, Vibrational spectra of polyatomic molecules, normal coordinates and normal modes of vibration

Electronic Spectra of Diatomic Molecules: Salient features of molecular electronic Spectra, Vibrational structure of electronic bands, Deslandres tables, rotational structure of electronic bands, Fortrat Parabola, Combinations relations, electronic states. Frank Condon principle.

UNIT-4

Raman Spectra: Raman effect and its salient features, quantum mechanical explanation of Raman effect, Vibrational Raman Spectra, Pure rotational Raman Spectra, Vibrational-rotation Raman spectra, Raman spectra and molecular structure, Advantages of IR over Raman.

Instrumentation for Raman spectroscopy, Applications Raman and Fraud.

UNIT-5

Spin Resonance Spectroscopy: Nature of Spinning Particles, Interaction between nuclear spin and magnetic field, Nuclear magnetic resonance, Nuclear quadrupole resonance, Electron spin resonance, Hyperfine structure of E.S.R absorptions.

Books Suggested

Sidney F. A. Kettle, Symmetry and Structure: Readable Group Theory for Chemist, Wiley

Claire Vallance, Molecular symmetry, Group theory & Applications, Wiley

UNIT-1

Elastic properties of crystals: Different type of elastic constants, energy density, elastic waves in cubic crystals in different directions.

X-ray crystal analysis: Reciprocal lattice, geometrical structure factor and intensity for SC, BCC, FCC, monatomic diamond and polyatomic crystals. Different techniques as the Laue, the powder and rotating methods.

UNIT-2

Dielectric properties in A.C fields: complex dielectric constant and dielectric losses, Debye equations, dielectric polarization and optical absorption. Long distance order theory of alloy by Bragg and Williams.

Ferroelectric properties: dipole theory, thermodynamics of ferroelectric transitions, second and first order transition, Ferroelectric domains, Piezoelectric and pyroelectric materials and applications.

UNIT-3

Defects in crystals: Point defects, Schottky defects, Frenkel defects, Line defects, colour centres, excitations, Planer defects.

Band theory: Bloch theorem, Bloch function and their eigen values. Tight bonding approximation for SC, BCC and FCC. Nearly free electron model, Wigner Seitz method, construction of the Fermi-surfaces, de. Hass-Von Alfen effect, Cyclotron resonance, magneto resistance and quantum Hall effect.

UNIT-4

Magnetism: Quantum theory of dia and para magnetism, Weiss theory of Ferromagnetism. Heisenberg model and exchange integral, Ferromagnetic domains and Bloch wall, Neel model of anti ferromagnets, thermal excitation of magnons, Magnons in antiferromagnets NMR, conditions of resonance, Bloch equation. NMR experiment and Characteristics of an absorption line.

UNIT-5

Superconductivity: Meissner effect, London equations, Type-1 and Type-2 superconductors thermodynamic properties, cooper pair and derivation of BCS Hamiltonian and BCS results. Superconducting tunnelling, DC and A.C Josephson effect, Super current quantum interference, Fullerenes preparation. Properties and applications. High temperature superconductors and their structure, applications.

Books Suggested

C. Kittel, Introduction to Solid State Physics, Seventh Edition, John Wiley & Sons, Inc., Singapore, New York.

A. J. Dekker, Solid State Physics, Macmillan India Ltd, Delhi.

M. A. Omar, Elementary Solid State Physics, Pearson.

J. P. Mckely, Solid State Physics and Semiconductor Physics, A Harper International Edition, New York.

PH-405 COMMUNICATION AND MICROWAVE ELECTRONICS LABORATORY

1. Design and study of amplitude modulation and demodulation circuits
2. Design and study of frequency modulation and demodulation circuits
3. Design and study of pulse width modulation and demodulation circuits
4. Design and study of pulse position modulation and demodulation circuits
5. Design and study of pulse amplitude modulation and demodulation circuits
6. Study of optical fiber parameters
7. Waveform analysis using storage CRO
8. Study of reflex klystron characteristics
9. Study of Gunn diode characteristics and PIN modulator
10. Determination of unknown impedance by VSWR measurements at microwave frequency
11. Determination of real part of relative complex permittivity of a solid sample by two point method at microwave frequency
12. Study of horn antenna characteristics
13. Measurements of complex permittivity of liquid at microwave frequencies
14. Study of micro-strip components characteristics
15. Design and study of ASK, FSK, BPSK and DBPSK modulation and demodulation.
16. Study of RADAR characteristics

1. K-emission spectrum of Copper using a plane oscillating crystal spectrograph
2. K-absorption edge of Bromine using a 20 cm curved crystal spectrograph
3. K-absorption edge of Nickel using a 20 cm curved crystal spectrograph
4. Laue photograph of muscovite mica crystal
5. L-emission spectrum of Tungsten using 40 cm/20 cm curved crystal spectrograph
6. Absorption spectrum of Iodine and calculation of dissociation energy
7. Spectrum of C-N and determination of vibrational constants
8. Fine Structure constant using Yellow and Green doublets of Sodium
9. XRD of standard Silicon and characterization of peaks
10. Study of glow curve of a crystal using thermo luminescence analyzer
11. UV-VIS spectrum of a given solution in varying concentration
12. To determine the velocity of Ultrasonic wave in a given liquid
13. Determination of Rydberg constant 'R' from Balmer series of Hydrogen atom

Analog and digital signals,

Block diagram of regulated DC power supply and its use in biasing the electronics circuits,

Block diagram of digital multimeter and its uses in voltage, current and resistance measurements,

Block diagram of function generators (sine, square and triangular wave) and their characteristics,

Block diagram of frequency counter and its working and uses,

Block diagram of various cathode ray oscilloscopes and their uses in frequency, phase and voltage measurement,

Origin of bio-electric signals associated with various organs,

Electric cardio gram (ECG) and its application in heart functioning,

Sonography (ultrasound imaging) and its application in diagnosis

Practicals

1. Measurements of voltage, current and resistance by DMM
2. Study of waves generation by function generator
3. Study of waves using CRO
4. Use of digital storage oscilloscope (DSO) in waveform study
5. Study of DC power supply
6. Study of function generator
7. Study of ultra sound generation and its application

Books Suggested

A. D. Helfrick and W. D. Cooper, Modern Electronic Instrumentation and Measurement Techniques, PHI

R. S. Khandpur, Handbook of Biomedical Instrumentation, TMH

DEPARTMENT OF MATHEMATICS AND STATISTICS
SYLLABUS BASED ON CHOICE BASED CREDIT SYSTEM (CBCS)

FOR

M.Sc. (Semester I) STATISTICS EXAM. 2023
(Academic Session 2022-23)



JAI NARAIN VYAS UNIVERSITY
JODHPUR

DEPARTMENT OF MATHEMATICS AND STATISTICS
JAI NARAIN VYAS UNIVERSITY:JODHPUR

AN OVERVIEW:

The Department of Mathematics of the Jai Narain Vyas University (formally known as University of Jodhpur) was established in 1962 with the inception of the University in the same year. The Department has been engaged in teaching under-graduate and post-graduate course in Mathematics since then. The graduate teaching in Statistics started in 1989 and the teaching of post graduate courses in Statistics began in 1989. The Department has also run M.Phil. Programme in Mathematics since 1988 and, M.A./M.Sc. under UGC's COSIST Programme during 1990-1995. The Department has been provided with grants for establishing the Computer Laboratory under the COSIST Programme. This Laboratory has been set up in the Department which is well equipped with a PC/AT 80386 computer with 8 terminals, 7 PC/ST Plotter and a digitizer.

The Department has been engaged in research in both Pure and Applied Mathematics and in Statistics. The Department has produced 5 D.Sc.'s, and more than 120 Ph.D.'s. The Department in National and International journals has published more than 1500 research papers. At present 11 Research Scholars are working for Ph.D. Degree in Mathematics.

Thrust areas of research are Fractional Calculus, Generalized Functions, Integrals Transforms, Differential and Integral Equations, Operations Research, Fluid Mechanics, Magneto hydrodynamics, and Plasma Dynamics. In Statistics, the research being carried out in the are of Sample Surveys, Statistical Distributions, Applications of Distributions in Demographic Studies, and Educational Statistics.

The First Professor and Head of the Department, Prof. R.K. Kushwaha, Ph.D. (Princeton), D.Phil. (Allahabad), F.N.A.Sc., F.N.A., has served the University from 1963 to 1982. An eminent Astrophysicist and reputed Mathematician, he was the President, Section of Mathematics, Indian Science Congress during 1973-74 and was General Secretary, National Academy of Science of India, Allahabad for 4 years during 1973-77.

Professor R.K. Saxena, Ph.D., D.Sc., F.N.A.Sc., chaired the Department of Mathematics and Statistics during March 1982-Sept. 1982; March 1983-July 1988, July 1991-July 1994. He was the first President of Rajasthan Ganita Parishad in 1987-88, and has published more than 300 research papers in reputed journals. He is the first D.Sc. in Rajasthan and was appointed National Lecturer by the UGC in 1984-85. Prof. Saxena has had several assignments abroad, including fellowship of National Research Council of McGill University, Canada.

Professor P.K. Bhatia, Ph.D., D.Sc., F.N.A.Sc., F.I.M.A. (U.K), FRAS (London), has been engaged in research in Applied Mathematics, particularly in Fluid Mechanics and MHD. He was the President, Section of Mathematics of Indian Science Congress during 1990-91. He has published more than 150 research papers in reputed journals. Prof. Bhatia Chaired the Department during July 1988-July 1991 and January 1996-November 1997.

Several Members of the Department has visited foreign countries on teaching and other assignments. Professor R.K. Saxena has visited Canada, Iraq, Libya and U.S.A. Professor Bhatia has visited Australia, Nigeria and U.S.A. Dr. R.C. Bhatt has spent four years in Iraq, Dr. P.K. Banerji was in Nigeria, Dr. S.K. Agarwal was in Kenya for about three years, Dr. G.C. Tikkiwal was in Nigeria and U.S.A. for about five years, and Dr. B.S. Bhaduria visited Eritrea (N.E. Africa) on teaching assignment during 2003-04 under United Nations Development Programme. Dr. Banerji visited Italy to attend an International Conference in 1988 and went to Hungary in 1990 under the UGC's Cultural Exchange Programme and visited Switzerland to participate in an International Conference. In October 2003, Dr. Bhaduria visited USA to attend an International Conference in the University of Southern Maine, Portland,. Dr. R.K. Yadav visited Spain to attend the 25th Conference of International Congress of Mathematicians in Madrid during August 22-30, 2006. Recently Prof. R.K.Kumbhat, Dr.S.S.Tak, and Dr. Aiyub Khan have visited Switzerland to attend the International Congress on Industrial and Applied Mathematics organized between July 16-20, 2007 at Zurich. The members of the Department have, thus had interaction with scientists in other countries. The above teachers also attended and presented their research work at the 26th International Congress of Mathematicians held at Hyderabad during August 2010.

The Department is proud of recalling Mathematicians Prof. S. Saran, Prof. H.M. Srivastava, Prof. K.M. Srivastava, Prof. B.R.K. Kashyap, Prof. S.C. Rajvanshi, Prof. C.M.Joshi,

Prof. J.P. Singhal, Prof. R.C. Sharma, Prof. B.L. Sharma, Prof. J.L. Bansal, Prof. P.N. Rathie. Prof. P.C. Munot, Prof. S.L. Kalla, Prof. K.N. Gaur and many others who had initiated research in various fields of Mathematics in this Department and brought the name of the Department in the Academic Map of India and abroad.

M.Sc./M.A. (Statistics) Semester-wise course description: Exam 2023

The academic program at M.Sc. level is through a semester examination scheme. The course work includes lectures, seminars and quiz/laboratory activities.

The full course is of **FOUR SEMESTERS** spread for **TWO YEARS** duration. A semester-wise list of courses to be offered is given below:

SEMESTER- I

Stats – 101: Special Functions

Stats – 102: Probability and Sampling Distributions - I

Stats – 103: Statistical Inference - I

Stats – 104: Sampling Techniques and Design of Experiments - I

Stats – 105: Practicals – A

Stats – 106: Practicals – B

SEMESTER – II

Stats – 201: Classical Polynomials and Matrix Algebra

Stats – 202: Probability And Sampling Distributions - II

Stats – 203: Statistical Inference - II

Stats – 204: Sampling Techniques And Design Of Experiments - II

Stats – 205: Practicals – A

Stats – 206: Practicals – B

SEMESTER - III

Stats – 301: Statistical Inference

Stats – 302: Sample Surveys - I

Stats – 303 and Stats – 304: (Any two of the following):

(i) Operations Research - I

(ii) Non-Parametric Statistical Inference And Sequential Analysis

(iii) Advanced Theory of Design Of Experiments – I

(iv) Stochastic Processes - I

(v) Mathematical Economics and Econometrics - I

Stats – 305: Practicals – A

Stats – 306: Practicals - B

SEMESTER – IV

Stats – 401: Mutivariate Analysis

Stats – 402: Sample Surveys - II

Stats – 403 and Stats – 404 (Any two of the following):

(i) Operations Research - II

(ii) Non-Parametric Statistical Inference And Sequential Analysis - II

(iii) Advanced Theory of Design Of Experiments – II

(iv) Stochastic Processes - II

(v) Mathematical Economics and Econometrics - II

Stats – 405: Practicals – A

Stats – 406: Practicals – B

List of Skill Courses (SC) in Statistics

Stats – SC – 1 : Knowledge of Mathematical typing software- I

Stats – SC – 2: Knowledge of Mathematical typing software –II

Stats – SC – 3 : Knowledge of SPSS – I

Stats – SC – 4 : Knowledge of SPSS – II

Stats – SC – 5 : Sampling and test of Significance – I

Stats – SC – 6 : Sampling and test of Significance – II

***List of Elective Papers ((Any two of the following):for Semester – III)**

(Stats – 303 and Stats – 304)

(i) Operations Research - I

(ii) Non-Parametric Statistical Inference and Sequential Analysis

(iii) Advanced Theory of Design Of Experiments – I

(iv) Stochastic Processes - I

(v) Mathematical Economics and Econometrics - I

Stats – 305: List of Practical Exercises for Semester - III

***List of Elective Papers (((Any two of the following):for Semester–IV)**

(Stats – 403 and Stats – 404)

(i) Operations Research - II

(ii) Non-Parametric Statistical Inference And Sequential Analysis

(iii) Advanced Theory of Design Of Experiments – II

(iv) Stochastic Processes - II

(v) Mathematical Economics and Econometrics - II

Stats – 405: List of Practical Exercises for Semester - IV

Not more than 33% of the total admitted students of M.A./M.Sc. (Final) Mathematics will be allowed in any elective paper.

Selection of these elective papers will be strictly on merit, obtained in M.A./M.Sc. (Previous) Mathematics Examinations.

GUIDELINES FOR CHOICE BASED CREDIT SYSTEM:

Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. **Each student has to complete four skill courses: two within the Department and two from other Department within JNV University or the Universities approved by JNV University.**
3. **Course:** Usually referred to, as ‘papers’ is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of **number of credits to be completed by the students.**
5. **Credit Point:** It is the **product of grade point and number of credits for a course.**
6. **Credit:** **A unit by which the course work is measured.** It determines the number of hours of instructions required per week. **One credit is equivalent to one period of teaching** (lecture or tutorial) or two periods of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.

8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. **It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.**
12. **Semester:** Each semester will consist of 15-18 weeks of academic work **equivalent to 90 actual teaching days.** The odd semester may be scheduled from **July to November/ December and even semester from December/January to May.**
Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May. The Department shall conduct the Practical examinations of odd and even semesters as per the Panel of Examiners approved by the University. Each Board of examiners shall consist of one external Examiner from other University/Institute and another from the Department.
13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the **registered students after every semester.** This statement will display the course details (**code, title, number of credits, grade secured**) along with SGPA of that semester and **CGPA earned** till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Science resolves the following:

- a. **All internal assessments shall be open assessment system only and that are based on Quizzes, term test and seminar.**
- b. Attendance shall carry the prescribed marks in all papers and Practical examination CCA (Continuous Comprehensive Assessment).
- c. In each semester **three out of four theoretical component University examinations shall be undertaken by external examiners from outside the**

university conducting examination, who may be appointed by the competent authority.

Grievances and Redressal Mechanism

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head/Principal of the College or the Chairperson of the University Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.
- b) The appeal will be assessed by the Chairman and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Dean, Faculty of Science comprising all HODs of the Faculty and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	'O'	Outstanding	10
2	'A+'	Excellent	9
3	'A'	Very Good	8
4	'B+'	Good	7
5	'B'	Above Average	6
6	'C'	Average	5
7	'P'	Pass	4
8	'F'	Fail	0
9	'Ab'	Absent	0

- i. A student obtaining Grade F in a paper shall be **considered failed and will be required to reappear in the University End Semester examination.**
- ii. For **noncredit courses** (Skill Courses) **'Satisfactory'** or **"Unsatisfactory"** shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

= and > 95 % marks Grade Point 10.0
90 to less than 95 % marks Grade Point 9.5
85 to less than 90 % marks Grade Point 9.0
80 to less than 85 % marks Grade Point 8.5
75 to less than 80 % marks Grade Point 8.0
70 to less than 75 % marks Grade Point 7.5
65 to less than 70 % marks Grade Point 7.0
60 to less than 65 % marks Grade Point 6.5
55 to less than 60 % marks Grade Point 6.0

- 50 to less than 55 % marks Grade Point 5.5
- 45 to less than 50 % marks Grade Point 5.0
- 40 to less than 45 % marks Grade Point 4.5
- 35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,
i.e.

$$\text{SGPA} (S_i) = \Sigma (C_i \times G_i) / \Sigma C_i$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,
i.e.

$$\text{CGPA} = \Sigma (C_i \times S_i) / \Sigma C_i$$

where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.

- iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	6	B	6	6 x 6 = 36
2	Course 2	6	B+	7	6 X 7 = 42
3	Course 3	6	B	6	6 X 6 = 36
4	Course 4	6	O	10	6 X 10 = 60
5	Course 5	6	C	5	6 X 5 = 30
	Total	30			204

Thus, $\text{SGPA} = 204 / 30 = 6.8$

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	30	30	30	30
SGPA	6.67	7.25	7	6.25

$$\text{CGPA} = (30 \times 6.67 + 30 \times 7.25 + 30 \times 7 + 30 \times 6.25) / 120$$

$$815.1 / 120 = 6.79$$

SEMESTER-WISE THEORY PAPERS / SKILL COMPONENT:

Core Courses	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Semester I							
Course- 1	Stats - 101	Special Function	6-0-0	6	30	70	100
Course- 2	Stats – 102	Probability and Sampling Distributions – I	6-0-0	6	30	70	100
Course- 3	Stats – 103	Statistical Inference-I	6-0-0	6	30	70	100
Course- 4	Stats – 104	Sampling Techniques and Design of Experiments-I	6-0-0	6	30	70	100
Course- 5 Practicals-A	Stats – 105	Practical based on Paper II & III	0-0-6	3	30	70	100
Course – 6 Practicals-B	Stats – 106	Practical based on Paper IV	0-0-6	3	30	70	100
Skill Course I*	As per the list		2-0-2				
Total				30	180	420	600
Semester II							
Course- 7	Stats - 201	Classical Polynomials and Matrix Algebra	6-0-0	6	30	70	100
Course- 8	Stats – 202	Probability and Sampling Distributions – II	6-0-0	6	30	70	100
Course- 9	Stats – 203	Statistical Inference – II	6-0-0	6	30	70	100
Course-10	Stats – 204	Sampling Techniques and Design of Experiments – II	6-0-0	6	30	70	100
Course- 11 Practical –A	Stats - 205	Practical based on Paper II & III	0-0-6	3	30	70	100
Course -12 Practical –B	Stats - 206	Practical based on Paper IV	0-0-6	3	30	70	100
Skill course	As per the list		2-0-2				

II*							
Total				30	180	420	600
Semester III							
Course- 13	Stats -301	Statistical Inference	6-0-0	6	30	70	100
Course- 14	Stats -302	Sample Surveys-I	6-0-0	6	30	70	100
Course- 15 and Course – 16	Stats -303 & Stats – 304: (any two from list of elective papers)	(i) Operationis Research (ii)Non-parametric Statistical Inference and Sequential Analysis (iii) Advanced Theory of Design of Experiments (iv) Stochastic Processes (v) Mathematical Economics and Econometrics	6-0-0 6-0-0	6 6	30 30	70 70	100 100
Course – 17 Practical – A	Practicals-A Stats – 305		0-0-6	3	30	70	100
Course – 18 Practical – B	Practicals-B Stats - 306		0-0-6	3	30	70	100
Skill course –III*	As per the list		2-0-2				
Total				30	180	420	600
Semester IV							
Course- 19	Stats -401	Multivariate Analysis	6-0-0	6	30	70	100
Course- 20	Stats – 402	Sample Surveys – II	6-0-0	6	30	70	100
Course – 21 and Course – 22	Stats – 403 and Stats - 404 (any two from list of elective papers)	(i) Operationis Research (ii)Non-parametric Statistical Inference and Sequential Analysis (iii) Advanced Theory of Design of Experiments (iv) Stochastic Processes (v) Mathematical Economics and Econometrics	6-0-0 6-0-0	6 6	30 30	70 70	100 100
Course – 23	Practicals-A Stats - 405		0-0-6	3	30	70	100
Course – 24	Practicals-B Stats – 406		0-0-6	3	30	70	100
Skill course –III*	As per the list		2-0-2				
Total				30	180	420	600

*** The Department shall offer two skill courses per semester from the list of skill courses approved for the Department.**

****The course 21 and course 22 shall be in accordance to the allocation of the courses during the Counselling for the Semester – III (for the course 15 and course 16).**

In view of the course content, the Department of Mathematics and Statistics distributed the Periods between Theory/Tutorial/Practical as under per paper

- 4 : 0 : 0 (four lectures only (no tutorial and no practical) per week) – For Theory.
- 0 : 0 : 6 (no lecture, no tutorial, and four practical only per week) – For Practical per paper
- 2+0+2 (two lectures, no tutorial and two practical/field experimentations) – For Skill courses.

The Duration of the Period shall be forty five minutes. In each of these combinations, the first value stands for the same number of lecture instructions per week, whereas the last two values stand for double the number of tutorial / practical instructions per week.

In each practical group the number of students that can be accommodated will be fifteen.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective) involve an evaluation system of students that has the following two components:-

- (i) **Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
 - (ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.
- (i) **Continuous Comprehensive Assessment (CCA):** This would have the following components:
- a. **Quizzes:** Two Quiz examinations of 45 minutes duration each having a maximum of 25 marks shall be arranged for each theory paper during the semester course period
 - b. **Term Test:** One term test **shall be arranged for each theory paper** prior to End-Semester Examination; examination duration shall be of three hours; maximum marks shall be 70
 - c. **Seminar:** Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 15. The seminar shall commence after first quiz examination and shall be completed prior to term test for all the papers.
 - d. **Classroom Attendance** – Each student will have to attend a minimum of 75% Lectures / Tutorials / Practicals. **A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE).** Attendance shall have 15 marks and will be awarded by following the system proposed below:

Those having greater than 75% attendance (for those participating in Co-curricular activities, 25% will be added to per cent attendance) will be awarded CCA marks as follows:-

75% to 80%	=	3 marks
80% to 85%	=	6 marks
85 to 90%	=	9 marks
90% to 95%	=	12 marks
> 95%	=	15 marks

Each student's cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Science.

- e. CCA are based on open evaluation system without any bias to any student
- f. Any grievance received in the Department from student shall be placed before the **Grievance Redressal Committee** with adjudicated comments

Each component marks will be added without rounding and the total thus obtained is ratio by a factor of six. This value shall be rounded.

Illustration: Quiz 1 – Marks obtained = 20
 Quiz 2 – Marks obtained = 18
 Term Test Marks obtained = 50.5
 Seminar Marks obtained = 14
 Attendance Marks obtained = 9
 Total = 111.5
 Conversion = $111.5/5 = 22.3$
Award (Rounded off to next integer) = 23.00

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective Department shall declare the result as “Satisfactory” or “Non-Satisfactory”; each student need to get a minimum of three “Satisfactory” declaration for the course completion

In laboratory courses (having only practical (P) component), the CCA will be based on students attendance (50%); collection of plant material (25%) and hands on Practical, records, etc. (25%)

For QUIZ (2 quizzes per semester), 25 marks per Quiz and total of 50 marks, 45 minutes duration for each quiz:

Types of question	Number of Questions	Marks per question	Total marks per type
1. Multiple choice/Fill in the Blanks	5	1	5
2. Short answer (maximum 50 words)	10	2	20
Total	15		25

For the Term test and ESE:

Part A

Ten short type questions (Definitions, illustrations, functions, short explanations, etc; 25-50 words) for two marks each. $10 \times 2 = 20$ marks; two questions from each Unit; no choice in this part

Part B

Five short answer (250 words) type questions for four marks each. $5 \times 4 = 20$ marks; one question from each Unit with internal choice

Part C

Five questions of long/explanatory answer (500 words) type, one drawn from each Unit; student need to answer any three; ten marks each; $3 \times 10 = 30$ marks

$20+20+30 = 70$ marks

Qualifying for Next semester

- 1. A student acquiring minimum of 40% in total of the CCA is eligible to join next semester.**
2. A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as 'Fail'), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.
3. A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time, i.e. three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted, for additional chances examination fee shall be on additive basis.

Improvement Option:

Every student shall have the opportunity to improve Credit thorough University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final. There shall be no improvement opportunity in Practical examinations.

Result Declaration:

The ESE (End Semester Examination/University Examination) results shall be declared within twenty days of the last examination. The Theory/ Practical Classes of even semesters shall begin from the next

day of ESE; whereas odd semester classes shall commence after summer vacation.

ADMISSION

The minimum qualification for admission to M.Sc. Course is B.Sc. (10+2+3) degree with Mathematics as a major subject. The details of eligibility conditions and admission procedure are given in the admission form. The admission will be done on the basis of merit calculated by the aggregate marks obtained at the B.Sc. level including the marks award under the category (a) and (b) mentioned in the admission form [i.e. (a) benefit to the candidates who are resident of Rajasthan, and (b) benefit for candidates of J. N. Vyas University, Jodhpur]. Reservation of Scheduled Caste/Scheduled Tribes/Disabled/OBC/SBC and Teacher candidates will be as per university rules. The candidates are required to attend minimum of a 75% of classes in both theory and practical.

TEACHING AND EXAMINATION SCHEME

Per Semester

Course	Periods/Week	Examination hours	CCA	ESE	Total
Theory Papers					
Course - I	6	3	30	70	100
Course - II	6	3	30	70	100
Course - III	6	3	30	70	100
Course – IV	6	3	30	70	100
Course – V	6	3	30	70	100

Students are required to pass in each theory papers in every semester.

Skill Courses are to be passed (with satisfactory grade) in each Semester (Odd Semester from Department and Even Semester from outside Department).

UNIVERSITY EXAMINATION

Each course paper shall be of three hours duration.

The model examination schedule for odd semester shall be:

Day	Morning session	Next session
1	Paper I Semester I	Paper I semester II
2	Paper I Semester III	Paper I semester IV
3	Paper II Semester I	Paper II semester II
4	Paper II Semester III	Paper II semester IV
5	Paper III Semester I	Paper III semester II
6	Paper III Semester III	Paper III semester IV
7.	Paper IV Semester I	Paper IV semester II
8	Paper IV Semester III	Paper IV semester IV
9	Paper V Semester I	Paper V Semester II
10	Paper V Semester III	Paper V Semester IV

The model examination schedule for Even semester shall be:

Day	Morning session	Next session
1	Paper I Semester II	Paper I semester I
2	Paper I Semester IV	Paper I semester III
3	Paper II Semester II	Paper II semester I
4	Paper II Semester IV	Paper II semester III
5	Paper III Semester II	Paper III semester I
6	Paper III Semester IV	Paper III semester III
7.	Paper IV Semester II	Paper IV semester I
8	Paper IV Semester IV	Paper IV semester III
9	Paper V Semester II	Paper V Semester I
10	Paper V Semester IV	Paper V Semester III

**FACULTY OF THE DEPARTMENT AND THEIR
RESEARCH/TEACHING INTEREST**

Sr. No.	Name/Designation	Academic Qualification	Field of Specialization
	Professor		
01.	Dr. Chena Ram	M.Sc., Ph.D.	Special Functions, Fractional Calculus, Statistical Distributions.
02.	Dr. R.K.Yadav	M.Sc., Ph.D.	Special Functions, Integral Transforms, Fractional Calculus, Complex Analysis.
03.	Dr. R.K.Gupta (Head)	M.Sc., Ph.D.	Special Functions, Fractional Calculus, Integral Transforms
04.	Dr. Vijay Mehta	M.Sc., Ph.D.	Fluid Dynamics and M.H.D.
05.	Dr. Aiyub Khan	M.Sc., Ph.D.	Computational Fluid Dynamics
	Assistant Professor		
06.	Dr. Ramdayal Pankaj	M.Sc., Ph.D.	Applied Mathematics
07.	Mr. Madan lal	M.Sc.	
08.	Dr. Meena Kumari Gurjar	M.Sc. Ph.D.	Special Functions, Fractional Calculus and Operation Research

M.Sc./M.A. (Semester - I) Statistics
Examination 2023

There will be four theory papers as given below:

Paper I: Special Functions and Matrix Algebra

Paper II: Probability and Sampling Distributions

Paper III: Statistical Inference

Paper IV: Sampling Techniques and Design of Experiments

Each Paper will be of 100 marks.

Practical: The practical examination will be of 8 hours duration spread over two days. It will be conducted by two separate boards of examiners one for Part A and the other for Part B. Each board of examiners shall award marks out of 100. The marks shall be out of 200 for both the parts and shall be consolidated by the tabulators.

The distribution of marks shall be as follows:

Part A: Practical exercises based on Paper – II and III:

Practical exercises	50 Marks
Record	10 Marks
Viva-voce	10 Marks
Total	70 Marks

Quiz based on Practicals shall be of 30 marks (Total 70 + 30 = 100)

Part B: Practical exercises based on Paper - IV

Practical exercises	50 Marks
Record	10 Marks
Viva-voce	10 Marks
Total	70 Marks

Quiz based on Practicals shall be of 30 marks (Total 70 + 30 = 100)

For ex-students the total marks obtained in practical exercises and viva-voce will be converted out of 100 marks.

**Detailed Syllabus for M.Sc./M.A. (Semesters –I)
Statistics
Examination 2023**

Stats-101: Special Functions

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1: Definition of hypergeometric series and functions. Properties of hypergeometric functions. Integral representation for the Gaussian hypergeometric function ${}_2F_1(\cdot)$.

Unit 2: Simple transformations and contiguous relations for ${}_2F_1(\cdot)$. Linear relation between the solutions of hypergeometric differential equation. Kummer's Confluent hypergeometric function.

Unit 3: Elementary properties of the generalized hypergeometric function ${}_pF_q(\cdot)$.

Unit 4 : Legendre functions of first kind and Legendre Polynomials, generating functions, orthogonal properties, recurrence relations, Rodrigue's formula.

Unit 5: Bessel functions of first kind, differential equation and its solutions, generating function, orthogonality recurrence relations.

BOOKS RECOMMENDED

1. Rainiville, E.D.: Special Functions. Macmillan & Co. New York (1960).
2. Sneddon, I.N.: Special Functions of Mathematical Physics and Chemistry, Oliver and Byod (1961).
3. Labedev, W.N.: Special Functions and their Applications. Dover, (1972).
4. Saxena, R.K. and Gokhroo, D.C.: Special Functions, Jaipur Publishing House (2004).

**M.Sc./M.A. (Semesters –I) Statistics
Examination 2023**

Stats-102: PROBABILITY AND SAMPLING DISTRIBUTIONS-I

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1: Axiomatic approach to the theory of probability, Random variable (Discrete and Continuous). Cumulative Probability Distribution Function, Probability mass function, probability density function.

Unit 2: Joint conditional and marginal distributions. Mathematical expectation and moments. Chebyshev's and Schwartz's inequalities.

Unit 3: A detailed study of discrete probability distribution such as Bernoulli, Binomial, Poisson, Negative Binomial. Various properties of these distributions and applications.

Unit 4: A detailed study of Hypergeometric, Geometric and Multinomial distributions various properties of these distributions and applications.

Unit 5: Continuous probability Distributions: Normal, Lognormal, Beta type I, Beta type II, exponential, double exponential.

BOOKS RECOMMENDED

Parimal Mukhopadhyay: Mathematical Statistics, Pub. Books & Allied (P) Ltd.,

Mood, Graybill and Boes: Introduction to the Theory of Statistics, III Edition

Hogg, K.V. and Craig, A.T.: Introduction to Mathematical Statistics

Loeve, M.: Probability Theory

Pitt, L.R.: Integration, Measure and Probability

Kingman and Taylor: Introduction to Probability and Measure

M.Sc./M.A. (Semesters –I) Statistics
Examination 2023
Stats 103: STATISTICAL INFERENCE

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1: The general set-up of Statistical decision problem: Concepts of loss function, risk function, admissible decision function.

Unit 2: Bayes estimation, Bayes risk, Bayes rule, minimax principle, minimax estimate.

Unit 3: Point estimation, unbiased and consistent estimators, concept of efficient estimators, Cramer-Rao inequality and its use to obtain UMVU estimators. Examples to show-that C-R bound may not be attained.

Unit 4: Definition of Sufficiency through conditional distributions and through factorization theorem. Proof of equivalence of the two definitions, Rao-Black-well theorem, jointly sufficient statistics.

Unit 5: Methods of estimation: Maximum likelihood, Method of moments. Parametric Interval estimation, Confidence intervals, one sided confidence interval, Pivotal quantity. Sampling from the Normal distributions.

BOOKS RECOMMENDED

Kendall, M.G. and Stuart, A: Advanced Theory of Statistics, Vol. I,II

Mukhopadhyay, P.: Mathematical Statistics, Pub. Books & Allied (P.Ltd.,)

Mood, A.M., Graybill and Boes: Introduction to Theory of Statistics, III Ed.

Rotagi, V.K.: Statistics Inference (Wiley and Sons).

**M.Sc./M.A. (Semesters –I) Statistics
Examination 2023**

Stats – 104: SAMPLING TECHNIQUES AND DESIGN OF EXPERIMENTS

Duration of Paper: 03 Hours

Max. Marks: 70

Note: Each theory paper is divided in three parts i.e. Section – A, B and C .

Section A will consist of 10 compulsory questions. There will be two questions from each unit and answer (30 words). Each question carries 2 marks.

Section B will consist of 10 questions. Two questions from each unit and the examinee will answer (250 words) one question from each Unit. Each question carries 4 marks.

Section C will consist of 5 questions, one from each unit. The examinee will answer any 03 questions (with answer limit of 500 words). Each question carries 10 marks.

Unit 1: Simple Random Sampling: Estimation of proportions for $k(>2)$ classes, Inverse sampling, Quantitative and Qualitative characteristics, estimation of the sample size.

Unit 2: Sampling with varying probabilities with replacement; Sampling with pps: cumulative and Lahiri's methods, estimation of population mean, its variance and estimation of variance.

Unit 3: Stratified Random Sampling; Effects of deviation from optimum allocation, estimation of proportions, post-stratification, inaccuracy in strata sizes construction of strata.

Unit 4: Concepts of experiments, determination of number of replications, contrasts, Models of analysis of variances.

Unit 5: Analysis of two-way orthogonal data with m observations per cell, missing plot techniques.

BOOKS RECOMMENDED

Mukhopadhyaya, P.: Theory and Methods of Survey Sampling, Pub. Prentice-Hall of India Pvt. Ltd.,

Sukhatme, P.V. et al.: Sampling Theory of Surveys with Applications

Cochran, W.G.: Sampling Techniques, 3rd ed.

Goon, Gupta and Das Gupta: Fundamentals of Statistics, Vol.II

Joshi, D.D.: Design of Experiments

Goulden: Statistical Methods.

**M.Sc./M.A. (Semesters –I) Statistics
Examination 2023**

Stats – 105: Part A - PRACTICAL EXERCISES BASED ON PAPERS II AND III

1. Fitting of distributions such as:
Binomial, Poisson, negative binomial, geometric normal, lognormal and exponential distributions.
2. Fitting of curves such as:
Polynomials, logarithmic and exponential curves
3. Tests of significance of sample correlation and regression coefficients.

Stats – 106: Part B - PRACTICAL EXERCISES BASED ON PAPER - IV

1. Analysis of variance with one-way classifications with single and multiple observations per cell.
2. Analysis of RBD and LSD with missing observations.
3. Drawing of random samples with finite populations and binomial and normal populations.
4. Gain in precision due to stratification.
5. Drawing of pps samples using cumulative and Lahiri's methods and estimation of population mean and total.

M.Sc. Zoology Syllabus for Choice Based Credit System (CBCS)

Introduction of the Department

Postgraduate Department of Zoology came into existence in 1963 after establishment of University of Jodhpur in 1962. However, the root of this department goes back to 1948 in the erstwhile Jaswant College, a premier institution of Rajasthan at that time. Officially Zoology department has been functioning under the university structure for last 52 years. This period was full of events, achievements and growth in terms of student intake, teaching faculty, research projects, publications and research grants. The department is fortunate in having Professor Vishwanath, Sc.D. FNA at its founder head in 1963. A distinguished zoologist, Professor Vishwanath relinquished in 1965 handing over the reign to World renowned Entomologist Professor M.L. Roonwal, Sc.D., FNA, who headed the department till 1967 before taking over as Vice chancellor of this university. In 1967 Dr. S. Khera, D.Sc. a well known plant Nematologist took over as head followed by Professor S.D. Mishra, Professor K.N. Katiyar, Professor V.S. Durve, Professor B.G. Kapoor, Professor S. Johnson, Prof. S.C. Bhargava, Prof. H.S. Nama, Dr. M.L. Gupta, Prof. S.M. Mohnot, Prof. A.K. Purohit, Prof. G. R. Jakher, Dr. R.K.Gupta, Prof. S.P. Singh, Prof. D. Mohan and Prof. G. Tripathi. Four members of this department have been elevated as Vice-Chancellors of reputed universities.

Presently, there are 5 Professors, and 12 Assistant Professors. The faculty teaches about 90 P.G. students and about 800 U.G. students every year. Faculty members guide about 40 research scholars at a point of time. They are working in the areas of physiology, ecophysiology, toxicology, ecology, animal behavior, environmental biology, radiation biology, cell biology, entomology and taxonomy, parasitology, fish biology and limnology, bioinformatics, primate behavior and wildlife conservation, palaeozoology etc. This department successfully carried out over 60 minor and major research projects funded by the UGC, CSIR, ICAR, DST, ICMR, DOE, DBT and other funding agencies. Presently, department is having UGC – DRS (SAP) program. The faculties represented in several national and International academic bodies and policy formation Committees of State and Central Governments.

GUIDELINES FOR CHOICE BASED CREDIT SYSTEM:

Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete **four skill courses:** two within the Department and two from other Department within JNV University or the Universities approved by JNV University
3. **Course:** Usually referred to, as ‘papers’ is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period of teaching (lecture or tutorial) or two periods of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.
12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/ December and even semester from December/January to May.

Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May. The Department shall conduct the Practical examinations of odd and even semesters as per the Panel of Examiners approved by the University. Each Board of examiners shall consist of one external Examiner from other University/Institute and another from the Department.

13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Science resolves the following:

- a. All internal assessments shall be open assessment system only and that are based on Quizzes, term test, seminar
- b. Attendance shall carry the prescribed marks in all papers and Practical examination internal assessment
- c. In each semester three out of four theoretical component University examination shall be undertaken by external examiners from outside the university conducting examination, who may be appointed by the competent authority

Grievances and Redressal Mechanism

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head/Principal of the College or the Chairperson of the University Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.
- b) The appeal will be assessed by the Chairman and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Dean, Faculty of Science comprising all HODs of the Faculty and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S. No.	Letter Grade	Meaning	Grade Point
1	'O'	Outstanding	10
2	'A+'	Excellent	9
3	'A'	Very Good	8
4	'B+'	Good	7
5	'B'	Above Average	6
6	'C'	Average	5
7	'P'	Pass	4
8	'F'	Fail	0
9	'Ab'	Absent	0

- i. A student obtaining Grade F shall be considered failed and will be required to reappear in the examination.
- ii. For noncredit courses (Skill Courses) 'Satisfactory' or "Unsatisfactory" shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

- = and > 95 % marks Grade Point 10.0
- 90 to less than 95 % marks Grade Point 9.5
- 85 to less than 90 % marks Grade Point 9.0
- 80 to less than 85 % marks Grade Point 8.5
- 75 to less than 80 % marks Grade Point 8.0
- 70 to less than 75 % marks Grade Point 7.5
- 65 to less than 70 % marks Grade Point 7.0
- 60 to less than 65 % marks Grade Point 6.5
- 55 to less than 60 % marks Grade Point 6.0
- 50 to less than 55 % marks Grade Point 5.5
- 45 to less than 50 % marks Grade Point 5.0
- 40 to less than 45 % marks Grade Point 4.5
- 35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,
i.e

$$SGPA (S_i) = \frac{\sum(C_i \times G_i)}{\sum C_i}$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,
i.e.

$$\text{CGPA} = \frac{\sum(C_i \times S_i)}{\sum C_i}$$

where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.

- iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	4	B	6	4 x 6 =24
2	Course 2	4	B+	7	4 X 7 =28
3	Course 3	4	B	6	4X 6 = 24
4	Course 4	4	O	10	4 X 10 =40
5	Course 5- Practical I	4	C	5	4 X 5 =20
6	Course 6 – Practical II	4	B	6	4 X 6 = 24
	Total	24			24+28+24+40+20+24 =160

Thus, $\text{SGPA} = 160/24 = 6.67$

Illustration for CGPA

	Semester- I	Semester- II	Semester- III	Semester- IV
Credit	24	24	24	24
SGPA	6.67	7.25	7	6.25

$$\text{CGPA} = \frac{(24 \times 6.67 + 24 \times 7.25 + 24 \times 7 + 24 \times 6.25)}{96}$$

$$652.08/96 = 6.79$$

Semester-wise Theory Papers/Practical / Skill component

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical /Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Semester I							
Core course 1	Zool. 101	Lower Invertebrate	4-0-0	4	30	70	100
Core course 2	Zool. 102	Higher Invertebrate	4-0-0	4	30	70	100
Core course 3	Zool. 103	Biosystematics	4-0-0	4	30	70	100
Core course 4	Zool. 104	Quantitative Biology	4-0-0	4	30	70	100
Core course practical 1	Zool. 105	Practical 1	0-0-8	4	30	70	100
Core course practical 2	Zool. 106	Practical 2	0-0-8	4	30	70	100
Skill Course I	Zool.107/ Zool. 207/ Zool. 307/ Zool. 407	Medical Laboratory Technology / Vermitechnology / Pisciculture / Eco-wildlife Tourism	2-0-2				
				24	180	420	600
Semester II							
Core course 5	Zool. 201	General Mammalian Physiology	4-0-0	4	30	70	100
Core course 6	Zool. 202	Regulatory Physiology of Vertebrates	4-0-0	4	30	70	100
Core course 7	Zool. 203	Animal Ecology	4-0-0	4	30	70	100
Core course 8	Zool. 204	Animal Behavior	4-0-0	4	30	70	100
Core course practical 3	Zool. 205	Practical 1	0-0-8	4	30	70	100
Core course practical 4	Zool. 206	Practical 2	0-0-8	4	30	70	100
Skill course II	Zool.107/	Medical Laboratory	2-0-2				

	Zool. 207/ Zool. 307/ Zool. 407	Technology / Vermitechnology / Pisciculture / Eco-wildlife Tourism					
				24	180	420	600
Semester III							
Core course 9	Zool. 301	Biology of Lower Chordata and Vertebrata	4-0-0	4	30	70	100
Core course 10	Zool. 302	Biology of Higher Vertebrata	4-0-0	4	30	70	100
Discipline Specific Elective 1	Zool.303A/ Zool.303B/ Zool.303C/ Zool.303 D/ Zool. 303 E	Entomology Elective Paper –I / Biology of Parasitism Elective Paper – I/ Environmental Biology Elective Paper – I / Cell Biology Elective paper – I / Fish Biology Elective paper – I	4-0-0	4	30	70	100
Discipline Specific Elective 2	Zool.304 A/ Zool.304B/ Zool.304C/ Zool. 304D/ Zool. 304 E	Entomology Elective Paper –II/ Biology of Parasitism Elective Paper – II / Environmental Biology Elective Paper – II / Cell Biology Elective paper – II / Fish Biology Elective paper – II	4-0-0	4	30	70	100
Core course practical 5	Zool. 305	Practical 1	0-0-8	4	30	70	100
Discipline Specific Elective practical 1 (For	Zool.306A/ Zool.306B/ Zool.306C/	Practical 2	0-0-8	4	30	70	100

both elective)	Zool.306D/ Zool. 306E						
Skill course III	Zool.107/ Zool. 207/ Zool. 307/ Zool. 407	Medical Laboratory Technology / Vermitechnology / Pisciculture / Eco-wildlife Tourism	2-0-2				
				24	180	420	600
Semester IV							
Core course 11	Zool. 401	Developmental Biology	4-0-0	4	30	70	100
Core course 12	Zool. 402	Evolution and Population Genetics	4-0-0	4	30	70	100
Discipline Specific Elective 3	Zool. 403A/ Zool. 403B/ Zool. 403C / Zool. 403 D/ Zool. 403 E	Entomology Elective Paper – I / Biology of Parasitism Elective Paper I / Environmental Biology Elective – I / Cell Biology Elective paper – I/ Fish Biology Elective Paper – I	4-0-0	4	30	70	100
Discipline Specific Elective 4	Zool. 404A/ Zool. 404B/ Zool. 404C / Zool. 404 D/ Zool. 404 E	Entomology Elective Paper – II / Biology of Parasitism Elective Paper II/ Environmental Biology Elective – II / Cell Biology Elective paper / Fish Biology Elective Paper – II	4-0-0	4	30	70	100
Core course practical 6	Zool. 405	Practical 1	0-0-8	4	30	70	100
Discipline Specific Elective practical 2 (For both elective)	Zool. 406 A/ Zool. 406 B/ Zool. 406	Practical 2	0-0-8	4	30	70	100

	C/ Zool. 406 D/ Zool. 406 E						
Skill course IV	Zool.107/ Zool. 207/ Zool. 307/ Zool. 407	Medical Laboratory Technology / Vermitechnology / Pisciculture / Eco-wildlife Tourism	2-0-2				
				24	180	420	600

The Department shall offer four skill courses per semester.

In view of the course content, the Department of Botany distributed the Periods between Theory/Tutorial/Practical as under per paper

- 4 : 0 : 0 (four lectures only (no tutorial and no practical) per week) – For Theory
- 0 : 0 : 4 (no lecture, no tutorial, and four practical only per week) – For Practical per paper
- 2+0+2 (two lectures, no tutorial and two practical/field experimentations) – For Skill course

The Duration of the Period shall be forty five minutes. In each of these combinations, the first value stands for the same number of lecture instructions per week, whereas the last two values stand for double the number of tutorial / practical instructions per week.

In each practical group the number of students that can be accommodated will be fifteen.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective) involve an evaluation system of students that has the following two components:-

- (i) **Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
- (ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.

(i) Continuous Comprehensive Assessment (CCA): This would have the following components:

CCA Theory

- a. **Quizzes:** Two Quiz examinations of 45 minutes duration each having a maximum of 40 marks shall be arranged for theory paper during the semester course period

- b. **Term Test:** One term test shall be arranged for each theory paper prior to End-Semester Examination; examination duration shall be of three hours; maximum marks is 70
- c. **Seminar:** Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 15. The seminar shall commence after first quiz examination and shall be completed prior to term test for all the papers.
- d. **Classroom Attendance** – Each student will have to attend a minimum of 75% Lectures / Tutorials / Practical's. A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE). Attendance shall have 15 marks and will be awarded by following the system proposed below:

Those having greater than 75% attendance (for those participating in Co-curricular activities, 25% will be added to per cent attendance) will be awarded CCA marks as follows:-

75% to 80%	=	3 marks
80% to 85%	=	6 marks
85 to 90%	=	9 marks
90% to 95%	=	12 marks
> 95%	=	15 marks

Each student's cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Science.

- e. **Practical CCA are based on -**

	Board I (CCA= 30)	Board II (CCA = 30)
	Marks & Exercise	Marks & Exercise
Sem. I	15=Attendance 15= Slide Submission Invertebrate	15=Attendance 15=Biodiversity Assessments Local Tour
Sem. II	15=Attendance 15= Slide Submission Microtomy (10)	15=Attendance 15=Submission of report on soil texture/nest ecology/ Water quality
Sem. III	15=Attendance 15= Submission of Chart/ Model Related to Board I Practical	15=Attendance 15=Submission of report about lab. visit/ field tour
Sem. IV	15=Attendance 15= Submission of permanent slide of developmental stage of chick	15=Attendance 15=dissertation report

- a. Any grievance received in the Department from student shall be placed before the **Grievance Redressal Committee** with adjudicated comments

Each component marks will be added without rounding and the total thus obtained is ratio by a factor of six. This value shall be rounded.

Illustration :

Quiz 1 – Marks obtained	= 30
Quiz 2 – Marks obtained	= 35.5
Term Test Marks obtained	= 50.5
Seminar Marks obtained	= 14
Attendance Marks obtained	= 9
Total	= 139.00
Conversion	= 139/6 = 21.16666
Award	= 22.00

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective Department shall declare the result as “Satisfactory” or “Non-Satisfactory”; each student need to get a minimum of three “Satisfactory” declaration for the course completion

For QUIZ (2 quizzes per semester), 40 marks per Quiz and total of 80 marks, 45 minutes duration for each quiz:

Types of question	Number of Questions	Marks Per question	Total marks per type
1. Multiple choice	10	1	10
2. Fill in the blanks	10	2	20
3. Short answer (15 words)	5	2	10
Total	25		40

For the Term test and ESE:

Part A

Ten short type questions (Definitions, illustrations, functions, short explanations, etc; 25-50 words) for two marks each. $10 \times 2 = 20$ marks; two questions from each Unit; no choice in this part

Part B

Five short answer (250 words) type questions for four marks each. $5 \times 4 = 20$ marks; one question from each Unit with internal choice

Part C

Five questions of long/explanatory answer (500 words) type, one drawn from each Unit; student need to answer any three; ten marks each; $3 \times 10 = 30$ marks

20+20+30 = 70 marks

Qualifying for Next semester

1.A student acquiring minimum of 40% in total of the CCA is eligible to join next semester.

2.A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as 'Fail'), shall be permitted to appear in such failed course(s) in the

subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.

3. A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time i.e. three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted. Additional chances examination fee shall be on additive basis.

Improvement Option:

Every student shall have the opportunity to improve Credit through University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final. There shall be no improvement opportunity in Practical examinations.

Result Declaration:

The ESE (End Semester Examination/University Examination) results shall be declared within twenty days of the last examination. The Theory/ Practical Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation.

The academic program at M.Sc. level is through a semester examination scheme. The course work includes lectures, seminars and laboratory works.

The full course is of FOUR SEMESTERS spread for TWO YEARS duration.

Semester I Examination (2023)

Core Course I

Max. Marks: 70

Zool. 101: Lower Invertebrate

Unit - 1

Organization of coelom, acoelomates, pseudocoelomates, coelomates; locomotion in Ciliata, Flagellata and Coelenterata.

Unit - 2

Food, mode of feeding and physiology of digestion in Protozoa, Porifera and Coelenterata.

Unit - 3

Organs of respiration, mechanism of respiration; organs of excretion and mechanism of excretion.

Unit - 4

Nervous systems of Coelenterata, Platyhelminthes and Nematoda.

Unit - 5

Larval forms of free-living invertebrates and parasites; concept and significance of minor phyla; organization and general characters of Nemertini, Nematomorpha and Rotifera.

Core Course 2

Max. Marks: 70

Zool. 102: Higher Invertebrate

Unit - 1

Locomotion in Annelida, Arthropoda, Mollusca and Echinodermata.

Unit - 2

Food, Mode of feeding, Physiology of digestion in annelids, arthropods, molluscs and echinoderms.

Unit - 3

Organs of respiration and mechanism of respiration; coelomoducts, nephridia and malpighian tubules; coxal glands, Kaber's organ and Bojanus organ.

Unit - 4

Nervous system of Annelida, Crustacea, Insecta, Cephalopoda and Echinodermata.

Unit - 5

Larval forms of Annelida, Crustacea, Mollusca and Echinodermata; strategies and evolutionary significance of larval forms.

Suggested Reading Materials (All latest editions)

1. Hyman, L.H. The invertebrates. Vol. I. Protozoa through Ctenophora. McGraw Hill Co., New York
2. Barrington, E.J.W. Invertebrate structure and function. Thomas Nelson and Sons Ltd., London
3. Jagerstein. G. Evolution of Metazoan life cycle. Academic Press, New York & London.
4. Hyman, L.H. The Invertebrates. Vol. 2. McGraw Hill Co., New York
5. Hyman, L.H. The Invertebrates. Vol. 3. McGraw Hill Co., New York
6. Hyman, L.H. The Invertebrates. Vol. 4. McGraw Hill Co., New York
7. Hyman, L.H. The Invertebrates. Vol. 5. McGraw Hill Co., New York
8. Hyman, L.H. The Invertebrates. Vol. 6. McGraw Hill Co., New York
9. Hyman, L.H. The Invertebrates. Vol. 7. McGraw Hill Co., New York

10. Hyman, L.H. The Invertebrates. Vol. 8. McGraw Hill Co., New York
11. Hyman, L.H. The Invertebrates. Vol. 9: McGraw Hall Co., New York
12. Barnes, R.C. Invertebrate Zoology, III edition. W.B. Saunders Co., Philadelphia.
13. Russel-Hunter. W.D. A biology of higher invertebrates. The Macmillan Co. Ltd., London
14. Read, C.P. Animal Parasitism. Prentice Hall Inc., New Jersey
15. Sedgwick, A.A. Student Text Book of Zoology, Vol. I, II and III. Central Book Depot., Allahabad.
16. Parker, T.J., Haswell, W.A. Text book of Zoology Vol. I, Macmillan Co., London.

Core Course 3

Max. Marks: 70

Zool. 103: Biosystematics

Unit - 1

Definition, concepts, history, scope and applications of biosystematics; biological species category; code of zoological nomenclature and operative principles; applications of important rules.

Unit - 2

Formation of scientific names; neotaxonomy; chemotaxonomy; cytotoxonomy and molecular taxonomy.

Unit - 3

Collection, preservation, curation, identification; taxonomic characters; quantitative and qualitative analysis of variation; taxonomic keys, their kinds, merits and demerits.

Unit - 4

Taxonomic decision on the species level; procedure of classifying; taxonomic publications; Different kinds of types and their significance.

Unit – 5

Methods in field biology and estimating population density of Animals; ranging patterns through direct, indirect and remote observations.

Core Course 4

Max. Marks: 70

Zool. 104: Quantitative Biology

Unit – 1

Ground and remote sensing methods for habitat characterization; collection of data and their presentation such as Graphs, Bar diagrams, Histograms, Line diagrams and Pie diagrams.

Unit – 2

Measures of central tendency - mean, median and mode; analysis of variance and standard deviation.

Unit – 3

Probability theory, distribution and their properties, concept of skewness and kurtosis.

Unit – 4

Hypothesis testing, chi-square(X^2) test and its applications, students 't' – test.

Unit - 5

Experimental design and sampling theory; Shannon-Weinner index, dominance index, similarity and dissimilarity index, association index.

Zool. 105: Core Course Practical 1 (Course 1 and 2)

1. Dissections of some invertebrates.
2. Microscopic preparation of permanent slides.
3. Identification, classification and characteristics of invertebrates of different phyla.

Marking scheme

Max. Marks: 70

1. Dissection	18
2. Slide preparation	08
3. Spotting (8)	24
4. Practical record and submission of slides	10
5. Viva – voce	10

Total marks	70

Zool. 106: Core Course Practical 2 (Course 3 and 4)

1. Assessment of biodiversity in habitat.
2. Influence of climatic factors on biodiversity index in desert
3. Preparation of models showing the status of certain taxa/species in a particular habitat.
4. To derive mean, mode and median
5. To derive standard deviation, correlation and regression
6. Application of chi-square (X^2) test
7. Analysis of level of significance

Marking scheme

Max. Marks: 70

- | | |
|------------------------------|----|
| 1. Biostatistics problem – 1 | 20 |
|------------------------------|----|

2. Biostatistics problem – 2	20	
3. Presentation of model	10	
4. Practical record		10
5. Viva – voce	10	

Total marks	70	

Suggested Reading Materials (All latest editions)

1. M. Kato. The Biology of Biodiversity, Springer.
2. E.O. Wilson. Biodiversity, Academic Press, Washington.
3. G.G. Simpson. Principle of animal taxonomy, Oxford IBH Publishing Company.
4. E. Mayer. Elements of Taxonomy, Tata McGraw Hill, N. Delhi.
5. E.O. Wilson. The Diversity of Life (The College Edition), W.W. Northem & Co.
6. B.K. Tikadar. Threatened Animals of India, ZSI Publication, Calcutta.
7. Batschelet, E. Introduction to mathematics for life scientists. Springer-Verlag, Berling.
8. Jorgensen, S.E. Fundamentals of ecological modeling. Elsevier, New York.
9. Lendren, D. Modelling in behavioral ecology. Chapman & Hal, London, UK.
10. Sokal, R.R. and F.J. Rohlf. Biometry. Freeman, San Francisco.
11. Snedecor, G.W. and W.G. Cochran. Statistical methods. Affiliated East-West Press, New Delhi (Indian ed.).
12. Green, R.H. Sampling design and statistical methods for environmental biologists. John Wiley & Sons, New York.
13. Murray, J.D. Mathematical biology, Springer-Veriag. Berlin.
14. Pielou, E.C. The interpretation of ecological data : A primer on classification and ordination.
15. Sokal, R.R. and F.J. Rohlf Text Book of Biostatistics W.H. Freeman Co., San Francisco.
16. Gurvmani, N. An Introduction to Biostatistics. MJP Publishers, Chennai.

Zool. 107: Skill Course I - Medical Laboratory Technology

Collection, separation, preservation of biological samples; laboratory safety procedures; microscopy and spectrophotometry; column chromatography; gel filtration; gel electrophoresis; acid, base and buffer; fixation, staining and mounting of tissues; classification of protein, carbohydrate and lipid; anticoagulants; preparation of different blood components for use; biochemistry of blood.

Practical

1. Estimation of protein.
2. Estimation of DNA.
3. Preparation of buffer.
4. Blood groups detection.
5. Counting of RBC / WBC.

Suggested Reading Materials (All latest editions)

1. [Harold Varley](#) , Varley's practical clinical biochemistry. CBS.
2. **Barbara J. Bain, Imelda Bates, Mike A Laffan, S. Mitchell Lewis** Dacie and Lewis Practical Haematology.
3. [Kim S Suvarna](#), [Christopher Layton](#), [John D. Bancroft](#) Bancroft's Theory and Practice of Histological Techniques. Churchill Livingstone, USA.
4. [Keith Wilson](#) (Editor), [John Walker](#) Principles and Techniques of Biochemistry and Molecular Biology. Cambridge University Press, USA.
5. Richard Drake , A. Wayne Vogl , Adam W. M. Mitchell , Richard Tibbitts, Paul Richardson Gray's Atlas of Anatomy, 2e (Gray's Anatomy). Churchill Livingstone, USA.
6. [Stefan Surzycki](#) Basic Techniques in Molecular Biology. Springer.

Semester II Examination (2023)

Core Course 5

Max. Marks: 70

Zool. 201: General Mammalian Physiology

Unit - 1

Biochemical process of food digestion, absorption and assimilation; different types of vitamins, their physiological functions and effects due to vitamin deficiency.

Unit - 2

Mechanism of breathing; transport of oxygen and carbon dioxide; physiology and biochemistry of haemoglobin.

Unit - 3

Cellular respiration including glycolysis, TCA cycle, electron transport system and ATP synthesis.

Unit - 4

Structure of heart and specialized tissues; cardiac cycle; blood pressure and ECG.

Unit – 5

Structure of eye, ultrastructure of rod and cone cells, molecular physiology of vision.

Core Course 6

Max. Marks: 70

Zool. 202: Regulatory Physiology of Vertebrates

Unit - 1

Structure and types of nephrons; counter-current mechanism of urine formation, urea cycle; osmoregulation in marine and fresh water vertebrate.

Unit - 2

Types and ultrastructure of muscle; biochemistry of muscle; physiology of muscle contraction.

Unit - 3

Mechanism of nerve conduction; types of neurotransmitters and their mode of action; cholinergic mechanisms.

Unit - 4

Thermoregulation; bioluminescence; chromatophores and colour change.

Unit - 5

Structure and function of various endocrine glands; mechanism of action of peptide and steroid hormones.

Suggested Reading Materials (All latest editions)

1. Hoar, W.S. General and Comparative Animal Physiology, Prentice Hall of India.
2. Schiemdt Nielsen. Animal Physiology: Adaptation and Environment. Cambridge Strand, F.L. Physiology: A regulatory Systems Approach. Macmillan Publishing Co., New York.
3. Pummer, L. Practical Biochemistry, Tata McGraw-Hill.
4. Prosser, C.L. Environmental and Metabolic Animal Physiology. Wiley-Liss Inc., New York.
5. Wilson K. and Walker, J., Practical Biochemistry.
6. Willmer, P.G. Stone, and I. Johnson. Environmental Physiology. Blackwell Sci. Oxford, UK, 644pp.
7. Newell, R.C. (ed.). Adaptation to environment. Essays on the physiology of marine animals. Butterworths, London, UK, 539pp.

8. Townsend, C.R. and P. Calow. *Physiological Ecology: An evolutionary approach to resource use*. Blackwell Sci. Publ., Oxford, UK.
9. Alexander, R.M.N. *Optima for animals*. Princeton Univ. Press, Princeton, NJ.
10. Dejours, P., L. Bolis, C.R. Taylor and E.R. Weibel (eds.), *Comparative Physiology: Life in Water and on Land*. Liviana Press, Padova, Italy.
11. Johnston, I.A. & A.F. Benett (eds.). *Animals and Temperature : Phenotypic and evolutionary adaptation*. Cambridge Univ. Press, Cambridge, UK.
12. Louw, G.N. *Physiological animal ecology*. Longman Harloss, UK.
13. E.J.W. Barrington. *General and Comparative Endocrinology*, Oxford, Clarendon Press.
14. P.J. Bentley. *Comparative Vertebrate Endocrinology*. Cambridge University Press.
15. R.H. Williams. *Text Book of Endocrinology*, W.B. Saunders
16. C.R. Martin, *Endocrine Physiology*. Oxford Univ. Press.
17. Gorbman et al. *Comparative Endocrinology*, John Wiley & Sons.
18. Singh, H.R. *Animal Physiology and Related Biochemistry*, SLN Chand & Co., Jalandhar.
19. Pandey, K. and Shukal, J.P. *Regulatory mechanism in Vertebrates*, Rastogi Publications, Meerut.
20. Sastry, K.V. *Animal Physiology and Biochemistry*, Rastogi Publications, Meerut.

Core Course 7

Max. Marks: 70

Zool. 203: Animal Ecology

Unit - 1

Energy flow; primary production and estimation of primary productivity in terrestrial and aquatic ecosystem.

Unit - 2

Concept of community, its nature, structure, species diversity and its measurement; types of ecological succession, mechanism and concept of climax.

Unit - 3

Characteristic of population; population growth curves; population regulation; life history strategies (r and k selection).

Unit - 4

Concept of meta population- demes and dispersal; interspecific and intra specific interaction.

Unit - 5

Global environmental changes; biodiversity status; monitoring and documentation; major drivers of biodiversity changes; principles of conservation.

Core Course 8

Max. Marks: 70

Zool. 204: Animal Behavior

Unit - 1

Approaches and methods in study of behaviors; developments of behavior: instinct and learned behavior.

Unit - 2

Learning: imprinting, kineses, taxes and reflexes; motivation and its phases; Lorenz's psychohydraulic model of motivated behavior.

Unit - 3

Role of brain in animal behavior; hormones and reproductive behaviour in insects and mammals.

Unit - 4

Social behaviour with special reference to insects, fish, birds and mammals.

Unit - 5

Social organization and communication in Primates with special reference to Hanuman langur.

Zool. 205: Core Course Practical 3 (Course 5 and 6)

1. Detection of carbohydrate, protein and lipid in milk.
2. To demonstrate salivary digestion
3. To determine the respiratory rate of rat
4. Total R.B.C. count
5. Total W.B.C. count
6. Differential leucocyte count (DLC)
7. Packed cell volume (PCV) measurement
8. Estimation of haemoglobin content in mammalian blood
9. To determine the total amount of water in rat
10. To detect and separate amino acids with paper chromatography
11. Demonstration of reflex action
12. To study the temperature variation in a body of mammal
13. Microtomy of different tissues

Marking scheme

	Max. Marks: 70
1. Physiological experiment major	15
2. Physiological experiment minor	10
3. Microtomy	15
4. Permanent preparation	10
5. Practical records	10
6. Viva – voce	10

Total marks	70

Zool. 206: Core Course Practical 4 (Course 7 and 8)

1. Water analysis for CO₂, O₂, HCO₃, pH and hardness.
2. Study of water bodies to identify zoo planktons and their permanent preparations
3. Study of soil profile
4. Estimation of water holding capacity of different soil samples
5. Estimation of moisture in different soil samples
6. Investigation of nest structure of pigeon.

7. Study of garden snail habituation to vibration
8. Simple measurement of dominance hierarchy in rats/mice

Marking scheme

Max. Marks: 70

1	Ecological experiment – Major	15
2	Ecological experiment – Minor	10
3	Water analysis	15
4	Identification and permanent preparation of slide of zooplankton	10
5	Practical record	10
6	Viva – voce	10

Total marks

70

Suggested Reading Materials (All latest editions)

1. M. Kato: The Biology of Biodiversity, Springer.
2. Louw, G.N. Physiological animal ecology. Longman Harloss, UK
3. E.O. Wilson. The Diversity of Life (The College Edition), W.W. Northem & Co.
4. B.K. Tikadar. Threatened Animals of India, ZSI Publication, Calcutta.
5. Jorgensen, S.E. Fundamentals of ecological modeling. Elsevier, New York.
6. Swartzman, G.L., and S.P.O. Kaluzny. Ecological simulation primer. Macmillan, New York.
7. Lendren, D. Modelling in behavioral ecology. Chapman & Hal, London, UK.
8. Johnston, I.A. & A.F. Benett (eds.). Animals and Temperature : Phenotypic and evolutionary adaptation. Cambridge Univ. Press, Cambridge, UK.
9. E. Hillary, The Changing Face of Earth, Ecology 2000.
10. E.P. Odum, Fundamentals of Ecology. W.B. Saunders.
11. Edward J. Kormondy, Concept of Ecology, Prectice Hall Saddle River, New Jersey, USA.
12. Manning and Dawkins, Animal Behaviour, Cambridge Univ. Press, Cambridge.
13. Alcock John, Animal Behaviour, Sinauer Assoc. Inc. Publishers, Sunderland, Massachusetts.
14. Hinde, R.A. Animal Behaviour, McGraw Hill, New York and London.
15. Lorenz,K. The Evolution of Behaviour, Scientific, American.
16. Reen Mathur, Animal Behaviour, Rastogi and Company, Meerut.
17. Prasad, S. Animal Behaviour, CBS Publishers, New Delhi and Bangalore.

Zool. 207: Skill Course II - VERMITECHNOLOGY

General characteristics of earthworms; earthworms species diversity; ecological categories of earthworms; breeding and culture methods; vermicomposting; chemical and biological properties of vermicompost; use of earthworms in agricultural, industrial and household waste management; designing of various types of vermireactors.

PRACTICAL / INTERNAL ASSESSMENT

Max. Marks: 15

Study of systematic position, habit, habitat and external features of an earthworm species and its life cycle; preparation of vermiculture; maintenance of culture; preparation of vermicompost.

Suggested Reading Materials (All latest editions)

1. Edwards, C.A. Earthworm Ecology, CRC Press, The Netherlands.
2. Edwards, C.A. and Lofty, J.R. Biology of Earthworms, Chapman & Hall, England.
3. Ismail, S.A. Vermicology, Orient Longman, Chennai, India.
4. Talashilkar, S.C. Vermitechnology, Khadigramodyog, Maharashtra, India.

M.Sc. Final Syllabus 2023-24

The examination will be through theory papers/practical. Pass marks for the previous and final examination are 36% of the aggregate marks in all the theory papers and practical and not less than 25% marks in an individual theory paper. A candidate is required to pass in the written and the practical examinations separately.

Successful candidates will be placed in the following division on the basis of the total marks obtained in previous and final examinations taken together.

First division 60%, Second division 48% and Third division 36%, No student will be permitted to register himself /herself simultaneously for more than one post-graduate course.

Note: Special paper will be allotted on merit-cum-choice basis with equal number of students in each paper

ATTENDANCE

1. For all regular candidates in the faculties of Arts, Education and Social Science, Science, Law and Commerce the minimum attendance requirement should be that a candidate should have attend at least 75% of the lectures delivered and tutorials held taken together from the date of her/his admission.
2. The shortage of attendance upto the limits specified below may be condoned.
 - (i) Upto 3% of the total (a) Lectures delivered and tutorials held (taken together), and (b) Practicals of Practicals and Sessionals subject-wise condonable by the Dean/Director/Principal on the recommendation of the Department concerned.
 - (ii) Upto 6% including (i) above by the Syndicate on the recommendation of the Dean/Director/Principal.
 - (iii) Upto further 5% attendance in all subjects/papers/practicals and

sessionals(taken together) by the Vice Chancellore inspecial cases, on the recommendation of the Dean/Director/Principal.

3. The N.C.C. cadets sent out to parades and camps and such students who are deputed by the University to take part in games, athletics or cultural activitics may, for purpose of attendance, be trated as present for the days of their absence in connection with aforesaid activities and that period shll be added to their total attendance subject to the maximum of 20 days.
4. Advantage of fraction while calculating the attendance, shall be given to the candidate.

M.Sc. (Final) Zoology Examination, 2023-24

Note: Each theory paper is divided in three parts i.e. Section-A, Section –B and Section –C.

Section-A: Will consist of 10 compulsory questions. There will be two questions from each unit and answer of each question shall be limited up to 30 words. Each question will carry of 2 marks.

Section –B: Will consist of 10 questions. Each unit will be having two questions; students will answer one question from each Unit. Answer of each question shall be limited up to 250 words. Each question carry 7 Marks.

Section-C: Will consist of total 05 questions. Students will answer any 03 questions and answer of each question shall be limited up to 500 words. Each question carries 15 Marks.

Semester III Examination (2024)

Core Course 9

Max. Marks: 70

Zool. 301: Biology of Lower Chordata and Vertebrata

Unit - 1

Classification, evolution, affinities and phylogeny of protochordates; structure, function and life histories of *Pyrosoma*, *Doliolum*, *Salpa* and *Oikopleura*.

Unit - 2

Classification of Cyclostomata, structure of *Myxine* and *Petromyzon*, affinities and phylogenetic status of Cyclostomata.

Unit - 3

Classification of Pisces; origin and evolution of fishes; deep sea adaptations in fishes.

Unit - 4

Parental care in fishes; offensive and defensive mechanism; sensory, hydrostatic and lateral line system in fishes.

Unit - 5

Classification, origin and adaptive radiation in Amphibia; extinct amphibians; parental care in Amphibia.

Core Course 10

Max. Marks: 70

Zool. 302: Biology of Higher Vertebrata

Unit - 1

Classification, origin and adaptive radiations in reptiles; evolutionary significance of *Sphenodon*; Dinosaurs, types and causes of their extinction.

Unit - 2

Biting mechanism in snake; identification of snake-bite by wounds, symptoms and treatment; snake venoms, anti sera and their production.

Unit - 3

Classification of Aves up to orders; origin and evolution of birds; migration of birds; types of palate, aquatic and flight adaptation in birds; *Archaeopteryx*.

Unit - 4

Classification of mammals up to orders; origin and evolution of mammals; Prototheria and Metatheria; salient adaptive radiation in Eutheria; dentition in mammals.

Unit - 5

Old and new world monkeys; ancestry of horse and man; wild life Sanctuaries and National Parks of Rajasthan.

Suggested Reading Materials (All latest edition)

1. Colbert, E.H.: Evolution of Vertebrates, Wiley Eastern Pvt. Ltd., New Delhi
2. Parker, T.J. & Haswell, W.A.: A Text Book of Zoology, Vol. II, Macmillan & Co., London.
3. Sedgwick, A. : Student's Textbook of Zoology, Vol. II, Central Book Depot, Allahabad

4. Gharpurey, K.G.: Snakes of India and Pakistan, Popular Prakashan, Mumbai
5. Huetner, A.F. : Fundamental of Comparative Embryology of Vertebrates, Macmillan & Co., New York
6. Romer, A.S. : The Vertebrate Body, Vakils Feffers & Simont Pvt. Ltd., Mumbai
7. Young, I.Z. : The Life of Vertebrates, Oxford University Press, London
8. Alexander, R.M. The Chordata, Cambridge University Press, London
9. Carter, G.S. Structure and habit in vertebrate evolution – Sedgwick and Jackson, London
10. Walters, H.E. and Sayles, L.D. Biology of Vertebrates. MacMillan & Co., New York
11. Hyman, L.H. The Aves. McGraw Hill Co., New York.
12. Alexander, R.M. The Chordata. Cambridge University Press, London.
13. Barrington, E.J.W. The Biology of Hemichordata and Protochordata. Oliver and Boyd, Edinbough.
14. Malcom Jollie, Chordata morphology. East-West Press Pvt. Ltd., New Delhi.
15. Milton Hilderbrand. Analysis of vertebrate structure. IV. Ed. John Wiley and Sons Inc., New York.
16. Monielli, A.R. The chordates. Cambridge University Press, London.
17. Smith, H.S. Evolution of chordata structure. Hold Rinehart and Winstoin Inc., New York.
18. Sedgwick, A. A Student's Text Book of Zoology, Vol. II.
19. Walters, H.E. and Sayles, L.D. Biology of vertebrates. MacMillan & Co., New York.
20. Young, J.Z. Life of vertebrates. The Oxford University Press, London.
21. Colbert, E.H. Evolution of the vertebrates, John Wiley and Sons Inc., New York.
22. Clark, W.E. History of the Primates IV Edn. University of Chicago Press, Chicago.
23. Weichert, C.K. and Presch, W. Elements of chordate anatomy. 4th Edn. McGraw Hall Book Co., New York.
24. Montagna, W. Comparative anatomy. John Wiley and Sons Inc.
25. Andrews, S.M. Problems in vertebrate evolution. Academic Press, New York.
26. Joysey, K.A. and T.S. Kemp. Vertebrate evolution. Oliver and Boyd, Edinbough.
27. Smyth. Amphibia and their ways. The McMillan Co., New York.
28. Harper & Shipley, The Chordates [volumes Protochordata, Pisces, Amphibia, Reptilia, Aves & Mammalia], Cambridge Natural History Society, Series. CNH Publications, London.

Discipline Specific Elective 1

Zool. 303 A: Entomology Paper –I

Max. Marks: 70

Unit –I

Segmentation of insect body:

- a. Head : Segmentation, Orientation of head, Types of mouthparts, Types of antenna
- b. Thorax : Structure of typical leg, Modification of legs, Structure, articulation and coupling of wings.
- c. Structure of insect abdomen
 - a. Male genitalia and their modification
 - b. Female ovipositor, genitalia and its modifications.

Unit – II

Integument:

- a. Structure of cuticle
- b. Chemical composition of cuticle
- c. Functions of cuticle
- d. Sclerotization of cuticle
- e. Ecdysis

Unit-III

Digestive system:

- a. Alimentary canal and its modification,
- b. Physiology of digestion,
- c. Types of feeding.

Unit- IV

Excretory system:

- a. Excretory organs and their modification including cryptonephridial arrangement
- b. Physiology of excretion
- c. Regulation of water balance.

Unit-V

Respiratory system:

- i. Basic structure of respiratory organs :
 - a. Trachea and Tracheoles
 - b. Air sacs
 - c. Spiracles
- ii. Physiology of respiration
- iii. Respiration in aquatic and parasitic insect

Zool. 304 A: Entomology Paper –II

Unit- I

Unit- I

Circulatory system–Structure of heart and aorta, Accessory pulsatile organ, Physiology of circulation, Composition and functions of haemolymph.

Unit-II

Nervous system- Morphology of brain, Sympathetic and peripheral nervous system
Endocrine and Exocrine glands, function of hormones.

Unit-III

Sense organs-Mechanoreceptor, Chemoreceptor, Auditory organs (tympanum), Structure of simple and compound eye, Physiology of vision.

Unit- IV

Bioluminescence and Sound production– Structure of luminous organs, Mechanism of light production, Significance of bioluminescence, Sound producing organs, various, mechanism of sound production

Unit-V

Reproductive system – Structure and function of male and female reproductive organs, Metamorphosis, Types of Larvae and Pupae. Parthenogenesis, Paedogenesis

Suggested Reading Materials for both III and IV Semesters (All latest edition)

1. Atwal : Agricultural pests of India and South East Asia, Kalyani Publishers.
2. Ayyar, T.V.R. : Hand Book of Economic Entomology of South India, Govt. Press, Chennai
3. Beeson, C.F.C.: The Ecology and Control of the Forest Insects of India and the Neighbouring Countries, 1007 pp., Govt. India Press.
4. Chapman, R. F. : Structure & Function of Insects, Cambridge University Press.
5. Essig, E.O. : College Entomology, Mac Millan Co., New York.
6. Hill, D. S. : Insect Pests of Tropical and subtropical regions of the World.
7. Imms, A. D. : Recent Advances in entomology, Churchill, London.
8. Imms, A. D. : A General text book of entomology, Methuen and Co., London.
9. Mani, M.S.: General Entomology, Oxford and I.B.H., Mumbai and New Delhi
10. Metcalf & Flint, Destructive and useful insects, McGraw Hill book Co., New York (Indian reprint Tata McGraw Hill Publication Co., New Delhi).
11. Pruthi, H.S.: Text book of Agricultural Entomology, Indian Council of Agricultural Research, New Delhi.
12. Ross, H. : A Text Book on Entomology, John Wiley & Sons, London
13. Snodgrass, R.E. : Principles of Insect Morphology, McGraw Hill Co., New York
14. Trigunayat, M.M. : A Manual of Practical Entomology, Scientific Publishers.

Zool. 303 B: Parasitology Paper –I

Max. Marks: 70

Systematic, Gross Morphology, Life history, Epidemiology, Pathogenicity and Management of parasites of medical, veterinary and agricultural importance.

Unit 1. Protozoa: *Trypanosoma*, *Lieshmania*, *Plasmodium* and *Giardia*.

Unit 2. Protozoa: *Entamoeba*, *Babesia*, *Criardia* and *Trichomonas*.

Unit 3. Trematoda: *Fasciola*, *Schistosoma*, *Fasiolopsis* and *Dicro-coelium*.

Unit 4. Cestoda: *Taenia*, *Echinococcus*, *Hymenolepis*,

Unit 5. Nematoda: *Dipyllidium*, *Rallietina* and *Cotugnia*.

Zool. 304 B: Parasitology Paper –II

- Unit 1. Nematoda: *Ancylostoma*, *Haemonchus*, *Ascaridia* and *Wuchereria*.
 Unit 2. Nematoda: *Trichinella*, *Dracunculus*, *Enterobius*, and *Strongyloides*
 Unit 3. Arthropoda: *Argas*, *Ixodes*, *Sarcoptes*, *Simulium*,
 Unit 4. Arthropoda: *Anopheles*, *Culex*, *Pediculus*, *Cimex*.
 Unit 5. Plant Nematode: Introduction, classification, General organization and economic importance of plant nematode, *Meloidogyne* (Root nematode), *Heterodera* (Cyst nematode) and *Tylenchulus* (Citrus nematode).

Suggested Reading Materials for both III and IV Semesters (All latest edition)

1. Hyman, L. H. :The invertebrates, Vol. IIIrd, Mc Graw Hill Book Company, Inc.
2. CHATTERJEE, K. D.:Parasitology, Twelfth Edition, Calcutta
3. Smyth, J.D.:Introduction of Animal Parasitology, London (English Univ. Press)
4. Dogiel, V.A. :General Parasitology (revised) by Polyanski and Khelsin, 516 pp., Edinburg (Oliver & Boyd)
5. Southey, J.F. :Plant Nematology, her majesty's stationary office, London, pp– 282.
6. Cheng, T.C.:The Biology of Animal and Parasites. 727 PP, London (W.B. Sunder Co.).
7. SOULSby, E.J.L.:Biology of Parasites, 454 PP., New York (Academic Press)
8. CROLL, N.A.:Ecology of Parasites, 136 PP., London (Heinman Educational Book Ltd.)
9. Chandler, C. and Clark, P. : Introduction to Parasitology. John Willey Read. and Sons Inc., New York and London.
10. Noble, E.R. and Noble, G.A.: The Biology of Animal Parasites, Philadelphia Lea & Fediger.

Zool. 303 C: Environment Biology Paper –I

Max. Marks: 70

Unit 1: Structure and Classification of biosphere. Classification of Biomes, biomes and habitat diversity. Major biotic elements of each biome and their Characteristics. General relationship between landscapes, biomes and climates.

Unit 2: Physico-chemical characteristics and fauna of freshwater, marine and estuarine ecosystem and zonation. Deserts of the world, control of desertification with reference to fauna of Thar desert of Rajasthan.

Unit 3: Biological diversity of India: definition and nature, India's biogeographically history. Physiography, Climate and its impact on biodiversity.

Unit 4: Strategies for biodiversity conservation, in-situ and ex-situ conservation. National Parks Sanctuaries, Protected Areas and Biosphere Reserves. Biodiversity loss: factors causing loss of species and genetic diversity, Factors affecting ecosystem degradation and loss, reasons for loss in biodiversity of major ecosystems of the world.

Unit 5: Economic value of biodiversity: Biodiversity values, ethical & Aesthetic value, use and non use values. Landscape ethics (oran, gochar land).

Zool. 304 C: Environment Biology Paper –II

Unit 1: Principles and scope of Environmental science. Earth, Man and Environment, Ecosystem, Pathways in Ecosystems, Physicochemical and biological factors in the Environment.

Unit 2: Air Pollution – natural and anthropogenic sources of pollution, primary and secondary pollutants, transport and diffusion of pollutants, methods of monitoring and control of air pollution, SO₂ NO_x, CO, SPM. Green house gases and their major sources, greenhouse effect and climate change global warming and its effect.

Unit 3: Water Pollution – types, sources and consequences of water pollution, physico-chemical sampling. Analysis of water quality, Water quality and standards. Noise pollution – sources of noise pollution, measurements and indices. Effects of pollutants on human beings, plants, animals & climate.

Unit 4: Soil Pollution – Physico-chemical sampling as analysis of soil quality, soil pollution control, industrial waste effluents and heavy metals and their interactions with soil components.

Unit 5: Solid and hazardous waste: Definition, types sources, its generation, collection, environmental effects and safe disposal practices. Concepts of waste reduction, recycling and reuse, land reclamation.

Suggested Reading Materials for both III and IV Semesters (All latest edition)

1. Agarwal, V.P. and Dass, P.:Recent Trends in Limnology, Muzaffarnagar (Society of Biosciences).
2. Agarwal, V.P., Desai, B.N. and Abidi, S.A.H. : Management of Aquatic Ecosystems, Delhi (Narendra Publishing House).
3. Bandhu, D.S., Chauhan, A.: Current Trends in Indian Environment, Delhi (Today and Tomorrow Printers and Publishers).
4. Gray, P.: Environmental Measurement and Interpretation, New York (Nobel Offset Printers, Inc.)
5. Lectruswicz, Mastadyen, A.: Productivity of Terrestrial Animals – Principles and Methods (I.B.P.) Handbook No. 13, Oxford (Blackwell Scientific Publication).

Zool. 303 D: Cell Biology Paper –I

Cell, Molecular Biology and Basic Biotechnology

Unit 1. Basic features of cellular structures, organization and function of cell membrane, cellular differentiation, cell signalling, cell ageing and apoptosis, centriole, and micro tubules.

Unit 2. Structure and functions of nucleus, ribosomes, endoplasmic reticulum, Golgi complex, lysosomes, peroxisomes, mitochondria, and oxidative phosphorylation.

Unit 3. Cell Cycle – Key events of the cell cycle, genetic analysis of the Cell cycle, Regulation of cell cycle, checkpoints in the cell cycle, regulation of phosphorylation by kinases and phosphatases, spindle poison and cell fate.

Unit 4. Cancer biology – abnormalities of cell cycle and origin of cancer, type of cancer, molecular mechanism of cancer, Therapeutics of cancers, current anticancer drugs and challenges.

Unit 5. Basic properties of nucleic acids: Background of nucleic acids, Physical, chemical, and structural properties of DNA and RNA, DNA as genetic material, Law of DNA constancy and C-Value Paradox, polymorphism of DNA and RNA.

Zool. 304 D: Cell Biology Paper –II

Unit 1. Comparative overview of prokaryotic and eukaryotic DNA and RNA, basic idea about virus and its nomenclature, viral nucleic acid, brief idea about viroid, prions and chaperones.

Unit 2: Multiplications of nucleic acids: Replication and transcription in prokaryotes and eukaryotes – required enzymes, proteins, nucleotides, mechanism, procedural faults, stabilizing agents, modifications in nascent DNA and RNA molecules and methylation.

Unit -3: Reverse transcription, DNA damage and repair: types and causes of DNA damages, DNA repairs mechanisms, DNA damages and mutagenesis.

Unit 4. Protein synthesis – Basic idea of central dogma, genetic code, translation machinery in prokaryotes and eukaryotes, mechanism of protein synthesis in prokaryotes and eukaryotes.

Unit 5. Post translational modifications, protein folding, protein targeting, Protein sequencing.

Suggested Reading Materials for both III and IV Semesters (All latest edition)

1. Burns, G.W.: The Science of Genetics, Macmillan Publishing Co.
2. De Robertis, E.D.P. and Robertis, E.M.P.: Cell and Molecular Biology, Lea and Febiger, Philadelphia
3. Gardner, E.J. and Snustad, D.P. : Principles of Genetics, John Wiley & Sons, New York
4. Sheeler, P. and Bandhi, D.E. : Cell and Molecular Biology, John Wiley & Sons, Inc., New York
5. Peters, P., Biotechnology – A Guide to Genetic Engineering, WMC, Brown Publishers, Dubuque.
6. Trevan, M.D.: Immobilized Enzymes : An Introduction and Application in Biotechnology, Chichester, John Wiley.
7. Bruce Albert and Bray : Molecular Biology of the Cell, Garland Publishing House, Taylor and Francis Group
8. Benjamin Lewin : Gene VII, Oxford University press.
9. Robert J. Brooker : Genetics – Analysis and Principles, Addison Wesley Longman Inc.,
10. Snustad, Simmons and Jenkins : Principles of Genetics, John Wiley & Sons Inc.

Zool. 303 E: Fish Biology Paper –I

Fish Biology, Fisheries and Limnology

Unit 1. Characteristics and classification of fishes, Evolution phylogeny & distinguishing characters of principal subdivision, Body form and Locomotion in fishes.

Unit 2. Integument and Exoskeleton:Scales: Characteristics, structure and types, aging and scales, Modification and functions of fins, theories of origin of median and paired fins.

Unit 3. Respiratory system: structures and types of gills, Accessory respiratory organs, Weberian apparatus, Blood vascular system: Comparative anatomy of heart and blood vessels.

Unit 4. Digestive system: Food Feeding and adaptive modification, Excretory system: structure, types of kidneys and osmoregulation and Nervous system: Structures of brain and cranial nerves.

Unit 5. Reproductive behaviour, reproduction, development, and hatching, Viviparity in fishes, structure, and function of endocrine glands.

Zool. 304 E: Fish Biology Paper –II

Unit 1. Coloration, Bioluminescent, Electric organs, Poisons and Venoms, Sound producing organs, Lateral line system and sense organs of fishes.

Unit 2. Hill stream, cave dwelling and deep-sea adaption of fishes, idea about ornamental fishes and commercial indigenous ornamental fishes and fresh water ornamental fishes.

Unit 3. Basic idea about migration, causes and pattern of fish migration, mechanism and regulation of fish migration, Parental care.

Unit 4. Survey of principal fisheries of India Fresh water, brackish water and estuarine with special reference to fisheries development. Biology of Indian major carps, cat fishes, Hilsa, Sardine, Mackerel, sharks.

Unit 5. Biochemical composition of fish; By product of fishing industry; Fish preservation and processing; Disease of fishes, their symptoms and treatment.

Suggested Reading Materials for both III and IV Semesters (All latest edition)

1. Jhingran, V.G. Fish and fisheries of India. Hindustan Publishing Corporation (India).
2. Kristogenson, H. Modern fishing Gear of the World fishing New Ltd., London
3. Parihar, R.P.: Fish biology and Indian fisheries. Central Publishing House, Allahabad.
4. Srivastava, C.B.L.: Fishery science and Indian Fisheries, ICAR, New Delhi.
5. Agarwal, V.P. and Dass, P. Recent trends in Limnology. Society of Biosciences, Muzaffar Nagar
6. Agarwal, V.P., Desai, B.N. and Abidi, S.A.M.L: Management of Aquatic Ecosystem, Delhi. Narendra Publishing House, Muzaffar Nagar
7. Gray, P.: Environmental measurement and interpretation, New York (Nobel offset Printers Inc.)
8. Lect. Ruswicz, Mastadyam, A.: Productivity of Terrestrial animals. Principle and methods (IBP). Handbook No. 13. Blackwell Scientific Publication, Oxford.
9. APWA, AWWA, WPCF. : Standard methods for the examination of water and waste water. Washington.
10. The Wealth of India : Raw materials, Vol. IV, Council of Scientific & Industrial Research, New Delhi.
11. Odum, E.P.: Fundamental of Ecology, W.B. Saunders Co., Philadelphia.
12. Welch, P.S.: Limnological methods, Philadelphia, Balkiston Co.
13. Cole, G.A. : Text book of Limnology. C.V. Moeby Company.
14. Wetzel : Limnology. W.B. Saunders Co. Philadelphia,

15. Gunther, A. : An introduction to the study of fishes. A and C Black, Edinburgh
16. Lagler, K.F., Bordach, J.E. Miller, R.R., Parsino, D.M.: Ichthyology, John Wiley and Sons, New York.
17. Roamer, A.S.: The vertebrate story. University of Chicago Press, Chicago.

Zool. 305: Core Course Practical 5 – Board I (Course 9 and 10)

1. Study of museum specimens and permanent slides related to-
 - a. Protochordata
 - b. Pisces
 - c. Amphibia
 - d. Reptilia
 - e. Aves
 - f. Mammalia
2. Dissection/ demonstration of dissection of:

Fish: Carnial nerves of *Wallago attu*, *Labeo rohita*, *Chirrhinus mrigla*; Webarian apparatus and accessory respiratory organs in *Clarias*, *Ophiocephalus* and *Anabas*; Electric organs in electric ray.

Fowl: Air sacs, blood vascular system and flight muscles.

Rat: Cranial nerves and ear ossicles.
3. Osteology of frog, varanus, fowl and rabbit.
4. Permanent preparations.

Marking scheme

Max. Marks: 70

1	Dissection/diagrammatic presentation of dissection – Major	20
2	Dissection/ diagrammatic presentation of dissection	12

	– Minor	
3	Spotting – specimen, bones and slides (6)	18
4	Preparation of permanent slide	8
5	Practical records	06
6	Viva – voce	06

	Total marks	70

Discipline Specific Elective Practical (both elective papers)

Zool. 306 (Practical 6)

Entomology Practical

1. Permanent preparation of different type of mouthparts, antennae, legs ,wings
2. Study of different types of wing venation
3. Study of different types of modification of legs
4. Study of different types of antennae
5. Study of different patterns of external genitalia
6. Study of development stage of any insect (egg, larva, pupa)
7. Dissections of insects- nervous system of grasshopper and cockroach
8. Field trips for insects collection

MarkingScheme

maximum marks 70

Dissection	15
Permanent preparation	05
Spotting , 04 spots (types of mouthpart, wing venation, legs, antennae)	10
Developmental stages	05
Collection of insects	15
Practical record	10
Viva-voce	10

Parasitology Practical

1. Dissection of given host animal and identification of parasites.
2. Study of different types of parasitic protozoans from permanent slide/chart.
3. Study of different types of parasitic helminthes from permanent slide/chart.
4. Study of different types of insect vectors from permanent slide/chart.
5. Collection, Preservation, Staining, Mounting, identification and description of various ecto and endo parasites.
6. Study of mouth parts of insect vectors.

Marking Scheme:

Max. Marks: 70

(Min. Pass Marks: 27)

1.	Dissection and/or preparation		10 marks
2.	Identification and comments on spot (1 to 10)	10x2	20 marks
3.	Submission of Slides and Collection of parasites		10 marks
4.	Project work		10 marks
5.	Practical Record		10 marks
6.	Viva-voce.		10 marks

Total	70 marks
--------------	-----------------

Environmental Biology Practical

1. Identification of different tools and instruments.
2. Plankton identification and quantifications from water samples.
3. Study of fauna in relation to their habitat.
4. Study of biodiversity.
5. Estimation of DO₂, Free Co_r, Carbonate & bicarbonate (Alkaline)

6. Measurement of SPM, SO_x NO_x (Air pollutants).
7. Measurement of sound by db meter in silent, industrial, residential & commercial zones.
8. Estimation of pH of water, waste water & soil.
9. Estimation of hardness of water, waste Water & soil.
10. Water sample analysis for Nitrate and Phosphate.
11. Identification of ecological adaptation in animals for arboreal etc.

Marks distribution

1. Major Experiment	-	20
2. Minor Experiment	-	10
3. Spots (6)	-	12
4. Preparation of permanent slide	-	08
5. Practical Record	-	10
6. Viva-voce	-	10
Total	=	70

Cell Biology Practical

1. Study of structures of living cell by phase-contrast microscope and vital staining.
2. Temporary and permanent cytological preparations of cell organelles.
3. Histochemical tests of protein, enzymes, lipids, carbohydrates, and nucleic acids.
4. Cytological preparation of chromosomes by non-sectioning method for study of karyotypes, meiotic and sex chromosome mechanisms.
5. Cytological preparations for chromosome banding.
6. Study of ultrastructure of cell organelles and DNA from electron micrographs.
7. Experimental study of effects of colchicine on chromosomes.

8. Cytological preparation of ovary to study cell growth.

Marking Scheme	Max. Marks: 70
1. Experiment Major	25
2. Experiment Minor	15
3. Experiment Minor	10
4. Practical Record	10
5. Viva-Voce	10
Total Marks	70

Fish Biology Practical

1. Dissections/Demonstration of dissection of cranial nerves of a carps (*Labeo / Chirrhinus, Wallago attu* and sting ray)
2. Preparation: Scales, scroll valve, Ampulla of Lorenzini, Weberian apparatus
3. Identification of local fish fauna up to species
4. Demonstration/dissection of Accessory respiratory organs of *Saccobranchus, Clarias, Ophiocephalus, Anabas*.
5. Demonstration/dissection of internal ear of *labeo*.
6. Demonstration/dissection of electric organs of *Torpedo*
7. Osteology of *Labeo rohita* and *wallago attu*
8. Seminar
9. Practical record

Marks distribution

1.	Dissection/ diagrammatic presentation of dissection (Major)	15
2.	Dissection/ diagrammatic presentation of dissection (Minor)	10

3.	Spots (5)	10
4.	Preparation of permanent slide	15
5.	Practical record	10
6.	Viva – voce	10
	Total	70

Zool. 307: Skill Course III - Pisciculture

Characteristics and classification of fishes, selection of major cultivable fishes for inland fresh water bodies; food and nutrition of fishes; layout of fish ponds, gears and crafts; induced breeding, hypophysation techniques; limnology of fresh water ponds i.e., alkalinity, salinity, dissolve gases and hardness; fish composition, preservation and packaging of fishes.

Practical

1. Identifications of fishes.
2. Hypophysation technique for fishes.
3. Collection and identification of zooplanktons.
4. Limnology of fish pond.

Suggested Reading Materials (All latest editions)

1. Day F. The Fauna of British India (Fishes), Vol I & II, Golt of India Press (Delhi).
2. Eugene W. Rice, Rodger B. Baird, Andrew D. Eaton and Lenore S. Clesceri. APHA Standard Methods for Examination of Water and Wastewater. APHA, Washington DC.
3. Brian Harvey. Induced breeding in tropical fish culture. ITDG Publishing, Rugby, CV23 9QZ, UK.
4. Paul J. B. Hart and John D. Reynolds. Handbook of Fish Biology and Fisheries - I & II Vol. John Wiley & Sons Singapore Pvt. Ltd.
5. Gary Wedemeyer. Physiology of Fish in Intensive Culture Systems. Springer.

Semester IV Examination (2024)

Core Course 11

Max. Marks: 70

Zool. 401: Chordate

Unit 1

Classification of Protochordata and Cyclostomata; evolution, affinities and phylogeny of protochordates. Structure, function and life histories of Pyrosoma, Doliolum, Salpa and Oikopleura. Evolution and affinities of Cyclostomata.

Unit 2

Classification, origin, evolution and deep sea adaptations in fishes, Parental care; offensive and defensive mechanism; sensory, hydrostatic and lateral line system in fishes.

Unit 3

Classification, origin and adaptive radiation in Amphibia, extinct amphibians, parental care in Amphibia

Classification, origin and adaptive radiations in Reptile. Evolutionary significance of Sphenodon, Dinosaurs, types and causes of their extinction. Biting mechanism, identification of snake bite by wounds, symptoms and treatment. Snake venoms, anti sera and their production.

Unit 4

Classification (up to orders), origin and evolution of birds, migration of birds, types of palate, aquatic and flight adaptation in birds, Archcopteryx, Wild life sanctuaries and National Parks of Rajasthan with reference to birds.

Unit 5

Classification (up to orders) and, origin and evolution of Mammals, primitive mammals (prototheria and metatheria), salient adaptive radiation in eutheria, dentition in mammals, old and new world monkeys. Ancestry of horse and man.

Core Course 12

Max. Marks: 70

Zool. 402: Developmental Biology, evolution and population genetics

Unit 1

Gametogenesis, egg and sperm structure, fertilization, biochemical aspects of fertilization, penetration and activation of egg and early development, fate maps, embryonic induction and differentiation.

Unit 2

Organogenesis in mammals: brain, eye, alimentary canal, kidney and gonads. Parthenogenesis, limb development and regeneration in amphibia, brief idea of insects metamorphogenesis.

Unit 3

History of evolutionary thoughts, Lamarkism and neo-Lamarckism, Darwinism and neo-Darwinism, mutation and synthetic theory of evolution, adaptation, isolation and speciation.

Unit 4

Hardy-Weinberg's law of genetic equilibrium, detailed account of destabilizing forces: natural selection, mutation, genetic drift, migration, meiotic drive. Genetic structure of natural population, phenotypic variation, factors affecting human diseases frequency.

Unit 5

Genetics of quantitative traits in population: analysis of quantitative traits, quantitative traits and natural selection, estimation of heritability, genotype-environment interactions, inbreeding depression and heterosis, molecular analysis of quantitative traits.

Suggested Reading Material

1. Colbert, E.H. (1970): Evolution of Vertebrates, 535 pp., Wiley Eastern Pvt. Ltd., New Delhi
2. Parker, T.J. & Haswell, W.A. (1943) : A Text Book of Zoology, Vol. II 789 pp., Macmillan & Co., London.
3. Sedgwick, A. (Reprinted 1966) : Student's Textbook of Zoology, Vol. II 705 pp., Central Book Depot, Allahabad
4. Arey, L.B. (1961) : Developmental Anatomy, 680 pp., Asia Publ. House, Mumbai
5. Gharpurey, K.G. (1962) : Snakes of India and Pakistan, 156 pp., Popular Prakashan, Mumbai
6. Huettner, A.F. (1958) : Fundamental of Comparative Embryology of Vertebrates, 309 pp., Macmillan & Co., New York
7. Nelson, O.E. (1953) : Comparative Embryology of the Vertebrates, Balkiston Co., Inc., New York
8. Romer, A.S. (1969) : The Vertebrate Body, 627 pp., Vakils Feffers & Simont Pvt. Ltd., Mumbai
9. Young, I.Z. (1962) : The Life of Vertebrates, 820 pp., Oxford University Press, London
10. Alexander, R.M. The Chordata, Cambridge University Press, London
11. Carter, G.S. Structure and habit in vertebrate evolution – Sedgwick and Jackson, London
12. Walters, H.E. and Sayles, L.D. Biology of Vertebrates. MacMillan & Co., New York
13. Schatten and Schatten : Molecular Biology of Fertilization
14. Hyman, L.H. The Aves. McGraw Hill Co., New York.
15. Read, C.P. Animal parasitism. Prentice Hall Inc. New Jersey.
16. Alexander, R.M. The Chordata. Cambridge University Press, London.
17. Barrington, E.J.W. The Biology of Hemichordata and Protochordata. Oliver and Boyd, Edinburgh.
18. Bourne, G.H. The structure and functions of nervous tissue. Academic Press, New York.
19. Eccles, J.C. The understanding of the brain. McGraw Hill Co., New York and London.
20. Malcom Jollie, Chordata morphology. East-West Press Pvt. Ltd., New Delhi.
21. Milton Hilderbrand. Analysis of vertebrate structure. IV. Ed. John Wiley and Sons Inc., New York.
22. Monielli, A.R. The chordates. Cambridge University Press, London.
23. Smith, H.S. Evolution of chordata structure. Hold Rinehart and Winstoin Inc., New York.

24. Sedgwick, A. A Student's Text Book of Zoology, Vol. II.
25. Tansley, K. Vision in vertebrate. Chapman and Hall Ltd., London.
26. Walters, H.E. and Sayles, L.D. Biology of vertebrates. MacMillan & Co., New York.
27. Wolstenholmf, E.W. and Knight, J. (Ed.). Taste and Smell in vertebrates, J&A Churchill, London.
28. Young, J.Z. Life of vertebrates. The Oxford University Press, London.
29. Colbert, E.H. Evolution of the vertebrates, John Wiley and Sons Inc., New York.
30. Clark, W.E. History of the Primates IV Edn. University of Chicago Press, Chicago.
31. Weichert, C.K. and Presch, W. Elements of chordate anatomy. 4th Edn. McGraw Hall Book Co., New York.
32. Montagna, W. Comparative anatomy. John Wiley and Sons Inc.
33. Andrews, S.M. Problems in vertebrate evolution. Academic Press, New York.
34. Joysey, K.A. and T.S. Kemp. Vertebrate evolution. Oliver and Boyd, Edinburgh.
35. Smyth. Amphibia and their ways. The McMillan Co., New York.
36. Harper & Shipley, The Chordates [volumes Protochordata, Pisces, Amphibia, Reptilia, Aves & Mammalia], Cambridge Natural History Society, Series. CNH Publications, London.

Discipline Specific Elective

Zool. 403 A: Entomology Paper – I

Max. Marks: 70

Unit- I

Elementary idea of Primitive insects (Apterygotes) order: Protura, Collembola, Dipleura, Thysanura.

Habit , Habitat and distinguishing characters of various insects orders: Odonata, Ephemeroptera and Phasmida

Unit - II

Studies of various insect orders classification upto important families including economic importance: Orthoptera, Isoptera, Hemiptera

Unit- III

Studies of various insect orders classification upto important families including economic importance: Coleoptera, Hymenoptera, Diptera, Lepidoptera

Unit- IV

Dynamics of insects population, factors affecting insect population Host plant and insect interaction, pest outbreak and its causes

Unit- V

Insect and environment – Abiotic and biotic ecological relationships of insects, Biochemical adaption of environmental stress (Hibernation, aestivation, Diapause, Polymorphism, Swarming)

Zool. 404 A: Entomology Paper –II

Circulatory system–Structure of heart and aorta, Accessory pulsatile organ, Physiology of circulation, Composition and functions of haemolymph.

Unit-II

Nervous system- Morphology of brain, Sympathetic and peripheral nervous system
Endocrine and Exocrine glands, function of hormones.

Unit-III

Sense organs-Mechanoreceptor, Chemoreceptor, Auditory organs (tympanum), Structure of simple and compound eye, Physiology of vision.

Unit- IV

Bioluminescence and Sound production– Structure of luminous organs, Mechanism of light production, Significance of bioluminescence, Sound producing organs, various, mechanism of sound production

Unit-V

Reproductive system – Structure and function of male and female reproductive organs, Metamorphosis, Types of Larvae and Pupae. Parthenogenesis, Paedogenesis

Books Suggested

1. Atwal : Agricultural pests of India and South East Asia, Kalyani Publishers.
2. Ayyar, T.V.R. : Hand Book of Economic Entomology of South India, Govt. Press, Chennai
3. Beeson, C.F.C.: The Ecology and Control of the Forest Insects of India and the Neighbouring Countries, 1007 pp., Govt. India Press.
4. Chapman, R. F. : Structure & Function of Insects, Cambridge University Press.
5. Essig, E.O. : College Entomology, Mac Millan Co., New York.
6. Hill, D. S. : Insect Pests of Tropical and subtropical regions of the World.
7. Imms, A. D. : Recent Advances in entomology, Churchill, London.
8. Imms, A. D. : A General text book of entomology, Methuen and Co., London.
9. Mani, M.S.: General Entomology, Oxford and I.B.H., Mumbai and New Delhi
10. Metcalf & Flint, Destructive and useful insects, McGraw Hill book Co., New York (Indian reprint Tata McGraw Hill Publication Co., New Delhi).
11. Pruthi, H.S.: Text book of Agricultural Entomology, Indian Council of Agricultural Research, New Delhi.
12. Ross, H. : A Text Book on Entomology, John Wiley & Sons, London
13. Snodgrass, R.E. : Principles of Insect Morphology, McGraw Hill Co., New York
14. Trigunayat, M.M. : A Manual of Practical Entomology, Scientific Publishers.

Zool. 403 B: Parasitology Paper – I

Max. Marks: 70

Unit 1. Animal Association: Homospecific and Heterospecific Parasitism, Characteristics of Parasites,

Unit 2. Origin and evolution of Parasitism, host-parasite relationship, host specificity.

Unit 3. Ecology of Parasite: Parasite population growth and changes, extrinsic and intrinsic factors influencing parasite population,

Unit 4. dispersal and location of host, dispersal of parasite within a host-parasite system.

Unit 5. Immunology: Concept of immune reaction, immunoglobulin, antigen-antibody interaction, hypersensitivity, auto-immune diseases.

Zool. 404 B: Parasitology Paper – II

Unit 1. Pathogenic Microbes: Virus and Bacteria – General Character, Morphology and Pathogenesis; Bacterial and Viral disease of man.

Unit 2. Epidemiology: Principles of epidemiology, epidemiologic approach and concept of disease, methods of survey, evaluation of data.

Unit 3. Physiology: Principles of parasite physiology, as evident in nematodes of the following: feeding and digestion, osmoregulation, excretion, hatching and moulting.

Unit 4. Control: Principles of control of parasites and parasitic diseases, mode of action of anthelmintic drugs.

Unit 5. Toxicology: Principles of toxicology with special reference to arthropod parasites, history and action of insecticides.

Books Suggested:

11. Hyman, L. H. (1951) :The invertebrates, Vol. IIIrd, Mc Graw Hill Book Company, Inc.
12. CHATTERJEE, K. D. (1980):Parasitology, Twelfth Edition, Calcutta
13. Smyth, J.D. (1962) :Introduction of Animal Parasitology, London (English Univ. Press)
14. Dogiel, V.A. (1964) :General Parasitology (revised) by Polyanski and Khelsin, 516 pp., Edinburg (Oliver & Boyd)
15. Southey, J.F. (1965) :Plant Nematology, her majesty's stationary office, London, pp– 282.
16. Cheng, T.C. (1964) :The Biology of Animal and Parasites. 727 PP, London (W.B. Sunder Co.).
17. SOULSBY, E.J.L. (1966) :Biology of Parasites, 454 PP., New York (Academic Press)
18. CROLL, N.A. (1968):Ecology of Parasites, 136 PP., London (Heinman Educational Book Ltd.)
19. Chandler, C. and Clark, P. : Introduction to Parasitology. John Willey and Sons Inc., New York and London. (1961)
20. Noble, E.R. and Noble, G.A. :The Biology of Animal Parasites, Philadelphia Lea & Febiger.

Zool. 403 C: Environmental Biology Paper – I

Unit 1: Basic concepts of toxicology, toxicity and its impacts, industrial toxicants and hazardous materials, toxic and hazardous waste management, measurement of toxicity, TLM & lethality studies. Biotransformation, biomagnification, and bioremediation.

Unit 2: Ecophysiological adaptations with special reference to hot and cold desert, high altitude, hibernation and aestivation in poikilotherms and homeotherms.

Unit 3: Concept of health and occupational health, spectrum of health and occupational health work related diseases, levels of prevention, characteristics of occupational diseases, epidemiological issues.

Unit 4: Environmental quality – Definition, methods of assessment of environment quality: short term studies/ survey. Rapid assessment: continuous / short and long term monitoring. Procedure and methodologies of environmental impact assessment EIA, cost-benefit analysis, environmental clearance procedure with particular reference to India ISO, Sustainable development.

Unit 5: Basic concept of microorganisms. Use of microorganisms in bioremediation of soil & oil spills. Application of Microbes in removal of contaminants from water.

Zool. 404 C: Environmental Biology Paper – II

Unit 1: Environmental protection laws in India – Environmental protection act 1986, Biological diversity act 2002, Environmental policy 2006, Environmental policy resolution, Legislation.

Unit 2: Brief about IUCN Threatened species, Central Zoo Authority (CZA), WII, ZSI, WWF, Traffic, Red data Book. Wild life protection act 1972, Forest (Conservation Act), 1980 Air (prevention & control of pollution) Act-1981. Water prevention and control of pollution act 1974, Disaster management act 2005, disaster management of administration reforms.

Unit 3: The concept of environmental ethics, philosophies of biocentrism, ecoceatrimon, application of ethics to environmental issues. Eastern and western philosophical – traditions and the relationships between humans, animals, and the natural environment, value of wilderness.

Unit 4: sampling techniques: Sampling of air water & soil, sampling of animal populations concept of random and stratified sampling.

Unit 5: Disaster management – introduction, management capability, vulnerability-rises-preparedner and mitigation, disaster management cycle – community planning education hazard donation and mapping riser reduction measures, land reclamation.

Books suggested

1. Agarwal, V.P. and Dass, P. (1990):Recent Trends in Limnology, Muzaffarnagar (Society of Biosciences).
2. Agarwal, V.P., Desai, B.N. and Abidi, S.A.H. (1989) : Management of

- Aquatic Ecosystems, Delhi (Narendra Publishing House).
3. Bandhu, D.S., Chauhan, A. (1977) : Current Trends in Indian Environment, Delhi (Today and Tomorrow Printers and Publishers).
 4. Gray, P. (1964) : Environmental Measurement and Interpretation, New York (Nobel Offset Printers, Inc.)
 5. Lectruswicz, Mastadyen, A. (1970) : Productivity of Terrestrial Animals – Principles and Methods (I.B.P.) Handbook No. 13, Oxford (Blackwell Scientific Publication).

Zool. 403 D: Cell Biology Paper – I

Cell, Molecular Biology and Basic Biotechnology – 1

Unit 1. Genome organisation: Organization of prokaryotic and eukaryotic chromosomes, nomenclature of chromosomes, modifications, and polymorphism of chromosomes.

Unit 2. Human karyotype, chromosome banding, genome mapping, numerical and structural changes in chromosome. Sex determination in *Caenorhabditis elegans* and *drosophila*, dosage compensation.

Unit 3. Gene Regulation – Transcriptional regulation in Prokaryotes, Lactose metabolism & the Operon system of Gene regulation, regulation of Tryptophan operon, regulation in Bacteriophage Lambda,

Unit 4. Epigenetics basic concept and principle, Epigenetic mechanisms of Transcriptional regulation, epigenetics in health and disease.

Unit 5. Principle of Recombinant DNA technology, gene transfer techniques, vectors and gene cloning, gene therapy, hybridoma technology, applications of genetic engineering in human.

Zool. 404 D: Cell Biology Paper – II

Cell, Molecular Biology and Basic Biotechnology – 2

Unit 1. Human welfare and bioethics, understanding mechanisms of metabolic diseases and identification involving genes and disease diagnostics.

Unit 2. Animal Cell culture: Principles and characteristics of primary cell culture, characteristics and types culture media, procedure and maintenance of culture, animal cell culture growth patterns and regulations, secondary cell line.

Unit 3. Microscopy and cell biology techniques: Principles of different types of microscopy, fixation and staining, cell fractionation and biochemical techniques for study of cellular constituents.

Unit 4. Principle of molecular separation techniques: chromatography, electrophoresis and blot-transfer techniques and autoradiography.

Unit 5. Principles and applications of FISH, GISH, DNA sequencing and DNA array.

Zool. 403 E: Fish Biology Paper – I

Fish Biology, Fisheries and Limnology - 1

Unit 1. Characteristics of fish farm Lay out and management of fish farm, Transportation of fish seed and breeders, Induced breeding, Bundh breeding.

Unit 2. Evolution of fish hatcheries in India with special references to CIFE and Chinese Models.

Unit 3. Composite fish culture, Sewage fed fisheries, Conventional fishing gears for inland waters, Unconventional fishing gears (Eco sounder and its use, Electric fishing, and light fishing) for inland waters,

Unit 4. Exotic fishes and their role in fresh water, weeds, and their control in inland waters.

Unit 5. Definition and characteristics of Lentic and Lotic water bodies, Origin of lakes, Morphometry of lakes, Lake zonation, Classification of lakes and their origin,

Zool. 404 E: Fish Biology Paper – II

Fish Biology, Fisheries and Limnology – 2

Unit 1. Characteristics and classification of marine environment, zonation, and brief account of brackish fishes.

Unit 2. Physical Characteristics of inland water bodies: Temperature, thermal stratification, turbidity, conductivity, transparency, and pH.

Unit 3. Limnochemistry: Alkalinity, hardness, salinity, dissolved gases, Biogeochemical cycle (nutrient cycling organic matter and redox potential).

Unit 4. Biological productivity: Primary and secondary productivity and their estimation, Ecological factors affecting the life of fishes, Aquatic pollution,

Unit 5. Fresh water biota, Ecological classification of freshwater organisms, General account including spatial and temporal distribution of Phytoplankton, zooplankton, and benthos.

Books suggested:

1. Jhingran, V.G. (1982) : Fish and fisheries of India. Hindustan Publishing Corporation (India).
2. Kristogensson, H. (1983) : Modern fishing Gear of the World fishing New Ltd., London
3. Parihar, R.P.: Fish biology and Indian fisheries. Central Publishing House, Allahabad.
4. Srivastava, C.B.L. (1990) : Fishery science and Indian Fisheries, ICAR, New Delhi.
5. Agarwal, V.P. and Dass, P. (1990) ; Recent trends in Limnology. Society of Biosciences, Muzaffar Nagar
6. Agarwal, V.P., Desai, B.N. and Abidi, S.A.M. (1989) : Management of Aquatic Ecosystem, Delhi. Narendra Publishing House, Muzaffar Nagar
7. Gray, P. (1964) : Environmental measurement and interpretation, New York (Nobel offset Printers Inc.)
8. Lect. Ruswicz, Mastadyam, A. (1970) : Productivity of Terrestrial animals. Principle and methods (IBP). Handbook No. 13. Blackwell Scientific Publication, Oxford.
9. APWA, AWWA, WPCF. (1985) : Standard methods for the examination of water and waste water. Washington. 10th edition.
10. The Wealth of India (1962) Raw materials, Vol. IV, Council of Scientific & Industrial Research, New Delhi.
11. Odum, E.P. (1971) : Fundamental of Ecology, 574 pp., W.B. Saunders Co., Philadelphia.
12. Welch, P.S. (1948) : Limnological methods, Philadelphia, Balkiston Co. 381 pp.
13. Cole, G.A. (1978) : Text book of Limnology, 2nd edition. C.V. Moeby Company. 426 pp.
14. Wetzel (1975) : Limnology. W.B. Saunders Co. Philadelphia, 743 pp.

15. Gunther, A. (1980) : An introduction to the study of fishes. A and C Black, Edinburgh
16. Lagler, K.F., Bordach, J.E. Miller, R.R., Parsino, D.M. (1977) : Ichthyology (2nd Edn.) John Wiley and Sons, New York (1-506)
17. Roamer, A.S. (1959) : The vertebrate story. University of Chicago Press, Chicago.

Zool. 405: Core Course Practical 7- Board I (Course 11 and 12)

1. Study of museum specimens and permanent slides
2. Dissections
Fish: Cranial nerves of *Wallago attu* and *Labeo rohita*, *Chirrhinus mriagla*, Weberian apparatus, accessory respiratory organs in *Heteropneustes*, *Clarias*, *Ophiocephalus* and *Anabas*, electric organs in Electric Ray.
Fawl : Air sacs, blood vascular system. Flight muscles.
Rat : Cranial nerves, ear ossicles.
3. Permanent preparation of microscopic slides.
4. Osteology of representative vertebrate classes: Amphibia, Reptilia, Aves & Mammalia; Disarticulated bones of various skulls.
5. Study of Embryology, in situ.
6. Study of permanent slides and preparation of slides of gametogenesis and developmental stages of fish and chick.
7. Estimation of gene and genotypic frequencies in the light of Hardy and Weinberg Law based on facial traits.
8. *Drosophilla* culture and identification of mutants.
9. Preparation of salivary gland chromosomes
10. Study of sperm motility.

Marking scheme

Max Marks	100	Min Pass Marks	36
Board I			
1.	Dissection: Two		25
2.	Preparations (including embryology) 4+4		08
3.	Comments up on the following spots (8): [Museum specimens 2; Bones 2; Slides: histological 2; Embryological and genetics 2].		24

4.	Viva-voce	10
5.	Year work and internal assessment	
	Practical record	10
	Submission of slides	05
6.	Tour report, presentation of collection	18
	Total	100 Marks

For ex-student, the marks of year work and internal assessment and tour reports may be readjusted by the examiners by raising the marks in items 1 to 4 according to the set parameters.

Discipline Specific Elective Practical 2- Board- II (both elective papers)

Zool.406 (Practical 8)

Entomology Practical

1. Identification of different orders of insects upto families by using the dichotomous keys
2. Studies of various apterygota and pterygota insects
3. Permanent preparation of whole mount (w.m.) of various small insects
4. Application of plant protection appliances (dusters and sprayers) on crops
5. Project work

MarkingScheme

maximum marks 70

Identification of insects with the help of dichotomous keys (two insects)	10
Spotting , 04 spots (various insects)	10
Permanent preparation	05
Plant protection appliances	10
Project report	15
Practical Record	10
Viva – voce	10

Parasitology Practical

1. Identification of Parasitic Eggs.
2. Autopsy of hosts for parasitic infection.
3. Histological preparation of helminth parasites.
4. Clinical parasitological techniques.
5. Collection, staining, identification and Description of Parasitic Protozoan from Blood smear.
6. Collection, staining, identification and Description of Parasitic Protozoan from Stool sample.
7. Microbiological preparation.
8. Epidemiological Survey.
9. Submission of parasitological preparation (submission of histological prepared slides)
10. Practical Record
11. Viva- voce

Distribution of Marks.

1. Identification and comments on spot (1 to 10)	(10x2)	20 Marks
2. Staining, Identification and description of blood and Rectal smear.		10 Marks
3. Microbiological Preparation.		10 Marks
2. Submission of slides (histological)		10 Marks
6. Practical record		10 Marks
7. Viva-voce		10 Marks

Total 70 marks

Environmental Biological Practical

1. Sampling for soil microflora is soil and water through dilution plate method.
2. LD50 Value of a toxicant – principle and procedure.
3. Comparative Study of soil biodiversity in polluted and unpolluted site.
4. Hypothetical Study of EIA of different polluted sites.
5. Analysis of air, water and soil quality data of an EIA report.
6. Identify ecological adaptations to live in different aquatic ecosystems.
7. To identify ecological adaptations to live in different desert ecosystems.
8. Study of desert/ Aravali ecosystem and its biodiversity.
9. Study of most probable number (MPN) in water.
10. To draw the flow chart for industrial effluent treatment.

Marks Distribution

1. Major Experiment	-	20
2. Minor Experiment	-	10
3. Hypothetical Report of EIA (Environment Impact Assessment)	-	10
4. Inter National/National model presentation of current disaster	-	10
5. Practical Record	-	10
6. Viva-voce	-	10
Total	=	70

Cell Biology Practical

1. Living study of dynamics of cell division by phase-contrast microscopy.
2. Preparation of standard plot and quantification of proteins.
3. Quantitative estimation of carbohydrates from tissue preparation
4. Estimation of DNA in the given sample.
5. Estimation of RNA in the given sample.
6. Preparation of animal cell culture.
7. DNA ladder formation.
8. Chromosome preparation by squash method.

Marking Scheme

Max. Marks: 70

- | | |
|---------------------|----|
| 1. Experiment Major | 25 |
| 2. Experiment Minor | 15 |

3. Experiment Minor	10
4. Practical Record	10
5. Viva-Voce	10
Total Marks	70

Fish Biology Practical

1. Analysis of water quality of Physicochemical Characteristics: Estimation of pH, free carbon dioxide, dissolved oxygen, chloride, nitrate, ammonia and silica.
2. Analysis of water quality of Physicochemical Characteristics: Alkalinity, total hardness and phosphate.
3. Estimation of primary productivity.
4. Collection, preservation and identification of zooplankton and benthos.
5. Soil analysis for pH and texture.
6. Seminar.
7. Practical record.

Marks distribution

1.	Water quality assessment (Major)	15
2.	Water quality assessment (Minor)	10
3.	Spots (5)	10
4.	Preparation of permanent slide	15
5.	Practical record	10
6.	Viva – voce	10
Total		70

Zool. 407: Skill Course IV - Eco-wildlife Tourism

Climate and wildlife of desert; cultural heritage; bird watching; wildlife trekking; desert National Park; fauna of Thar desert and its conservation; sacred grove; role of humans in environmental protection; environmental impacts with special reference to wildlife; environmental awareness; clean India campaign

Practical

Study of wildlife rich area, Jodhpur fort, other sites of cultural heritage; local field visit to carry out assignment; skill development for nature interpretation, trekking and camp managing; identification of local fauna.

Suggested Reading Materials (All latest editions)

1. Pathak, R. Indian National Park. Sumit Enterprises, New Delhi.
2. Samuel Israel and Toby Sinclari. Indian Wildlife. APA Production, Singapore.
3. Prater, S.H. The Book of Indian Animals. BNHS, Mumbai.
4. Krishnan, M. The Handbook of India's Wildlife. Maps and Hygiene Publisher, Channai.



Department of Geology

JAI NARAIN VYAS UNIVERSITY, JODHPUR

FACULTY OF SCIENCE

NEW CAMPUS

GUIDELINES FOR CHOICE BASED CREDIT SYSTEM:

Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete **four skill courses**: two within the Department and two from other Department within JNV University or the Universities approved by JNV University
3. **Course:** Usually referred to, as 'papers' is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period

of teaching (lecture or tutorial) or two periods of practical work/field work per week.

7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.
12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/ December and even semester from December/January to May.
Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May. Each Department shall conduct the Practical examinations of Odd semester with internal examiners only; however during even semester one Examiner shall be from other University/Institute.
13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Science resolves the following:

- a. All internal assessments shall be open assessment system only and that are based on Quizzes, term test, seminar
- b. Attendance shall carry the prescribed marks in all papers and Practical examination internal assessment
- c. In each semester three out of four theoretical component University examination shall be undertaken by external examiners from outside the university conducting examination, who may be appointed by the competent authority

Grievances and Redressal Mechanism

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head/Principal of the College or the Chairperson of the University Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.
- b) The appeal will be assessed by the Chairman and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Dean, Faculty of Science comprising all HODs of the Faculty and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	'O'	Outstanding	10
2	'A+'	Excellent	9
3	'A'	Very Good	8
4	'B+'	Good	7
5	'B'	Above Average	6
6	'C'	Average	5
7	'P'	Pass	4
8	'F'	Fail	0
9	'Ab'	Absent	0

- i. A student obtaining Grade F shall be considered failed and will be required to reappear in the examination.

- ii. For noncredit courses (Skill Courses) ‘Satisfactory’ or ‘Unsatisfactory’ shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

= and > 95 % marks Grade Point 10.0
90 to less than 95 % marks Grade Point 9.5
85 to less than 90 % marks Grade Point 9.0
80 to less than 85 % marks Grade Point 8.5
75 to less than 80 % marks Grade Point 8.0
70 to less than 75 % marks Grade Point 7.5
65 to less than 70 % marks Grade Point 7.0
60 to less than 65 % marks Grade Point 6.5
55 to less than 60 % marks Grade Point 6.0
50 to less than 55 % marks Grade Point 5.5
45 to less than 50 % marks Grade Point 5.0
40 to less than 45 % marks Grade Point 4.5
35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,

i.e

$$\text{SGPA (Si)} = \frac{\sum(C_i \times G_i)}{\sum C_i}$$

where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,
i.e.

$$\text{CGPA} = \frac{\sum(C_i \times S_i)}{\sum C_i}$$

where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.

- iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	4	B	8	4 x 6 =24
2	Course 2	4	B+	7	4 X 7 =28
3	Course 3	4	B	6	4X 6 = 24
4	Course 4	4	O	10	4 X 10 =40
5	Course 5- Practical I	4	C	5	4 X 5 =20
6	Course 6 – Practical II	4	B	6	4 X 6 = 24
	Total	24			24+28+24+40+20+24 =160

Thus, **SGPA =160/24 =6.67**

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	6.67	7.25	7	6.25

CGPA = (24X6.67+ 24X 7.25 + 24X7 + 24 X 6.25)/ 96

652.08/96 = 6.79

The Department is free to distribute the Periods between Theory/Tutorial/Practical as per the Course content and the need of the course. However the selection shall be from any one of the following pattern

- 4 : 0 : 0 (four lectures only (no tutorial and no practical) per week).
- 2 : 1 : 1 (two lectures, one tutorial, and one practical per week).
- 0 : 2 : 2 (no lecture, two tutorials, and two practicals per week).
- 1 : 2 : 1 (one lecture, two tutorials, and one practical per week).
- 2 : 2 : 0 (two lectures, two tutorials, and no practical per week).
- 0 : 4 : 0 (no lecture, four tutorials only, and no practical per week).
- 1 : 1 : 2 (one lecture, one tutorial, and two practicals per week).
- 2 : 0 : 2 (two lectures, no tutorial, and two practicals per week).
- 0 : 0 : 4 (no lecture, no tutorial, and four practicals only per week).
- 1 : 0 : 3 (one lecture, no tutorial, and three practicals per week).
- 3 : 1 : 0 (three lectures, one tutorial, and no practical per week).
- 0 : 1 : 3 (no lecture, one tutorial, and three practicals per week).
- 1 : 3 : 0 (one lecture, three tutorials, and no practical per week).
- 3 : 0 : 1 (three lectures, no tutorial, and one practical per week).
- 0 : 3 : 1 (no lecture, three tutorials, and one practical per week).

The Duration of the Period shall be forty five minutes. In each of these combinations, the first value stands for the same number of lecture instructions per week, whereas the last two values stand for double the number of tutorial / practical instructions per week.

In each practical group the number of students that can be accommodated will be decided by the respective Department Council; the general/existing pattern is 15 to 20 students in each group. The workload is to be computed accordingly.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective) involve an evaluation system of students that has the following two components:-

- (i) **Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
 - (ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.
- (i) **Continuous Comprehensive Assessment (CCA):** This would have the following components:
- a. **Quizzes:** Two Quiz examinations of 45 minutes duration each having a maximum of 40 marks shall be arranged for theory paper during the semester course period
 - b. **Term Test:** One term test shall be arranged for each theory paper prior to End-Semester Examination; examination duration shall be of three hours; maximum marks is 70

- c. **Seminar:** Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 15. The seminar shall commence after first quiz examination and shall be completed prior to term test for all the papers.
- d. **Classroom Attendance** – Each student will have to attend a minimum of 75% Lectures / Tutorials / Practicals. A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE). Attendance shall have 15 marks and will be awarded by following the system proposed below:

Those having greater than 75% attendance (for those participating in Co-curricular activities, 25% will be added to per cent attendance) will be awarded CCA marks as follows:-

75% to 80%	=	3 marks
80% to 85%	=	6 marks
85 to 90%	=	9 marks
90% to 95%	=	12 marks
> 95%	=	15 marks

All students' cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Science.

- e. CCA are based on open evaluation system without any bias to any student
- f. Any grievance received in the Department from student shall be placed before the **Grievance Redressal Committee** with adjudicated comments

Each component marks will be added without rounding and the total thus obtained is ratio by a factor of six. This value shall be rounded.

Illustration :

Quiz 1 – Marks obtained	= 30
Quiz 2 – Marks obtained	= 35.5
Term Test Marks obtained	= 50.5
Seminar Marks obtained	= 14
Attendance Marks obtained	= 9
Total	= 139.00
Conversion	= $139/6 = 21.16666$
Award	= 22.00

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective Department shall declare the result as “Satisfactory” or “Non-Satisfactory”; each student need to get a minimum of three “Satisfactory” declaration for the course completion

In laboratory courses (having only practical (P) component), the CCA will be based on students attendance (50%); hands on Practical in physical science stream (50%) and collection of biological material (25%) and hands on Practical (25%) in biological and earth science stream.

For QUIZ (2 quizzes per semester), 40 marks per Quiz and total of 80 marks, 45 minutes duration for each quiz:

Types of question	Number of Questions	Marks Per question	Total marks per type
1. Multiple choice	10	1	10
2. Fill in the blanks	10	2	20
3. Short answer (15 words)	5	2	10
Total	25		40

For the Term test and ESE:

Part A

Ten short type questions (Definitions, functions, short explanations, etc) for two marks each. $10 \times 2 = 20$ marks; two questions from each Unit; no choice in this part

Part B

Five short answer (25 words) type questions for four marks each. $5 \times 4 = 20$ marks; one question from each Unit with internal choice

Part C

Five questions of long/explanatory Answer (400 words) type, one drawn from each Unit; student need to answer any three; ten marks each; $3 \times 10 = 30$ marks

20+20+30 = 70 marks

Qualifying for Next semester

- 1. A student acquiring minimum of 35% in total of the CCA is eligible to join next semester.**
- A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as 'Fail'), shall be permitted to appear in such failed course(s)'in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.
- A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time i.e three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted. Additional chances examination fee shall be on additive basis.

Improvement Option:

Every student shall have the opportunity to improve Credit through University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final. There shall be no improvement opportunity in Practical examinations.

Result Declaration:

The ESE (End Semester Examination/University Examination) results shall be declared within twenty days of the last examination. The Theory/ Practical Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation.

M.Sc. Environmental Geology (2017-2019)

M.Sc. Environmental Geology: Semester I

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Core course 1	EG 101	Basic concepts and elements of Ecology and Environment	4-0-0	4	30	70	100
Core course 2	EG 102	Earth Processes and Natural Cycle	4-0-0	4	30	70	100
Core course 3	EG 103	Natural Resources and their conservation	4-0-0	4	30	70	100
Core course 4	EG 104	Environmental Pollution and Monitoring	4-0-0	4	30	70	100
Core course practical 1	EG 105	Basic concepts and elements of Ecology and Environment and Earth Processes and Natural Cycle	0-0-8	4	30	70	100
Core course practical 2	EG 106	Natural Resources and their conservation and Environmental Pollution and Monitoring	0-0-8	4	30	70	100
Skill Development Course I	EG 107	Survey in Field	2-0-2				
				24	180	420	600

M.Sc. Environmental Geology: Semester II

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Core course 5	EG 201	Biodiversity Conservation	4-0-0	4	30	70	100
Core course 6	EG 202	Environmental Chemistry	4-0-0	4	30	70	100
Core course 7	EG 203	Environmental Sustainability and Management	4-0-0	4	30	70	100
Core course 8	EG 204	Environmental Hazards and management	4-0-0	4	30	70	100
Core course practical 3	EG 205	Biodiversity Conservation and Environmental Chemistry	0-0-8	4	30	70	100
Core course practical 4	EG 206	Environmental Sustainability and Management and Environmental Hazards and management	0-0-8	4	30	70	100
Skill Development course II	EG 207 (any one)	A) Minerals and rocks	2-0-2				
				24	180	420	600

M. Sc. Environmental Geology: Semester III

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuou s Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Core course 1	EG 301	Environmental Toxicology	4-0-0	4	30	70	100
Core course 2	EG 302	Environmental Awareness and Social Issue	4-0-0	4	30	70	100
Core course 3	EG 303	Environmental Laws	4-0-0	4	30	70	100
Core course 4	EG 304	Instrumentation and Environmental Analysis	4-0-0	4	30	70	100
Core course practical 1	EG 305	Environmental Toxicology and Environmental Awareness and Social Issue	0-0-8	4	30	70	100
Core course practical 2	EG 306	Environmental Laws and Instrumentation and Environmental Analysis	0-0-8	4	30	70	100
Skill Development Course I	EG 307	RS and GIS for Urban and Regional Planning	2-0-2				
				24	180	420	600

M. Sc. Environmental Geology: Semester IV

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuou s Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Core course 1	EG 401	Environmental Impact Assessment	4-0-0	4	30	70	100
Core course 2	EG 402	Environmental and Occupational Health	4-0-0	4	30	70	100
Core course 3	EG 403	Environmental Planning and Biostatistics	4-0-0	4	30	70	100
Core course 4	EG 404	Restoration Ecology	4-0-0	4	30	70	100
Core course practical 1	EG 405	Environmental Impact Assessment and Environmental and Occupational Health	0-0-8	4	30	70	100
Core course practical 2	EG 406	Environmental Planning and Biostatistics and Restoration Ecology	0-0-8	4	30	70	100
Skill Development Course I I	EG 407	Building and Decorative stone	2-0-2				
				24	180	420	600

M.Sc. Environmental Geology Syllabus (2017-2019)

SEMESTER I

Core PAPER EG. 101: BASIC CONCEPTS AND ELEMENTS OF ECOLOGY AND ENVIRONMENT

Unit I

Basic concept of ecology and Environment, Scope of ecology and its relations with other disciplines of ecology; Principles pertaining to ecosystem; ecosystem components; Ecosystem energetics; processes of primary productivity, gross and net productivity; Homeostasis; Principles of limiting factors.

Unit II

Biogeochemical cycles in Environment: concept and significance; Carbon cycle, Nitrogen cycle, Phosphorus cycle, Sulphur cycle; Autecology: Basic principles; concept of population growth and survivorship; population characteristics and dynamics; population growth forms and concept of carrying capacity; Population regulation,

Unit III

Biotic community: concept and classification; community characteristics; Ecotone and continuum concept, Life form and biological spectrum; Community coefficients; Ecological dominance and ecological niche; ecological succession, concept of climax and community stability.

Unit IV

Aquatic ecosystems: Physicochemical characteristics of fresh water environment, Biotic communities of pond and lakes, thermal stratification of lakes, conservation and management of fresh water habitats. Physicochemical characteristics of Marine ecosystem, biotic communities of oceanic regions, coral reefs and mangroves, Estuarine ecology.

Unit V

Terrestrial Environment: Physicochemical characteristics; Forest Biomes, Grassland Biomes, Desert Biomes, Tundra Biomes; Flora and Vegetation of India; Endemism; Age and Area hypothesis, Dispersal dynamics.

Paper EG 102: EARTH PROCESSES AND NATURAL CYCLES

Unit I

Evolution of atmosphere; Chemical composition and thermal stratification of present day atmosphere, Atmosphere and earth radiation balance; Circulation of earth's atmosphere and world precipitation pattern; precipitation to evaporation ratio; Hydrological cycle

Unit II

Climate classification; World climate regimes; Climate types of India, Indian Monsoon; El Nino; Climate control and distribution of plants and animals, Gaia hypothesis, Climate and biosphere feedback mechanisms, Climate elements in crop production.

Unit III

Climate and habitable areas; climate and rural housing; climate and buildings; Micro climate and architectural design; Human body and heat balance; climate and human health, climate and race temperament, clothing insulation and clothing zones of the world.

Unit IV

Meteorology fundamentals– Pressure, temperature, wind, humidity, radiation, atmospheric stability adiabatic diagrams, turbulence and diffusion. Scales of meteorology. Applications of micrometeorology to vegetated surfaces, urban areas, human beings, animals; Application of meteorological principles to transport and diffusion of pollutants.

Unit V

Scavenging processes; Effects of meteorological parameters on pollutants and vice versa; Wind roses; Topographic effects; Pollution climatology; Preliminary concepts of climate change – global warming sea level rise, ozone depletion, green house gases.

Paper EG 103: NATURAL RESOURCES AND THEIR CONSERVATION

Unit I

Natural resources and their classification, biosphere reserves, nature conservation and its importance in national economy. Human use of surface and ground water. Environmental impact of resource exploitation; Resources of oceans and their conservation; Mineral resources and their conservation

Unit II

Types of energy resources: conventional and non conventional energy resources; Renewable and non-renewable energy resources, commercial and non commercial energy demand; Fossil fuel classification, composition, energy content of coal, petroleum and natural gas; Principles of generation of hydroelectric power, tidal power, thermal energy conversion, wind, geo thermal energy, solar collectors, photovoltaics, solar ponds, oceans.

Unit III

Nuclear energy- fission and fusion, bio energy -energy from biomass and biogas, anaerobic digestion, energy use patterns in different parts of the world; energy conservation policies. Impacts of large scale exploitation of solar, wind, hydro and ocean energy.

Unit IV

Biomass fuel types: solid fuels, liquid fuels, gaseous fuels; biomass fuel conservation devices; management of information on biomass fuels; Concept of environmental sustainable technology; Sun as the source of energy, solar radiation and its special characteristics.

Unit V

Economic and environmental perspectives of energy demand, Energy conservation, energy from Refuse; Studies of biomass fuels; availability of biomass fuels in India: Organic residues, energy plantation, carbohydrate crops, petro crops, energy weeds.

Paper EG 104: ENVIRONMENTAL POLLUTION AND MONITORING

Unit I

Natural and anthropogenic sources of pollution; primary and secondary pollutants; Transport and diffusion of pollutants; Photochemical smog and acid rain; Air pollution: source, effect of gaseous air pollutants on plants and animals, TSP and their effect on plants and animals; Principles of air monitoring; Air Pollution Tolerance Index, Air Quality Standards, control of air pollution, Euro standards. Indoor air pollution.

Unit II

Sources and consequences of water pollution; Principles of water quality monitoring, physicochemical and bacteriological sampling and analysis of water quality; water quality standards; water pollution control; Ganga Action Plan; Marine pollution; Thermal pollution.

Unit III

Sources and classification of Radioactive pollution, effect of radioactive pollution on biological system; Sources and measurement of noise pollution, noise exposure levels and standards; noise pollution control and abatement measures.

Unit IV

Sources of Soil pollution, Heavy metals sources and effects on biological systems; Pesticides sources and effect on biological systems, Detrimental effects of soil pollutants on soil micro biota, Ecological consequences and soil pollution control.

Unit V

Sources and characteristics of solid wastes, Solid waste disposal and management, Biomonitoring of air, water and soil environment, concept of indicator species and their environmental significance.

EG 105 : Core Practical 1:

1. Determination of minimum size of quadrat by species area curve method.
2. Study of vegetation by line transect
3. Determination of IVI
4. Find out the similarity and dissimilarity indices between disturbed and undisturbed grassland.
5. Determination of pattern (non randomness) in vegetation.
6. Estimation of total chlorophyll content of herbaceous vegetation on per square meter of land area basis
7. Study of biotic interactions
8. Representation of climate data
 - (1) Simple graph
 - (2) Hytherograph
 - (3) Rainfall variability graph
 - (4) Wind rose
 - (5) Combine bar and line graph
 - (6) Climograph
9. Observation of India weather maps.

10. Preparation of wind rose.

11. working of weather instruments Thermometer, Rain gauge, Anemometer, Barometer, Pedometer, Compass

EG 106: Core Practical 2:

1. Analysis of air samples

(1) SO₂

(2) SPM

2. Analysis of water sample

(1) Dissolved oxygen

(2) Chlorides

(3) Nitrates

(4) Hardness

(5) Biological oxygen demand

(6) pH

3. Analysis of Soil

(1) Texture

(2) Moisture

(3) pH

(4) Water holding capacity

(5) Chloride

(6) Wilting coefficient

(7) Porosity

4. Quantitative and qualitative analysis of planktons.

5. Study of foot prints and demarcation of territorial limits of few wild animals.

6. Estimation of crude proteins

7. Study faecal coli forms in water sample by M.P.N.

8. Qualitative and quantitative analysis of water samples for zooplanktons and phytoplankton's.

9. Preparation of field report of any case study carried out in any areas to assess the pollution status.

10. Analysis of soil for biotic components like bacterial fungi and soil nematodes

EG 107: SKILL DEVELOPMENT COURSE:

Survey in Field

1. Principles of surveying. Survey equipments.
2. Radial method of plane table survey.
3. Plane table survey with intersection methods.
4. Pace/Tape and compass methods survey with theodolite with various applications.

SEMESTER II

Paper: EG 201 : BIODIVERSITY CONSERVATION

Unit I

Concepts and component of biodiversity- genetic, species and ecosystem biodiversity, evolution of organisms & distribution in space and time, levels of biodiversity, biodiversity indices, value of biodiversity, biodiversity trends, modern techniques of measurement and monitoring of biodiversity, bio prospecting, patent protection and bio piracy .

Unit II

Major threats to biodiversity, IUCN threat categories, Red data book, threatened plants & animals of India; Endangered flora and fauna of India and Rajasthan, Mega diversity zones of India, Hot spot concept and hot spots of India, Biodiversity informatics, International efforts in biodiversity conservation

Unit III

Conservation of biodiversity- *In-situ*- Sanctuaries, biospheres Reserves, National Parks, Nature Reserves, Preservations plots; *Ex- situ* - Botanical gardens, Zoos, Aquaria, Home Garden & Herbarium, In vitro conservation: Germplasm & gene banks, tissue culture, pollen and spore bank, DNA bank; Wildlife reserves in India, Theory of reserve design, Restoration of biodiversity; Ecosystem people and traditional conservation mechanism; Importance of

biodiversity in Ecotourism; endemic flora and fauna of tropics and India with special reference to Rajasthan

Unit IV

National and International programmes for biodiversity conservation; Conservation of wildlife-significance and status of India, Wildlife reserves- Biosphere and nature reserves, Project tiger, sanctuaries and national parks in India; Impact of tourism on wildlife and problem in wildlife protection; Role of WWF, WCU, CITES, TRAFFIC .

Unit V

Conservation of forests; Indian strategies and planning; Agroforestry, Social forestry; Management of forest products; Forests and tribals; Chipko Aandolan; Coral reefs, mangroves and estuarine biodiversity and their conservation; wetland conservation with special reference to Rajasthan; Biodiversity and agenda-21; Biodiversity conventions.

Paper: EG 202: ENVIRONMENTAL CHEMISTRY

Unit –I

Concept and Scope of Environmental Chemistry; segments of environment; Principles and cyclic pathways in the environments; Chemistry of Biologically Important Molecules: Chemistry of Water: Unusual physical properties, hydrogen bonding in biological systems, unusual solvent properties, changes in water properties by addition of solute. Protein structure and biological functions, enzymes, enzyme metabolism.

Unit - II

Basic chemistry: Structure of atoms, their properties, their nuclear stabilities and their arrangement in the periodic table; fundamentals of chemical thermodynamics and solution formation-Normality, Molarity, Molality, Molecular weight, Equivalent weight, Mole concept; basic organic chemistry and biochemistry; Stoichiometry, Gibb's energy, Chemical potential, chemical equilibria, acid-base reactions; Solubility product, solubility of gases in water, the carbonate system, unsaturated and saturated hydrocarbons.

Unit – III

Classification of elements, chemical speciation, Particles, ions and radicals in the atmosphere. Chemical processes for formation of inorganic and organic particulate matter; Thermochemical and photochemical reactions in the atmosphere; Basic concepts of surface and interface chemistry: Absorption, adsorption, catalysis; collides, surfactants; carbonate system, radionuclides, radioactivity, decay of parent and growth of daughter nuclides & methods of radiometric dating; C14 dating system and procedure, stable isotopes – their fractionation and application to geo thermometry and paleo climates.

Unit – IV

First law of thermodynamics, enthalpy, adiabatic transformations; second law of thermodynamics, Carnot's cycle, entropy, Gibb's free energy, chemical potential, phase equilibria, Gibb's Donnan equilibrium; third law of thermodynamics, enzymes catalysis, Michaelis/ Menten equation; Concept, principle and utility of green chemistry, green reagents, green catalysts, industrial interest in green chemistry.

Unit – V

Oxygen and ozone chemistry, Chemistry of air pollutants, Photochemical Smog, Chemistry of water, concept of D.O., B.O.D., and C.O.D. Water treatment: Sedimentation, Coagulation, Filtration, tertiary and advanced treatment; Redox potential; Inorganic and organic components of soil; nitrogen pathways and NPK in soils. Bio transformation and bio magnification; Principles of photo chemistry- Photo chemical & photo sensitized reactions, energy transfer.

Paper EG 203: Environmental Sustainability and Management

Unit I

Introduction, concept and scope of environmental management; Systems and approaches, environmental management of resources-water, forest, biological, minerals and agriculture; International summits and treaties-Vienna convention, Montreal protocol, Kyoto protocol, Copenhagen convention

Unit II

Sustainable development –concept & growth of idea, indicators of sustainability, Sustainable use of natural resources, Sustainability in industry and agriculture, eco restoration, green funding

Unit III

Basic concept of environmental economics, International trade & environmental integrity, eco labeling, eco marketing, current environmental issues in India-case studies, Narmada Dam, Tehri & Almeti dam; the role of risk assessment in environmental Management decisions.

Unit IV

Management systems-Quality, environment, Health and safety, Social responsibility (ISO 9000, 14000,18000, 8000); international organization of standardization (ISO) and their clarification; Relation of EIA to Sustainable development;

Unit V

Environmental Management of Industrial pollution, Management of Pollution due to mining, chemical & manufacturing industries (Petroleum, coal, cement, Paper & fertilizer)

Paper EG 204 : Environmental Hazards and Management

Unit I

Introduction to hazards, classification and types: –Natural Hazards, Chemical hazards, Physical hazards, Biological hazards; Basics of hazard management and mitigation, natural Hazards – causes, continental drift, plate tectonics and sea floor's spreading; hazard analysis, potential risk; Human perturbation and natural hazards – impact of deforestation, land use and developmental activities on natural hazards, Role of climate change; Man Made hazards - Dams & reservoirs, NPP; Desertification-causes, evaluation, Mitigation.

Unit II

Natural Disasters: nature, causes and effect, Cyclone, tornadoes, floods, earthquakes, avalanches, Tsunami ,land slides, drought, fires, volcanism, Case study of disasters- community reaction to disasters, coping mechanism; disaster management- pre disaster phase, actual disaster phase, post disaster phase.

Unit III

Disaster assistance-technological assistance, relief camps, food requirement, water needs, sanitation security, information administration, fire fighting training, Safety Measures – a general account, emergency rescue, disaster education- alternatives and new direction, Forecasting and warning systems

Unit IV

Concept of disaster recovery- mitigation and preparedness, program planning and management, Vulnerability analysis, Training needs – Target Groups, emergency preparedness plan, occupational risk analysis survey and health evaluation, behavioral studies, Man-made disasters- occupational injury, Industrial Safety Management Techniques – Industrial Safety Standards, Industrial Accidents and Disasters - Frequency Rate, Prevention and Control; Dispersion of Radioactive material and release of Toxic and inflammable materials

Unit V

Environmental hazards, protective measure while handling hazardous substance, hazardous waste disposal. Hospital waste handling and disposal, guidelines for their disposal, fire and explosion hazards, radiation hazards. Case studies related to hazardous waste accidents, simplified measures for their assessment. Various diseases related to handling of hazardous waste. Nasal cancer and other fatal diseases- their symptoms, prevention and control.

EG 205: Core Course Practical 1

1. Find out the percentage frequency values of grassland species using 1 x 1 size quadrat. Classify the species into frequency classes A to E and prepare the frequency diagram. Compare result with Raunkiers standard frequency diagram.
2. Determine the biomass of producers.
3. Find out the effect of various quadrat size 25 x 25, 50 x 50, 75 x 75 and 1 x 1 m on percentage frequency result on same grassland plot considered in exercise I
4. Find out the species diversity index in disturbed and protected vegetation area.
5. Find out the leaf area index of crop field.
6. Study of anatomical features of ecological adaptation in selected hydrophytes and xerophytes.

7. Study of climatic conditions obtained in open field and under the shade of trees for temperature, light intensity, wind velocity, R.H and comparison of ground vegetation of these areas.
8. To determine the age of forest patch by DBH.
9. To determine the vegetation by Point frame quadrat method.

➤ **Spotting:**

- **Xerophytes:** Nerium – Stem & leaf; calotropis stem; capparid stem; pinus needle; opuntia; euphorbia, casuarina
- **Hydrophytes:** Ecchorhia, Hydrilla, trapa, nymphaea, chara, potamogeton, scirpus, nelumbo
- Point frame
- **Xerophytic animals:** Phrynosoma, draco
- **Aquatic animals:** exocoetidae, hyla, guppy, katla, Rohu, gambusia

EG 206: Core Course Practical 2

1. Analysis of Soil samples
 - (1) Texture
 - (2) Moisture
 - (3) pH
 - (4) conductivity
 - (5) Water holding capacity
 - (6) Bulk density & porosity
 - (7) Calcium carbonate
 - (8) Sulphate
 - (9) Carbonate and bicarbonate
 - (10) Organic carbon & organic matter
 - (11) Chlorides
 - (12) Nitrates
 - (13) Available phosphorus
2. To compare the wilting coefficient of a xerophytic and mesophytic plant.
3. Assessment of noise pollution in different zones of the city by Sound level meter.

4. Study of soil for biotic components like bacteria, fungi & soil nematodes.

➤ **Spotting:**

- Instruments- Spectrophotometer, sound level meter, colorimeter, refrigerated centrifuge
- Foot prints- of wild animals as available for demarcation of territory.
- Soil fauna-Micro & macro fauna: Milipede, centipede, earthworm, nematodes, actinomycetes
- Soil fungi and soil bacteria
- Seives set for soil texture

EG 207: SKILL DEVELOPMENT COURSE (Any One)

1. Introduction to minerals and rocks: common rock forming mineral.
2. Common non silicate minerals.
3. Igneous rocks.
4. Sedimentary rocks
5. Metamorphic rocks

SEMESTER III

EG 301 ENVIRONMENTAL TOXICOLOGY

Unit I

Toxicology: definition, Origin, classification & general nature of toxicants in environment; Principles in toxicology: Concept of dose response relationship, Chronic toxicity, Sub acute toxicity and acute toxicity, concept of LC 50 & LD 50, Median tolerance limit, Statistical concepts of LD₅₀; Safe limits, MATC, threshold concentration, NOEL, NOAEL & bioaccumulation; Risk assessment; Biological and chemical factors that influence toxicity; Influence of ecological factors on the effects of toxicity.

Unit II

Toxicity testing: Holistic and numeric approach; Drug toxicity and abuse; Heavy Metal toxicity in animals; mutagenesis, Teratogenicity and carcinogenicity; Practical problems in toxicity testing; Global dispersion of toxic substance; Dispersion and circulating mechanisms of

pollutants; degradable and non-degradable toxic substances in food chain; Eco-system influence on the fate and transport of toxicants.

Unit III

Route of entry of pollutants into ecosystem-Surface water, land, Air; Uptake of toxic substances by plants, metabolic basis of toxicity of SO₂, NO₂, O₃ and heavy metals in plants; Microbial transport of toxic metals; Air and water borne toxins and diseases; Radiation toxicity and safety measures; Biomonitoring and bioindicators of toxicants; response of ecosystem to toxicants ; biodegradable and non-biodegradable toxic substance.

Unit IV

Uptake of toxic substances by animals; Accumulation and chemical localization of toxic substances by animals; detoxification and excretion of toxic substances by animals; Metabolism of toxic substances by animals.; Aquatic toxicity testing ,Response of planktons to animals; pest & pesticides: classification, surveillance, resistance & residual effects.

Unit V

Toxic effect of pollution on terrestrial animals; xenobiotics in environment, bioconcentration, biological and non biological degradation, detoxification; chemical hazard assessment and communication; Information management system in Eco-toxicology; fumicatoris and masticatoris; Microbial toxicology-concepts and principle , Algal toxins, Mycotoxins, Cynobacteria; Eco toxicology-legal perspectives and animal ethics.

EG 302 Paper II: Environmental Awareness and Social Issues.

Unit I

Basic concept of sustainable development, social environmental issues and urban problems related to energy, need for environmental awareness, role of government and non- government organization in creating environmental awareness, environmental awareness programme, local state, national and international level environmental awareness among rural and urban population.

Unit II

Problems of increasing population ,population status in India, population explosion, family welfare programme, human rights value education, Environmental education at school level

,environmental education in colleges and universities, women and child welfare ,role of environmental education in the management of environment.

Unit III

Role of information technology in the management of human health, role of natural resources in the human development, Role of the human society in conservation of forest, rivers, ponds other natural resources ,Role of plants to control the human population from diseases. Case studies.

Unit IV

Basic knowledge of personal hygiene and cleanliness, Environmental awareness camps and programmes, involvement of rural population in environmental awareness programmes, Special environmental education courses for rural women and children. Environmental education through films, dramas and skits. Consequences of lack of environmental education, spread of various communicable diseases and epidemics due to poor sanitation.

Unit V

Environmental ethics, social and cultural values of biodiversity. Role of various plants and animals in traditional Medicare, ethno botanical and zoological values, social values for water conservation, water harvesting and water shed management.Role of communities in conserving environment.Social interaction among various population and communities. Community welfare programmes local and national level.

EG 303: Paper III: ENVIRONMENTAL LAWS

Unit – I

Law relating to hazardous substances and relevant provisions in the Factories Act 1948; Environment (protection) act 1986; powers of central government and provisions pertaining to prevention control and abatement of environmental pollution; Report of Tiwari committee; Environmental (prevention) rules 1986.

Unit - II

Central and state boards for prevention and control of air and water pollution; Air (prevention and control of pollution) Act 1981; Air (prevention and control of pollution) Amendment Act 1987 and rules 1982; The Water (prevention and control of pollution) Act 1974; The water (prevention & control of pollution) amendmend 1988 & rules 1975.

Unit - III

Motor Vehicle Act 1988; legislation related to forest and wild life conservation; Forest Conservation Act 1980; Indian Forest Act, 1970, revised 1982; Wildlife Protection Act 1972 and amendment 1991; Biodiversity Act, 2002.

Unit - IV

Code of criminal procedure and environmental protection; guidelines issued by the government of India for inspection of Industries under pollution control laws; Scheme of labeling of environmentally friendly products (ecomark). Public liability Insurance Act. 1991. Provision of constitution of India regarding environment (article 48 A & 58A).

Unit - V

Environment guidelines for industries which required industrial licensing, Industrial licensing procedure; Environmental Clearance Process; Consents for handling hazard substances; Environment protection issues & problems, international & national efforts for environment protection, provision of constitution of India regarding environment (Article A & 58 A).

EG 304 Paper IV: Instrumentation and Environmental Analysis

Unit I

Basic concepts of instrumentation, current, voltage and power; pH meter, conductivity meter, TDS meter, Visible spectrophotometer, Homogenizer, Autoclave , colony counter.

Introduction of various equipments of environmental monitoring and analysis: High volume air sampler, Atomic absorption spectrophotometer, Flame photometer, Infrared gas analyzer, UV spectrophotometer, H.P.L.C, scanning electron microscope, transmission electron microscope. Cooling centrifuge, growth chamber, Autoclave, polarograph, nuclear magnetic resonance.

Unit II

Introduction of basic field instruments: Handy air sampler, Noise level/Sound level meter; lux meter; pedometer; compass; Anemometer; High volume air sampler-construction, principle and working .

Machines involved in various equipments, working principles of all the equipments used in environmental monitoring and analysis.

Unit III

Introduction to advance concepts of Instrumentation –theory, principle & working and application of UV-Spectrophotometer, flame photometer, CO₂ analyzer, AAS, methane analyzer,

refrigerated centrifuge, plant growth chamber, HPLC, gas chromatography, Paper chromatography, NMR, X-ray, Infra red gas analyzer.

Air pollution analysis, monitoring of SO₂, NO₂, CO₂ and analysis of SPM, sampling methods for aerosol, organic gases and vapor analysis.

Unit IV

Introduction to solution preparation; calculation of concentration of solution using specific gravity and molecular weight; units of concentration of solution; inter conversion; ionic product of water, pH, p^{OH}, buffer solutions.

Water pollution analysis, Physical analysis, chemical analysis, Biological Analysis, analysis of minor components, Industrial and domestic effluent analysis, Primary, Secondary and tertiary treatment of water.

Unit V

Selection of sampling sites, analytical methods and selection of appropriate analytical technique; sample blank preparation and solvent blank preparation ; efficiency of sampling; preparation of serial dilutions and standard curves for air, water ,soil and plant analysis.

Soil pollution and pesticide analysis, agricultural pollution, Role of micronutrient in soil, trace elements in soil, pesticide and soil pollution ,chromatography characterized zones, polarographic spectroscopic analysis. Soil pollution and crop health, soil microbes and plants diseases. Physical, chemical and biological analysis of soil.

EG 305: Core Course Practical 1

1. Determination of the dust capturing capacity and percent leaf area injury of selected plant species.
2. Effect of heavy metals on seed germination and early seedling growth.
3. Effect of heavy metals on ascorbic acid content in plant leaves.
4. Effect of heavy metals on chlorophyll content, soluble protein, phenols and carbohydrates.
5. To calculate the LC 50 in fishes for heavy metals calculation of MATC and threshold concentration.

6. Short term bioassay lists of industrial pollutants in relation to fresh water animals.
 - a) Calculation of 96 hours LC 50
 - b) Assessment of threshold concentration.
 - c) Calculation of MATC (Maximum acceptable toxicant concentration)
 - d) Calculation of application factor or safe concentration)
7. Observation of stomata movement and measurement of stomatal aperture
8. Observation of various stages of cell division in onion root tips with special reference to heavy metals
9. Observation of plant cell structure in onion peel
10. Study of petio plants and energy weeds
11. Principle, construction and working of biogas plant

➤ **Spotting :**

- Study and identification of minerals and rocks.
- Toxicity curves
- Heavy metal identification
- Principle & working of STP's and ETP's
- Identification and study of coal : bituminous, lignite, anthracite, peat
- Biomass pellets
- Different types of woods : briquettes
- Solar equipments: solar cooker, solar lantern, solar water heater, solar dryer, photovoltaic cell

EG 306: Core Course Practical 2

1. Working and principles of handling various equipments:
 - a) High volume air sampler
 - b) Spectrophotometer
 - c) Refrigerated centrifuge
 - d) Homogenizer
 - e) Flame photometer
 - f) Gas analyzer
 - g) Growth chamber

- h) Atomic Absorption Spectrophotometer
- i) Autoclave
- j) Polarograph
- k) Muffle furnace
- l) Bomb calorimeter

Diagram, working and instrumentation of all the equipments mentioned above

➤ **Spotting :**

- pH meter, conductivity meter, TDS meter , turbidity meter, weigh balance
- Identification and study of local and migratory birds in and around the wetlands of Udaipur
- Study and ecological significance of endemic plants and animals of southern Rajasthan
- Field excursion

EG 307: SKILL DEVELOPMENT COURSE (Any One)

RS & GIS for Urban and Regional Planning

- (i) To study the RS and GIS data
- (ii) To study the Mapping for Urban and Regional areas
- (iii) To study GIS Tool in Urban Planning

SEMESTER IV

EG 401: ENVIROMENTAL IMPACT ASSESSMENT

Unit-I

Introduction to environmental impact assessment; origin and development of environmental impact assessment; relationship of environmental impact assessment to sustainable development; basic concepts, objectives and its significance of EIA; EIA guidelines -1994 and modified in 2006; Generalized approach to impact analysis.

Unit II

Environmental Impact statement process; environmental impact assessment methodologies- Adhoc method; Check list methodologies-Matrix method, LCA method

Unit III

Introduction to environmental planning, Baseline Information and predictions- land, water, atmosphere, energy and socio-economic status and demographic profile; environmental audit-guidelines concept and process; concept of public participation- public hearing; ISO 9000,14000 & 18001.

Unit IV

Prediction and assessment of impact on water, air, Noise, soil and biological systems; cost benefit analysis.

Unit V

R & R plan(Act).2007; Green belt development; National environmental policies and guidelines in India; condition and approach for EIS review; Case–studies-River valley projects, Thermal power plants, Mining projects, Dams and reservoirs, Oil refineries, Petro chemicals, national Highway Projects; Identification and prediction of Impact mitigation measures.

EG 402: ENVIRONMENTAL AND OCCUPATIONAL HEALTH

Unit I

Basic principle of environmental health; Environmental factors and human health; Physiological responses of man to relevant stresses in the environment; Disease causing infectious organisms (Virus, bacteria, and parasites); teratogens and mutagens; Detailed account of AIDS and sexually transmitted diseases (STD); Environmental health management.

Unit II

Air pollution and human health; causes of air pollution and air borne diseases, Soil pollution- Sources and effect on human health; Water pollution- sources and effects on human health; water borne diseases; Risk assessment and preventive measures; Toxicogenomics- interaction of pollutants with biological systems at different levels-organism ,organ and organelles.

Unit III

Environmental health management in India; Occupational health safety and health administration; Environmental health in indigenous tribal communities- problems and remedies; Environmental health protection - Issues and problems ;Industrial safety management techniques and standards.

Unit IV

Definition of occupational health, Occupational hazards and associated diseases- silicosis, anthrax and other lung diseases; WHO standards of working conditions; factors affecting occupational health (physical, chemical and biological); prevention of occupational diseases; Various international organizations (WHO, ILO, UNICEF) on human health, Lead poisoning, occupational cancers, Dermatitis.

Unit V

Nuclear pollution and human health- case studies; Agriculture chemicals and human health; Hazardous wastes- human health and management; Noise pollution and human health hazards; Human health education and awareness. Hazard evaluation in polluted environment with specific emphasis on radiological health; causes and consequences of hazardous wastes in soil, water and air with respect to human health; Industrial hygiene application and statistical methods through medical records, in study of health problems of human population in green environment

EG 403: Paper III: ENVIRONMENTAL PLANNING AND BIOSTATISTICS

Unit I

Basic concepts of Environmental planning; Environmental priorities in India; urban planning; Environmental problems of urban planning; rural environmental planning; national and state Environmental policies.

Unit II

Land use and degradation; land use planning; waste land and their reclamation; water logging; Salinization of lands; strategies for sustainable land management.

Unit III

Watershed management and planning in India; Structure and functioning of MOEF, CPCB, SPCB; wetlands planning and management; eco friendly technologies for natural resources.

Unit IV

Fundamentals of bios statistics -basic concept & introduction to sampling methodology; measures of central tendency and graphical representation of data: Mean (arithmetic, harmonic and geometric), Median and Mode; Measures of central tendency & dispersion; skewness and kurtosis, Poisson and binomial distribution; Standard deviation; Standard error of mean.

Unit V

Null hypothesis, t test and pair T test; Chi square test, Coefficient of association (measure of association); Analysis of variance; Probability –definition, addition and multiplication laws; concept of random variable; Correlation coefficient- testing of significance of correlation coefficient; Regression coefficient and the line of best fit; relationship between correlation and regression; introduction to multivariate methods for environmental sciences –ANOVA (one way & two way), PCA, factor analysis and cluster analysis.

EG 404 Paper IV: Restoration Ecology

Unit I

Contaminated lands: Types of contaminated lands and contaminants; effects of contaminants on biota; Ecology of Disturbed Ecosystems: disturbance and its impact on the structure and functioning of terrestrial and aquatic ecosystems; Types of waste and its characteristics.

Unit II

Aims and strategies of restoration: Concepts of restoration, single vs. multiple end-points; ecosystem reconstructions; physical, chemical, biological and biotechnological tools of restoration; Restoration of biological diversity: Acceleration of ecological succession, reintroduction of biota.

Unit III

Degradation and restoration of natural ecosystems: Forests, Grasslands, Savanna, Aquatic; Selection of plant species for restoration

Unit IV

Restoration of degraded soils: Restoration of contaminated soils and soil fertility; mine spoil restoration. Phytoremediation, phytostabilization, rhizofiltration, phytodegradation, Conditioning strategies

Unit V

Advances and possibilities in phytoremediation: Plant biochemistry, genetic engineering, transgenic plants, use of bacteria. Application and performances; Case studies: In India and abroad

EG 405: Core Course Practical 1

- (i) To determine the LAI, chlorophyll content, soluble leaf protein, ascorbic acid, phenol, carbohydrate and air pollution tolerance index (APTI) of selected plants species and comparison of plants for their relative susceptibility to pollution
- (ii) Permanent Preparation of slides- xerophytes, hydrophytes, zooplankton and phytoplankton in polluted and non polluted areas.
- (iii) Assessment of respiratory activity with increasing branch diameter
- (iv) Qualitative and Quantitative analysis of plant enzymes
- (v) Estimation of chlorophyll a, b and total chlorophyll from commercial, roadside and industrial areas.
- (vi) Estimation of crude proteins
- (vii) To evaluate bryophytes and lichens for their sensitivity to different pollutants
 - a. Number of species
 - b. Degree of cover
 - c. Frequency of each species
 - d. Growth and development
 - e. Biomass
 - f. Chlorophyll content
- (viii) Use of animals in terrestrial and aquatic ecosystem as bio indicators/ bio monitors (mammals/micro arthropods/earthworms/wood lice/molluscs)

EG 406: Core Course Practical 2

1. Test the difference between means of two samples using 't' test and paired t test.

2. To determine the correlation between two variables.
3. Test of null hypothesis by computing SE of difference between two means.
4. To determine the association between two species by using chi- square test.
5. To determine mean, median and mode between various samples.
6. Introduction of biotechnological tools and techniques: principles and applications.
7. Isolation and culture of excised plant parts for micropropagation studies.
8. Isolation, purification and identification of aerobic bacteria from different soil and water sources.
9. Application of stage and ocular micrometer for measurements of microbes.
10. Preparation of different type's media for culture of bacteria, algae and plant tissues.
11. Isolation, purification and identification of mycorrhizal fungi.
12. Demonstration of biogas production by methanogen bacteria.
13. Study of the following:
 - a) Organisms as bio fertilizer- *Azolla*, *Anabena*, *Nostoc*, *Aulosira*, *Plectonema*, *Oscillaloria*, *Tolypothrix*, *Glomus*, *Gigaspora*, *Sclerocystis*, *Rhizobium*
 - b) Different stages of micropropagation -shoot multiplication, rooting, in vitro hardening
 - **Spotting** : Laminar Flow
 - Auto Clave
 - Hot Air oven
 - Sterlizer
 - Sprit lamp
 - Instruments for inoculation
 - Plant growth chamber
 - Micro Pipette
 - Stage & ocular Micro meter
 - Compound Micro scope

EG 407: SKILL DEVELOPMENT COURSE
Building and Decorative Stone

M.Sc. Syllabai 2016- 2018

SEMESTER I

PAPER I : MINEROLOGY

Unit - I

Fundamentals of Mineral Chemistry: Periodic table, Ionic Radii, Co-ordination number and bonding in mineral; Crystallographic concepts: Crystal forms, Symmetry elements, Unit cell, Introduction to Bravais lattices and space groups; Crystal imperfections: defects, zoning and Twinning.

Unit - II

Symmetry classes and crystal systems; Crystal structure: Structural classification of silicates, Isomorphism, polymorphism, Pseudomorphism and mineraloids

Unit - III

Polarized light, Nicol prism and working of petrological microscope. Study of orthoscopic and conosopic properties of minerals. Optical accessories and their use. Uniaxial and biaxial indicatrix and interference figures.

Unit - IV

Silicate mineralogy: structure, mineral chemistry, P.T. stability, Physical and optical properties, mode of occurrence of Quartz (Silica), Feldspar, Feldspathoid, Olivine, Garnet, Epidote, Pyroxene, Amphibole, Mica, Chlorite and Aluminosilicates.

Unit - V

Nonsilicate Mineralogy: Structure, habit, physical and optical properties, mode of occurrence of carbonates (Calcite, Aragonite & Dolomite), oxides, sulphides, sulfates, phosphate, and halide groups; Clay Minerals: Properties and occurrences. Introduction to X-Ray Crystallography; Bragg's Law, Principles and geological application of X-ray diffractometry, atomic absorption spectrophotometry, inductively coupled plasma-atomic emission spectrometry, scanning and transmission electron microscopy, X-ray fluorescence spectrometry.

BOOKS RECOMMENDED

Dexter Perkins, 2014: Mineralogy, PHI Learning Pvt. Ltd. ISBN-9788120345089.
Deer, W.A., Howie, R.A. and Zussman, J., 1996: The Rock Forming Minerals Longman.
Klein, C. and Hurlbut, Jr., C.S.. 1993: Manual of Mineralogy. John Wiley.
Putnis, Andrew, 1992: Introduction to Mineral Sciences. Cambridge University Press.

Spear, F.S. 1993: Mineralogical Phase Equilibria and Pressure -Temperature. Time Paths. Mineralogical Society of America Publ.
Phillips, Wm, R. and Griffen, D.T., 1986: Optical Mineralogy, CBS Edition.

Paper II: Structural and Field Geology

Unit - I

Mechanical properties of rocks; Concept of stress and strain; Stress and its components, stress in two and three dimensions; Types of strain ellipses and ellipsoids, their properties and geological significance ; Mohr diagrams; Measurement of strain in naturally deformed rocks.

Unit - II

Folds: Geometry, classification, mechanism of folding and buckling. Superposed folding. Interference patterns and structural analyses in areas of superposed folding. Recognition of fold in the field.

Faults: Geometry, classification, mechanism of faulting. Recognition of faults in the field. Unconformities and basement-cover relations.

Unit - III

Shear zones, Shear sense indicators, shear zone kinematics. Role of fluids. Behaviour of minerals and rocks under deformation conditions. Time relationship between crystallization and deformations. Structural behaviour of igneous rocks, diapirs and salt domes

Unit - IV

Cleavage: Types, origin, mechanics and relationship with folding. Lineation: Types, origin and deformation. Basic principles of structural analyses.

Unit - V

Concept of petrofabrics and symmetry; Types of fabrics, fabric elements, π and β diagrams; Thrust geometry.
Principles of geological mapping and map reading, projection diagrams. Construction and use of clinometers, Method of measuring strike, dip and dip direction in the field.

PAPER III : Geomorphology, Tectonic and Climatology

Unit I

Theory of Plate Tectonics, Plate Tectonics and Seismicity, seismic belts of the earth, Causes of Plate motion; Mantle Plumes and Plume mechanics; Structure and tectonic evolution of the Himalaya; Mobile belts, with special reference to India.

Unit - II

Submarine relief, Features associated with oceanic crust, mid-oceanic ridges, gravity and magnetic anomalies at mid oceanic ridges, Deep sea trenches, Island arcs and Volcanic arcs, Paleo-magnetism.

Unit - III

Geomorphic processes and landforms: Fluvial, Eolian, Aeolian, Glacial, Karst and Coastal, and associated landforms.

Unit- IV

Geomorphology of Indo-Gangetic Plain, Peninsular India, Indian coast, Indian Ocean and Himalaya. Applications of geomorphology in mineral prospecting, civil engineering and environmental studies. Geomorphological mapping based on genesis of landforms. Terrain evolution for strategic purposes.

Fundamental principles of climatology. Earth's radiation balance, latitudinal and seasonal variation of insolation, temperature, pressure wind belts and humidity,

Unit- V

Cloud formation and precipitation, water balance. Air masses monsoon, Jet streams, tropical cyclones and El Nino. Climatic cycles during Quaternary; Terminal Pleistocene-Holocene climatic and sea level changes.

Paper IV: SEDIMENTOLOGY

Unit I

Earth surface system: weathering, erosion process of transportation, deposition and post depositional changes. Sedimentary textures-grain size, shape, sorting, packing and orientation. Methods of study of grain size distribution parameters. Methods of study of grain shape and fabric. Mineralogical characteristics, separation and study of the heavy minerals. Sedimentary structures and their significance.

Unit II

Sedimentary environments and facies continental alluvial-fluvial, lacustrine, desert-aeolian and glacial sedimentary system. Shallows coastal and Tidal sedimentary system. Marine and continental evaporites.

Unit III

Diagenesis and Clastic petrofacies. Palaeocurrent, palaeoenvironmental, and basin analysis. Classification, nomenclature and genesis of major sedimentary rocks: conglomerate, shale, sandstone carbonate and siliceous rocks; Diagenesis of sandstones and carbonates. Clastic and non-clastic sedimentary rocks.

Unit IV

Petrogenesis of important clastic and non clastic sedimentary rocks. Evolution of sedimentary basins: tectonics and sedimentation, classification of sedimentary basins. Elementary idea of application of trace-elements and stable isotopes geochemistry to sedimentological problems.

Unit V

Paleocurrent analysis and its application in basin analysis. Sedimentary basins of India.

Stratigraphy and Sedimentation. Concepts of stratigraphy, Vertical and lateral relationships, subsurface correlation. Modern concepts in stratigraphy.

PRACTICAL:

1. Structural Geology and Field Mapping
2. Mineralogy and Sedimentology

Structural Geology :-

1. Solution of structural problems by stereographic and orthographic projections.
2. Identification of structural elements and their chronology in hand specimen.
3. Structural analysis with stereonet: S-pole and beta-pole diagrams; Fold axis and axial plane; Contoured diagrams; Methodology and interpretation of patterns.
4. Interpretation of complex geological maps and drawing of cross sections.

Mineralogy:

- i. Identification of minerals in hand specimen.
- ii. Microscopic study of rock forming minerals using optical accessories.
- iii. Identification of Crystal models in hand specimen.
- iv. PT stability diagram.)

Sedimentology:

1. Field and laboratory techniques in sedimentary: Recording of sedimentary structures, preparation of lithologs. Thin section preparation and staining techniques.
2. Study of primary, secondary and biogenic sedimentary structure in hand specimens in photographic atlas, field photography and wherever possible on the outcrops.
3. Grain size analysis and granulometric analysis: Histogram, cumulative frequency distribution curve of grain size data. Computation of statistical

parameters such as median, mean, standard deviation, skewness and kurtosis etc. and their interpretation.

4. Exercise related to palaeocurrent data.
5. Exercise related to analysis and interpretation of depositional sedimentary environments using actual case histories from western Rajasthan stratigraphic record.
6. Petrography of important clastic and non-clastic sedimentary rocks.
7. Microscopic study of heavy minerals and interpretation of prominence.

SKILL COURSE:

Surveying

SEMESTER II

PAPER I : Principles of Stratigraphy and Precambrian Geology

Unit I

Development of Stratigraphy. Geological Time-scale and its equivalent Indian rocks. Stratigraphic principles and methods of correlation. Stratigraphic nomenclature and various schemes namely, Geochronology and Chronostratigraphy. Lithostratigraphy. Biostratigraphy, Magnetostratigraphy, Allostratigraphy, Quantitative Stratigraphy, Cyclostratigraphy, Eventstratigraphy, Pedostratigraphy, seismicstratigraphy and sequence stratigraphy.

Unit II

Early history of the earth Nature and evolution of early crust. Nature and form of Precambrian life. Evolution of Granite-Greenstone and Granulite belts during Precambrian. Archean and Proterozoic tectonic patterns. Major Stratigraphic breaks and events in Stratigraphy. Episodic nature of the stratigraphic records. Precambrian-Cambrian boundary.

Unit III

Precambrian province of India and their Stratigraphic correlation, succession, structure, geochronology and economic importance of Dharwar, Singhbhum, Aravalli, Bundelkhand and Sausar – Sakoli including Igneous Intrusions if any.

Unit IV

Proterozoic Sedimentary Basins of India: Palaeoproterozoic, Mesoproterozoic and Neoproterozoic including Malani and other Igneous Intrusions.

Unit V

Global Precambrian events; Precambrian Geology of Greenland, Canadian Shield, Rhodesian Craton, Western Australia and Baltic Shield with their equivalents in Indian shield.

OR

Radiometric dating methods: K-Ar dating; Rb-Sr isochron method; Sm-Nd dating; U-Th-Pb system; Concordia and Discordia diagrams; Radiocarbon, Fission Track (FT) and OSL dating techniques; Dendrochronology and Lichenometry.

PAPER II: Igneous Petrology

Unit -I

Magma: Composition and constitution of magma; Generation and Emplacement and its relation Physics of magma generation in the crust and mantle, to plate tectonics; Magmatic crystallization, differentiation and assimilation; Bowen's Reaction Principle. Factors affecting magma and evolution of magma.

Unit - II

Crystallization process in silicate melts in light of experimental studies especially for following systems: Binary (Albite-Anorthite, Diopside-Anorthite, Albite-Orthoclase, Forsterite-silica and leucite-silica system) and Ternary (Diopside-Albite- Anorthite, Diopside, Forsterite-Silica and Albite-Orthoclase- Silicic systems), its relation to magma genesis and crystallization behaviour.

Unit - III

Igneous Rock: Intrusive Forms and Extrusive Forms; Textures and Structures of Igneous rock; classification of igneous rocks (mineralogical, chemical, genetic, IUGS)

Unit – IV

Petrographic Provinces: Definition and characteristics; major, trace, REE and Isotopic compositions of igneous rock and their role in petrogenesis; Origin of major igneous rock types viz Granites, Basalts and Alkaline rocks; Ophiolites and Carbonatites.

Unit – V

Petrography, mode of occurrence and origin of following rock groups: Granite – Granodiorite – Diorite; Rhyolite – Rhyodacite – Dacite; Gabbro – Dolerite – Basalt; Syenite – Nepheline syenite and related rock; Ultrabasic rock; Pegmatites. Classification and composition of Meteorites;

Paper III: Phanerozoic Stratigraphy

Unit –I

Nomenclature, classification, distribution, structures, succession, sedimentary history, fauna, flora, age, igneous intrusion, palaeogeography, palaeoclimate and regional correlation of the Paleozoic sediments of India.

Unit- II

Permian- Triassic boundary. Marine Triassic sequences of the Himalaya with special reference to Spiti Valley, Himachal Pradesh.

Nomenclature, classification, distribution, structures, succession, sedimentary history, fauna, flora, age, igneous intrusion, palaeogeography, palaeoclimate and regional correlation of the Gondwana Supergroup of India.

Unit- III

Nomenclature, classification, distribution, structures, succession, sedimentary history, fauna, flora, age, igneous intrusion, palaeogeography, palaeoclimate and regional correlation of the Mesozoic marine rocks of India. Cretaceous/ Tertiary (K/T) Boundary.

Unit- IV

Deccan Volcanic Province: Stratigraphy, Field Features of Basalt Flows, Regional Volcano- Plutonic Complexes, petrology and petrogenesis, Age and Duration of Volcanism. Inter- Trappeans and associated sedimentary Formations.

Distribution, Stratigraphy and Sedimentation, Fauna, Tectonic Setting and Structure, Correlation and Age of Siwaliks.

Unit – V

Nomenclature, classification distribution magmatic activity, succession, sedimentary history, fauna, flora, age, igneous intrusion, palaeogeography, palaeoclimate and regional correlation of the Tertiary rocks of India including Geology of offshore basins of India.

Paper IV : Palaeontology

Unit - I

Origin of life, major events in the history of Precambrian and Phanerozoic life. Mechanism of evolution. Species concepts and Nomenclature. Introduction to Taphonomy, Biostratigraphy and Palaeobiogeography. Palaeoecology: ecosystem and limiting environmental factors. Collection, preparation and preservation of fossils. Use of fossils as indicators of Palaeoenvironment. Mass extinction and its causes.

Unit - II

Types of microfossils and significance of micropaleontology.

Foraminifers: Morphology, Classification, evolution, geological history, and palaeoecology.

Ostracods: Morphology, Classification, palaeoecology, and geological history.

Graptolites : Evolution, palaeoecology and geological history

Unit - III

Functional morphology of Anthozoans (corals) and their geological history.

Brachiopoda: Classification; Variation in brachial skeleton, pedical opening and commissure.

Pelecypoda (Bivalvia or Lamellibranchia): Evolution of hinge and dentition, adaptive modification of foot, mantle and pallial sinus;, palaeoecology, geological history and classification

Gastropoda: forms, various apertures, palaeoecology, classification and geological history.

Unit - IV

Cephalopoda: Ammonite - Morphology, ornamentation and type of sutures, evolutionary theories about ammonite, classification and geological history.

Nautiloidea: variation of conchs of nautiloidea, Morphology of Dibranchia.

Trilobite: evolutionary trends, geological history and palaeoecology.

Echinoidea: Change in symmetry, variation in oculogenital system, ambulacral areas and compound plates, classification, and geological history.

Unit - V

Vertebrates of Siwalik. Evolutionary histories of man, elephant and horse.

Gondwana flora, their significance and distribution. Introduction to Palynology.

Spores and pollen grains.

PRACTICAL

1. Igneous Petrology and geological tour
2. Stratigraphy and Palaeontology

Stratigraphy:

1. Identification, description and geochronology of the Indian stratigraphic rocks.
2. Stratigraphic maps of India.
3. Palaeogeographic maps of India.
4. Standard rock symbols used in lithological maps

Palaeontology: Drawing, classification, description, age and identification of important fossils.

Igneous Petrology:

1. Identification and description of important igneous rocks in hand specimen.
2. Petrographic studies of important igneous rocks.
3. Preparation and interpretation of variation diagrams in relation to petrogenesis.
4. Calculation of CIPW norms.

SKILL COURSE

Introduction to minerals and rocks:

Introduction to Igneous, metamorphic and Sedimentary rocks and their types along with texture and structures.

Definition of minerals. Physical properties of minerals. Major mineral of metallic and non-metallic categories.

SEMESTER III

Paper I: Geohydrology

Unit I

Ground water: origin, types, importance, occurrence. Hydrogeologic properties of rocks: porosity, permeability, specific yield, specific retention, hydraulic conductivity, transmissivity, storage coefficient. Types of aquifers. Geological formations as aquifers. Water-bearing characteristics of rocks.

Unit II

Hydrogeology of arid zones. Hydrographs. Flownets, Water table contour maps. Ground water quality – physical and chemical properties of water, quality criteria for different uses (domestic, irrigation and industrial purposes). Groundwater contamination and methods of treatment. Groundwater Resources of Rajasthan and Groundwater provinces of India.

Unit III

Well hydraulics: Confined, unconfined, steady and unsteady radial flow conditions. Darcy's law and its application, Methods of pumping test and analysis of test data, Evaluation of aquifer parameters using Jacob and Walton methods. Salt water intrusion in coastal aquifers and its prevention

Unit IV

Water well technology: Development and maintenance of wells. Surface geophysical methods of groundwater exploration, Subsurface geophysical methods – well logging for delineation of aquifers and estimation of water quality. Hydrogeomorphic mapping using remote sensing techniques. Radioisotopes in hydrogeological studies.

Unit –V

Ground water problems related to foundation work, mining, canals and tunnels, problem of overexploitation and groundwater mining, groundwater development in urban areas, Rainwater harvesting. Artificial recharge: need and benefits, method of artificial recharge. Groundwater balance and methods of estimation. Groundwater legislation. Sustainability criteria and managing renewable and nonrenewable groundwater resources.

Paper II: Ore Genesis and Mineral Deposits

Unit I

Brief history of development of economic Geology and modern concept of ore genesis. Spatial and temporal distribution of Ore deposit in the World. Material of mineral deposits and their formation. Principle ore mineral groups. Methods of geothermometry and geobarometry in Ore Geology. Ore texture, Para genesis and zoning of Ore and their significance.

UNIT II

Chemical composition of Ores and host rock: bulk chemistry, major, minor, trace and rare earth elements. Stable and radiogenic isotopes. Ore microscopy: Optical principle and properties of Ore minerals. Fluid inclusion in ores: Principle, applications and limitations. Earths evolutionary history and evolutionary trends of Ore deposits. Precambrian and present Plate tectonics and genesis of Ore deposits. Classification of Ore forming processes.

Unit III

Ore forming processes of igneous associations with possible Indian example, Magmatic deposits associated with acidic, basic and ultra basic rocks. Mineralization associated with Komatiite (Gold), Kimberlite (Diamond), Carbonates (R.E.E), Peridotites (Cr, Ni and PGE), Granite (W and Sn) and Pegmatite's (mica, uranium, gems and R.E.E), Cyprus type Cu-Zn deposit and Kuroko type Pb-Zn-Cu deposit. Porphyry copper.

Pegmatites: As a rock and economic deposit forming process. Simple and complex pegmatite and their genesis. Indian pegmatite belts.

Skarn and greisens deposits, contact metasomatism: role of invaded and intrusive rock. Characteristic of the deposits. Hydrothermal process and deposits. Origin and nature of hydrothermal solutions. Wall rock alteration, crustification and comb structures. Cavity filling and metasomatic replacement type of deposits. Hypo-, Meso-, Epi-, Tele-, Xeno and Lepto thermal deposits.

Volcanogenic process and deposits: characteristics, mode of occurrence and genesis Mn nodules. Metamorphosed deposits and metamorphism as Ore forming process.

Unit IV

Economic mineral deposit forming process of sedimentary association (with possible Indian examples) Sedimentation: Chemical and Clastic sedimentation chemical perception of iron and Manganese deposit. Factors controlling economic concentration and their mutual dependence.

Residual concentration: characteristic of the process and controlling factors. Bauxite, classification and Indian deposits of bauxite. Blue dust Ore. Residual Cr and Ni /Au profiles.

Mechanical concentration: Eluvial, Alluvial, Wind and Beach placers, Placer gold, diamonds and thorium.

Oxidation and Supergene Sulphide enrichment: formation of solvent, dissolution migration and deposition of metals. Gossans: Type and importance.

Biogenic deposits and process.

Stratiform and Strata bound Ore deposits (Mn, Fe and Base metals).

Contemporary Ore forming systems: black smokers, mineralized crust, Mn nodules and Red sea.

Unit – V

Geology and genesis of important metallic deposits of India: iron, manganese, chromium, nickel, tin, tungsten, gold, lead, zinc, copper and aluminum deposits.

Paper III: Metamorphic Petrology and Geochemistry

Unit I

Agents and kinds of metamorphism; metamorphic zones; grades; iso-grades; metamorphic facies; Fabric of metamorphic rocks formed under regional, dynamic and thermal metamorphisms; Classification of regional metamorphism based on P/T ratio.

UNIT – II

Principles of thermodynamics; Mineralogical phase rule; Diagrammatic representation of mineral paragenesis in: ACK, AKF and AFM diagrams; thermodynamics and kinetics of metamorphic reactions.

UNIT – III

Studies of metamorphic facies: zeolite facies; pumpellyite-prehnite facies; glaucophane schist facies; greenschist facies; amphibolite facies; granulite facies, eclogite facies; albite-epidote hornfels facies; hornblende-hornfels facies; pyroxene-hornfels facies; sanidinite facies.

UNIT – IV

Principles of metasomatism and metamorphic differentiation; petrogenetic grids; pressure, temperature, time paths; mineralogical and textural changes accompanying progressive regional metamorphism of mafic, ultramafic, pelitic and carbonate rocks.

UNIT – V

Anatexis and formation of migmatites and origin of granitic magma; petrographic and petrogenetic studies of charnockite, migmatite and amphibolite; Regional metamorphism and paired metamorphic belts. Pressure-temperature-time paths. Ultra-high temperature, ultra-high pressure and ocean floor metamorphism. metamorphism in relation to magma and orogeny; metamorphism in relation to plate tectonics.

AND OR

Origin and abundance of elements in the Solar system and in the Earth, and its constituents. Atomic structures and properties of elements in the Periodic Table. Special properties of transition and rare earth elements. Geochemical classification of elements. Geochemistry of atmosphere, hydrosphere and biosphere; Geochemical cycle. Fundamentals of isotope geochemistry;

Paper IV: Geoenvironment and Geohazards

Unit - I

Scope of Environmental Geology; Global Biogeochemical cycle; Concepts of Environmental Geology; Application of Geology to Sustainable Development. Terrain evaluation and Land-use planning; Environmental Protection Law.

Unit - II

Geological causes of Environmental degradation - lithological, structural, geomorphological and anthropogenic causes; Soil pollution and desertification; Environmental Impact Assessment (EIA); Environmental Impact Mining; Eco-Tourism.

Unit - III

Sediment pollution and its role in environmental studies; River water pollution; Groundwater pollution; Water quality; Nitrate hazard, Fluorine and Arsenic pollution; Waste Disposal, Management and Recycling; Fly-ash. Greenhouse effect and Global warming. depletion of ozone layer, acid rain. Medical Geology.

Unit - IV

Types and distribution of natural hazards; Floods their type and distribution, flood hazard zonation, mitigation of flood-prone areas; Storms and Tsunamis: causes and distribution; Cyclones in the Indian seas; Cyclone and Tsunami-prone zones of India.

Unit - V

Landslides: their types; Factors controlling landslides; Landslide hazard zonation mapping; Monitoring and control of Landslides; Earthquake: occurrence and distribution in the Indian subcontinent; Seismic zonation map of India; Earthquake resistant structures; Avalanches.

PRACTICAL

1. Hydrogeology and geological tour and training
2. Economic minerals and metamorphic petrology

Groundwater :

Delineation of hydrological boundaries on water-table contour maps and estimation of permeability. Analysis of hydrographs and estimation of infiltration capacity. Chemical analysis of water. Pumping test: time-drawdown and time-recovery tests and evaluation of aquifer parameters. Step drawdown tests, Electric resistivity sounding for delineation of fresh and saline aquifers. Study of geophysical well logs. Estimation of TDS using resistivity and SP logs. Exercises on groundwater exploration using remote sensing. Study of seismic and flood-prone areas in India. Analyses for alkalinity, acidity, pH and conductivity (electrical) in water samples. Classification of ground water for use in drinking, irrigation and industrial purposes. Presentation of chemical analyses data and plotting chemical classification diagram.

Geoenvironment: Evaluation of environmental impact of air pollution groundwater, landslides, deforestation, cultivation and building construction in specified areas.

SKILL COURSE

Ore Reserve estimation

SEMESTER IV

Paper I: Mineral Fuels and Mineral Economics

Unit- I

Coal: Definition and origin of kerogen and coal. Sedimentology of coal bearing strata. Rank, grade and type of coal. Indian and international classifications. Chemical characterization, proximate and ultimate analysis. Macroscopic ingredients and microscopic constituent and concept of ‘maceral’ and micro litho types.

Coal petrology, and its applications in solving industrial and geological problems. Preparation of coal for industrial purposes, coal carbonization (coke manufacture) coal gasification and coal hydrogenation. Application of coal petrology in hydrocarbon exploration.

Coal bed methane: a new energy resource. Maturation of coal and generation of methane in coal beds. Coal as reservoir. Fundamentals of coal bed methane exploration and production.

Coal forming epochs in the geological past. Geological and geographical distribution of coal deposits in India. Detail geology of some important coalfields of India.

Methods of coal prospecting and estimation of coal reserves. Coal production and problems of coal industry in India.

Unit II

Petroleum: Its composition and different fractions. Origin, nature and migration (primary and secondary) of oil and gas. Transformation of organic matter into kerogen, organic maturation, thermal cracking of kerogen.

Characteristics of reservoir rocks and traps (structural, stratigraphic and combination).

Oil field fluid – water, oil and gas occurrence. Prospecting for oil and gas, drilling and logging procedures.

Unit III

Oil production methods.

Oil bearing basins of India (Assam, Cambay, Bombay, Krishna-Godavari and other Petroliferous basins of India) and the world. Geology of the productive oil fields of

India. position of oil and natural gas in India, future prospects and the economic scenario .

Unit IV

Atomic fuel: Mode of occurrence and genesis of atomic minerals in nature. Atomic minerals as source of energy. Methods of prospecting and productive geological horizons in India.

Nuclear power stations of the country and future prospects. Atomic fields and environments.

Unit V

Strategic, critical and essential minerals. India's status in mineral production. Changing patterns of mineral consumption. National Mineral Policy. Mineral Concession Rules. Marine mineral resources and Law of Sea.

Paper II : Mineral prospecting, Exploration and Mining Methods

Unit I

Industrial Mineral Deposits: Refractory, abrasives, ceramics and glass making materials, fertilizers, paints and pigment materials cement, materials and gemstones. Study of following with reference to origin mode of occurrence ,distribution in India and uses; mica, asbestos, pyrite, barites, gypsum, bentonite, garnet, corundum, kyanite, sillimanite, graphite, talc, fluorite, beryl, zircon and rock phosphate.

Unit II

(i) Exploration : Basic aim of exploration. Classification of methods of exploration. Surface exploration and Sub Surface exploration. Aerial photography and remote sensing Interpretative characteristics of Aerial photographs and their application in identification of Geomorphology , Structures and Lithology for exploration.

(ii) Sampling : Sampling in mining geology. Different types of samples, and their collection, Treatment and handling of samples, precautions, Ore reserves estimation, Different types of Reserves and their estimation, Calculation of grade and tonnage, Methods for averaging of assays, Elements of blasting and effect of lithological and structural features on fragmentation.

(iii) Ore guides and controls; Ore Shows target rings and intersecting loci, Regional and local guides to ore, Physiographic guides, Lithological and stratigraphic guides, Structural guides and fracture pattern. Mineralogical guides , Bottoming and zoning of mineral deposits.

Unit III

Geophysical Exploration: Variation of Gravity over the surface of the earth. Principle of gravimeters. Gravity field surveys. Various type correction applied to gravity data. Preparation of gravity anomaly maps and their interpretations in term of shape size and depth. Geomagnetic field of the earth . Magnetic properties of rocks . Working principle of magnetometers. Field surveys and data collection. Preparation of magnetic anomaly maps and their quantitative interpretation. Magnetic anomalies due to single pole and dipole. Introduction to Aeromagnetic survey. Three dimensional current flow, potential due to a point current source. Resistivity Method: Basic principles , various type of electrode configurations, Field procedure: profiling and sounding . Applications of electrical methods in ground water prospecting and civil engineering problems. Seismic Methods : Fundamental principle of wave propagation , refraction and reflection surveys for single interface , horizontal and dipping cases. Concept of seismic channel and multi-channel recording of seismic data. End- on and spread shooting technique . CDP method of data acquisition , sorting , gather stacking and record section. Seismic velocity and interpretation of seismic data. Application in mineral and petroleum exploration . Description of borehole environment. Brief outline of various well- logging techniques . Principles of electrical logging and its application in petroleum, groundwater and mineral exploration .

Unit IV

Geochemical explorations : Principles and methods of geochemical prospecting, methods of geochemical exploration , applicability and precautions in geochemical exploration. Pedo-,Litho-, Geo- and hydrogeochemical–explorations.

Boring: principles of boring ; selections of sites for boreholes ; surface layout ; method of percussive (solid hollow and ropes), rotary , (diamond, chilled shot, clay and other system), details of equipments , properties of drilling mud , Core recovery wire line core barrel : interpretations of bore hole data, bore hole logging, maintenance of records , difficult boring , controlled directional drilling , deflection of boreholes, Difficulties in boring , Fishing tool and their uses.

Unit V

Introduction to mining terms (shaft, adit, chute, cross cut, stopping, room and pillaring, hanging and foot wall etc) and mining methods: open and underground. factors involving in selection of open cast and underground mining methods; coal mining methods: room and pillar method, long wall method. Ore dressing and National mineral policy.

Paper III: Geoinformatics

UNIT – I

Fundamental principles and technology of aerial photography; types of aerial photographs; factors affecting aerial photography; types of camera, film and

filters; scale of aerial photography and factors affecting scale; mosaics and annotation; relief displacement; vertical exaggeration.

UNIT – II

Methods of planimetric mapping through aerial photographs; fundamental principles of radial line triangulation methods; techniques of visual interpretation of aerial photographs; application of aerial photographs in geoscience and geomorphological studies.

UNIT – III

Fundamentals of remote sensing;
Concepts of remote sensing; Electromagnetic spectrum and its interaction with atmosphere and earth surface objects; Atmospheric windows; remote sensing systems; space platforms and orbit patterns; remote sensing sensors; thermal, radar and hyperspectral images; signatures of rocks, minerals and soils. Sensors: active and passive; Sensors on LANDSAT; SPOT and IRS.

UNIT – IV

Digital image processing; digital data formats; fundamental steps in image processing; image rectification and restoration; elements of pattern recognition and image classification.

UNIT – V

Introduction to Geographic Information System (GIS); components of GIS; product generation in GIS; tools for map analysis; integration of GIS with remote sensing.

Paper IV: Engineering Geology

Unit I

Role of engineering geology in civil construction and mining industry. Various stages of geological investigation for civil engineering projects. Engineering properties of rocks; rock discontinuities. Physical characters of building stones. Metal and concrete aggregates. Alkali-aggregate reaction.

Unit II

Geological consideration for evaluation of dams and reservoir sites. Dam foundation rock problems. Geotechnical evaluation of tunnel alignments and transportation routes, method of tunneling; classification of ground for tunneling purposes; various types of support.

Unit III

Bridges — types and foundation problems. Shoreline engineering.
Landslides — classification, causes, prevention and rehabilitation.

Geological investigations for river valley projects — Dams and reservoirs;
tunnels — types, methods and problems.

Unit IV

Aseismic designing — seismicity in India and earthquake-resistant structures.
Problems of groundwater in engineering projects; Case studies of Indian dams:
Bhakra, Tehri, and Idduki Dams; Site selection for the construction of roads in
hilly terrains.

Unit V

Earthquakes and seismicity, seismic zones of India. Aseismic design of building.
Influence of geological conditions on foundation and design of buildings.
Case history of engineering projects and geological causes for mishaps and
failures of engineering structures.

PRACTICAL

1. Remotesensing and Tour
2. Mineral fuels and mining training

Skill Course

Hydrogeology:

Ground water: origin, types, importance, occurrence. Hydrogeologic properties of rocks: porosity, permeability, specific yield, specific retention, hydraulic conductivity, transmissivity, storage coefficient. Types of aquifers. Geological formations as aquifers. Water-bearing characteristics of rocks.

Introduction to geohydrological and geophysical methods of groundwater exploration.

Wells types and their construction in soils and hard rock areas. Development and rehabilitation of tube-wells.

Conjunctive use of surface and groundwater. Inland salinity problem and saline fresh water interface. National Water Policy.

END

PAPER IV: PALAEOBIOLOGY AND STRATIGRAPHY

Unit I

Development of Stratigraphy . International code of stratigraphic nomenclature. Stratigraphic principles and methods of correlation. Stratigraphic records. Geochronology and chronostratigraphy. Lithostratigraphy. Biostratigraphic: Biozone. Controlling factors, time significance, quantitative stratigraphy. Magnetostratigraphy, cyclostratigraphy, eventstratigraphy, pedostratigraphy, seismic stratigraphy and sequence stratigraphy. Geophysical and chemostratigraphic correlation.

Unit II

Study of morphology, classification, palaeoecology with special emphasis on Indian biostratigraphy and evolutionary trend of following invertebrate fossil groups: Corals, Echinoidea, Lamellibranchia, Cephalopoda, Gastropoda, Brachiopoda; Trilobita and Graptoloids.

Unit III

Applied Micropalaeontology: Introduction to Foraminifera. Ostracods. Conodonts and Nanoplankton. Vertebrates of Siwalik. Evolutionary histories of man, elephant and horse. Gondwana flora, their significance and distribution. Introduction to Palynology. Spores and pollen grains.

Unit IV

Detailed stratigraphy of Precambrian cratons of India with special reference to following Supergroups- Aravalli, Dharwar, Cuddapah, Delhi, Vindhya and their equivalents.

Unit V

Detailed study of Phanerozoic stratigraphy of India with special reference to Rajasthan.

PRACTICAL

Recognition of fossil groups in an assorted assemblage and identification of their classes. Study of important fossils from Indian stratigraphic horizons. Measurement of dimensional parameters and preparation of elementary growth-curves and scatter-plots. Exercises on stratigraphic classification and correlation. Exercises on interpretation of seismic records for stratigraphy. Study of palaeogeographic maps of all geological periods.

BOOKS RECOMMENDED

Kathal, P. K., 1998: Microfossils and their applications. CBS Pub. And distributor. 4596/ 1A, 11 Dariyaganj. Delhi-2.

Woods, H., 1985: Paleontology invertebrate. 8th edition. CBS Pub. And distributor, Delhi.

Raup : Principles of paleontology. 2nd edition. CBS Pub. and distributor.

Moore, R. C., Lalicher, C. G., Fisher, A. C.: Invertebrate fossils. McGrawhill.

Colbert, E. H.: Evolution of the vertebrates. John wiley & sons.

Schrock, R. R. and Twendhofel, W. H.: Principles of invertebrate paleontology. McGraw Hill.

Krishnan, M. S., 1982. Geology of India and Burma. 6th edition. CBS Pub. And distributor, Delhi.

Kumar Ravindra, 1985: Fundamentals of historical Geology and stratigraphy of India. Iley Eastern Ltd., New Delhi.

Weller, J. M., 1960: Stratigraphic principles and practice. Universal Book Stall. Delhi. (5, Dariyaganj Ansari road)

Dunber, C. O. and Roadger, J.: Principles of Stratigraphy. John wiley and Sons.

Eicher, D. L.: Geological Time. Prentice Hall.

Rodger and Naquvi.

Clarkson, E.N.K., 1998: Invertebrate Paleontology and Evolution. 4th edition. Blackwell.

Stern, C. W. and Carrol, R. L., 1989: Paleontology-The Record of Life. John Wiley.

Smith, A. B., 1994; Systematics and the Fossils Record – Documenting Evolutionary Pattern. Blackwell.

Prothero, D. R., 1998: Bringing Fossils to Life-An Introduction to palaeobiology. McGraw Hill.

Pomeroy, C., 1982: The Cenozoic Era: Tertiary and Quaternary. Ellis Harwood Ltd.

Goodwin, A.M., 1991: Precambrian Geology: The Dynamic Evolution of Continental Crust. Academic Press.

Boggs, Sam Jr., 1995: Principles of Sedimentology and Stratigraphy. Prentice Hall.

- Doyle, P. and Bennett. M.R., 1996: Unlocking the Stratigraphic Record. John Wiley.
- Brenner, R.E. and McHargue, T.R., 1988: Integrative Stratigraphy: Concepts and Applications. Prentice Hall.
- Naqvi, S.M. and Rogers, J.J.W., 1987: Precambrian Geology of India, Oxford Univ.Press.
- Pascoe, E.H., 1968. A Manual of Geology of India and Burma, Vol.I-IV, Govt of India Press.

M. Sc. (Pr) Geology Examination, 2016

TEACHING AND EXAMINATION SCHEME

	Pd/W	Exam. (Hrs)	Marks	
A. Theory Papers				
Geology I Geol. 401	Structural Geology, Tectonics and Remote Sensing in Geology.	4	3	100
Geology II Geol. 402	Sedimentology and Geomorphology	4	3	100

Geology III. Minerology, Instrumentation and
 Geol. 403 analytical techniques and
 Geochemistry. 4 3 100

Geology IV. Palaeobiology and Stratigraphy 4 3
 100
 Geol. 404

B. Practical and Field Training Total Marks: 200

Time: 6 Hours for Each group in separate days. Max. Marks: 200
 Min. pass Marks: 72

	Practical	Record	Total	Hrs.
Group A				
Structural Geology & Remote sensing	30	5	70	6
Sedimentology and Geomorphology Viva-voce	30	5	5	
Total			75	
Group B				
Mineralogy, Geochemistry Palaeobiology, stratigraphy Viva-voce	30	5		6
Total			75	
Seminar	10		10	
Geological Mapping (Training and report)	20		20	
Geological Tour	20		20	
Total			50	
Grant Total			200	

Note: The Examination will be carried out by two sets of examiners- one internal and one external member for each group on two separate days.

GEOLOGY

M. Sc. (PREVIOUS) EXAMINATION 2016

PAPER I: STRUCTURAL GEOLOGY, TECTONICS AND REMOTE SENSING IN GEOLOGY

Unit I

Mechanical principles and properties of rocks and their controlling factors. Theory of rock failure. Concept of stress and strain. Two-dimensional strain and stress analyses. Types of strain ellipses and ellipsoids, their properties and geological significance. Strain markers in naturally deformed rocks. Mechanics of folding and buckling. Classification of folds. Fold development and distribution of strains in folds.

Unit II

Faults and Joints: Their nomenclature, age relationship, origin and significance. Causes and dynamics of faulting, strike-slip fault, normal faults, over thrust and nappe. Planar and linear fabrics in deformed rocks, their origin and significance. Concepts of petrofabrics and Symmetry: objective, field and laboratory techniques. Graphic treatment types of fabrics, fabric elements and interpretation of fabric data on microscopic and mesoscopic scale. Use of Universal Stage in petrofabrics. Analysis of simple and complex structures on macroscopic and microscopic scale.

Unit III

Plate tectonics: recent advances, pros and cons. Dynamic evolution of continental and oceanic crust, Tectonics of Precambrian Orogenic Belts of India. Formation of mountain roots. Anatomy of orogenic belts. Structure and origin of the Alpine – Himalayan belt, the Appalachian- Caledonian belt, the Andes, the North American Cordillera. Study of Map Projections.

Unit IV

Remote Sensing: Principles of remote sensing: general idea about electromagnetic spectrum, aerial photographs and their geometry, photogrammetry: recent advances and applications. Satellite remote sensing. Global and Indian space missions. Different satellite exploration programs and their characteristics: LANDSAT, METEOSAT, SEASAT, SPOT, IRS. Image interpretation and digital processing techniques.

Unit V

Remote Sensing in Geological Studies: Image characters and their relations with ground objects based on tone, texture and pattern; principles of terrain analysis, evolution of ground water potential, rock type identification; and interpretation of topographic and tectonic features.

PRACTICAL

Preparation and interpretation of geological maps and sections. Structural problems concerning economic mineral deposits. Recording and plotting of field data. Plotting and interpretation of petrofabrics data and resultant diagrams. Study of large-scale tectonic features of the Earth. Exercises on MSS, TM, FCC, IR, Thermal IR, Radar, and SPOT images for geological and geomorphological mapping and in (georesources) vegetation, water and mineral resource evolution. Making false color composites, and study of multi-spectral scans and spectral patterns. Exercises on digital image processing. Study of environmental hazard maps.

BOOKS RECOMMENDED

- Badgley, P.C., 1965: Structure and Tectonics. Harper and Row.
- Ramsay, J.G., 1967: Folding and Fracturing of Rocks. McGraw Hill.
- Hobbs, B.E., Means, W.D., and Williams, P.F., 1976: An Outline of Structural Geology. John Wiley.
- Davis, G.R., 1984: Structural Geology of Rocks and Region. John Wiley.
- Ramsay, J.G., and Huber, M.I., 1987: Modern Structural Geology, Vol. 1 & II. Academic Press.
- Price, N.J. and Cosgrove, J.W., 1990: Analysis of Geological structure. Cambridge Uni. Press
- Bayly B., 1992: Mechanics in structural Geology. Springer Verlag.
- Ghosh, S.K., 1995: Structural Geology Fundamentals of Modern Developments. Pergamon Press.
- Moore, E. and Twiss, R.J., 1995: Tectonics. Freeman.
- Keary, P., and Vine, F.J., 1990: Global Tectonics. Blackwell.
- Storetvedt, K.N., 1997: Our Evolving Planet: Earth 's history in new perspective. Bergen (Norway), Alma Mater Forlag.
- Valdiya, K.S., 1998: Dynamic Himalaya. Universities Press, Hyderabad.
- Summerfield, M.A., 2000: Geomorphology and Global Tectonics. Springer Verlag.
- Miller, V.C., 1961: Photogeology. McGraw Hill
- Sabbins, F.F., 1985: Remote Sensing – Principles and Applications. Freeman.
- Ray, R.G., 1969: Aerial Photograph in Geologic Interpretations. USGS Prof. Paper 373.
- Drury, S.A., 1987: Image Interpretation in Geology. Allen and Unwin.
- Moffitt, F.H. and Mikhail, E.M., 1980: Photogrammetry, Harper and Row.
- Lillesand, T.M. and Kieffer, R.W., 1987: Remote Sensing and Image Interpretation. John Wiley.
- Paine, D.P., 1981: Aerial Photography and Image Interpretation for Resource Management. John Wiley.
- Pandey, S.N., 1987: Principles and Applications of Photogeology. Wiley Eastern. New Delhi.
- Gupta, R.P., 1990: Remote Sensing Geology. Springer Verlag.

PAPER II: SEDIMENTOLOGY AND GEOMORPHOLOGY

Unit I

Earth surface system: weathering, erosion process of transportation, deposition and post depositional changes. Sedimentary textures-grain size, shape, sorting, packing and orientation. Methods of study of grain size distribution parameters. Methods of study of grain shape and fabric. Mineralogical characteristics, separation and study of the heavy minerals. Sedimentary structures.

Unit II

Sedimentary environments and facies continental alluvial-fluvial, lacustrine, desert-aeolian and glacial sedimentary system. Shallows coastal and Tidal sedimentary system.. Marine and continental evaporites.

Unit III

Diagenesis and Clastic petrofacies. Palaeocurrent, palaeoenvironmental, and basin analysis. Clastic and non clastic sedimentary rocks.

Unit IV

Petrogenesis of important clastic and non clastic sedimentary rocks. Evolution of sedimentary basins: tectonics and sedimentation. Elementary idea of application of trace-elements and stable isotopes geochemistry to sedimentological problems.

Unit V

Geomorphological studies : dynamics of geomorphology, geomorphic processes and resulting land forms. Geomorphological mapping based on genesis of landforms. Terrain evolution for strategic purposes.

PRACTICAL

5. Field and laboratory techniques in sedimentary: Recording of sedimentary structures, preparation of lithologs. Thin section preparation and staining techniques.
6. Study of primary, secondary and biogenic sedimentary structure in hand specimens in photographic atlas, field photography and wherever possible on the outcrops.
7. Grain size analysis and granulometric analysis: Histogram, cumulative frequency distribution curve of grain size data. Computation of statistical parameters such as median, mean, standard deviation, skewness and kurtosis etc. and their interpretation.
8. Exercise related to palaeocurrent data.
5. Exercise related to analysis and interpretation of depositional sedimentary environments using actual case histories from western Rajasthan stratigraphic record.
6. Petrography of important clastic and non -clastic sedimentary rocks.
7. Microscopic study of heavy minerals and interpretation of prominence.

8. Study of nature of aerial photographs: resolution, mosaics, symbols, gully pattern and drainage analysis, image parallax. Determination of scale, height, dip, slope, vertical exaggeration and image distortion.

Books Recommended:

Allen J R L 1985, Principles of physical sedimentation, George Allen and Unwin
Allen P 1997, Earth surface processes, Blackwell
Nicholas G 1999, Sedimentology and stratigraphy, Blackwell.
Reading H G, 1996 Sedimentary environments, Blackwell.
Davis R A Jr, 1992, Depositional systems, Prentice Hall.
Einsele G 1992, Sedimentary basins, Springer Verlag.
Reineck H E and Singh I B, 1980, Depositional Sedimentary Environments, Springer Verlag.
Pronthero DR and Schwab F 1996, Sedimentary Geology, Freeman.
Miall AD 2000, Principles of sedimentary Basin Analysis, Springer Verlag
Pettijohn FJ, Potter PE and Seiver R 1990, Sand and Sandstone, Springer Verlag
Blatt H Murray GV and Middleton RC, 1980 Origin of Sedimentary rocks
Bhattacharya and Chakroborti C 2000, Analysis of sedimentary successions, Oxford IBH
Boggs Sam Jr 1995, Principles of sedimentology and stratigraphy, Prentice Hall
Sengupta S 1997, Introduction to Sedimentology, Oxford IBH
Babu SK and Sinha DK 1987 Practical Manual of Sedimentary Petrology, CBS Publisher

PAPER III : MINEROLOGY, INSTRUMENTATION & ANALYTICAL TECHNIQUES AND GEOCHEMISTRY

Unit I

Systematic mineralogy: mineral chemistry, physical and optical properties. Their PT-stability and mode of occurrence of following silicate mineral groups: Silica, Feldspar, Feldspathoid, Amphibole, Pyroxene and Alumino silicates.

Unit II

Systematic mineralogy: mineral chemistry, physical and optical properties, mode of occurrence of the following silicate mineral groups: Mica, Chlorite, Garnet Olivine and Epidote, and following nonsilicate minerals: sulfides, halide, oxides, hydroxides, Phosphate and carbonates.

Unit III

Crystallography: Space lattice. Instrumentation and Analytical Techniques: Thin section and polished section making. Sample etching and staining. Principles and geological application of atomic absorption spectrophotometry, inductively coupled plasma-atomic emission spectrometry, X-ray fluorescence spectrometry, scanning electron microscopy, electron-probe microanalysis, X-ray diffractometry.

Unit IV

Origin and abundance of elements in the Solar system and in the Earth, and its constituents.

Atomic structures and properties of elements in the Periodic Table. Special properties of transition and rare earth elements. Geochemical classification of elements.

Radiogenic isotopes. Radioactive decay schemes of U-Pb, Sm-Nd, Rb-Sr, K-Ar, and growth of daughter isotopes. Radiometric dating of single minerals and whole rocks. Stable isotopes: nature, abundance, and fractionation.

Unit V

Laws of thermodynamics; concept of free energy; activity, fugacity and equilibrium constant. Principles of ionic substitution in minerals; element partitioning in mineral/rock formation. Introduction to Planetary Science: Meteorites, Impact Craters. Elemental mobility in surface environment.

PRACTICAL

Microscopic study of rock forming minerals using optical accessories. Depending upon availability of facility, exercises in sample dissolution, determination of elemental composition of minerals and rocks by flame photometer and AAS, sample preparation for powder diffraction by XRD and interpretation of x-ray diffractogram of common minerals and components of the bulk rocks. Exercises on thin section and polished section making, etching and staining.

Calculation of mineral formulae from the concentration of various oxides in minerals. Calculation of normative mineralogy from rock composition. Calculation of weathering indices in soil and sediments. Calculation of age of rocks by radiometric data. Presentation of analytical data. PT stability diagram.

BOOKS RECOMMENDED

Deer, W.A., Howie, R.A. and Zussman, J., 1996: The Rock Forming Minerals Longman.

Klein, C. and Hurlbut, Jr., C.S., 1993: Manual of Mineralogy. John Wiley.

Putnis, Andrew, 1992: Introduction to Mineral Sciences. Cambridge University Press.

Spear, F.S. 1993: Mineralogical Phase Equilibria and Pressure -Temperature. Time Paths. Mineralogical Society of America Publ.

Phillips, Wm, R. and Griffen, D.T., 1986: Optical Mineralogy, CBS Edition.

Hutchinson, C.S., 1974: Laboratory Handbook of Petrographic Techniques. John Wiley.

Mason, B. and Moore, C.B., 1991: Introduction to Geochemistry, Wiley Eastern.

Krauskopf, K.B., 1967: Introduction to Geochemistry. McGraw Hill.

Faure, G., 1986: Principles of Isotope; Geology. John Wiley.

Hoefs, J., 1980: Stable Isotope Geochemistry. Springer Verlag.

Marshall, C.P. and Fairbridge, R.W., 1999: Encyclopaedia of Geochemistry. Kluwer Academic.

Govett, G.J.S. (Ed), 1983: Handbook of Exploration Geochemistry. Elsevier.

Phillips F C: An Introduction to Crystallography. Oliver Boyd.

Nordstrom, O.K. and Munoz, J.L., 1986: Geochemical Thermodynamics, Blackwell.

Henderson, P, 1987: Inorganic Geochemistry, Pergamon Press.

PAPER IV: PALAEOBIOLOGY AND STRATIGRAPHY

Unit I

Fossils and their preservations, Uses. Nomenclature : General and Species concept, biometrics and molecular systematics.

Organic evolution : Origin of life, Theories and evidences of organic evolution. Mechanism of evolution. Phylogenic and ontogenic analysis. Precambrian and Phanerozoic life . Growth and allometry. Functional morphology and evolutionary trends.

Palaeoecology : Concept of palaeoecology. Limiting factors. Marine and terrestrial ecosystems. Mass extinctions.

Geological timescale: Reasoning and equivalents of its divisions.

Development of Stratigraphy . International code of stratigraphic nomenclature. Stratigraphic principles and methods of correlation. Stratigraphic records.

Geochronology and chronostratigraphy. Lithostratigraphy. Biostratigraphic: Biozone. Controlling factors, time significance, quantitative stratigraphy. Magnetostratigraphy, cyclostratigraphy, eventstratigraphy, pedostratigraphy, seismic stratigraphy and sequence stratigraphy. Geophysical and chemostratigraphic correlation.

Unit II

Study of morphology, classification, palaeoecology with special emphasis on Indian biostratigraphy and evolutionary trend of following invertebrate fossil groups: Corals, Echinoidea, Lamellibranchia, Cephalopoda, Gastropoda, Brachiopoda; Trilobita and Graptoloids.

Unit III

Applied Micropalaeontology: Introduction to Foraminifera. Ostracods. Conodonts and Nanoplanktones. Vertebrates of Siwalik. Evolutionary histories of man, elephant and horse. Gondwana flora, their significance and distribution. Introduction to Palynology. Spores and pollen grains.

Unit IV

Detailed stratigraphy of Precambrian cratons of India with special reference to following Supergroups- Aravalli, Dharwar, Cuddapah, Delhi, Vindhyan and their equivalents.

Unit V

Detailed study of Phanerozoic stratigraphy of India with special reference to Rajasthan.

PRACTICAL

Recognition of fossil groups in an assorted assemblage and identification of their classes. Study of important fossils from Indian stratigraphic horizons. Measurement of dimensional parameters and preparation of elementary growth-curves and scatter-plots. Exercises on stratigraphic classification and correlation. Exercises on interpretation of seismic records for stratigraphy. Study of palaeogeographic maps of all geological periods.

BOOKS RECOMMENDED

- Kathal, P. K., 1998: Microfossils and their applications. CBS Pub. And distributor. 4596/ 1A, 11 Dariyaganj, Delhi-2.
- Woods, H., 1985: Paleontology invertebrate. 8th edition. CBS Pub. And distributor, Delhi.
- Raup : Principles of paleontology. 2nd edition. CBS Pub. and distributor.
- Moore, R. C., Lalicher, C. G., Fisher, A. C.: Invertebrate fossils. McGrawhill.
- Colbert, E. H.: Evolution of the vertebrates. John wiley & sons.
- Schrock, R. R. and Twendhofel, W. H.: Principles of invertebrate paleontology. McGraw Hill.
- Krishnan, M. S., 1982. Geology of India and Burma. 6th edition. CBS Pub. And distributor, Delhi.
- Kumar Ravindra, 1985: Fundamentals of historical Geology and stratigraphy of India. Iley Eastern Ltd., New Delhi.
- Weller, J. M., 1960: Stratigraphic principles and practice. Universal Book Stall. Delhi. (5, Dariyaganj Ansari road)
- Dunber, C. O. and Roadger, J.: Principles of Stratigraphy. John wiley and Sons.
- Eicher, D. L.: Geological Time. Prentice Hall.
- Rodger and Naquvi.
- Clarkson, E.N.K., 1998: Invertebrate Paleontology and Evolution. 4th edition. Blackwell.
- Stern, C. W. and Carrol, R. L., 1989: Paleontology-The Record of Life. John Wiley.
- Smith, A. B., 1994; Systematics and the Fossils Record – Documenting Evolutionary Pattern. Blackwell.
- Prothero, D. R., 1998: Bringing Fossils to Life-An Introduction to palaeobiology. McGraw Hill.
- Pomerol, C., 1982: The Cenozoic Era: Tertiary and Quaternary. Ellis Harwood Ltd.
- Goodwin, A.M., 1991: Precambrian Geology: The Dyanmic Evolution of Continental Crust. Academic Press.
- Boggs, Sam Jr., 1995: Priciples of Sedimentology and Stratigraphy. Prentice Hall.
- Doyle, P. and Bennett. M.R., 1996: Unlocking the Stratigraphic Record. John Wiley.
- Brenner, R.E. and McHargue, T.R., 1988: Integrative Stratigraphy: Concepts and Applications. Prentice Hall.
- Naqvi, S.M. and Rogers, J.J.W., 1987: Precambrian Geology of India, Oxford Univ.Press.
- Pascoe, E.H., 1968. A Manual of Geology of India and Burma, Vol.I-IV, Govt of India Press.

M. Sc. (Final) Geology Examination, 2017

TEACHING AND EXAMINATION SCHEME

	Pd/W	Exam. Hrs.	Marks
A Theory Papers			
Geology V Ore Geology and Fuel Geology Geol. 501	4	3	100
Geology VI Mining Geology, Engineering			

Geol. 502	Geology and Exploration	4	3	100
Geology VII Geol. 503	Hydrogeology and Environmental Geology	4	3	100
Geology VIII Geol. 504	Igneous and Metamorphic petrology	4	3	100

B. Practical and Field Training	Total Marks:	200
Time: 6 Hours for Each group in separate days.	Max. Marks:	200
	Min. pass Marks:	72

	Practical	Record	Total	Hrs.
Group A				
Ore Geology, Fuel Geology, Mining Geology, Exploration	30	5	70	6
Engineering Geology and Survey Viva-voce	30 5	5	5	
Total			75	
Group B				
Hydrogeology, Environmental Geology Igneous and Metamorphic petrology Viva-voce	30 30 5	5 5	70 5	6
Total			75	
Seminar	10		10	
Geological Tour	20		20	
Mining and Hydrogeological Training	10+10		20	
Total			50	
Grand Total			200	

Note: The Examination will be carried out by two sets of examiners- one internal and one external member for each group on two separate days.

M. Sc. (FINAL) EXAMINATION 2017

PAPER V: ORE GEOLOGY AND FUEL GEOLOGY

Unit I

Brief history of development of economic Geology and modern concept of ore genesis. Spatial and temporal distribution of Ore deposit in the World. Material of mineral deposits and their formation. Principle ore mineral groups. Methods of goethermometry and geobarometry in Ore Geology. Ore texture Para genesis and zoning of Ore and their significance. Chemical composition of Ores and host rock: bulk chemistry, major, minor, trace and rare earth elements. Stable and radiogenic

isotopes. Ore microscopy: Optical principle and properties of Ore minerals. Fluid inclusion in ores: Principle, applications and limitations. Earths evolutionary history and evolutionary trends of Ore deposits. Precambrian and present Plate tectonics and genesis of Ore deposits. Classification of Ore forming processes.

Unit II

Ore forming processes of igneous associations with possible Indian example, Magmatic deposits associated with acidic, basic and ultra basic rocks. Mineralization associated with Komatiite (Gold), Kimberlite (Diamond), Carbonates (R.E.E), Peridotites (Cr, Ni and PGE), Granite (W and Sn) and Pegmatite's (mica, uranium, gems and R.E.E), Cyprus type Cu-Zn deposit and Kuroko type Pb-Zn-Cu deposit. Porphyry copper.

Pegmatites: As a rock and economic deposit forming process. Simple and complex pegmatite and their genesis. Indian pegmatite belts.

Skarn and greisens deposits, contact metasomatism: role of invaded and intrusive rock. Characteristic of the deposits. Hydrothermal process and deposits. Origin and nature of hydrothermal solutions. Wall rock alteration, crustification and comb structures. Cavity filling and metasomatic replacement type of deposits. Hypo-, Meso-, Epi-, Tele-, Xeno and Lepto thermal deposits.

Volcanogenic process and deposits: characteristics, mode of occurrence and genesis Mn nodules. Metamorphosed deposits and metamorphism as Ore forming process.

Unit III

Economic mineral deposit forming process of sedimentary association (with possible Indian examples) Sedimentation: Chemical and Clastic sedimentation chemical perception of iron and Manganese deposit. Factors controlling economic concentration and their mutual dependence.

Residual concentration: characteristic of the process and controlling factors. Bauxite, classification and Indian deposits of bauxite. Blue dust Ore. Residual Cr and Ni /Au profiles.

Mechanical concentration: Eluvial, Alluvial, Wind and Beach placers, Placer gold, diamonds and thorium.

Oxidation and Supergene Sulphide enrichment: formation of solvent, dissolution migration and deposition of metals. Gossans: Type and importance.

Biogenic deposits and process.

Stratiform and Strata bound Ore deposits (Mn, Fe and Base metals).

Contemporary Ore forming systems: black smokers, mineralized crust, Mn nodules and Red sea.

Unit – IV

Geology and genesis of important metallic deposits of India: iron, manganese, chromium, nickel, tin, tungsten, gold, lead, zinc, copper and aluminum deposits.

Unit- V

Coal: Definition and origin of kerogen and coal. Sedimentology of coal bearing strata. Rank, grade and type of coal. Indian and international classifications.

Chemical characterization, proximate and ultimate analysis. Macroscopic ingredients and microscopic constituent and concept of 'maceral' and micro litho types.

Coal petrology, and its applications in solving industrial and geological problems. Preparation of coal for industrial purposes, coal carbonization (coke manufacture) coal gasification and coal hydrogenation. Application of coal petrology in hydrocarbon exploration.

Coal bed methane: a new energy resource. Maturation of coal and generation of methane in coal beds. Coal as reservoir. Fundamentals of coal bed methane exploration and production.

Coal forming epochs in the geological past. Geological and geographical distribution of coal deposits in India. Detail geology of some important coalfields of India.

Methods of coal prospecting and estimation of coal reserves. Coal production and problems of coal industry in India.

Petroleum: Its composition and different fractions. Origin, nature and migration (primary and secondary) of oil and gas. Transformation of organic matter into kerogen, organic maturation, thermal cracking of kerogen.

Characteristics of reservoir rocks and traps (structural, stratigraphic and combination).

Oil field fluid – water, oil and gas occurrence. Prospecting for oil and gas, drilling and logging procedures.

Oil bearing basins of India and the world. Geology of the productive oil fields of India. position of oil and natural gas in India, future prospects and the economic scenario .

Atomic fuel: Mode of occurrence and genesis of atomic minerals in nature. Atomic minerals as source of energy. Methods of prospecting and productive geological horizons in India.

Nuclear power stations of the country and future prospects. Atomic fields and environments.

PRACTICAL

Megascopic study of structures and fabrics of different ores and their associations. Mineralogical and textural studies of common ore minerals under ore-microscope and petrological study of other industrial and non-metallic minerals. Exercises in the determination of reflectivity and microhardness of common ore minerals.

Megascopic characterization of banded coals. Proximate analysis of coal. Completion of outcrops in the given maps and calculation of coal reserves. Preparation of polished particulate mounts of coal. Microscopic examination of polished coal pellets (identification of macerals in coal).

Megascopic and microscopic study of cores and well cuttings. Study of geological maps and sections of important oilfields of India and world. Calculation of oil reserves. Study of geological sections of U- Th bearing rocks of the country. Megascopic study of some uranium and thorium bearing minerals and rocks.

BOOKS RECOMMENDED

- Gokhle KVGK and Rao T.C. 1973 Ore deposits of India their distribution and processing. Thomson and press (India) Limited. Delhi.
- Krishnaswami S. 1979. Indian Mineral Resources. Oxford & IBH pub. Comp. Delhi
- Shcheglov A.D.1976 Fundamentals of metallogenetic analysis Mir Pub. Moscow.
- Leverison A.I. 1985 Geology of petroleum II ed. CBS Pub. Delhi.
- Maynard J.B. 1983 “ Geochemistry of sedimentary ore deposits” . Springer Verlag.
- Jenson and Batman A.M. Economic Mineral Deposits John Wiley and Sons .
- Smirnov V.I. Geology of Mineral Deposits Mir pub. Moscow.
- Evan A.M.1993 Ore Geology and Industrial Minerals , Black well . Scientific Pub.
- Park C.F. and Mac Diarmid R.A. Ore deposits , W.H. Freeman .
- Hutchinson Economic Mineral Deposits and their tectonic settings .
- Mukherajee A. 2000 Ore genesis – A holistic approach, Allied Pub.
- Gilbert J.M. and Park Jr. and C.F. 1986 The Geology of Ore deposits , Freeman.
- Sawkins F.J. 1984 Metallic Deposits in relation to plate tectonics .Springer Verlag.
- Torling D.H. 1981 Economic Geology and Geotectonics Blackwell Science Pub.
- Klemm D.D. and Schneider H.G. 1977 Time and Stratabound Ore deposits . Springer Verlag.
- Stanton R.L.1972 Ore Petrology Mc Graw Hill.
- Craig J. M. and Vaugham D.J. 1981 Ore petrology and Mineralogy John Wiley .
- Huge Frund. Applicationj of Ore Microscopy .
- Camron . Ore Microscopy.
- Ramdhor P. 1969 The Ore Mineral and their intergrowth.Pergamon Press.
- Wolf K.S. 1976 – 1981 Hand book of Stratabound and Stratiform Ore deposits. Elsevir(vol. 1 to vol. 8).
- Babu S.K and Sinha D.K.practical manual of exploration and prospecting CBS Pub.and distributor. Shahadara Delhi – 32
- Satya Narayan Swami B.S. 2000 Engineering Geology Dhanpatrai and cop.Limtd.1710 Nai Sarak Delhi-6

PAPER VI: MINING GEOLOGY, ENGINEERING GEOLOGY AND EXPLORATION

Unit I

Industrial Mineral Deposits: Refractory, abrasives, ceramics and glass making materials, fertilizers, paints and pigment materials cement, materials and gemstones. Study of following with reference to origin mode of occurrence ,distribution in India and uses; mica, asbestos, pyrite, barites, gypsum, bentonite, garnet, corundum, kaynite, sillimanite, graphite, talc, fluorite, beryl, zircon and rock phosphate.

Unit II

(i) Exploration : Basic aim of exploration. Classification of methods of exploration. Surface exploration and Sub Surface exploration. Aerial photography and remote sensing Interpretative characteristics of Aerial photographs and their

application in identification of Geomorphology , Structures and Lithology for exploration.

(ii) Sampling : Sampling in mining geology. Different types of samples, and their collection, Treatment and handling of samples, precautions, Ore reserves estimation, Different types of Reserves and their estimation, Calculation of grade and tonnage, Methods for averaging of assays, Elements of blasting and effect of lithological and structural features on fragmentation.

(iii) Ore guides and controls; Ore Shoots target rings and intersecting loci, Regional and local guides to ore, Physiographic guides, Lithological and stratigraphic guides, Structural guides and fracture pattern.

Mineralogical guides , Bottomming and zoning of mineral deposits.

Unit III

Geophysical Exploration: Variation of Gravity over the surface of the earth. Principle of gravimeters. Gravity field surveys. Various type correction applied to gravity data. Preparation of gravity anomaly maps and their interpretations in term of shape size and depth. Geomagnetic field of the earth . Magnetic properties of rocks . Working principle of magnetometers. Field surveys and data collection. Preparation of magnetic anomaly maps and their quantitative interpretation. Magnetic anomalies due to single pole and dipole. Introduction to Aeromagnetic survey. Three dimensional current flow, potential due to a point current source.

Resistivity Method: Basic principles , various type of electrode configurations, Field procedure: profiling and sounding . Applications of electrical methods in ground water prospecting and civil engineering problems.

Seismic Methods : Fundamental principle of wave propagation , refraction and reflection surveys for single interface , horizontal and dipping cases.

Concept of seismic channel and multi-channel recording of seismic data. End- on and spread shooting technique . CDP method of data acquisition , sorting , gather stacking and record section. Seismic velocity and interpretation of seismic data.

Application in mineral and petroleum exploration . Description of borehole environment. Brief outline of various well- logging techniques . Principles of electrical logging and its application in petroleum, groundwater and mineral exploration .

Unit IV

Geochemical explorations : Principles and methods of geochemical prospecting, methods of geochemical exploration , applicability and precautions in geochemical exploration. Pedo-,Litho-, Geo- and hydrogeochemical–explorations.

Boring: principles of boring ; selections of sites for boreholes ; surface layout ; method of percussive (solid hollow and ropes), rotary , (diamond, chilled shot, clay and other system), details of equipments , properties of drilling mud , Core recovery wire line core barrel : interpretations of bore hole data, bore hole logging, maintenance of records , difficult boring , controlled directional drilling , deflection of boreholes, Difficulties in boring , Fishing tool and their uses.

Introduction to mining terms (shaft, adit, chute, cross cut, stopping, room and pillaring, hanging and foot wall etc) and mining methods: open and underground.

Unit V

Role of engineering geology in civil construction and mining industry. Various stages of geological investigation for civil engineering projects. Engineering properties of rocks; rock discontinuities. Physical characters of building stones. Metal and concrete aggregates.

Geological consideration for evaluation of dams and reservoir sites. Dam foundation rock problems. Geotechnical evaluation of tunnel alignments and transportation routes, method of tunneling; classification of ground for tunneling purposes; various types of support.

Mass movements with special emphasis on landslides and causes of hill slope instability. Earthquakes and seismicity, seismic zones of India. Aseismic design of building. Influence of geological conditions on foundation and design of buildings.

Case history of engineering projects and geological causes for mishaps and failures of engineering structures.

PRACTICAL

Study of gravimeter, magnetometer and seismographs. Resistivity survey. Interpretation of underground structure on the basis of seismic data. Study of properties of common rocks with reference to their utility in engineering projects. Study of maps and models of important engineering structures as dam sites and tunnels. Interpretation of geological maps for landslide problems.

BOOKS RECOMMENDED

Evan A.M. 1993 Ore Geology and Industrial minerals. Blackwell .Sci. Pub,Dev M. Nonmetallic and Industrial minerals.

Gokhle and Rao. Ore deposits

Lamey cc Metallic and Industrial mineral deposits.

Mc Kinstry H.E. 1962 Mining Geology 2^{Ed} . Asia Pub. House.

Lewis R.A. and Clark G.A. 1967 Elements of Mining 3^{Ed} . John Wiley

Young. G.J. Elements of Mining Mc Graw Hill.

Arogyaswami R.N.P. Courses in Geology I.B.H.

Sharma, P.V.,1986 : Geophysical method in Geology. Elsevier.

Sharma , P.V., 1997 : Environmental and Engineering Geophysics, Cambridge University Press.

Volgelsang, D.,1995 : Environmental Geophysics – A practical Guide . Springer Verlag.

Dobrin , M.B., 1976 Introduction of Geophysical Prospecting.McGraw Hill.

Parasnis , D.S. , 1975 : Principles of Applied Geophysics. Chapman and Hall.

Stanislave, M., 1984 Introduction to Applied Geophysics . Reidel Pub.

Hawks and Webb : Geochemical Exploration.

Krynine D.P. and Judd W.R. 1998 : Principles of Engineering Geology and Geotectonics . (McGraw Hill.)CBS Edition.

Schul J.R. and Cleaves A.B. Geology in Engineering . J.Wiley and Sons.

PAPER VII: HYDROGEOLOGY AND ENVIRONMENTAL GEOLOGY

Unit I

Ground water: origin, types, importance, occurrence and reservoirs. Hydrogeologic properties of rocks: porosity, permeability, specific yield, specific retention, hydraulic conductivity, transmissivity, storage coefficient. Types of aquifers. Geological formations as aquifers. Hydrogeology of arid zones. Hydrographs. Flownets, Water table contour maps.

Ground water quality – physical and chemical properties of water, quality criteria for different uses, problems of arsenic and fluoride, Groundwater contamination and methods of treatment. Groundwater Resources of Rajasthan and Groundwater provinces of India.

Unit II

Well hydraulics: Confined, unconfined, steady, unsteady and radial flow conditions. Darcy's law and its application, determination of permeability in laboratory and in field. Methods of pumping test and analysis of test data, evaluation of aquifer parameters using Jacob and Walton methods.

Unit III

Water well technology: Development and maintenance of wells. Surface and subsurface geological and geophysical methods of groundwater exploration, hydrogeomorphic mapping using various remote sensing techniques. Radioisotopes in hydrogeological studies. Salt water intrusion in coastal aquifers and its prevention.

Unit IV

Time scales of global changes in the ecosystems and climate. Cenozoic climate extremes- impact on human evolution. Carbon di-oxide in atmosphere, limestone deposits in the geological sequences, records of palaeotemperatures in ice cores of glaciers. Global warming caused by CO₂ increase in present atmosphere due to indiscrete exploitation of fossil fuels, volcanic eruptions and deforestation. Conservation of mineral resources and impacts of mining.

Unit V

Water resources– Hydrogeological considerations, problems and management. Impact assessment of degradation and contamination of surface water and ground water quality due to industrialization and urbanization. Water logging problems due to the indiscrete construction of canals, reservoirs and dams. Soil profiles and soil quality degradation due to anthropogenic activities. Influence of neotectonics in seismic hazard assessment. Seismic zones of India. Distribution, magnitude and intensity of earthquakes.

PRACTICAL

Delineation of hydrological boundaries on water-table contour maps and estimation of permeability. Analysis of hydrographs and estimation of infiltration capacity. Chemical analysis of water. Pumping test: time-drawdown and time-recovery tests and evaluation of aquifer parameters. Step drawdown tests, Electric resistivity sounding for delineation of fresh and saline aquifers. Study of geophysical well logs. Estimation of TDS using resistivity and SP logs. Exercises on groundwater exploration using remote sensing. Study of seismic and flood-prone areas in India. Analyses for alkalinity, acidity, pH and conductivity (electrical) in water samples. Classification of ground water for use in drinking, irrigation and industrial purposes. Presentation of chemical analyses data and plotting chemical classification diagram.

Evaluation of environmental impact of air pollution groundwater, landslides, deforestation, cultivation and building construction in specified areas.

BOOKS RECOMMENDED

- Todd, O.K., 1980: Groundwater Hydrology. John Wiley.
Karanth K.R. Hydrogeology, Tata McGraw Hill
Karanth K.R. Hydrogeology II, Tata McGraw Hill
Driscoll F.G., 1989: Groundwater and Wells II Edition Johnson Division/Scientific Publishers
Davies, S.N. & De Wiest, A.J.M., 1966: Hydrogeology. John Wiley.
Freeze, A.A. & Cherry, J.A., 1979: Ground Water. Prentice Hall.
Valdiya, K.S., 1987: Environmental Geology -Indian Context. Tata McGraw Hill
Keller, E.A., 1978: Environmental Geology, Bell and Howell, USA
Bryant, E., 1985: Natural Hazards, Cambridge University Press.
Patwardhan, A.M., 1999: The Dynamic Earth System. Prentice Hall
Subramaniam, V., 2001: Textbook in Environmental Science, Narosa International.
Bell, F.G., 1999: Geological Hazards. Routledge, London.
Smith, K., 1992: Environmental Hazards. Routledge, London.

PAPER VIII: IGNEOUS AND METAMORPHIC PETROLOGY

Unit I

Physics of magma generation in the mantle, their constitution and composition. Factors affecting magma and evolution of magma. Phase equilibrium of single, binary (Albite-Anorthite, Diopside-Anorthite, Albite-Orthoclase, Forsterite-silica and leucite-silica system) and ternary (Diopside- Albite- Anorthite, Diopside, Forsterite-Silica and Albite-Orthoclase- Silicic systems), its relation to magma genesis and crystallization behaviour.

Unit II

Criteria for classification of the igneous rocks. Norms -CIPW, and Niggli values, Rock suite, series: petrographic provinces and associations.

Unit III

Petrogenesis of major igneous rock types such as ultramafic/komatiite, basaltic, granitic and alkaline rocks.

Unit IV

Mineralogical Phase rule of closed and open systems, Graphical representation and compositional plotting, ACF and A KF diagrams.

Factors of metamorphism with special reference to composition of fluid phase, classification of metamorphic zones, Glaucophane schist, eclogite and granulite facies. Nature of metamorphic reactions and pressure-temperature conditions of metamorphism.

Unit V

Isoreaction grid, Schreinmakers rule and construction of petrogenetic grids .

Metamorphic differentiation. Anatexis, Migmatites Regional metamorphism and paired metamorphic belts. Pressure-temperature-time paths. Ultra-high temperature, ultra-high pressure and ocean floor metamorphism.

PRACTICAL

Megascopic and microscopic study of igneous lithotypes. Calculation of CIPW Norms, Preparation of variation diagrams.

Megascopic and microscopic study of metamorphic rocks of different facies. Time relationship between deformation and recrystallisation. Graphic construction of ACF, AKF and AFM diagrams. Estimation of pressure and temperature from important models of geothermobarometry. Interpretation of reaction textures.

BOOKS RECOMMENDED

Turner, F.J. 1980: Metamorphic Petrology, McGraw Hill, New York.

Yardley, B. W. 1989: An Introduction to Metamorphic Petrology. Longman New York.

Bucher, K. and Frey, M. 1994: Petrogenesis of Metamorphic Rocks, Springer -Verlag.

Philipotts, A, 1992: Igneous and Metamorphic Petrology. Prentice Hall.

Best, M.G., 1986: Igneous Petrology, CBS Publ.

McBirney, A.A., 1993: Igneous Petrology. Jones & Bartlet Publ.

Kretz, A., 1994: Metamorphic Crystallization, John Wiley.

Bose, M.K., 1997; Igneous Petrology. World Press.

Perchuk, L.L. and Kushiro, I. (eds), 1991: Physical Chemistry of Magmas. Springer Verlag.



Department of Geology

JAI NARAIN VYAS UNIVERSITY, JODHPUR

FACULTY OF SCIENCE

NEW CAMPUS

GUIDELINES FOR CHOICE BASED CREDIT SYSTEM:

Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete **four skill courses**: two within the Department and two from other Department within JNV University or the Universities approved by JNV University
3. **Course:** Usually referred to, as 'papers' is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period

of teaching (lecture or tutorial) or two periods of practical work/field work per week.

7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.
12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/ December and even semester from December/January to May.
Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May. Each Department shall conduct the Practical examinations of Odd semester with internal examiners only; however during even semester one Examiner shall be from other University/Institute.
13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Science resolves the following:

- a. All internal assessments shall be open assessment system only and that are based on Quizzes, term test, seminar
- b. Attendance shall carry the prescribed marks in all papers and Practical examination internal assessment
- c. In each semester three out of four theoretical component University examination shall be undertaken by external examiners from outside the university conducting examination, who may be appointed by the competent authority

Grievances and Redressal Mechanism

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head/Principal of the College or the Chairperson of the University Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.
- b) The appeal will be assessed by the Chairman and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Dean, Faculty of Science comprising all HODs of the Faculty and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	'O'	Outstanding	10
2	'A+'	Excellent	9
3	'A'	Very Good	8
4	'B+'	Good	7
5	'B'	Above Average	6
6	'C'	Average	5
7	'P'	Pass	4
8	'F'	Fail	0
9	'Ab'	Absent	0

- i. A student obtaining Grade F shall be considered failed and will be required to reappear in the examination.

- ii. For noncredit courses (Skill Courses) ‘Satisfactory’ or ‘Unsatisfactory’ shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

- = and > 95 % marks Grade Point 10.0
- 90 to less than 95 % marks Grade Point 9.5
- 85 to less than 90 % marks Grade Point 9.0
- 80 to less than 85 % marks Grade Point 8.5
- 75 to less than 80 % marks Grade Point 8.0
- 70 to less than 75 % marks Grade Point 7.5
- 65 to less than 70 % marks Grade Point 7.0
- 60 to less than 65 % marks Grade Point 6.5
- 55 to less than 60 % marks Grade Point 6.0
- 50 to less than 55 % marks Grade Point 5.5
- 45 to less than 50 % marks Grade Point 5.0
- 40 to less than 45 % marks Grade Point 4.5
- 35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,

i.e

$$\text{SGPA (Si)} = \frac{\sum(C_i \times G_i)}{\sum C_i}$$

where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme, i.e.

$$\text{CGPA} = \frac{\sum(C_i \times S_i)}{\sum C_i}$$

where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.

- iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	4	B	8	4 x 6 =24
2	Course 2	4	B+	7	4 X 7 =28
3	Course 3	4	B	6	4X 6 = 24
4	Course 4	4	O	10	4 X 10 =40
5	Course 5- Practical I	4	C	5	4 X 5 =20
6	Course 6 – Practical II	4	B	6	4 X 6 = 24
	Total	24			24+28+24+40+20+24 =160

Thus, **SGPA = 160/24 = 6.67**

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	6.67	7.25	7	6.25

CGPA = (24X6.67+ 24X 7.25 + 24X7 + 24 X 6.25)/ 96

652.08/96 = 6.79

The Department is free to distribute the Periods between Theory/Tutorial/Practical as per the Course content and the need of the course. However the selection shall be from any one of the following pattern

- 4 : 0 : 0 (four lectures only (no tutorial and no practical) per week).
- 2 : 1 : 1 (two lectures, one tutorial, and one practical per week).
- 0 : 2 : 2 (no lecture, two tutorials, and two practicals per week).
- 1 : 2 : 1 (one lecture, two tutorials, and one practical per week).
- 2 : 2 : 0 (two lectures, two tutorials, and no practical per week).
- 0 : 4 : 0 (no lecture, four tutorials only, and no practical per week).
- 1 : 1 : 2 (one lecture, one tutorial, and two practicals per week).
- 2 : 0 : 2 (two lectures, no tutorial, and two practicals per week).
- 0 : 0 : 4 (no lecture, no tutorial, and four practicals only per week).
- 1 : 0 : 3 (one lecture, no tutorial, and three practicals per week).
- 3 : 1 : 0 (three lectures, one tutorial, and no practical per week).
- 0 : 1 : 3 (no lecture, one tutorial, and three practicals per week).
- 1 : 3 : 0 (one lecture, three tutorials, and no practical per week).
- 3 : 0 : 1 (three lectures, no tutorial, and one practical per week).
- 0 : 3 : 1 (no lecture, three tutorials, and one practical per week).

The Duration of the Period shall be forty five minutes. In each of these combinations, the first value stands for the same number of lecture instructions per week, whereas the last two values stand for double the number of tutorial / practical instructions per week.

In each practical group the number of students that can be accommodated will be decided by the respective Department Council; the general/existing pattern is 15 to 20 students in each group. The workload is to be computed accordingly.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective) involve an evaluation system of students that has the following two components:-

- (i) **Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
 - (ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.
- (i) **Continuous Comprehensive Assessment (CCA):** This would have the following components:
- a. **Quizzes:** Two Quiz examinations of 45 minutes duration each having a maximum of 40 marks shall be arranged for theory paper during the semester course period
 - b. **Term Test:** One term test shall be arranged for each theory paper prior to End-Semester Examination; examination duration shall be of three hours; maximum marks is 70

- c. **Seminar:** Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 15. The seminar shall commence after first quiz examination and shall be completed prior to term test for all the papers.
- d. **Classroom Attendance** – Each student will have to attend a minimum of 75% Lectures / Tutorials / Practicals. A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE). Attendance shall have 15 marks and will be awarded by following the system proposed below:

Those having greater than 75% attendance (for those participating in Co-curricular activities, 25% will be added to per cent attendance) will be awarded CCA marks as follows:-

75% to 80%	=	3 marks
80% to 85%	=	6 marks
85 to 90%	=	9 marks
90% to 95%	=	12 marks
> 95%	=	15 marks

All students' cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Science.

- e. CCA are based on open evaluation system without any bias to any student
- f. Any grievance received in the Department from student shall be placed before the **Grievance Redressal Committee** with adjudicated comments

Each component marks will be added without rounding and the total thus obtained is ratio by a factor of six. This value shall be rounded.

Illustration :

Quiz 1 – Marks obtained	=	30
Quiz 2 – Marks obtained	=	35.5
Term Test Marks obtained	=	50.5
Seminar Marks obtained	=	14
Attendance Marks obtained	=	9
Total	=	139.00
Conversion	=	$139/6 = 21.16666$
Award	=	22.00

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective Department shall declare the result as “Satisfactory” or “Non-Satisfactory”; each student need to get a minimum of three “Satisfactory” declaration for the course completion

In laboratory courses (having only practical (P) component), the CCA will be based on students attendance (50%); hands on Practical in physical science stream (50%) and collection of biological material (25%) and hands on Practical (25%) in biological and earth science stream.

For QUIZ (2 quizzes per semester), 40 marks per Quiz and total of 80 marks, 45 minutes duration for each quiz:

Types of question	Number of Questions	Marks Per question	Total marks per type
1. Multiple choice	10	1	10
2. Fill in the blanks	10	2	20
3. Short answer (15 words)	5	2	10
Total	25		40

For the Term test and ESE:

Part A

Ten short type questions (Definitions, functions, short explanations, etc) for two marks each. $10 \times 2 = 20$ marks; two questions from each Unit; no choice in this part

Part B

Five short answer (25 words) type questions for four marks each. $5 \times 4 = 20$ marks; one question from each Unit with internal choice

Part C

Five questions of long/explanatory Answer (400 words) type, one drawn from each Unit; student need to answer any three; ten marks each; $3 \times 10 = 30$ marks

20+20+30 = 70 marks

Qualifying for Next semester

- 1. A student acquiring minimum of 35% in total of the CCA is eligible to join next semester.**
- A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as 'Fail'), shall be permitted to appear in such failed course(s)'in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.
- A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time i.e three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted. Additional chances examination fee shall be on additive basis.

Improvement Option:

Every student shall have the opportunity to improve Credit through University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final. There shall be no improvement opportunity in Practical examinations.

Result Declaration:

The ESE (End Semester Examination/University Examination) results shall be declared within twenty days of the last examination. The Theory/ Practical Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation.

M.Sc. Geophysics (2018-2020)
M.Sc. Geophysics: Semester I

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Core course 1	GP 101	Geodynamics	4-0-0	4	30	70	100
Core course 2	GP 102	Physics of Earth	4-0-0	4	30	70	100
Core course 3	GP 103	Seismology	4-0-0	4	30	70	100
Core course 4	GP 104	Geomagnetism	4-0-0	4	30	70	100
Core course practical 1	GP 105	Geodynamics and Physics of Earth	0-0-8	4	30	70	100
Core course practical 2	GP 106	Seismology and Geomagnetism	0-0-8	4	30	70	100
Skill Development Course I	GP 107	Survey in Field	2-0-2				
				24	180	420	600

M.Sc. Geophysics: Semester II

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Core course 5	GP 201	Solid Earth Geology	4-0-0	4	30	70	100
Core course 6	GP 202	Gravity Method	4-0-0	4	30	70	100
Core course 7	GP 203	Magnetic Method	4-0-0	4	30	70	100
Core course 8	GP 204	Electric Method	4-0-0	4	30	70	100
Core course practical 3	GP 205	Solid Earth Geology and Gravity Method	0-0-8	4	30	70	100
Core course practical 4	GP 206	Magnetic Method and Electric Method	0-0-8	4	30	70	100
Skill Development course II	GP 207 (any one)	A) Minerals and rocks	2-0-2				
				24	180	420	600

M. Sc. Geophysics: Semester III

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Core course 1	GP 301	Petroleum Geology and Geophysics	4-0-0	4	30	70	100
Core course 2	GP 302	Well logging and Reservoir Analysis	4-0-0	4	30	70	100
Core course 3	GP 303	Seismic Methods	4-0-0	4	30	70	100
Core course 4	GP 304	Signal Processing and inversion theory	4-0-0	4	30	70	100
Core course practical 1	GP 305	Petroleum Geology and Geophysics, Well logging and Reservoir Analysis	0-0-8	4	30	70	100
Core course practical 2	GP 306	Signal Processing and inversion theory	0-0-8	4	30	70	100
Skill Development Course I	GP 307	RS and GIS for Urban and Regional Planning	2-0-2				
				24	180	420	600

M. Sc. Geophysics: Semester IV

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Core course 1	GP 401	Remote Sensing	4-0-0	4	30	70	100
Core course 2	GP 402	Marine Geophysics	4-0-0	4	30	70	100
Core course 3	GP 403	Electromagnetic Methods (Active & Passive)	4-0-0	4	30	70	100
Core course 4	GP 404	Mining, Groundwater and Environment Geophysics	4-0-0	4	30	70	100
Core course practical 1	GP 405	Remote Sensing and Marine Geophysics	0-0-8	4	30	70	100
Core course practical 2	GP 406	Electromagnetic Methods (Active & Passive) and Mining, Groundwater and Environment Geophysics	0-0-8	4	30	70	100
Skill Development Course I I	GP 407	Building and Decorative stone	2-0-2				
				24	180	420	600

M.Sc. Geophysics Syllabus (2018-2020)

SEMESTER I

Core PAPER GP 101: Geodynamics

UNIT I

Continental drift: Super continents, Gondwana land and its break up, Geophysical Evidences for continental drift and drift of India, Indian Ocean floor its evolution and active lithospheric processes.

UNIT II

Plate Tectonics: The lithosphere, Distribution of Plates, Major and Minor plates, Kinds of Plate Margins-Constructive, destructive and conservative plates, Characteristics and processes at accreting and consuming plate boundaries, Stability and stress distribution within plates, active and passive continental margins, marginal basins, transform faults.

UNIT III

Differences between plate tectonics and continental Drift, magnetostratigraphy, paleomagnetism, Plate tectonics and mountain building, relative motion of the plates, Methods of measuring plate motions, Causes of plate motions, Eulers pole of rotation, Forces acting on the lithospheric plates, the Wilson cycle, Continental collisions, seismicity and Intraplate earthquakes.

UNIT IV

Eustatic movements, Evidences of sealevel changes, Global sea level changes, sea level changes during the Quaternary period, Pre-quaternary sea level changes, Mechanism of sea level change, Impact of sea level changes. Brief description of structure and composition of the oceanic and continental crusts, upper and lower mantle and core (inner and outer), Rheological effects of lithosphere, Brittle and ductile deformation, creep mechanism in the earth, Rigidity of Lithosphere, flexure of plates and compensation models in lithospheric studies. Stresses in the Lithosphere and their sources.

UNIT V

Convection: Mantle viscosity, Concepts of mantle convection Models, Coupling between plates and mantle convection, Hot spots and Mantle plumes, Plume generation Mechanism, Evidence for mantle plumes from seismology and Geoid, Deep Continental structure of India-Sources of

data, Suggested crustal column, seismic velocity structure, Heat flow and seismicity structure, evaluation of tectonic stress, Plate tectonics and evolution of Himalayas, models based on gravity, DSS data and seismicity (Brief description only).

Paper GP 102: PHYSICS OF THE EARTH

Unit I:

Origin of the earth- the Universe and our galaxy, chemical evolution of galaxy formation of the earth and planets, primary differentiation of the earth. Composition of the various zones, abundance of elements in the earth, the rotation of the earth, the moon, salient concepts of plate tectonics.

Unit II:

The earth's gravity field, the force of gravity on the surface of the earth, the figure of the earth, Clairaut's theorem, the geometric and gravitational flatten! International gravity formula, geoid and spheroid, the gravity potent establishment of gravity bases, drift correction, reduction of gravity data, free and Bouguer anomalies, Isostasy - Pratt - Hayford, Airy - Heiskanen system anomalies.

Unit III:

Geochronology, Radioactive decay. Dating of rocks - potassium-argon – rubidium strontiumuranium- lead-carbon 14 methods, age of the earth. The earth's thermal properties, the basic thermal data, the measurement of terrestrial flow, calculation and analysis of heat flow rate, heat flow over the ocean floor, flow over continents, sources of heat in the earth, temperature distribution in earth. The equality of continental and oceanic heat flows, regions of anomalous flow, hot spots, relation ship of heat flow to the radioactivity of the earth.

Unit IV:

The atmosphere, composition - internal structure, prevailing and adiabatic lapse rates, instability of dry and moist air, geo potential, cloud classification, condensation nuclei, artificial precipitation, fundamental forces in the atmosphere, coriolis force and the geo strophic winds, monsoon systems, cyclones, anticyclones and tornadoes, air masses and fronts, jet streams, climate and climatic changes, ozone and other trace gases.

Unit V:

Hydrology - definition, hydrologic cycle, vertical distribution of groundwater types of aquifers, Darcy's law, porosity, permeability - laboratory measurement, well hydraulics - steady and unidirectional flow, quality of groundwater, concepts of water balance, sea water intrusion in coastal aquifers.

Paper GP 103: SEISMOLOGY**Unit I:**

Introduction to seismology. Earthquakes and Plate Tectonics: Plate kinematics, Spreading centers, and Subduction zones. Oceanic interplate seismicity, Continental earthquakes and tectonics. Faulting and Fracture, Secondary effects of earthquakes: landslides, tsunami, fires and fatalities, Seismicity of India and Globe, Seismic zoning. Earthquake effects and hazards. Elastic waves- Elastic, Anelastic and Plastic behavior of materials. Stress, Strain, elastic constants. Seismic waves- Introduction, Body waves. Surface Waves, Types and Phases of waves. Free oscillations of the Earth, the internal Structure of the Earth- Refraction and Reflection in the earth's interior. Types of Earthquakes.

Unit II:

Seismometry: Introduction, Principle of Seismometer, Vertical motion seismometer, and Horizontal motion seismometer. Broad Band seismometer, Analog recorders. Digital recorders, Seismogram- Identification of Phases on a seismogram. Selection of seismograph stations. Global seismic network

Unit III:

Seismic Sources - Faults, Introduction of earthquake focal mechanism, Single- Couple and Double couple radiation patterns. Fault-plane solutions. Mechanics of faulting, Travel-Time curves, locating earthquakes.

Unit IV:

Seismogram Interpretation, Earthquake intensity Magnitude, Frequency, Energy released in an earthquake. Epicenter determination. Analysis of earthquake focal Mechanism.

Unit V:

Micro earthquakes- Analysis and interpretation of seismograms, Reservoir induced earthquakes. Prediction of location of the earthquake. Earthquake control. Monitoring of Nuclear explosions.

Paper GP 104: GEOMAGNETISM

Unit I:

The main magnetic field, magnetic observatories, Instruments - proton precision magneto meter, magnetic elements, magnetic charts, the magnetic dipole, the magnetic field of an electric current, separation of magnetic fields of external and internal origin, the magnetic field of the external origin, ionosphere, magnetosphere, diurnal variations of magnetic field, Sq and L variations, magnetic storms and Aurora.

Unit II:

The magnetic field of the internal origin, IGRF, the dipole field, the non – dipole field, secular variation and west ward drift, magnetic fields of the Sun, Moon and planets, theories on the origin of earth's magnetic field, the permanent magnet hypothesis, Blakett's theory, the earth as a dynamo, the disc dynamo, dynamo of Lowes and Wilkinson.

Unit III:

Magnetic properties of rocks, dia, para and ferromagnetism, the ternary oxide system of magnetic minerals, the titanomagnetite series, the titanohematite series, other ferromagnetic minerals. Magnetic susceptibility of rocks, NRM in rocks, measuring instruments. Spinner magnetometer, Cryogenic magnetometers.

Unit IV:

Palaeomagnetism, remanant magnetism in rocks, TRM, DRM, CRM, VRM, hysteresis curve. Isolation of remnance, cleaning methods. AF demagnetization, thermal demagnetization, laboratory procedure, tests for stability.

Unit V:

Reversals of the magnetic field, polarity of the geomagnetic field, geomagnetic scale, projective method of presenting palaeomagnetic data, magnetic latitude and co - latitude, calculation of mean direction of virtual geomagnetic poles, palaeomagnetic poles, reconstruction of palaeomagnetic poles, continental drift, northward drift of India, results from different continents.

GP 105 : Core Practical 1:

(i) Geodynamics and Physics of Earth

GP 106: Core Practical 2:

(i) Seismology and Geomagnetism

GP 107: SKILL DEVELOPMENT COURSE:

Survey in Field

1. Principles of surveying. Survey equipments.
2. Radial method of plane table survey.
3. Plane table survey with intersection methods.
4. Pace/Tape and compass methods survey with theodolite with various applications.

SEMESTER II

PAPER GP 201 : Solid Earth Geology

UNIT I: Basic assumptions in Geology, relation of geology with sciences-branches of geology-figure and dimensions of earth, structure, composition and origin of earth-Envelops of the earth-crust, mantle, core, External dynamic process- weathering, geological work of wind-weathering, erosion and denudation, cycle of erosion, transportation and deposition agents-loess, relief. Desert types.

Geological work of surface flowing water-streams, rivers, their development. River systems-meandering, oxbow lakes, flood plains, peneplains and deltas. Geological work of underground water-permeability of rocks, types of water in rocks-classification of underground water-springs. Minerals waters-carbonate, sulphide and radioactive waters. Karst-forms, landslides, lakes and swamps, estuaries. Internal dynamic process-tectonic dislocations, neotectonics, earthquakes. Magmatism-volcanoes. Geological work of the sea-marine basins-relief features of the world, ocean floor. Temperature, salinity of seawater. Destructive work of sea-near shore accumulation forms-sedimentation in various zones of sea. Distribution of marine sediments.

UNIT II: Fundamental concepts in geomorphology-geomorphic processes-distribution of landforms-drainage patterns -development. Morphometric analysis of drainage basins, water sheds. Elements of hill slopes-pediment, badlands. Landforms in relation to rock types, paleochannels, buried channels. Soils types and their classification. Evolution of major geomorphic process in India. Marine geomorphic processes, coastal morphological processes.

Field and laboratory map scales, topographic maps, thematic maps, topographic and geomorphic profiles.

Structural, textural, and chemical classification and origin of igneous, metamorphic and sedimentary rocks- Petrogenesis, granitisation. Petrographic characters of pegmatites, kimberlites and gondites- Sedimentary structures- petrographic characters of conglomerate, sandstone, shale, limestones. Process of dolomitisation. Metamorphism-structural classification of shale, phyllite, schist, gneiss, marble quartzite and granulites.

UNIT III: Science of minerals, physical and optical properties of minerals. Classification, structure and chemistry of Feldspar, Mica, Pyroxenes, Amphiboles, Olivine, Quartz and Garnet groups. Clay minerals, genesis and chemistry of native elements. Elements of crystallography, Objectives of structural geology-composition and resolution of forces-stress, strain. Description of folds. Classification, mechanics and causes of folding. Foliation and lineation. Classification of faults, brittle and ductile structures, shearing and shear zones. Classification of unconformities. Map patterns and their uses in determination of large scale structures. Tectonic evolution of Dharwar, Eastern Ghats, Aravalis, Singhbhum and Cuddapahs. Evolution of Himalayas and tectonics. Outlines of geological mapping.

UNIT IV: Earth and stratified rocks-importance of stratigraphy-geological cycle and time scale. Stratigraphic nomenclature and classification. Sargur, Dharwar, Singhbhum super groups, Aravalis and Eastern Ghat Mobile Belts, Cuddapahs, Vindyan and Kurnool systems, Deccan basalts, Cretaceous formations, and quaternary formations- boundary problems in stratigraphy. Geochemical cycle, geochemical exploration methods, classification of elements. Analytical techniques for geochemical analysis. Outlines of standards preparation. Instruments and their exposure. Elements of ore petrology, characteristic features and genesis of ferrous and non-ferrous ore deposits of India. Metallogeny, origin, migration and entrapment of petroleum deposits. Properties of source and reservoir rocks. Petroliferous basins of India- an outline. Classification of coal, ranking, and grading of coal deposits of India.

UNIT V: Physiography and divisions of seas and world oceans. Properties of sea water-salinity, temperature, density. Littoral and sublittoral zones. Continental shelves, slopes, deep sea, aprons, seamounts and guyots, abyssal plains- Mid ocean ridge system, aseismic ridges. Coral reefs and their formation. Tectonic domains of oceans, island arcs, trenches, hotspot mechanism. Turbidity currents and deep sea sediments, placers on the beach and shelves, conditions for formation of

polymetallic nodules. Law of the seas. Orogeny-continental drift hypothesis-breakup of continents-plate tectonics-convergent and divergent margins, eustatic changes of sea level, lithosphere. subduction, obduction and benioff zones, plate margins, mineralisation near plate margin, major and minor plates. Transform and transcurent faults, driving mechanism of the plates, convection currents, triple junction, movement of Indian subcontinent. Origin and evolution of life, fossils and their uses. Biomineralisation studies on fossils, pale ecology, oxygen and carbon isotopic studies on fossils, and analysis of paleontological record for tracing plate tectonic process.

PAPER GP 202: Gravity Method

Unit I

Earth's Gravity field, Properties of Newtonian potential, Laplace's and Poissons's equations, Green's theorem, Gauss law, continuation integral, equivalent stratum, spatial and temporal variations, Principle of gravity prospecting, concept of gravity anomaly. Rock densities, factors controlling rock densities, Bouguer density, Insitu determinations, Borehole methods. Gravity prospecting instruments – Static gravimeters, Astatization, Zero-length spring, Worden & Lacoste Romberg Gravimeters.

Unit II

Plan of Gravity surveys – mineral exploration, oil prospecting and Geological mapping, Establishment of gravity bases, drift correction. Problems in airborne and shipborne gravimetry, horizontal and vertical accelerations, Eotvos correction. Application of gravity methods for regional geological mapping, Oil exploration – salt domes, structural traps, mineral exploration – sulphide ores, ferrous and non-ferrous ores, diamonds, placer deposits, groundwater and Engineering problems.

Unit III

Interpretation of gravity data – Qualitative interpretation, identification of structural features and litho contacts, two-dimensional and three-dimensional bodies - nature of anomalies. Regional and residual separation – graphical, average , grid and curve fitting methods, reliability of different types of residuals, use of filters, vertical derivative calculations, upward and downward continuation of anomalies, classical methods using continuation integral, employing harmonic analysis and Fourier Transformation.

Unit IV

Ambiguity in gravity interpretation, classical method of interpretation, gravity anomalies of point and line masses, circular discs, vertical cylinders, sheets, faults and rectangular slabs, Characteristics of anomalies, properties, interpretation by simple thumb rules and characteristic curves.

Unit V

Forward modeling of gravity anomalies of two-dimensional and three-dimensional bodies of arbitrary shape, Graticules, computer models, anomalies of two-and-half-dimensional bodies, Inversion of gravity anomalies of 2-D polygonal bodies, Automatic gravity modeling of sedimentary basins and density interfaces by Bott's method. Modeling of gravity anomalies using linear, exponential and quadratic density contrast. Use of Fourier Transforms in Gravity interpretation, Mass estimation in gravity.

Paper GP 203: Magnetic Method

UNIT I

Earth's main magnetic field, origin and temporal variations (outlines only), Geomagnetic elements, Vectorial representation, spatial variation, Basic concepts, Coulombs law of magnetic force and fields, magnetic moments, intensity of magnetization and induction, magnetic potential and its relation to field, units of measurement, origin of magnetic anomalies, interrelationship between different component anomalies, Poisson's relation, Magnetic susceptibility, factors controlling susceptibility, magnetic classification of minerals and rocks, Laboratory and in-situ methods of determining susceptibility, Natural remanent magnetism, Astatic and Spinner Magnetometers, demagnetization effects,

UNIT II

Principle of magnetic prospecting, Instruments - Nuclear, fluxgate, Squid's and optical pumping magnetometers, gradient measurements, Plan of magnetic surveys in different mineral exploration programs, Magnetic data reduction, diurnal and normal corrections, IGRF, Airborne magnetometry, orientation mechanisms, survey techniques, data acquisition and reduction, Advantages and disadvantages, brief principles of ship-borne and satellite magnetometry

UNIT III Interpretation of magnetic data, qualitative interpretation, nature of anomalies, identification of different structural features. – Dependence of magnetic anomalies on latitude and orientation. Isolation and enhancement of anomalies using graphical, trend surface analysis,

digital filtering, reduction to pole filter, derivative and continuation filters (Brief descriptions), Ambiguity in magnetic interpretation, generalized approach of interpretation.

UNIT IV

Magnetic anomalies (vertical and total field) of single poles and sphere, anomaly equations, profiles, properties and interpretation procedures. Similarity of magnetic anomalies of two dimensional bodies in different components – generalized equations for the magnetic anomalies of line dipoles, dykes, sheets and faults, profile shapes and interpretation by thumb rules and characteristic curves, ambiguity in interpretation of magnetized dyke, Koloumzine method, Forward modelling of magnetic anomalies: Gulatee's rule, two dimensional and three-dimensional bodies of arbitrary shape, use of graticules, Computer models, familiarization of anomaly equations,

UNIT V

Principles of inversion, Inversion of magnetic anomalies of 2D polygonal bodies, magnetic anomalies of dykes and magnetic interfaces - Frequency domain interpretation: Use of Fourier transforms in magnetic interpretation with special reference to dykes and faults, end corrections, use of Hilbert transforms, Relation figures, brief interpretation procedures of MAGSAT anomalies- Application of magnetic method for regional geological mapping, oil exploration, mineral exploration, ground water and Engineering problems.

Paper GP 204 : Electrical Methods – 1

Unit I

Principle of electrical methods of prospecting – Electrical fields in Geophysics- current and potential in the Earth- equipotential lines of force –due to single point and dipole sources and line of electrodes. Distribution of current across layers of contrasting resistivities. Electrical properties of rocks and minerals – Laboratory measurements of electrical properties of rocks.

Electric conduction in rocks and minerals – electronic- ionic and dielectric. Electrochemical properties. Factors affecting the resistivity of rocks. Archies Law. Isotropy and Anisotropy. Principle of equivalence and suppression. Dar Zarrouk parameters – longitudinal conductance and transverse resistance.

Unit II

Self Potentials: origin- classification – electrochemical and electro-kinetic potentials – behavior.

Measurement of self potentials- equipment- field techniques. SP anomalies over different geometrical models – sphere, fault, dyke and sheet etc.. - Interpretation of SP anomalies. Potential due to a point source- dipole and line sources in homogeneous earth. Effect of inhomogeneous ground. Concept of apparent resistivity – apparent resistivity for multi-layered earth. Principle of reciprocity. Reflection coefficient.

Unit III

Different types of electrode arrays: Wenner- Schlumberger - Dipole- Dipole- Half Schlumberge-, Central Gradient etc.. Geometric factors and theoretical derivations for apparent resistivity for different electrode configurations. Horizontally stratified earth – concepts and assumptions. Computation of apparent resistivity model curves- Image point - numerical integration- linear filter methods. General description of multilayered earth. Resistivity methods field procedures- sounding and profiling.

Unit IV

Vertical Electrical Soundings – transformations of VES curves. Interpretation- indirect and direct methods of interpretation- approximate methods –curve matching – auxiliary curves – Resistivity transform function for Schlumberger and Dipole-Dipole – Relation between transform and layer parameters. Application of linear and digital filtering – iterative techniques. Direct methods of interpretation. Anisotropy and slope boundary planes – The resistivity profiling- over fault, dyke, vertical contact, Buried 2D and 3D regular geometric bodies. Comparison of different arrays in profiling applications.

Unit V

Induced Polarization method: Basic concepts – Sources of the induced polarization effects – Over voltage and induced polarization – Warburg impedance – Membrane polarization and Electrical polarization – Induced polarization- Induced polarization measurements: Time domain measurements – Principle, Chargeability, delay time– Frequency domain measurements- percentage frequency effect, Metal conduction factor. Relation between time-and frequency-domain IP measurements. Induced Polarization sounding and profiling – Field procedures – Noise sources – Plotting methods – Pseudo section plotting – Spectral IP – relaxation models in spectral IP – complex resistivity –electromagnetic coupling and capacitive coupling in IP - removal of EM coupling in spectral IP –Interpretation – mineral discrimination by spectral IP – Magnetic Induced Polarization (MIP) method.

GP 205: Core Course Practical 1
Solid Earth Geology and Gravity Method
RS 206: Core Course Practical 2

Magnetic Method and Electric Method

GP 207: SKILL DEVELOPMENT COURSE (Any One)

1. Introduction to minerals and rocks: common rock forming mineral.
2. Common non silicate minerals.
3. Igneous rocks.
4. Sedimentary rocks
5. Metamorphic rocks

SEMESTER III

GP 301 Paper I: PETROLEUM GEOLOGY AND GEOPHYSICS

Unit I

Petroleum – occurrence – distribution- chemical and physical properties – Origin- various theories, source rock, organic matter – Maturation into petroleum – P&T conditions, Migration – primary and secondary.

Unit II

Reservoir – rocks – properties – Fluids, water – oil- Natural gas- properties, Traps- structural – stratigraphic – combination, seals, sedimentary basins – cratonic – convergent and divergent margin basins – classification, Category-1 basins of India.

Unit III

Gravity and Magnetic methods in petroleum exploration – surveys – Land and ocean areas – differences – data processing operations, Gravity anomalies – salt domes – stratigraphic traps. Magnetic methods – basement mapping, computer oriented methods.

Unit IV

Seismic data processing – outlines, preparation of seismic section, Reflection character-structure, pitfalls – migration 2D & 3D significance – velocity pull up, structure identification.

Unit V

Seismic stratigraphy – Unconformities – seismic sequences – reflection pattern – depositional environment – basin history – construction, Modelling concept – Reservoir parameters – forward and inverse, direct detection – Bright spots – flat spots Gas hydrates, Coal bed methane.

GP 302 Paper II: WELL LOGGING AND RESERVOIR ANALYSIS

Unit I:

Reservoir Properties: Porosity, Permeability, Thickness, Temperature, Flow Types, Flow rates, Wire line sampling pressures, thief zones, Perforations, Leaks, Cement Repairs, Yield & sustainability, Water Hold – up, Slippage Velocity, Repeat Formation Tester, Modular Dynamic Tester.

Unit II:

Production Logs: Thermal Decay Time Log, Temperature Log, Continuous Flow Meter, Backer Flow meter, Spinner Flow meter, Manometer, Gradio-manometer, Radio Active Tracers, Multi finger Caliper-Casing Inspection tool.

Unit III:

Injection Wells: Injection rates, Temperature changes, Producing well behaviour, Tube Case analysis. Maintenance of well pressures through injection of fluids.

Unit IV:

Role of Logging in Water cut and prevention-remedies, Reperforations, Re-cementations. Zone transfers. Secondary Recovery methods.

Unit V:

Sustainability: Flow storages, Production planning, Re-estimation of Oil/Gas saturations in old wells using Reservoir Saturations Tool (RST) etc.

GP 303: Paper III: SEISMIC METHODS

Unit –I

Principles of elasticity: Normal strains, shearing strains, Hook's law, Elastic moduli, wave equations, Huygen's & Fermat's Principles, Zeoppritz equations, refraction, reflection, critical refraction, diffraction, attenuation & absorption of seismic waves, acoustic impedance, surface waves, dispersion multiples, reflection and transmission coefficients. Elastic wave velocities of rocks: laboratory and field measurements, dynamic moduli, P and Swave velocities, anisotropy, attenuation, factors affecting velocity, different types of velocities, geometry of ray paths, refraction and reflection, horizontal layers and dipping layers, NMO and dip move out, discrete and continuous velocity changes, velocity inversion, low velocity layer, blind zone, hidden layer.

Unit-II

Electromagnetic geophone and its performance, damping coefficient, hydrophones, detector arrays, array response, uniform arrays, amplitude weighted arrays, distance tapered arrays, streamer, analog data acquisition, amplifiers, filters, gain control and recording types. Seismic energy sources for land and marine surveys. Dynamite thumper, dinoesies, vibrosies, land air gun, pinger, boomer, sparker, airgun, water gun, vaporchoc etc. Controlled explosions, shot control, source arrays, energy content, frequency, pulse length and resolution, penetration, signatures of energy sources. Digital data acquisition, digital field system, signal flow and recording. Constituent units and modules. Telemetry systems, wireline and radio telemetry, telemetry system configuration and specifications, dynamic range of signals noise: shot generation, ambient and electrical noises, their nature and attenuation requirements. Noise survey, noise analysis, fold back experiment, optimization of parameters.

Unit – III

Single channel and multi channel surveys, field layouts and shooting procedures for land and marine 2D surveys, split spread and end-on spreads, CDP procedures for land and marine surveys, stacking chart. 3D surveys, 3D layouts, swath, brick, odds & evens, zig zag, button patch, full range 3D, loop survey. Marine 3D shooting: two streamer system, alternate shooting, two boat operation, circles shooting, 3D bottom cable survey, quad quad 3D, multiple streamers, static binning and dynamite binning. Refraction surveys: Field procedures, fan shooting, broad side shooting, inline profiling, long refraction profiles, reversed and unreversed profiles, marine refraction surveys, sonobuoy surveys. (VSP, shear wave data acquisition and other special surveys procedures are included in paper II along with processing and interpretation of seismic data). Reduction of refraction data, interpretation of refraction data, analysis of refraction records, interpretation of reversed and unreversed profiles, delay time methods, forward modeling, masked layers and hidden layers, reduction and interpretation of sonobuoy data, crustal seismology, engineering surveys, exploration for ground water, application in mining industry.

Unit- IV Reflection data processing, static and dynamic corrections, velocity determination. Preparation of seismic sections migration, analysis of analog records, automatic processing of digital seismic data, demultiplexing, TAR, velocity analysis, velocity spectra and velocity scan, automatic statics, picking, stacking, spiking deconvolution, dereverberation, whitening, time variant frequency filtering, apparent velocity filtering. AVO analysis, different methods of

migration, automatic migration, wavelet processing. Seismic section plotting, display types, picking of events, marking-isochron & isopach maps, geological interpretation, application of reflection method exploration for oil and gas, groundwater, coal, mineral deposits, gas hydrates, etc., engineering applications, crustal studies, structural and stratigraphic traps, identification of geological structures like anticlines, faults, salt domes etc; fit falls in interpretation.

Unit-V

hydrocarbon indicators, bright spot, seismic attributes, AVO analysis, vertical seismic profiling, equipment, configurations like deviated well, walk away, offset VSP etc., applications, 3D data processing and interpretation, visualization in an animated interactive environment. Seismic stratigraphy, geological sea level change model, depositional patterns, seismic sequence, seismic facies, reflection character, synthetic seismogram, modeling concepts, high resolution seismic surveys, shallow engineering surveys and suitable energy sources, 4C, 4D recording, seismic tomography, reservoir applications of petrophysics concepts, generation and recording of shear waves, energy sources, geophones, recording, processing, section plotting, interpretation V_p/V_s as lithology indicator, hydrocarbons, engineering applications.

GP 304 Paper IV: SIGNAL PROCESSING AND INVERSION THEORY

Unit I

Introduction, Definition of signal and noise, various signal classes such as continuous, piece wise continuous, absolute integrable, singularity, unit impulse, unit step, etc. Fourier series and Fourier Transforms: Time and frequency domain, relations between various operations in both the domain, Fourier Transform and its properties, Fourier Transforms of some important functions: Rectangular, exponential functions, singularity functions and periodic functions.

Unit II

Time-series analysis: Discrete time signals, Correlation and convolution functions, impulse response and Transfer function spectrum of observational data: Discrete Fourier Transform (DFT), FFT, Z-Transforms, Delay properties of wavelets.

Unit III

Band limited signals: Properties, Sampling Theorem, Nyquist frequency, Aliasing, Sampling of band and time limited signals; Effect of sampling on spectrum and vice-versa; reproduction of continuous function from sampled data. Importance and effects of Windowing, Gibbs

phenomenon, spectral leakage, various types of windows; power spectrum; Estimation of power spectrum, Wiener Khinchin theorem, use of various windows in power spectrum computation, spectrum computation via Auto-correlation and Periodogram.

Unit IV

Digital filtering: Design of digital filters, amplitude and phase response of various filters; onesided and two sided filters, low-pass, high pass and band-pass, optimum filters, Butter worth filter, Recursive and non-recursive filters, optimal and Weiner filters, Deconvolution and predictive deconvolution.

Unit-V

Inversion Theory: Introduction, Fundamentals of Inversion, Linear Inversion, Non-Linear Inversion, Incorporating prior information, Parametric Inversion, Assessing the uncertainty in inverted models.

RS 305: Core Course Practical 1

Petroleum Geology and Geophysics, Well Logging and Reservoir Analysis

RS 306: Core Course Practical 2

Signal Processing and Inversion Theory

GP 307: SKILL DEVELOPMENT COURSE (Any One)

RS & GIS for Urban and Regional Planning

- (i) To study the RS and GIS data
- (ii) To study the Mapping for Urban and Regional areas
- (iii) To study GIS Tool in Urban Planning

SEMESTER IV

GP 401 Paper I: OPTICAL REMOTE SENSING

UNIT-1

Fundamentals of Remote Sensing: Introduction: basic principles of remote sensing; electromagnetic spectrum; Planck's law and wien's displacement law; concept of incoming short wave and outgoing long wave radiation: passive and active remote sensing, interaction of electromagnetic radiation with matter; interaction of electromagnetic radiation with atmosphere; selective and non-selective scattering; impact of scattering on remotely sensed data; atmospheric windows and absorption bands

UNIT-2

Spectral reflectance properties and Sensors: interaction of electromagnetic radiation with solids and liquids of the earth's surface; spectral reflectance curves of water, snow, clouds, and vegetation. Soils/rocks/minerals. Sensors: imaging and non-imaging sensors: radiometers, spectrometers. Spectroradiometers; Scanner dependent systems: line scan systems, array scanning systems, multispectral scanner systems: whiskbroom and pushbroom imaging systems; circular/conical/side scanning systems: sensor characteristics - spatial resolution, spectral resolution, radiometric resolution and temporal resolution.

UNIT -3

Aerial photography: various types of aerial cameras and black and white films; scale, brightness, contrast of photograph; resolution of photograph - resolving power of film and camera lens; vertical and oblique aerial photographs; methods of aerial photographic surveys; parallax/relief displacement, stereophotography, mirror and pocket stereoscopes, Photomosaic, low and high sun elevation angle photography. Color theory - primary and secondary colors; additive and subtractive color mixtures to generate colors, color code, working principle of normal and infrared color films and photographs; color composites - true, standard false color and false color composites; application of normal and infra red photographs.

UNIT - 4

Satellite remote sensing: Various platforms used for remote sensing data acquisition; orbits of satellites; geo-synchronous and sun-synchronous orbits; **OPTICAL REMOTE SENSING SATELLITES:** environmental meteorological satellites (past and present) and their sensors - GOES, Meteosat, INSAT, GMS, NOAA etc.; earth resources observation satellites (past, present and future) and their sensors - NIMBUS/coastal zone color scanner, Landsat, Spot, Mos, IRS-1a, 1b, 1c, 1d, p2, p3, p4, p5, p6 etc. Indian remote sensing activity; future remote sensing missions of ISRO for earth observation.

UNIT-5

Thermal infrared remote sensing: Thermal processes and properties, radiant flux, heat transfer, atmospheric transmission, thermal properties of materials, thermal infrared signatures of various rocks and minerals, influence of water and vegetation on thermal inertia; thermal infrared sensors like infrared radiometers, working principle of thermal infrared scanner; TIRS etc.; satellites and sensors acquired and acquiring data under thermal infrared region - HCMM, NOAA-AVHRR, EOS-TERRA, EOS-AQUA, Geostationary satellite sensors etc.; characteristics of thermal

infrared images, relative comparison of night and daytime thermal infrared imagery; advantage of thermal infrared remote sensing.

GP 402: Paper II : MARINE GEOPHYSICS

Unit I:

Physiography and divisions of the sea floor, continental shelves, slopes and aprons, submarine canyons and deep sea channels, sea mounts and abyssal plains, turbidity currents and submarine sedimentation, the mid oceanic ridge systems and its structure, aseismic ridges, various types of ridges in the Indian ocean region, the continental fracture system and island arcs, occurrence of offshore mineral deposits and hydrocarbons, hotspots, mineral resources of the sea: surficial deposits of the shelf and deep sea, heavy mineral placers, calcareous shells, pearl oysters, phosphorites, glauconite, barium sulfate concretions, sand and gravel, extensions of ore deposits, hydrocarbon potential of the shelf and offshore sedimentary basins.

Unit II:

Geophysical instrumentation and surveys: Adaptation of geophysical instruments for marine surveys, Measurements at the sea surface and under water, geophysical equipment currently in use and board research vessels, complement of equipment on board the survey ship and layout of equipment, towing logistics, survey procedures and planning of survey lines, marine magnetometers, marine gravimeters, surface and under water gravimeters, Graf Askaniian, Lacoste Romberg and vibrating string gravimeters, calculation of gravity anomalies.

Unit III:

Map projections: Different kinds of map projections, Position fixing at sea: long range and short range systems, integrated satellite navigation, Global Positioning System (GPS), Bathymetry: echosounding, bathymetric charts, bathymetry as an adjunct to geophysical surveys, submersibles, seabed mapping by side scan sonar, multibeam, lidar and other surveys, seabed sampling, dredging and coring, marine geophysical surveys for seabed resources, site selection for production platforms, tunneling, waste disposal etc.

Unit IV:

Oceanic magnetic anomalies, sea floor spreading, Vine-Mathews hypothesis, geomagnetic time scale and dating the ocean floor, linear magnetic anomalies. Heat flow: Earth's internal sources

of heat, transfer of heat within the earth, measurements at the ocean bottom, heat flow probes and measurements, factors affecting the Heat flow measurements in sea, oceanic heat flow, ocean ridges and ocean basins, marginal basins, rift valleys.

Unit V:

Objectives of marine geophysical surveys, marine geophysical surveys for sea bed resources, engineering investigations, deep sea geological mapping, delineation of continent-oceanic boundary, geological mapping in the coastal zone. Results of some rare studies. Geophysical anomalies of trenches, active and passive margins, ridges, island arcs, Large scale and small-scale structural features of the oceanic crust from seismic surveys (velocity structure)

GP 403: Paper III: ELECTROMAGNETIC METHODS (ACTIVE & PASSIVE)

UNIT I

Basics: Electromagnetic Induction, Primary-Secondary field relations, Vector Diagram- Real and Imaginary components resolving; Inductive and resistive limits, Response function, Elliptic polarization, Maxwell's equations, Boundary conditions, Wave equation, Quasi static condition, Solution of wave equation, Plane wave characteristics, propagation of plane waves in conducting media, Wave number, Impedance, Skin depth versus effective depth, factors controlling depth penetration. *Classification of E.M. methods:* Sources used, continuous wave and pulse excitation principles, Measured components. Brief principles of solving electrodynamic problems including scale modeling. Field of large loop, magnetic dipole and electric dipole in air – frequency and Time domain approaches

Unit II

Field of magnetic dipole and electric dipole (both in transient and frequency domains) in homogeneous, isotropic space. Response of stratified medium to the above sources. Frequency and transient response of local conductors in homogeneous field – Sphere and Cylinder. Effect of frequency and magnetic permeability on the secondary fields – Sphere as an example, Generalized induction parameter. Effect of overburden and Host rock on E.M. response. Methods using artificial fields: Surface low frequency methods: Principles, field procedures and various corrections, quantitative interpretation in Turam, Tilt angle and Slingram methods, Operation at low induction numbers - terrain conductivity measurements. Surface transient methods: Principles, Comparison with harmonic methods, Description of different current

functions, various T-R configurations, General field procedures, Interpretation of surface transient method data.

Unit III

Radio wave methods: Principles, Theory and description, different equipment of VLF EM method. Interpretation of VLF EMR data - Applications. Brief principles of Ground Penetrating Radar and its applications in shallow depth investigations. Principles of EM soundings, Field procedures, Geometric versus parametric sounding, data preparation, interpretation and applications. *Methods using natural fields*: Principle of MT, Origin of Earth's natural EM field: Magneto-telluric source field characteristics, MT field procedure and instrumentation. Cagniard's relation, Impedance over N-layer medium. Apparent resistivity and phase, MT tensor,

Unit IV

MT Signal Processing. Swifts optimum rotation, Skew, Tipper, Ellipticity, coherency, Static shift, remote reference magnetotellurics, Induction arrows, Polar diagrams, 1-D, 2-D interpretation of magnetotelluric data – Applications. Principles of AMT, controlled source Audio Magnetotellurics, sea MT and AFMAG. Telluric current method: Principles and Field procedures, Telluric profiling technique, Theoretical considerations, Relative ellipse, Absolute ellipse, triangle, Polygon and amplitude ratio methods for interpretation of telluric data. Comparison of tellurics with MT.

Unit V

Airborne EM methods: Continuous wave systems, Different systems in operation, Airborne transient system (INPUT) description, Rigid Boom Helicopter System, passive Airborne EM systems – AFMAG and VLF, Different noises in AEM systems and methods of suppression, interpretation of AEM data and applications. Geomagnetic depth soundings: Origin and classification of long period geomagnetic Variations, separation of magnetic field of internal and external origin, normal and anomalous fields. Interpretation of Geomagnetic depth sounding data, Magnetometer array studies, principles of Ocean Bottom Electromagnetic methods.

GP 404 Paper IV: Mining, Ground water and Environmental Geophysics

Unit I

Crustal layers-upper and lower, Different elements in the crust, Precious and other useful substances in the upper crustal layers, Metallogenic provinces and periods. Classification of mineral deposits – Metallic and non metallic, Classification of metallic deposits-Ferrous and non ferrous, Base and noble metals, Sulphides, Oxides, Silicates and Carbonates, Processes of formation of mineral deposits –Igneous activity, Sedimentation, Metamorphism, Weathering and Erosion, Hydrothermal processes.

Unit II

Mineral deposits of India -Base metals and Ferrous metals, Geological mapping-Geophysical methods, Sulphide ores-Massive and disseminated ores-Prospecting strategies-examples, Iron ores- Strong and weak magnetic iron ores, genesis-prospecting.

Unit III

Manganese, Chromium, Placers-Prospecting strategies, Diamonds, Genesis of coal deposits of India - Geophysical prospecting, Logging in mineral exploration, Synergic interpretation.

Unit IV

Ground water occurrence – Igneous-Metamorphic and sedimentary rocks, Types of aquifers and their hydrological significance, Vertical distribution of water, surface investigations of groundwater-Geological method-Remote sensing-Hydrobotanical, Review of electrical resistivity and seismic refraction methods – Groundwater exploration, Buried channels, Sea water intrusion.

Unit V

Geophysics and earth's environment, Environmental problems amenable to solution by geophysical means, Engineering Geophysical problems, Survey procedures-modifications only for Environmental and Engineering Geophysics-Gravity, Magnetic, Seismic, Electrical and E.M, Radioactive and Geothermal surveys, Examples.

GP 405: Core Course Practical 1

Remote Sensing and Marine Geophysics

RS 406: Core Course Practical 2

Electromagnetic Methods and Mining , Groundwater and Environment Geophysics

RS 407: SKILL DEVELOPMENT COURSE

Building and Decorative Stone



Department of Geolog

JAI NARAIN VYAS UNIVERSITY, JODHPUR

FACULTY OF SCIENCE

NEW CAMPUS

GUIDELINES FOR CHOICE BASED CREDIT SYSTEM:

Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete **four skill courses:** two within the Department and two from other Department within JNV University or the Universities approved by JNV University
3. **Course:** Usually referred to, as ‘papers’ is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period

of teaching (lecture or tutorial) or two periods of practical work/field work per week.

7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.
12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/ December and even semester from December/January to May.
Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May. Each Department shall conduct the Practical examinations of Odd semester with internal examiners only; however during even semester one Examiner shall be from other University/Institute.
13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Science resolves the following:

- a. All internal assessments shall be open assessment system only and that are based on Quizzes, term test, seminar
- b. Attendance shall carry the prescribed marks in all papers and Practical examination internal assessment
- c. In each semester three out of four theoretical component University examination shall be undertaken by external examiners from outside the university conducting examination, who may be appointed by the competent authority

Grievances and Redressal Mechanism

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head/Principal of the College or the Chairperson of the University Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.
- b) The appeal will be assessed by the Chairman and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Dean, Faculty of Science comprising all HODs of the Faculty and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	'O'	Outstanding	10
2	'A+'	Excellent	9
3	'A'	Very Good	8
4	'B+'	Good	7
5	'B'	Above Average	6
6	'C'	Average	5
7	'P'	Pass	4
8	'F'	Fail	0
9	'Ab'	Absent	0

- i. A student obtaining Grade F shall be considered failed and will be required to reappear in the examination.

- ii. For noncredit courses (Skill Courses) ‘Satisfactory’ or ‘Unsatisfactory’ shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

- = and > 95 % marks Grade Point 10.0
- 90 to less than 95 % marks Grade Point 9.5
- 85 to less than 90 % marks Grade Point 9.0
- 80 to less than 85 % marks Grade Point 8.5
- 75 to less than 80 % marks Grade Point 8.0
- 70 to less than 75 % marks Grade Point 7.5
- 65 to less than 70 % marks Grade Point 7.0
- 60 to less than 65 % marks Grade Point 6.5
- 55 to less than 60 % marks Grade Point 6.0
- 50 to less than 55 % marks Grade Point 5.5
- 45 to less than 50 % marks Grade Point 5.0
- 40 to less than 45 % marks Grade Point 4.5
- 35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,

i.e

$$\text{SGPA (Si)} = \frac{\sum(C_i \times G_i)}{\sum C_i}$$

where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme, i.e.

$$\text{CGPA} = \frac{\sum(C_i \times S_i)}{\sum C_i}$$

where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.

- iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	4	B	8	4 x 6 =24
2	Course 2	4	B+	7	4 X 7 =28
3	Course 3	4	B	6	4X 6 = 24
4	Course 4	4	O	10	4 X 10 =40
5	Course 5- Practical I	4	C	5	4 X 5 =20
6	Course 6 – Practical II	4	B	6	4 X 6 = 24
	Total	24			24+28+24+40+20+24 =160

Thus, **SGPA =160/24 =6.67**

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	6.67	7.25	7	6.25

CGPA = (24X6.67+ 24X 7.25 + 24X7 + 24 X 6.25)/ 96

652.08/96 = 6.79

The Department is free to distribute the Periods between Theory/Tutorial/Practical as per the Course content and the need of the course. However the selection shall be from any one of the following pattern

- 4 : 0 : 0 (four lectures only (no tutorial and no practical) per week).
- 2 : 1 : 1 (two lectures, one tutorial, and one practical per week).
- 0 : 2 : 2 (no lecture, two tutorials, and two practicals per week).
- 1 : 2 : 1 (one lecture, two tutorials, and one practical per week).
- 2 : 2 : 0 (two lectures, two tutorials, and no practical per week).
- 0 : 4 : 0 (no lecture, four tutorials only, and no practical per week).
- 1 : 1 : 2 (one lecture, one tutorial, and two practicals per week).
- 2 : 0 : 2 (two lectures, no tutorial, and two practicals per week).
- 0 : 0 : 4 (no lecture, no tutorial, and four practicals only per week).
- 1 : 0 : 3 (one lecture, no tutorial, and three practicals per week).
- 3 : 1 : 0 (three lectures, one tutorial, and no practical per week).
- 0 : 1 : 3 (no lecture, one tutorial, and three practicals per week).
- 1 : 3 : 0 (one lecture, three tutorials, and no practical per week).
- 3 : 0 : 1 (three lectures, no tutorial, and one practical per week).
- 0 : 3 : 1 (no lecture, three tutorials, and one practical per week).

The Duration of the Period shall be forty five minutes. In each of these combinations, the first value stands for the same number of lecture instructions per week, whereas the last two values stand for double the number of tutorial / practical instructions per week.

In each practical group the number of students that can be accommodated will be decided by the respective Department Council; the general/existing pattern is 15 to 20 students in each group. The workload is to be computed accordingly.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective) involve an evaluation system of students that has the following two components:-

- (i) **Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
 - (ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.
- (i) **Continuous Comprehensive Assessment (CCA):** This would have the following components:
- a. **Quizzes:** Two Quiz examinations of 45 minutes duration each having a maximum of 40 marks shall be arranged for theory paper during the semester course period
 - b. **Term Test:** One term test shall be arranged for each theory paper prior to End-Semester Examination; examination duration shall be of three hours; maximum marks is 70

- c. **Seminar:** Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 15. The seminar shall commence after first quiz examination and shall be completed prior to term test for all the papers.
- d. **Classroom Attendance** – Each student will have to attend a minimum of 75% Lectures / Tutorials / Practicals. A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE). Attendance shall have 15 marks and will be awarded by following the system proposed below:

Those having greater than 75% attendance (for those participating in Co-curricular activities, 25% will be added to per cent attendance) will be awarded CCA marks as follows:-

75% to 80%	=	3 marks
80% to 85%	=	6 marks
85 to 90%	=	9 marks
90% to 95%	=	12 marks
> 95%	=	15 marks

All students' cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Science.

- e. CCA are based on open evaluation system without any bias to any student
- f. Any grievance received in the Department from student shall be placed before the **Grievance Redressal Committee** with adjudicated comments

Each component marks will be added without rounding and the total thus obtained is ratio by a factor of six. This value shall be rounded.

Illustration :

Quiz 1 – Marks obtained	=	30
Quiz 2 – Marks obtained	=	35.5
Term Test Marks obtained	=	50.5
Seminar Marks obtained	=	14
Attendance Marks obtained	=	9
Total	=	139.00
Conversion	=	$139/6 = 21.16666$
Award	=	22.00

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective Department shall declare the result as “Satisfactory” or “Non-Satisfactory”; each student need to get a minimum of three “Satisfactory” declaration for the course completion

In laboratory courses (having only practical (P) component), the CCA will be based on students attendance (50%); hands on Practical in physical science stream (50%) and collection of biological material (25%) and hands on Practical (25%) in biological and earth science stream.

For QUIZ (2 quizzes per semester), 40 marks per Quiz and total of 80 marks, 45 minutes duration for each quiz:

Types of question	Number of Questions	Marks Per question	Total marks per type
1. Multiple choice	10	1	10
2. Fill in the blanks	10	2	20
3. Short answer (15 words)	5	2	10
Total	25		40

For the Term test and ESE:

Part A

Ten short type questions (Definitions, functions, short explanations, etc) for two marks each. $10 \times 2 = 20$ marks; two questions from each Unit; no choice in this part

Part B

Five short answer (25 words) type questions for four marks each. $5 \times 4 = 20$ marks; one question from each Unit with internal choice

Part C

Five questions of long/explanatory Answer (400 words) type, one drawn from each Unit; student need to answer any three; ten marks each; $3 \times 10 = 30$ marks

20+20+30 = 70 marks

Qualifying for Next semester

1. **A student acquiring minimum of 35% in total of the CCA is eligible to join next semester.**
2. A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as 'Fail'), shall be permitted to appear in such failed course(s)'in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.
3. A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time i.e three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted. Additional chances examination fee shall be on additive basis.

Improvement Option:

Every student shall have the opportunity to improve Credit through University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final. There shall be no improvement opportunity in Practical examinations.

Result Declaration:

The ESE (End Semester Examination/University Examination) results shall be declared within twenty days of the last examination. The Theory/ Practical Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation.

M.Sc. Remote Sensing (2016-2018)

M.Sc. Remote Sensing: Semester I

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuou s Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Core course 1	RS 101	Remote Sensing and Its Techniques	4-0-0	4	30	70	100
Core course 2	RS 102	Digital Image Processing and Technique	4-0-0	4	30	70	100
Core course 3	RS 103	Geological remote Sensing and Technique	4-0-0	4	30	70	100
Core course 4	RS 104	Basic Digital Cartography	4-0-0	4	30	70	100
Core course practical 1	RS 105	Remote Sensing and Digital Image Processing and Technique	0-0-8	4	30	70	100
Core course practical 2	RS 106	Geological remote Sensing and Technique, Basic Digital Cartography	0-0-8	4	30	70	100
Skill Development Course I	RS 107	Survey in Field	2-0-2				
				24	180	420	600

M.Sc. Remote Sensing : Semester II

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuou s Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Core course 5	RS 201	GIS and Software	4-0-0	4	30	70	100
Core course 6	RS 202	GIS Data Analysis	4-0-0	4	30	70	100
Core course 7	RS 203	DBMS	4-0-0	4	30	70	100
Core course 8	RS 204	GPS and electronic Survey	4-0-0	4	30	70	100
Core course practical 3	RS 205	GIS and Software, GIS Data Analysis	0-0-8	4	30	70	100
Core course practical 4	RS 206	DBMS, GPS and electronic Survey	0-0-8	4	30	70	100
Skill Development course II	RS 207 (any one)	A) Minerals and rocks	2-0-2				
				24	180	420	600

M. Sc. Remote Sensing: Semester III

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Core course 1	RS 301	Microwave remote Sensing and Applications	4-0-0	4	30	70	100
Core course 2	RS 302	Hyperspectral Remote Sensing and Applications	4-0-0	4	30	70	100
Core course 3	RS 303	Digital Photogrammetry and Applications	4-0-0	4	30	70	100
Core course 4	RS 304	Lidar Remote Sensing and Applications	4-0-0	4	30	70	100
Core course practical 1	RS 305	Microwave remote Sensing and Applications, Hyperspectral Remote Sensing and Applications	0-0-8	4	30	70	100
Core course practical 2	RS 306	Digital Photogrammetry and Applications, Lidar Remote Sensing and Applications	0-0-8	4	30	70	100
Skill Development Course I	RS 307	RS and GIS for Urban and Regional Planning	2-0-2				
				24	180	420	600

M. Sc. Remote Sensing: Semester IV

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuou s Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Core course 1	RS 401	RS & GIS for Hydrology and Water Resources	4-0-0	4	30	70	100
Core course 2	RS 402	RS & GIS for Agriculture and Forestry	4-0-0	4	30	70	100
Core course 3	RS 403	RS & GIS for ocean Engg & Coastal Managment	4-0-0	4	30	70	100
Core course 4	RS 404	RS & GIS for Diaster Managment	4-0-0	4	30	70	100
Core course practical 1	RS 405	RS & GIS for Hydrology and Water Resources, RS & GIS for Agriculture and Forestry	0-0-8	4	30	70	100
Core course practical 2	RS 406	RS & GIS for ocean Engg & Coastal Management, RS & GIS for Diaster Managment	0-0-8	4	30	70	100
Skill Development Course I I	RS 407	Building and Decorative stone	2-0-2				
				24	180	420	600

M.Sc. Remote Sensing Syllabus (2016-2018)

SEMESTER I

1.Core PAPER RS 101: Remote Sensing and Its Techniques

UNIT I-INTRODUCTION AND CONCEPTS

Introduction of Remote Sensing – Energy sources and Radiation principles, Energy equation, EMR and Spectrum, EMR interaction with Atmospherescattering, Absorption, EMR interaction with earth surface features reflection, absorption, emission and transmission, Spectral response pattern , vegetation, soil, water bodies- Spectral reflectance 5 RS-2013 SRM(E&T)

UNIT II-AERIAL PHOTOGRAPHY AND PHOTOGRAMMETRY

Introduction-,Terrestrial and Aerial photographs - vertical and oblique photographs - height determination contouring - photographic interpretations - stereoscopy – parallax bar- Flight Planning- Photo Interpretation, Applications of aerial Photos-Photo theodolite

UNIT III-SATELLITE REMOTE SENSING PRINCIPLES

Data acquisition –Procedure, Reflectance and Digital numbers- Intensity-Reference data, Ground truth, Analog to digital conversion, Detector mechanism-Spectro- radiometer-Ideal remote sensing system – Characters of real and successful remote sensing system- Platforms and sensors- orbitstypes – Resolution

UNIT IV-REMOTE SENSING SATELLITES

Land observation satellites, characters and applications, IRS series, LANDSAT series, SPOT series, High resolution satellites, character and applications, CARTOSAT series, IKONOS Series, QUICKBIRD series, Weather/Meteorological satellites, INSAT series, NOAA, GOES, NIMBUS Applications, Marine observation satellites OCEANSAT

UNIT V-TYPES OF REMOTE SENSING AND IMAGE INTERPRETATION

Introduction- Active, Passive, Optical Remote sensing, visible, infrared, thermal, sensors and characters. Microwave remote sensing Sensors, Concept of Microwave remote sensing, SLAR, SAR Scattrometers,- Altimeter, Characteristics , Image interpretation characters.

Paper RS 102: Digital Image Processing and Techniques

UNIT I-IMAGE ACQUISITION AND FORMAT

Satellite data acquisition, DN characters-kernels- storage devices, CC, CDisk, Optical disk.Data retrieval. Export and import, Data formats, BSQ, BIL, BIP, Run length encoding, Image Compression Data products , hard copy, digital products, Image display system, requirement.

UNIT II-IMAGE DISTORTION AND RECTIFICATION

Introduction-Sensor model, Preprocessing and Post processing Geometric distortion, sources and causes for distortion, rectification, GCP, Resampling, Image registration, transformation, Radiometric distortion, sources and causes, Computation of radiance, Computation of reflectance, cosmetic operations, Noise removal, atmospheric correction.

UNIT III-IMAGE ENHANCEMENT

Satellite image statistics ,Univariate and multi-variate statistics. Basics of Histogram, noise models, image quality,. contrast manipulation, grey level thresholding, level slicing, contrast stretching- Spatial feature manipulations, spatial filtering, convolution Low pass, high pass, edge enhancement, edge detection, Fourier analysis .

UNIT IV-IMAGE CLASSIFICATION

Introduction,Classification techniques, feature extraction, Supervised, training stage, classification stage, scatterogram, minimum distance to mean 7 RS-2013 SRM(E&T) classifier, Parallelepiped classifier, Gaussian maximum Likelihood classifier,unsupervised classification, Hybrid classifier, classification of mixed pixel-fuzzy classification, output stage, classification accuracy , error matrix

UNIT V-IMAGE ANALYSIS

Digital Image interpretation ,Pattern recognition, shape analysis, Textural analysis, Decision concepts, fuzzy sets and Evidential reasoning, Change detection, multitemporal data merging, multi sensor image merging-merging image data with ancillary data, Expert system, Artificial Neural Network; Integration with GIS.

Paper RS 103: Geological Remote Sensing and Technique

UNIT I-SPECTRAL PROPERTIES OF ROCKS AND MINERALS

Reflectance Properties of Rocks, minerals in visible, NIR, MIR, SWIR, TIR and Microwave regions Laboratory spectroscopy - laboratory and field spectral data comparative studies, Spectral reflection curves for important Rocks, Minerals

UNIT II-GEOLOGICAL STRUCTURE AND APPLICATIONS

Significance of Geological structures, Role of aerial photographs, Photo interpretation characters of photographs and satellite images, structural mapping, Fold, fault, Lineaments, Direction circular features. Intrusive rocks, rock exposure, Fractures and Joints, Rose diagram. Digital image processing for structural mapping

UNIT III-LITHOLOGICAL MAPPING

Introduction on Igneous rocks, sedimentary rocks, metamorphic rocks, mapping of regional scale lithological units, Image Characters of igneous rocks, sedimentary and metamorphic rocks, examples. Digital image processing of various rock types, resolution and Scale of lithological mapping and advantages

UNIT IV-GEOMORPHOLOGICAL MAPPING

Significance of landform, Geomorphological guide, interpretation and image/photo characters, Tectonic landforms, Fluvial landforms, Denudational landforms, Volcanic landforms- Aeolian landforms, Coastal landforms. Importance of ground truth and geological field data collection

UNIT V-GEOLOGICAL SURVEY TECHNIQUES AND DATA INTEGRATION

Geophysical survey, surface investigation, subsurface investigation, Gravity survey, Seismic survey, refraction methods, reflection methods, applications, Magnetic survey and Electrical resistivity survey, self potential methods, potential drop methods, resistivity values, data interpretation, Curve fitting, GIS data generation , integration and analysis

Paper RS 104: Basic and Digital Cartography

UNIT I-INTRODUCTION

History and development of Cartography, Definition, scope and concepts of cartography. Characteristics of Map. Categories of maps.. Methods of mapping, relief maps, thematic maps. Trends in Cartography. 16 RS-2013 SRM(E&T)

UNIT II-EARTH MAP RELATION

Geodesy, Map projection, classification principles of construction of common projections, cylindrical, conical, azimuthal and globular projections. Properties & uses of projection. The spheroid, Map scale, and co-ordinate system. Plane co-ordinates in UTM system, projection used in Survey of India topographic sheets.

UNIT III-CARTOGRAPHIC PROCESS

Sources of Data-Ground Survey and positioning, Remote sensing, Census and sampling, Data processing-image processing, digital database, Geographic and cartographic database, basic Statistical processing, Design of colour and pattern, typography and lettering the map.

UNIT IV-CARTOGRAPHIC ABSTRACTIONS

Processing and generalizing geographic data, Simplification and Classification, computer assisted cartographic processes, symbolization, mapping with point, line and area symbols-Portraying the land surface form. Map Compilation-Analog and Digital Compilation.

UNIT V-MAP EXECUTION

Map reproduction. Methods of few copies and many copies. Map production: Form of Art Work-Construction Method-Output option- Digital cartography, Geographic Information System

RS 105 : Core Practical 1:

- (i) INTRODUCTION OF REMOTE SENSING AND CONCEPTS OF AERIAL PHOTOGRAPHY AND PHOTOGRAMMETRY
- (ii) SATELLITE REMOTE SENSING PRINCIPLES AND REMOTE SENSING SATELLITES
- (iii) TYPES OF REMOTE SENSING AND IMAGE INTERPRETATION AND IMAGE ACQUISITION AND FORMAT
- (iv) IMAGE DISTORTION AND RECTIFICATION, IMAGE ENHANCEMENT
- (v) IMAGE CLASSIFICATION AND IMAGE ANALYSIS

RS 106: Core Practical 2:

- (i) SPECTRAL PROPERTIES OF ROCKS AND MINERALS, GEOLOGICAL STRUCTURE AND APPLICATIONS

(ii) LITHOLOGICAL MAPPING AND GEOMORPHOLOGICAL MAPPING

(iii) GEOLOGICAL SURVEY TECHNIQUES AND DATA INTEGRATION, INTRODUCTION TO CARTOGRAPHY

(iv) EARTH MAP RELATION AND CARTOGRAPHIC PROCESS

(v) CARTOGRAPHIC ABSTRACTIONS AND MAP EXECUTION

RS 107: SKILL DEVELOPMENT COURSE:

Survey in Field

1. Principles of surveying. Survey equipments.
2. Radial method of plane table survey.
3. Plane table survey with intersection methods.
4. Pace/Tape and compass methods survey with theodolite with various applications.

SEMESTER II

PAPER RS 201 : GIS and Software

UNIT I-BASICS OF GIS

Introduction, concepts , Information system , components of GIS, History, Geospatial data architecture, Operations, Geographic co ordinate systems, Map projections, concepts, Input data for GIS , display ,types of output products. GIS categories, Level and scale of Measurement, importance of data quality

UNIT II-VECTOR DATA & PROCESSING

GIS data types, data Representation, Data sources, typical GIS data sets, Data Acquisition, vector data model , topology, topology rules, Non topological vector data, object based vector data model, relationship between classes, data structure, data verification and editing spatial data models and errors –GIS database , attribute data input and management

UNIT III-RASTER DATA AND PROCESSING

Raster data – elements of data model, cell, value, data structure, cell by cell encoding, run length encoding, Quad tree, Header files,, format, Types of raster data, data compression, Linking and integration of vector data, Registration 10 RS-2013 SRM(E&T)

UNIT IV-DATA CONVERSION AND EDITING

Data format conversion, Medium conversion, Spatial interpolation, measurement and analysis methods, Data accuracy and standards, Attribute data input and Management- Relational mode- Data manipulation-leclassification techniques,

UNIT V-META DATA AND GIS MODELLING

Meta data – data standard- OGC- open source GIS - GIS modeling, basic elements, classification, model processing, integration, Binary models, index model, regression models, linear regression model, logistic regression model, process model.

PAPER RS 202: GIS and Data Analysis

UNIT I-INTRODUCTION TO GIS SOFTWARES

Defining GIS -introduction to Spatial Data File Formats - Basics of Arc Catalog and Arc Map, Tabular Data Design, Functions, pitfall and Reprocessing, Tables, Queries, and Basic Geoprocessing Tools, Data sources and data collection data files in ArcMap and ArcPad, The Raster Data File Format-, Overview of MAP INFO, QGIS, ERDAS IMAGINE

UNIT II-DATA ANALYSIS TOOLS

The Spatial Analyst Extension and Model Builder, Metadata –Georeferencing – Geocoding- Network Analyst, Interpolation and Surface Modeling ,Interpolation Methods , The Geodatabase , Building a Geodatabase, Cartographic Design .

UNIT III-SPATIAL DATA ANALYSIS

Spatial interpolation, measurement and analysis methods, reclassification techniques, Buffer analysis, overlay analysis, Vector over lay analysis, Topological overlay, raster over lay analysis – measurement of length, perimeter and area – queries –2D to 3 D conversion- DTM and DEM, advantages and disadvantages, Network modeling,

UNIT IV-GIS MODELLING

GIS modeling, basic elements – classification, model processing, integration, Binary models, index model, regression models – linear regression model, logistic regression model, process model, applications – problem identification– designing data model, project management and evaluation – implementation

UNIT V-SPATIAL ANALYSIS

GIS Applications in automated mapping (AM)/ Facility management (FM) Multi criteria evaluation using GIS - Techniques - case studies - use of knowledge based tools with GIS - Expert system.Object oriented GIS, web based GIS, WEB based GIS Applications.

Paper RS 203: DBMS

UNIT I-TYPES OF DBMS

Data -Types -Database – Attribute – Types - Hardware and Software requirements -Database Management Systems -Types of DBMS -Hierarchical, Network, Relational Models - Distributed Databases - Client Server Databases -Knowledge Based Systems -Geographic Databases - E-R diagram

UNIT II-NORMALIZATION

File Organization -Sequential, Index Sequential, Random, Multikey file Organisation - advantages -Relational Database Management System - Normalization -First, Second, Third, Boyce-Codd, Fourth and Fifth normalizations.

UNIT III-ORACLE OPERATORS

Oracle Operators -Arithmetic, Comparison, Logical Operators – Operator Precedence -Privilege commands - SQL functions -Single row, data, 13 RS-2013 SRM(E&T) character and numeric functions -Group functions - Count functions-Triggers in Oracle.

UNIT IV-SQL FUNCTIONS

SQL – TCL, DDL, DML – Data types – basic constraints – change statements – basic queries in SQL – Complex SQL queries – Nested, correlated Nested queries – joined tables – Insert, Delete, update Statements in SQL.

UNIT V-ORACLE DEVELOPER 2000

Oracle forms – Object Navigator – Triggers – Hierarchical levels – Alerts – Blocks – Items – Editors – Record groups – LOVs – Object Groups – Menus – Query – Oracle reports – Data model Editor – Layout Editor

Paper RS 204 : GPS and Electronic Survey

UNIT I-BASICS OF GPS

Introduction – GPS satellites – components – Satellite Ranging – codes - Basics of Geodesy – Branches, Applications and Observations of Geodesy.

UNIT II-GPS RECEIVERS

GPS – DGPS - GPS Receiver and its Features – Receiver selection – enhancement of receiver - GPS processor Software – GPS Data – Processing of GPS data and types

UNIT III-TYPES OF GPS SURVEYING

GPS Field Survey techniques – advantages – Characteristics – Positioning modes – static surveying – kinematics surveying - Doppler effect and basic positioning concept - Dilution of Precision – Types - Multi-path effect – field practices

UNIT IV-FUNDAMENTALS OF ELECTRONIC SURVEYING

Refractive index. Factors affecting RI, computation of group refractive index for light and near infrared waves at standard conditions and ambient conditions.

UNIT V-TYPES OF EDM INSTRUMENTS

Electro-optical system, measuring principle, working principle, sources of errors, infrared EDM instruments, Laser EDM instruments and total station. Microwave system, measuring principle – field practices.

RS 205: Core Course Practical 1

- (i) BASICS OF GIS, VECTOR DATA PROCESSING
- (ii) RASTER DATA AND PROCESSING, DATA CONVERSION AND EDITING
- (iii) META DATA AND GIS MODELLING, INTRODUCTION TO GS SOFTWARES
- (iv) DATA ANALYSIS TOOLS, SPATIAL DATA ANALYSIS
- (v) GIS MODELLING AND SPATIAL ANALYSIS

RS 206: Core Course Practical 2

- (i) TYPES OF DBMS, NORMALIZATION
- (ii) ORACLE OPERATORS AND SQL FUNCTIONS
- (iii) ORACLE DEVELOPER 2000 AND BASICS OF GPS
- (iv) GPS RECEIVERS AND TYPES OF GPS SURVEYING
- (v) FUNDAMENTALS OF ELECTRONIC SURVEYING AND TYPES OF EDM INSTRUMENTS

RS 207: SKILL DEVELOPMENT COURSE (Any One)

1. Introduction to minerals and rocks: common rock forming mineral.
2. Common non silicate minerals.
3. Igneous rocks.

4. Sedimentary rocks
5. Metamorphic rocks

SEMESTER III

RS 301

Paper I: Microwave Remote Sensing and Applications

UNIT I-BASICS OF MICROWAVE REMOTESENSING

Fundamentals – EMR-Electromagnetic Spectrum - Microwave Band Designation Microwave interaction with atmospheric constituents, Earth's surface, vegetation, and ocean.

UNIT II-RADIOMETRY & ANTENNA SYSTEMS

19 RS-2013 SRM(E&T) Basics - Theory of Radiometry - Sensors applications in atmosphere, ocean and land. Antenna –Types and Functions of different types of antenna

UNIT III-RADAR

Radar-Real and synthetic aperture radars, - Principles - different platforms and sensors, System parameters, Target parameters, Radar equation measurement and discrimination, Airborne Data products and selection procedure - SEASAT, SIRA, SIRB, ERS , JERS, RADARSAT missions.

UNIT IV-RADAR DATA PROCESSING

Radar grammetry, Image processing, SAR Interferrometry – Polarimetry- Interpretation of microwave data - Physical mechanism and empirical models for scattering and emission, volume scattering.

UNIT V-APPLICATIONS OF MICROWAVE REMOTE SENSING

Geological interpretation of RADAR –sites-default-files, Application in Agriculture -forestry, Hydrology - ice studies – land use mapping and ocean related studies

RS 302 Paper II: Hyperspectral Remote Sensing and Applications

UNIT I-INTRODUCTION

Multispectral and hyperspectral remote sensing, Comparison of Multispectral and Hyperspectral Image Data, Spectral Signatures and BRDF in the Visible, Near Infrared and Shortwave Infrared regions of EMR, Hyperspectral Issues.

UNIT II-SENSORS AND HYPERSPECTRAL IMAGING DEVICES

Scanner types and characterization - specifications of various sensors Spectrographic imagers-hyperspectral sensors, Design tradeoffs. Data formats and systems, AVIRIS, CASI, NASA Terra Moderate Resolution Imaging Spectrometer (MODIS), Hyperion.

UNIT III-PREPROCESSING OF HYPERSPECTRAL DATA

Hyperspectral Data Cube, Hyperspectral Profiles, Data Redundancy. Problems with Dimensionality, Principal Component, Minimum Noise Fraction (MNF), Atmospheric Correction, Atmospheric Correction Measures, Flat Field Correction, Empirical Line Calibration, Empirical Flat Field Optimized, Reflectance Transformation (EFFORT), Continuum Removal, Spectral Feature Fitting.

UNIT IV-HYPERSPECTRAL DATA ANALYSIS

Derivative spectral analysis, techniques for analysis of hyperspectral data, first-order and second-order derivative spectra, Theoretical basis and relevance, Methods of generating derivative spectra, electronic, electromechanical, numerical techniques, case studies.

UNIT V-APPLICATIONS

21 RS-2013 SRM(E&T) Applications of Hyperspectral Image Analysis Forestry to Mineral exploration, soil mapping, coastal water quality studies, quantification of biophysical parameters

RS. 303: Paper III: Digital Photogrammetry and Applications

UNIT I-INTRODUCTION

Evolution of digital photogrammetry - analog, analytical, digital-Advantages - Auto - Imation - accuracy - Representation of digital images - 8/ W. RG8, CMYK, HLS. EMR - Band designation - Microwave interaction with atmospheric constituents, Earth's surface, vegetation, and ocean. 22 RS-2013 SRM(E&T)

UNIT II-DIGITAL PHOTOGRAMMETRY & ITS COMPONENTS

Digital Cameras - CCD Camera - Full frame CCD Frame transfer CCD, CCD cameras 1 with piezo shift, Interline transfer CCD, Time delay integration CCD sensor - Spectral Sensitivity of CCD sensor, Geometric problems of CCD images - line jitter, blooming, warm up effect, tailing - Typical CCD systems, line scanners - SPOT, MOMS Data.

UNIT III-DIGITAL CONVERSIONS

Analog to digital conversion - Scanner - flat bed, drum type – Sensor characteristics - Scanner resolutions - Scanner calibration -Video Cameras - Frame Grabber - Typical Scanner systems and Video cameras.

UNIT IV-IMAGE TRANSFORMATIONS & MEASUREMENTS

Merits, demerits - Stereo viewing - Spatial, spectral and temporal methods - Image measurement - Coordinate system - Image movement -fixed image, moved image - Image transformation - Geometrical transformation, Radiometric transformation - Concepts of Interior, Relative and Absolute orientation.

UNIT V-DIGITAL PHOTOGRAMMETRIC APPLICATIONS

DTM generation - Image correlation - Image matching - Digital Orthophoto generation - Automated aerotriangulation - Link between GIS and Digital Photogrammetry.

RS. 304

Paper IV: Lidar Remote Sensing and Applications

UNIT I-LIDAR SYSTEM DESIGN

Introduction to Lasers and Lidar – Definitions - History of Lidar Development - Lidar System Components - lidar sensors single-return, multireturn, waveform, photon-counting, Characteristics of Lidar Data - interaction of laser energy with earth surface features - Lidar Systems

UNIT II-LIDAR REMOTE SENSING PLATFORMS

Introduction to the Lidar remote sensing platform - Historical development of lidar remote sensing platforms Airborne platforms, Laser Scanning, Fixed- Wing Platforms, Rotary-Wing Platforms - Terrestrial, airborne, and spacebar types – Spaceborne platforms – orbits-Bathymetric Mapping.

UNIT III-GEOREFERENCING AND CALIBRATION OF LIDAR DATA

Geodesy, Datums, Map projections and Coordinate Systems – Direct Georeferencing Technology - Boresight Calibration - Lidar Data Preprocessing - Project Coverage Verification - Review Lidar Data against Field Control - Lidar data errors and rectifications, - processes calibration of Lidar data - artifacts and anomalies - Lidar Error Budget.

UNIT IV-AUTOMATED CLASSIFICATION

Noise Removal and other sensor-related artifacts - Layer Extraction - Automated Filtering -. Manual Editing and Product Generation – Surface Editing - Hydrologic Enforcement – Lidargrammetry - Terrain Data Products, definitions, DEM, DSM -TIN, Breaklines, Contours, Specifications, Terrain Products from Lidar - Quality Assurance, Control, and Accuracy Assessment.

UNIT V-LIDAR APPLICATIONS

24 RS-2013 SRM(E&T) Topographic Mapping, , flood inundation analysis, line-of-sight analysis – Forestry, various types of lidar sensors-, vegetation metric calculations - specific application software - corridor mapping system, data processing and quality control procedures.

RS 305: Core Course Practical 1

- (i) BASICS OF MICROWAVE REMOTE SENSING AND RADIOMETRY AND ANTENNA SYSTEM
- (ii) RADAR AND RADAR DATA PROCESSING
- (iii) APPLICATIONS OF MICROWAVE REMOTE SENSING AND INTRODUCTION TO HYPERSPECTRAL REMOTE SENSING AND APPLICATION
- (iv) SENSORS AND HYPERSPECTRAL IMAGING DEVICES AND PREPROCESSING OF HYPERSPECTRAL DATA
- (v) HYPERSPECTRAL DATA ANALYSIS AND ITS APPLICATIONS

RS 306: Core Course Practical 2

- (i) INTRODUCTION TO DIGITAL PHOTOGRAMMETRY AND APPLICATIONS AND DIGITAL PHOTOGRAMMETRY AND ITS COMPONENTS
- (ii) DIGITAL CONVERSIONS AND IMAGE TRANSFORMATIONS & MEASUREMENTS
- (iii) DIGITAL PHOTOGRAMMETRIC APPLICATIONS, LIDAR SYSTEM DESIGN
- (iv) LIDAR REMOTE SENSING PLATFORMS, GEOREFERENCING AND CALIBRATION OF LIDAR
- (v) AUTOMATED CLASSIFICATION AND LIDAR APPLICATIONS

RS 307: SKILL DEVELOPMENT COURSE (Any One)

RS & GIS for Urban and Regional Planning

- (i) To study the RS and GIS data
- (ii) To study the Mapping for Urban and Regional areas
- (iii) To study GIS Tool in Urban Planning

SEMESTER IV

RS 401

Paper I: RS and GIS for Hydrology and Water Resources

UNIT I-HYDROLOGICAL COMPONENTS

Hydrological cycle, Estimation of various components of hydrological cycle, rainfall, runoff, evaporation, transpiration, evapotranspiration, crop evapotranspiration, depression and interception loss, infiltration and percolation losses.

UNIT II-WATERSHED CHARACTERISTICS

Watershed, types, divide, catchment, command area, stream types, influent, effluent, ephemeral, non perennial. Drainage network, different pattern, morphometric analysis, linear, area, relief aspects. GIS applications for watershed analysis

UNIT III-HYDROLOGICAL STUDIES

Hydrological aspects- mapping and monitoring, management Mapping of snow covered area and glacial outburst, soil moisture estimation, Optical and microwave remote sensing techniques, drought zonation, Agricultural, meteorological and hydrological, flood mapping pre and post flood area estimation and control measures –GIS applications for hydrological disaster studies

UNIT IV-GROUND WATER RESOURCES APPLICATIONS

28 RS-2013 SRM(E&T) Types of Aquifers formations confined and unconfined aquifers Assessment of Groundwater potential zones and Groundwater mapping. Site selection for recharge structures- Hydrogeological Mapping GIS applications to ground water studies

UNIT V-SURFACE WATER RESOURCES APPLICATIONS

Surface water bodies, lakes, reservoirs, ponds, rivers, channels, mapping change detection, Water harvesting structures, in-situ and Ex-situ, Mapping and monitoring of catchment and

command area, Water logging and salt affected area mapping, Reservoir Sedimentation, sedimentation control. GIS applications to surface water studies

RS 402: Paper II : RS and GIS for Agriculture and Forestry

UNIT I-SPECTRAL CHARACTERISTICS OF LEAF

Structure of leaf - Spectral behavior of leaf – Vegetation indices – NDVI, TVI, SVI, PCA – Vegetation classification and mapping - Estimation of Leaf area index, Biomass estimation – Estimation of terrestrial carbon assimilation in forests - case studies.

UNIT II-FOREST MAPPING

Forest type and density mapping and forest stock mapping using RS technique -factors for degradation of forests – deforestation/afforestation/. Change detection in forests - case studies

UNIT III-BIODIVERSITY CHARACTERIZATION MAPPING

Forestry – Forest taxonomy – Linnaeus classification – Biodiversity characterization – Forest fire risk zonation – wildlife habitats suitability analysis - case studies.

UNIT IV-AGRICULTURAL APPLICATIONS

Identification of crops -acreage estimation -production forecasting - pests and disease attacks through remote sensing -crop stress detection due to flood and drought - catchments and command area monitoring.

UNIT V-SOIL APPLICATIONS

Soil survey and land use classification - water logging - characters of saline, alkali soils - soil erosion – types – Estimation of soil loss from USLE using Remote sensing and GIS - Wasteland development.

RS 403: Paper III: RS and GIS for Environmental Engineering

UNIT I-BASICS

Water- Air-Land-Marine Environment Global Climatologic, urban Environment Environmental satellites GEOS, NOAA, AVHRR, CZCR Monitoring land, water, atmosphere and ocean using Remote Sensing Data. Water- Air-Land-Marine Environment Global Climatologic, urban Environment:

UNIT II-SOIL DEGRADATION

Spectral characteristics of soil- Soil formation- classification of soils- soil survey interpretation and mapping- impact of agricultural and industrial activity on soil properties. RS & GIS in

assessing Soil salinity- alkalinity water logging studies- soil erosion- types and estimation - control measures.

UNIT III-WATER QUALITY AND GROUND WATER POLLUTION

Spectral characteristics of water- classification of water quality -Data base creation and quality modeling using GIS. Aquifer Vulnerability –Intrinsic and specific vulnerability- contaminant transport model

UNIT IV-AIR QUALITY AND COASTAL STUDIES

Atmosphere: Chemicals, Particulate matters present in the atmosphere, allowable limits, Remote Sensing techniques - Monitoring atmosphere 31 RS-2013 SRM(E&T) constituents- air pollution - industrial activity, modeling using GIS – Ecology studies- Coastal color monitoring- marine studies.

UNIT V-ENVIRONMENTAL MANAGEMENT

Revenue management-environment and ecological concerns- Resource development in remote areas-Impacts of anthropogenic activity- Solid Waste management- Forest classification Mapping – Biomass estimation – Carbon footprints and sinks, carbon trading, carbon credits and marketing, Indian and international status

RS 404

Paper IV: RS and GIS for Disaster Management

UNIT I-HYDROLOGICAL & GEOLOGICAL DISASTERS

Basic concepts and principles - Hydrological and geological disasters, Role of Government administration, NGO's - International disaster assistance -Sharing techno - logy and technical expertise.

UNIT II-PREDICTION & MITIGATION

Needs and approach towards prevention - Principles and components of mitigation - Disaster legislation and policy - Cost effective analysis - Utilisation of resources - Training - Education - Public awareness - Roles of media.

UNIT III-CYCLONES & FLOODS

Dams, Bridges, Hospitals, Industrial structures, Disaster resistant structures - Low cost housing for disaster prone areas - Cyclone shelter projects and their implications - Reconstruction after disasters.

UNIT IV-REMOTE SENSING MONITORING & ANALYSIS

Remote Sensing Application - Risk assessment - Damage assessment – Land use planning and regulation for sustainable development - Use of Internet - 34 RS-2013 SRM(E&T) Communication Network -Warning system - Post disaster review – Case studies.

UNIT V-ROLE OF GIS IN DISSTERS

Vulnerability analysis of infrastructure and settlements - Pre-disaster and post disaster planning for relief operations - Potential of GIS application in development planning and Disaster management plan - Case studies.

RS 405: Core Course Practical 1

- (i) HYDROLOGICAL COMPONENTS AND WATERSHED CHARACTERS
- (ii) HYDROLOGICAL STUDIES AND GROUNDWATER RESOURCES APPLICATIONS
- (iii) SURFACE WATER RESOURCES APPLICATIONS AND SPECTRAL CHARACTERISTICS OF LEAF
- (iv) FOREST MAPPING AND BIODIVERSITY CHARACTERIZATION MAPPING
- (v) AGRICULTURAL APPLICATIONS AND SOIL APPLICATIONS

RS 406: Core Course Practical 2

- (i) BASICS OF RS AND GIS FOR ENVIRONMENTAL ENGINEERING, SOIL DEGRADATION
- (ii) WATER QUALITY AND GROUNDWATER POLLUTION, AIR QUALITY AND COASTAL STUDIES
- (iii) ENVIRONMENTAL MANAGEMENT, HYDROLOGICAL AND GEOLOGICAL DISASTERS
- (iv) PREDICTION & MITIGATION, CYCLONES AND FLOODS
- (v) REMOTE SENSING MONITORING & ANALYSIS, ROLE OF GIS IN DISSTERS

RS 407: SKILL DEVELOPMENT COURSE

Building and Decorative Stone



**JAI NARAIAN VYAS UNIVERSITY JODHPUR
(RAJASTHAN)**

**FACULTY OF ARTS, EDUCATION AND SOCIAL SCIENCES
SYLLABI
FOR**

M.A. GEOGRAPHY (SEMESTER SCHEME)

(SEMESTER I AND SEMESTER II) EXAMINATIONS 2018-2019

&

(SEMESTER III AND SEMESTER IV) EXAMINATIONS 2018-2019

DETAIL EXAMINATION SCHEME FOR CHOICE BASED CREDIT SYSTEM

GUIDELINES

Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete **four skill courses:** two within the Department and two from other Department within JNV University or the Universities approved by JNV University
3. **Course:** Usually referred to, as 'papers' is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period of teaching (lecture or tutorial) or two periods of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.
12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/ December and even semester from December/January to May.
Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May. The Department shall conduct the Practical examination of odd and even semesters as per the Panel of Examiners approved by the University. Each Board of examiners shall consist for one external Examiner from other University/Institute and another from the Department.
13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Arts, Education & Social Sciences resolves the following:

- a. All internal assessments shall on term test and seminar. Attendance shall carry the prescribed marks in all papers.
- b. In each semester two out of four theoretical components of the University examinations shall be undertaken by external examiners from outside JNV University, who may be appointed by the competent authorities.

Grievances and Redressal Mechanism

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head of the Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.
- b) The appeal will be assessed by the Chairman and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Dean, Faculty of Arts, Education & Social Sciences comprising of the HOD of the concerned Department and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	'O'	Outstanding	10
2	'A+'	Excellent	9
3	'A'	Very Good	8
4	'B+'	Good	7
5	'B'	Above Average	6
6	'C'	Average	5
7	'P'	Pass	4
8	'F'	Fail	0
9	'Ab'	Absent	0

- i. A student obtaining Grade F in a paper shall be considered failed and will be required to reappear in the University End Semester examination.
- ii. For noncredit courses (Skill Courses) 'Satisfactory' or "Unsatisfactory" shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

= and > 95 % marks Grade Point 10.0
90 to less than 95 % marks Grade Point 9.5
85 to less than 90 % marks Grade Point 9.0
80 to less than 85 % marks Grade Point 8.5
75 to less than 80 % marks Grade Point 8.0
70 to less than 75 % marks Grade Point 7.5
65 to less than 70 % marks Grade Point 7.0
60 to less than 65 % marks Grade Point 6.5
55 to less than 60 % marks Grade Point 6.0
50 to less than 55 % marks Grade Point 5.5
45 to less than 50 % marks Grade Point 5.0
40 to less than 45 % marks Grade Point 4.5
35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,
i.e.

$$\text{SGPA (Si)} = \frac{\sum (C_i \times G_i)}{\sum C_i}$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,
i.e.

$$\text{CGPA} = \frac{\sum (C_i \times S_i)}{\sum C_i}$$

where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.

- iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	6	B	6	6 x 6 =36
2	Course 2	6	B+	7	6 X 7 =42
3	Course 3	6	B	6	6X 6 = 36
4	Course 4	6	O	10	6 X 10 =60
	Total	24			36+42+36+60=174

Thus, $\text{SGPA} = 174/24 = 7.25$

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	7.25	7.25	7	6.25

$$\text{CGPA} = \frac{(24 \times 7.25 + 24 \times 7.25 + 24 \times 7 + 24 \times 6.25)}{96}$$

$$666/98 = 6.94$$

Semester-wise Theory Papers/Practical / Skill component

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Semester I							
Core course 1	GCC 101		6-0-0	6	30	70	100
Core course 2	GCC 102		6-0-0	6	30	70	100
Core course 3	GCC 103		6-0-0	6	30	70	100
Core course 4	GCC 104		6-0-0	6	30	70	100
Practical Course 5	GPC 105		0-0-12	6	30	70	100
Skill Course I	GSC 101		2-0-2				
Total				30	150	350	500
Semester II							
Core course 6	GCC 201		6-0-0	6	30	70	100
Core course 7	GCC 202		6-0-0	6	30	70	100
Core course 8	GCC 203		6-0-0	6	30	70	100
Core course 9	GCC 204		6-0-0	6	30	70	100
Practical Course 10	GPC 205		0-0-12	6	30	70	100
Skill course II	GSC 202		2-0-2				
Total				30	150	350	500

Semester III							
Core course 11	GCC 301		6-0-0	6	30	70	100
Core course 12	GCC 302		6-0-0	6	30	70	100
Discipline Specific Elective 1	One Elective paper from the list of Group I GEC 303(a,b,c)		6-0-0	6-0-0	6	70	100
Discipline Specific Elective 2	One Elective paper from the list of Group II GEC 304(a,b,c)		6-0-0	6-0-0	6	70	100
Practical Course 15	GPC 305						
Skill course III	GSC 303		2-0-2				
Total				24	120	280	400
Semester IV							
Core course 16	GCC 401		6-0-0	6	30	70	100
Core course 17	GCC 402		6-0-0	6	30	70	100
Discipline Specific Elective 3	One Elective paper from the list of Group I GEC 403(a,b,c)		6-0-0	6-0-0	6	70	100
Discipline Specific Elective 4	One Elective paper from the list of Group II GEC 404(a,b,c)		6-0-0	6-0-0	6	70	100
Practical Course 20	GPC 405						
Skill course IV	GSC 404		2-0-2				
Total				24	120	280	400

*** The Department shall offer one skill course per semester from the list of skill courses approved for the Department.**

In view of the course content, the Department of Geography distributed the Periods between Theory/Tutorial/Practical as under per paper

- 6: 0 : 0 (six lectures only (no tutorial and no practical) per week) – For Theory
- 0: 0 : 12(no lecture, no tutorial and twelve practical only per week)- For practical per paper
- 2+0+2 (two lectures, no tutorial and two practical/field experimentations) - For Skill course

The Duration of the Period shall be forty five minutes. In each of these combinations, the first value stands for the same number of lecture instructions per week, whereas the last two values stand for doubles the number of tutorial/ practical instructions per week

In each practical group the number of students that can be accommodated will be fifteen.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective/ Practicals) involve an evaluation system of students that has the following two components:-

- (i) **Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
 - (ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.
- (i) **Continuous Comprehensive Assessment (CCA):** This would have the following components:
- a. **Term Test:** One term test shall be arranged for each paper prior to End-Semester Examination; examination duration shall be of three hours; maximum marks shall be 60 (reduced to 15).
 - b. **Seminar:** Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 40 (reduced to 10). The seminar shall be completed prior to term test for all the papers.
 - c. **Classroom Attendance** – Each student will have to attend a minimum of 75% Lectures / Tutorials / Practicals. A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE). Attendance marks will be awarded by following the system proposed below:

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

75% to 80%	=	1 mark
81% to 85%	=	2 marks
86 to 90%	=	3 marks
91% to 95%	=	4 marks
96% and above	=	5 marks

Note: Compensation in classroom attendance of a student will be as per prevalent University rules.

Each student's cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Arts, Education & Social Sciences.

- d. CCA is based on open evaluation system without any bias to any student.
- e. Any grievance received in the Department from student shall be placed before the **Grievance Redressal Committee** with adjudicated comments

Each component marks will be added making it rounding as per norms.

Marking Scheme of Continuous Comprehensive Assessment (CCA)

Components	Maximum Marks	Reduced and Original Marks
Term Test	60	(reduced to 15)
Seminar	40	(reduced to 10)
Classroom Attendance	05	05
Total Marks of CCA	100	30

Note : Classroom Attendance marks will be as follows :-

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

Percentage	Marks
75% to 80%	1 mark
81% to 85%	2 marks
86 to 90%	3 marks
91% to 95%	4 marks
96% and above	5 marks

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective Department shall declare the result as "Satisfactory" or "Non-Satisfactory"; each student need to get a minimum of three "Satisfactory" declaration for the course completion

For the Term test and ESE:

Part A

Ten questions (Definitions, illustrations, functions, short explanations, etc; 25-50 words) for one mark each. 10 × 1 = 10 marks; comprising questions from each Unit; no choice in this part

Part B

Four questions of long/explanatory answer (500 words) type, one drawn from each Unit; with internal choices : 4 x 15 = 60 marks.

10+60 = 70 marks

MEDIUM

Candidates are not allowed to use any medium except Hindi or English for answering question papers. For answering papers in the subjects of English/Hindi the medium will be corresponding language only.

Qualifying for Next semester

- i. **A student acquiring minimum of 40% in total of the CCA is eligible to join next semester.**
- ii. A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as 'Fail'), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.
- iii. A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time, i.e. three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted, for additional chances examination fee shall be on additive basis.

Improvement Option:

Every student shall have the opportunity to improve Credit through University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final.

Result Declaration:

The ESE (End Semester Examination/University Examination) results shall be declared within twenty days of the last examination. The Theory Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation.

POST -GRADUTE COURSE: A DESCRIPTION

The full course is of FOUR SEMESTERS spread for TWO YEARS duration. A semester-wise list of courses to be offered is given below. In each paper there will be four units.

SEMESTER I

SEMESTER II

SEMESTER III

SEMESTER IV

Elective paper group – First – Semester III

Elective paper group – Second – Semester III

Elective paper group – First – Semester IV

Elective paper group – Second – Semester IV

Skill Courses in the respective subject

Electives would be discipline centric and only students from concerned departments can register.

ADMISSION

The details of the eligibility conditions and admission procedures are given in the admission forms and on university website. The admission would be done on the basis of merit as per university rules. Reservation for SC, ST and OBC would also be done as per J.N.V. University, Jodhpur rules. Candidates are required to attend minimum 75% of the classes in theory and practicals both.

FACILITIES

The Department of Geography possesses several sophisticated, advanced and modern equipments required for teaching and research.

Faculty Members

Professor

Dr. Irfan Mehar (Head of the Department)

Associate Professor

Dr. Rajendra Parihar

Dr. Jai Singh

Assistant Professor

Dr. Arjun Lal Meena

Dr. Asha Rathore

Mr. Govind Singh

Dr. Lalit Singh Jhala

Mr. Omprakash

Mr. Gaurav Kumar Jain

TEACHING AND EXAMINATION SCHEME

Per Semester

Course	Periods/Week	Examination hours	CCA	ESE	Total
Theory Papers/ Practical					
Course I	6	3	30	70	100
Course II	6	3	30	70	100

Course III	6	3	30	70	100
Course IV	6	3	30	70	100
Practical Courses V	12	6	30	70	100

UNIVERSITY EXAMINATION

Each course paper shall be of three hours duration.

Note: The number of elective to be taught from each group in a particular year shall be decided by the Department. Electives offered will be announced at the beginning of the academic session. Each student shall be assigned one Elective Paper from Group ONE and the second from Group TWO. Elective papers will be allotted on merit-cum-choice basis as far as possible. In the odd semester two skill courses will be those offered by the respective departments in the even semester skill courses will be from other departments.

**SCHEME OF EXAMINATION FOR M.A GEOGRAPHY (SEMESTER SYSTEM) FOR
THE EXAMINATION OF 2018-19**

INSTRUCTIONS FOR THE PAPER SETTERS AND THE STUDENTS

Max. Marks - 70
Min. Marks – 25

Duration – 3 hours

Note :

- (i) There shall be 9 questions in all. Five questions have to be attempted.
- (ii) The first question shall be short answer type containing 10 short questions spread over the whole syllabus to be answered in about 30 words each. It shall carry 10 marks and shall be a compulsory question.
- (iii) Rest of the paper shall contain 8 questions with internal choice. The entire syllabus has been divided into four units. Each unit shall have two questions and the candidates shall be given internal choice i.e. the candidate shall attempt one question from each unit.

SEMESTER I

1. THEORY PAPER/ Practical (Four Core Papers)	ESE	CCA	Total	Lecture- Tutorial- Practical/Week	Credits
Paper- I (GCC 101) Advanced Physical Geography	70	30	100	6-0-0	6
Paper -II (GCC 102) Evolution of Geographical Thought	70	30	100	6-0-0	6
Paper-III (GCC 103) Geography of Arid lands	70	30	100	6-0-0	6
Paper- IV (GCC 104) Social and Cultural Geography	70	30	100	6-0-0	6
Paper- V (GPC 105)Practical (Cartography)	70	30	100	0-0-12	6

Grand Total

.....
500 Marks

.....
30 Credits

Total marks of Semester I 500 marks and credits 30

Skill Course-I(GSC101) (for Students of the Deptt.)

2-0-2

**M.A GEOGRAPHY
(SEMESTER I) 2018-19**

PAPER- I (GCC 101)

ADVANCED PHYSICAL GEOGRAPHY

Unit 1 : Interior of the earth, Isostasy, Continental drift, plate tectonics, Earth movements: folding and faulting;

Unit 2 : Work of sub-aerial denudation: Erosional and depositional work of rivers, winds, glaciers, Karst topography

Unit 3 : Heat balance of the earth and distribution of temperature, distribution of atmospheric pressure and winds; fronts; climatic classification- Koppen

Unit4 : Oceanography : Ocean bottom relief, ocean currents, coral reefs, tides

RECOMMENDED READINGS

Critchfield : General climatology

Davis, WM, : Geographical Essays: 2nd ed.

Jeffereys, H. : The earth

Jenkins, J.T. : A Text-Book of Oceanography

Miller, A.A. : Climatology

Monkhouse, F.J. : The principal of Physical Geography

Murray, J. : The ocean

Patterson, S. : Introduction to meteorology

Seeman, A. : Physical Geography

Stress, J. : The Unstable Earth

Strahler, A.N.: Modern Physical Geography

Thornbury, W.D.: Principles of Geomorphology

Worcester, P.G.: A text-book of Geomorphology

Wooldrighd & Morgan: A text book of Geomorphology

Kaushik, S.D. : Bhu-Akriti-Vigyan, Rustogi. & Co., Meerut, 1983

Savindra Singh : Bhu-Akriti-Vigyan, Tara Publication, Varanasi, 1976

Dayal, P. : Bhu- Akriti Vigyan, Shukla Book Depot, Patan, 1982

PAPER-II (GCC 102)

EVOLUTION OF GEOGRAPHICAL THOUGHT

Unit I: Contribution of Greek and Roman geographers

Unit II: Arab scholars, the dark age in geography Recent trends in Geography

Unit III: Main characteristics and contributions of different schools- German, French, American and British school

Unit IV: The study of man- land relationship; modern theme in geographical thought- positivism, idealism, Marxism, radicalism, behaviorism and humanism; Concept of areal differentiation

Recommended Readings:-

1. Ali, S.M.: Geography of Puranas
2. Bunbury, E.H. : A History of Ancient Geography, 1955 (in two volumes).
3. Chatterjee S.P. : 50 years of Science in India, Development of Geography, Indian Science Congress Association, 1964.
4. Dickinson: Makers of Modern Geography ,1964
5. Dickson and Howarth: The Makers of Geography
6. East and Wooldridge : The Sprit and purpose of Geography
7. Freeman : A Hundred years of Geography
8. James , P.E. : All possible World A study of Geographical ideas, Indian Edition, Sachin Publication, Delhi 1980
9. Sykes, P. : A History of Exploration, routledge and Kegan Paul, London, 1954
10. Tylor, G. (ed.) : Geography in the 29 Century Wooldridge: Geographers as a Scientist

PAPER III (GCC 103)

GEOGRAPHY OF ARID LANDS

Unit 1: Meaning and causes of aridity; Indices of Aridity; Climate; Topography, Soils, Water resources and Minerals of the Arid lands of the world

Unit 2: Desertification: Extent of desertification in the world; causes of desertification: Parameters of desertification measures to control desertification

Unit 3: Detailed study of arid regions of Israel and Egypt with reference to Physiography, Soil, Agriculture, Irrigation and land reclamation

Unit 4 :Great Indian Desert: Origin, Physiography, Climate, Agriculture, Irrigation, Livestock raising

and population

RECOMMENDED READINGS

Amiran, D.H.K. & Wilson, A.W. (ed.) : Coastal Deserts- Their Natural and Human Environments, The University of Arizona Press, Tucson, 1973

Arnon, I : Crop Production in Dry Regions; Vols. I & II, Leonard and Hill, London, 1972

Bhandari, M.M.: Flora of the Indian Desert, Scientific Publishers, Jodhpur, 1978

Biswas, M.R. & Biswas, A.X. : Desertification, Pergamon Press, New York, 1982

Chouhan, T.S. : Desertification in the World and its Control, Scientific Publishers, Jodhpur, 1997

Drenge, H.E. : Desertification of Arid Lands, Harwood Academic Publishers, 1983

Goudie, A. & J. Wilkinson: The Warm Desert Environment, Cambridge University Press, Cambridge, 1977

Hills, E.S.(ed.): Arid Lands, UNESCO. London, 1966

Hillel, D. : Negev Land, Water and Life in a Desert Environment, Praeger, N.Y. . 1982

Heathecote: Arid Lands- Their Uses and Abuses, Longmans, 1964

ICAR: Desertification and its Control, New Delhi, 1977

Jeanes, D.N. : Australia-A Geography, Routledge and Kegan Paul, London, 1978

Mann, H.S. (ed.) : Arid Zone Research and Development, Scientific Publishers, Jodhpur, 1980

Matlook, W.G.: Realistic Planning for Arid Lands, Harwood Academic Pub. 1981

Mann, H.S.(ed.) Scientific Reviews on Arid Zone Research, Scientific Publishers, Jodhpur, 1981

Meginnies, W.G., B.J. Godman and P. Paylore : Deserts of the World University of Arizona Press, 1968

Ministry of Food and Agriculture: Proceedings of the symposium on the Problems of Indian Arid Zone, New Delhi, 1967

PAPER- IV (GCC 104)

SOCIAL AND CULTURAL GEOGRAPHY

- Unit 1 : Nature, scope and contents of cultural geography; Evolution of cultural geography; Environment, culture and resources; Techniques and methods in cultural geography; Man's role as socio-cultural agent
- Unit 2 : Analysis of world population in terms of ethnic, religious and language groups; World pattern of literacy
- Unit 3 : Cultural regionalization of the world : A Study of the Culture, World with special reference to new world revolution – Polar World; European Worlds, American World
- Unit 4 : Dry World, Oriental World, African World and Pacific World

RECOMMENDED READINGS

- Carter, G.F. : Man and Land – A Cultural Geography, Holt, Rinehart and Winston, Inc. New York, 1968
- De Blij, Harm, J. : Man Shapes the Earth – Topical Geography, Hamilton Publication Company, Santa Barbara, California, 1974
- De Blij, Harm, J. : Human Geography- Culture, Society and Space, John Wiley and Sons, Inc., New York, 1977
- Dicken, S.N. and Pitts, F.R. : Introduction to Cultural Geography- A Study of Man and His Environment, Exrox College Publishing, Waltnam, Massachusetts, 1970
- Dohrs, F.E. : Cultural Geography – Selected Readings, Dun-Donnelly Publishing Corporation, New York, 1967
- Eidt. R.C., Singh K.N. and Rana, P.B. Singh (ed.) : Man Culture and Settlement, Kalyani Publishers, New York, 1977
- Haggett, P. : Geography A Modern Synthesis, Harper and Row, New York, 1975
- Jones E. (ed.) : Readings in Social Geography, Oxford University Press, London, 1975
- Jordon, T.G. and Rowtree, L. : The Human Mosaic – A Thematic Introduction in Cultural Geography, Canfield Press, Harper and Row, New York, 1976
- Kariel H.G. and Kariel, P.F. : Explorations in Social Geography, Addison-Wesley Publishing Company, Inc. Reading, Massachusetts, 1972

Kotars, John, F., and John, D. Nysteen ; Geography The Study of Location, Cultural and Environment, jMcGraw Hill Book Company, New York, 1974

Phillbrick, A.K. :- The Human World, John Wiley and Sons. Inc., New York, 1967

Raitz, Kari, B. : Cultural Geography on Topographic Maps, Hamilton Publishing Company, Santa Barbara, California, 1975

Rolstlung, F. : Outline of Cultural Geography, California Book Company, Berkely, California, 1963

Russel, R.J.F.B. Kniffen and E.L. Pruitt ; Culture Worlds, the Max Million Company Ltd., London, 1969

Saure, Carl O. : Agricultural Origins and Dispersal, The Domestication of Animals and Foods Stuffs, The M.L.T. Press, Massachuseets, 1970

Sopher, David E. : Geography of Religions : Foundations of Cultural Geography Series, Prentice Hall Inc., Englewool Cliffs, New Jersey, 1967

Spencer, E; & W.L. Thomas: Asia, East by South – A Cultural Geography Jon Wiley & Sons, Inc. New York, 1971

Wagner, P.L. & M.W. Mikesell : Readings in Cultural Geography, The University of Chic age Press, Chicago, 1962

Wagner, P.L. : The Human Use of Earth, The Free Press, New York, 1964.

जैन, जे.के. एवं बोहरा, डी.एम. : विश्व का सांस्कृतिक भूगोल, ऐकेडेमिक पब्लिशर्स, जयपुर, 1983

Prakasa Rao, V.L.S. : Urbanization in India, Spatial Dimensions concept Publishers, 1983

PAPER V: (GPC 105)

CARTOGRAPHY

Teaching in Geography Practical shall be imparted in groups of 15 students.

Out of 100 marks assigned for geography practical, 30 marks for CCA and 70 marks for ESE .The division of ESE marks will be as - 40 marks are reserved for Laboratory Work Test, 15 marks for the evaluation of record book and 15 marks for viva on record book.

Syllabus Contents –

Unit I: Laboratory Test: Scheme and nomenclature of Survey of India topographical maps.

Unit II: Profiles: Meaning and usefulness of profile in studying landforms, types of profiles: Serial, Superimposed, composite, projected.

Unit III: Map Projections; Projections and their classification; simple conical equal area (Lambert's

Projection), Bonne's Projection, Mercators; Gnomonic Zenithal (Polar and Equatorial cases), Orthographic Zenithal(Polar and Equatorial cases).

Unit IV: Statistical Methods: Classification and Tabulation of Statistical data, Frequency Distribution and graphs, Measures of Central tendency (Arithmetic mean, geometric mean, median and mode).

RECOMMENDED READINGS

Monkhouse, J. and Wilkinson, H.R. : Maps and Diagrams, Methuen & Co., London

Raisze, E. : General Cartography, McGraw Hill, New York, 1960

Strees, J.A. : Maps Projections

Gregory, S : Statistical Methods and the Geographers, Methuen & Co., London, 1971

Singh R.L. : Elements of Practical Geography, Kalyani Publishers, New Delhi, 1979

Robinson, A.H. : Elements of Cartography, Chapman and Hall, London

Lawrence, G.R.P. : Cartographic methods, Methuen & Co., London 1971

Singh R. and Kanujia, L.R.S. : Map Work and Practical Geography, Allahabad

J. Kellaway : Map Projections

SKILL COURSE –I (GSC 101): BASIC SKILLS IN GEOGRAPHY

Objectives: To develop an understanding of Basic Skills in Geography

Syllabus content-

Unit I: Electromagnetic Spectrum , Aerial Photographic And Satellite Image Interpretation, Digital Cartography.

Unit II: Meaning, Components and Importance of GIS; Meaning and Concept of Remote Sensing (RS) ; Data models: Raster and Vector.

Unit III: Geological time scale, Highland and Lowland Regions , Tropical Deserts, Rainfall and its Types , Western Disturbances, Social Forestry ,Temperate Grasslands

Unit IV: Shape & Size of Earth: Geoid, Spheroid and Ellipsoid , Concept of Coordinate System, Albedo, Green House Effect, ENSO

Books Recommended

Singh, R.L and Rana, P.B. 2002. *Elements of Practical Geography*. Kalayani Publishers, New

Delhi.

Khullar, D.R. 2000. *Essentials of Practical Geography*. New Academic Publishing Company, Jalandhar.25

Guha, P.K. 2008. *Remote Sensing for the Beginner*. East West Press Pvt. Ltd. New Delhi.

Panda, B.C. 2005. *Remote Sensing – Principles and Applications*. Viva Books Pvt. Ltd., New Delhi

Compbell, J. 1989. *Introduction to Remote Sensing*. Guilford, New York.



**JAI NARAIAN VYAS UNIVERSITY JODHPUR
(RAJASTHAN)**

FACULTY OF ARTS, EDUCATION AND SOCIAL SCIENCES

SYLLABI

FOR

M.A. GEOGRAPHY (SEMESTER SCHEME)

(SEMESTER I AND SEMESTER II) EXAMINATIONS 2018-2019

&

(SEMESTER III AND SEMESTER IV) EXAMINATIONS 2018-2019

DETAIL EXAMINATION SCHEME FOR CHOICE BASED CREDIT SYSTEM

GUIDELINES

Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete **four skill courses:** two within the Department and two from other Department within JNV University or the Universities approved by JNV University
3. **Course:** Usually referred to, as 'papers' is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period of teaching (lecture or tutorial) or two periods of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.
12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/ December and even semester from December/January to May.
Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May. The Department shall conduct the Practical examination of odd and even semesters as per the Panel of Examiners approved by the University. Each Board of examiners shall consist for one external Examiner from other University/Institute and another from the Department.
13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Arts, Education & Social Sciences resolves the following:

- a. All internal assessments shall on term test and seminar. Attendance shall carry the prescribed marks in all papers.
- b. In each semester two out of four theoretical components of the University examinations shall be undertaken by external examiners from outside JNV University, who may be appointed by the competent authorities.

Grievances and Redressal Mechanism

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head of the Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.
- b) The appeal will be assessed by the Chairman and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Dean, Faculty of Arts, Education & Social Sciences comprising of the HOD of the concerned Department and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	'O'	Outstanding	10
2	'A+'	Excellent	9
3	'A'	Very Good	8
4	'B+'	Good	7
5	'B'	Above Average	6
6	'C'	Average	5
7	'P'	Pass	4
8	'F'	Fail	0
9	'Ab'	Absent	0

- i. A student obtaining Grade F in a paper shall be considered failed and will be required to reappear in the University End Semester examination.
- ii. For noncredit courses (Skill Courses) 'Satisfactory' or "Unsatisfactory" shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

= and > 95 % marks Grade Point 10.0
90 to less than 95 % marks Grade Point 9.5
85 to less than 90 % marks Grade Point 9.0
80 to less than 85 % marks Grade Point 8.5
75 to less than 80 % marks Grade Point 8.0
70 to less than 75 % marks Grade Point 7.5
65 to less than 70 % marks Grade Point 7.0
60 to less than 65 % marks Grade Point 6.5
55 to less than 60 % marks Grade Point 6.0
50 to less than 55 % marks Grade Point 5.5
45 to less than 50 % marks Grade Point 5.0
40 to less than 45 % marks Grade Point 4.5
35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,
i.e.

$$\text{SGPA (Si)} = \frac{\sum (C_i \times G_i)}{\sum C_i}$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,
i.e.

$$\text{CGPA} = \frac{\sum (C_i \times S_i)}{\sum C_i}$$

where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.

- iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	6	B	6	6 x 6 =36
2	Course 2	6	B+	7	6 X 7 =42
3	Course 3	6	B	6	6X 6 = 36
4	Course 4	6	O	10	6 X 10 =60
	Total	24			36+42+36+60=174

Thus, $\text{SGPA} = 174/24 = 7.25$

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	7.25	7.25	7	6.25

$$\text{CGPA} = \frac{(24 \times 7.25 + 24 \times 7.25 + 24 \times 7 + 24 \times 6.25)}{96}$$

$$666/98 = 6.94$$

Semester-wise Theory Papers/Practical / Skill component

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Semester I							
Core course 1	GCC 101		6-0-0	6	30	70	100
Core course 2	GCC 102		6-0-0	6	30	70	100
Core course 3	GCC 103		6-0-0	6	30	70	100
Core course 4	GCC 104		6-0-0	6	30	70	100
Practical Course 5	GPC 105		0-0-12	6	30	70	100
Skill Course I	GSC 101		2-0-2				
Total				30	150	350	500
Semester II							
Core course 6	GCC 201		6-0-0	6	30	70	100
Core course 7	GCC 202		6-0-0	6	30	70	100
Core course 8	GCC 203		6-0-0	6	30	70	100
Core course 9	GCC 204		6-0-0	6	30	70	100
Practical Course 10	GPC 205		0-0-12	6	30	70	100
Skill course II	GSC 202		2-0-2				
Total				30	150	350	500

Semester III							
Core course 11	GCC 301		6-0-0	6	30	70	100
Core course 12	GCC 302		6-0-0	6	30	70	100
Discipline Specific Elective 1	One Elective paper from the list of Group I GEC 303(a,b,c)		6-0-0	6-0-0	6	70	100
Discipline Specific Elective 2	One Elective paper from the list of Group II GEC 304(a,b,c)		6-0-0	6-0-0	6	70	100
Practical Course 15	GPC 305						
Skill course III	GSC 303		2-0-2				
Total				24	120	280	400
Semester IV							
Core course 16	GCC 401		6-0-0	6	30	70	100
Core course 17	GCC 402		6-0-0	6	30	70	100
Discipline Specific Elective 3	One Elective paper from the list of Group I GEC 403(a,b,c)		6-0-0	6-0-0	6	70	100
Discipline Specific Elective 4	One Elective paper from the list of Group II GEC 404(a,b,c)		6-0-0	6-0-0	6	70	100
Practical Course 20	GPC 405						
Skill course IV	GSC 404		2-0-2				
Total				24	120	280	400

*** The Department shall offer one skill course per semester from the list of skill courses approved for the Department.**

In view of the course content, the Department of Geography distributed the Periods between Theory/Tutorial/Practical as under per paper

- 6: 0 : 0 (six lectures only (no tutorial and no practical) per week) – For Theory
- 0: 0 : 12(no lecture, no tutorial and twelve practical only per week)- For practical per paper
- 2+0+2 (two lectures, no tutorial and two practical/field experimentations) - For Skill course

The Duration of the Period shall be forty five minutes. In each of these combinations, the first value stands for the same number of lecture instructions per week, whereas the last two values stand for doubles the number of tutorial/ practical instructions per week

In each practical group the number of students that can be accommodated will be fifteen.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective/ Practicals) involve an evaluation system of students that has the following two components:-

- (i) **Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
 - (ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.
- (i) **Continuous Comprehensive Assessment (CCA):** This would have the following components:
- a. **Term Test:** One term test shall be arranged for each paper prior to End-Semester Examination; examination duration shall be of three hours; maximum marks shall be 60 (reduced to 15).
 - b. **Seminar:** Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 40 (reduced to 10). The seminar shall be completed prior to term test for all the papers.
 - c. **Classroom Attendance** – Each student will have to attend a minimum of 75% Lectures / Tutorials / Practicals. A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE). Attendance marks will be awarded by following the system proposed below:

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

75% to 80%	=	1 mark
81% to 85%	=	2 marks
86 to 90%	=	3 marks
91% to 95%	=	4 marks
96% and above	=	5 marks

Note: Compensation in classroom attendance of a student will be as per prevalent University rules.

Each student's cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Arts, Education & Social Sciences.

- d. CCA is based on open evaluation system without any bias to any student.
- e. Any grievance received in the Department from student shall be placed before the **Grievance Redressal Committee** with adjudicated comments

Each component marks will be added making it rounding as per norms.

Marking Scheme of Continuous Comprehensive Assessment (CCA)

Components	Maximum Marks	Reduced and Original Marks
Term Test	60	(reduced to 15)
Seminar	40	(reduced to 10)
Classroom Attendance	05	05
Total Marks of CCA	100	30

Note : Classroom Attendance marks will be as follows :-

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

Percentage	Marks
75% to 80%	1 mark
81% to 85%	2 marks
86 to 90%	3 marks
91% to 95%	4 marks
96% and above	5 marks

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective Department shall declare the result as "Satisfactory" or "Non-Satisfactory"; each student need to get a minimum of three "Satisfactory" declaration for the course completion

For the Term test and ESE:

Part A

Ten questions (Definitions, illustrations, functions, short explanations, etc; 25-50 words) for one mark each. 10 × 1 = 10 marks; comprising questions from each Unit; no choice in this part

Part B

Four questions of long/explanatory answer (500 words) type, one drawn from each Unit; with internal choices : 4 x 15 = 60 marks.

10+60 = 70 marks

MEDIUM

Candidates are not allowed to use any medium except Hindi or English for answering question papers. For answering papers in the subjects of English/Hindi the medium will be corresponding language only.

Qualifying for Next semester

- i. **A student acquiring minimum of 40% in total of the CCA is eligible to join next semester.**
- ii. A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as 'Fail'), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.
- iii. A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time, i.e. three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted, for additional chances examination fee shall be on additive basis.

Improvement Option:

Every student shall have the opportunity to improve Credit through University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final.

Result Declaration:

The ESE (End Semester Examination/University Examination) results shall be declared within twenty days of the last examination. The Theory Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation.

POST -GRADUTE COURSE: A DESCRIPTION

The full course is of FOUR SEMESTERS spread for TWO YEARS duration. A semester-wise list of courses to be offered is given below. In each paper there will be four units.

SEMESTER I

SEMESTER II

SEMESTER III

SEMESTER IV

Elective paper group – First – Semester III

Elective paper group – Second – Semester III

Elective paper group – First – Semester IV

Elective paper group – Second – Semester IV

Skill Courses in the respective subject

Electives would be discipline centric and only students from concerned departments can register.

ADMISSION

The details of the eligibility conditions and admission procedures are given in the admission forms and on university website. The admission would be done on the basis of merit as per university rules. Reservation for SC, ST and OBC would also be done as per J.N.V. University, Jodhpur rules. Candidates are required to attend minimum 75% of the classes in theory and practicals both.

FACILITIES

The Department of Geography possesses several sophisticated, advanced and modern equipments required for teaching and research.

Faculty Members

Professor

Dr. Irfan Mehar (Head of the Department)

Associate Professor

Dr. Rajendra Parihar

Dr. Jai Singh

Assistant Professor

Dr. Arjun Lal Meena

Dr. Asha Rathore

Mr. Govind Singh

Dr. Lalit Singh Jhala

Mr. Omprakash

Mr. Gaurav Kumar Jain

TEACHING AND EXAMINATION SCHEME

Per Semester

Course	Periods/Week	Examination hours	CCA	ESE	Total
Theory Papers/ Practical					
Course I	6	3	30	70	100
Course II	6	3	30	70	100

Course III	6	3	30	70	100
Course IV	6	3	30	70	100
Practical Courses V	12	6	30	70	100

UNIVERSITY EXAMINATION

Each course paper shall be of three hours duration.

Note: The number of elective to be taught from each group in a particular year shall be decided by the Department. Electives offered will be announced at the beginning of the academic session. Each student shall be assigned one Elective Paper from Group ONE and the second from Group TWO. Elective papers will be allotted on merit-cum-choice basis as far as possible. In the odd semester two skill courses will be those offered by the respective departments in the even semester skill courses will be from other departments.

SCHEME OF EXAMINATION FOR M.A GEOGRAPHY (SEMESTER SYSTEM) FOR THE EXAMINATION OF 2018-19

INSTRUCTIONS FOR THE PAPER SETTERS AND THE STUDENTS

Max. Marks - 70
Min. Marks – 25

Duration – 3 hours

Note :

- (i) There shall be 9 questions in all. Five questions have to be attempted.
- (ii) The first question shall be short answer type containing 10 short questions spread over the whole syllabus to be answered in about 30 words each. It shall carry 10 marks and shall be a compulsory question.
- (iii) Rest of the paper shall contain 8 questions with internal choice. The entire syllabus has been divided into four units. Each unit shall have two questions and the candidates shall be given internal choice i.e. the candidate shall attempt one question from each unit.

SEMESTER-II

1. THEORY PAPERS/Practical (Four Core Papers)	ESE	CCA	Total	Lecture Tutorial- Practical/Week	Credits
Paper- VI(GCC 201) Environment Geography	70	30	100	6-0-0	6
Paper –VII(GCC 202) Urban Geography	70	30	100	6-0-0	6
Paper- VIII (GCC 203) Economic and Resources Geography	70	30	100	6-0-0	6
Paper- IX (GCC 204) Geography of Tourism	70	30	100	6-0-0	6
Paper- X (GPC 205) Practical) (Cartography and project)	70	30	100	0-0-12	6
	Grand Total		500 Marks		30 Credits

Total marks of Semester II 500 and 30 Credits					

Total marks of M.A (Semester I and II) 1000 marks and Credits 60					

Skill Course-II(GSC202) (for Students of other Deptt.)

2-0-2

* Geographical Tour will organized before II semester and report will be submitted after the examination of II semester (For every 15 students one teacher shall accompany the group).

M.A GEOGRAPHY
SEMESTER II, Session-2018-19

PAPER- VI (GCC 201)

ENVIRONMENT GEOGRAPHY

Unit 1: Environmental Geography: Definition, Nature, And Scope.

Unit 2: Biosphere and Its Component; Concept of Ecology, Human Ecology And Ecosystem.

Unit 3: Biodiversity and Its Conservation, Concept of Biomes, Sustainable Development

Unit 4: Environment Pollution (Water, Air, Noise And Soil), Environmental Problems: Green House Effect, Ozone Deflection, Global Warming and Its Management

RECOMMENDED READINGS

Anderson, M.R.: Geography of Living Things

Clark, G.R.: The study of Soils in the field

Densereau, P.: Biogeography and Ecological Perspective

Hall, A.D. & Russel, P.J.: Social Conditions and plant Growth

Robinson, G.W.: Soils

Jones, R.L.: Biogeography-Structure, Process, Pattern and Change within the- Biosphere,

Hulton Educational Publication Ltd., Amersham, Bucks.

PAPER VII (GCC 202)

URBAN GEOGRAPHY

Unit-1: Meaning, scope and methods of approach in urban geography, origin and growth of cities from the earliest to the modern times, forces and processes of urban growth, Theories of urban Structure

Unit-2: Urban morphology and land use pattern, City retail structure and delimitation of CBD, Residential land use, urban population, Characteristics, Functional Classification of towns

Unit-3: Location, spacing and size of towns, urban hierarchy; The Central Place Theory, Rank-size rule, Growth Pole Theory

Unit-4: Urban sphere of Influence- Methods and criteria of delimitation, Rural- urban fringe, Elements And principles of town planning, Law of Garden City.

RECOMMENDED READINGS

- Abercrombie, P.: Town and Country Planning, Oxford University Press, London, 1961
- Alam, S.M. : Hyderabad-Secunderabad(Twin-cities) – A Study in Urban Geography, Allied Publishers, Bombay, 1965
- Bartholomew, H. : Urban Landuse, Harwad University Press, Harward, 1932
- Berry B.J. L. & A. Pred : Central Place Studies-Bibliography of Theory Applications, Regional Science Research Institute, Philadelphia 1961
- Chorley, R.J. & P. Hagget : Socio-Economic Models in Geography(Part II and III or Models in Geography) Methuen, London, 1968
- Dickinson, R.E. : The West European City, Rutledge and Kegan Paul, London, 1964
- Gallion, A.B. & S.E. Isner : The Urban Pattern, City Planning and Design, D. Van Nostrand, Princeton, New Jersey, 1965
- Garnier, B.J. & G. Chabot: Urban Geography, Longmans Green and Co. Ltd., London, 1967
- Ghose, M.: Calcutta – A study in Urban Growth Dynamics, 1972
- Jackson, J.N.: Surveys for Town and Country Planning, Hutchinson University Press, Syracuse, N.Y. , 1954
- Jonson, J.N.: Urban Geogrphahy- An Introductory Analysis, Pergamon Press, 1967
- Mayer, H.M. and Kohn, O.P.(ed.) : Readings in Urban Geography, University of Chicago Press, Chicago, 1959
- Humford, L.: The city in History, Pehcan: 1966
- Murphy, R.S. : The American City an Urban Geography, McGraw Hill, N.Y. 1966
- King, I.J. & Golledge, R.G. : Cities, Space, and Behavior- The elements of
- Norgorg, K (ed.) : Proceedings of the I.G.U. Symposium on Urban Geography, John Wiley & Sons, 1975
- Putnom, R.G. FJ – Taylor and P.G. Kettle (ed.) : A Geography of Urban Places, Methuen, London, 1970
- Robson, B.T. : Urban Growth, Methuen, Lodnon, 1963
- Singh, R.L. : Banaras – A Study in Urban Geography, Nand Kishore & Sons, Banaras, 1965
- Singh O.P. : Urban Geography (in Hindi), Tara Publishers, Varanasi, 1979
- Smailes, A.E. : The Geography of Town, Hutchinson University Press, London, 1961
- Taneja, K.L. : Morphology of Indian Cities, 1971
- Taylor, T. : Urban Geography, Methuen, London, 1961

PAPER-VIII (GCC 203)

ECONOMIC AND RESOURCES GEOGRAPHY

Unit I: Factors affecting Production, Consumption and distribution of Principal raw materials

Unit II: Sectors of economy-primary, secondary and tertiary, quaternary; Agricultural Regions of the world; Von Thunen's model and its modifications

UNIT III: Definition and Concept of Resources, Classification of Resources

UNIT IV: Conservation and Management of Natural Resources: Meaning and Concept of conservation of Natural Resources, Resources Conservation and Management Methods of Natural resources: Soil Resource, Water Resource, Problems of Natural Resource Management in India

Recommended Readings:-

1. Alexander, J.W., Economic geography, Prentice Hall of India, New Delhi.
2. Berry, B.J.J., et al., D.M., Economic Geography, Prentice Hall.
3. Chatterjee, S.R., Economic Geography of Asia, Allied Book Agency, Calcutta, 1984.
4. Chisholm, M., Geography and Economy, G.Bell, London.
5. Guha and Chatterjee, A New Approach to Economic Geography of resources.
6. Morgan, W.B. and R.J.C. Munton, Agricultural Geography, Methuen, London, 1997.
7. Robinson, H., Economic Geography, MacDonald and Evans.
8. Rostow, W.W., The Stages of Economic Growth, Cambridge University Press, London, 1960.
9. Thomas, R.S., The Geography of Economic Activity, McGraw Hill, New York.
10. Zimmermann, E.W., World Resources and Industries, Harber.
11. Ramesh, A. (1984) Resource Geography (Ed.) R.P. Misra, Contribution to Indian geography, Vol Heritage Publishers, New Delhi.
12. Borton, I. and R.W. Kates. (1984) Readings in Resource Management and Conservation, University of Chicago Press, Chicago.
13. श्रीवास्तव वी.के. एवं राव, बी.पी., आर्थिकभूगोल के मूलतत्त्व (वसुन्धरा प्रकाशन, गोरखपुर)।
14. जैन, हरकचन्द, सैद्धान्तिक आर्थिकभूगोल (कमलेश प्रकाशन, भीलवाड़ा)।
15. रजा, एमण एवं सिंह, ए., संसाधनभूगोल।
16. नेगी, बी.एस., संसाधनभूगोल।
17. सिंह एवं सिंह, आर्थिक और संसाधनभूगोल।
18. कौशिक, एस.डी., संसाधनभूगोल।

PAPER – IX (GCC 204)

GEOGRAPHY OF TOURISM

- Unit 1 : Tourism : Growth of travel through the ages, growth and development of modern tourism International organizations and tourism
- Unit 2 : Elements of Tourism : Economic and social significance of tourism, Domestic and Foreign tourism, Tourism transport and accommodation
- Unit 3 : Tourism in India : A land for all seasons; places of tourist interest, Cultural tourism, Problems and facilities, Role of Indian Tourism Development Corporation
- Unit 4 : Tourism in Rajasthan : Salient Features of desert and wild life of Rajasthan, Survey of the places of tourist interest; Cultural Heritage of Rajasthan, Fairs and Festivals, A study of internal and foreign tourist influx

RECOMMENDED READINGS

- Robinson, J.H. : A Geography of Tourism, Macdonald and Evans Ltd.
- Bhatia, A.K. : Tourism Development: Principles and Practices, Sterling Publishers, New Delhi(1982)
- Nagi, J.N. : Tourism and Hostelling: A worldwide Industry, Gitanjali Publishing House, New Dehli
- Robinson, H. : Geography and Tourism, Macdonald and Evans, New York(1976)
- Bhatia, A.K. : Tourism in India-History and Development, Sterling Publishers, New Delhi
- Ram Acharya : Tourism in India, National Publishers, New Delhi
- Dass Manoj : India- A Tourist Paradise, Sterling Publishers, New Delhi
- Crowthor, Geoff Raj Prakash and Wheeler Tony : India- A Travel- Survival Kit Lonely Plant Publications, Australia
- Dharampal : Idia- The Land People, National Book Trust, New Delhi
- Rathore, G.S. : Marwar Ki Sanskratic Dharohar, Sudha Prakashan, Jodhpur
- Seth, D.N. : Successful Tourism Management, Sterling Pub. Pvt. Ltd., New Delhi

PAPER – X (GPC 205)

CARTOGRAPHY AND PROJECT /INSTRUMENTAL SURVEY OF A REPUTED INSTITUTE/ GEOGRAPHICAL TOUR

Teaching in Geography Practical shall be imparted in groups of 15 students.

Out of 100 marks assigned for geography practical, 30 marks for CCA and 70 marks for ESE . The division of ESE marks will be as - 40 marks are reserved for Laboratory Work Test 10 marks for Project report & 05 marks for viva on project report *OR* instrumental survey of a reputed institute *OR* Geographical Tour (For every 15 students one teacher shall accompany the party), 10 marks for the evaluation of record book and 05 marks for viva on record book.

Syllabus contents:

Unit I: Laboratory Test: Interpolation of contours, methods of determination of intervisibility.

Unit II: Measures of dispersion: (Quartiles mean deviation and standard deviation), Variability Indices

Unit III: Morphometric Analysis: Drainage density, stream length, stream orders and confluences;

Unit IV: Map Projections: Sinusoidal (Normal and Interrupted), Mollweide (Normal and Interrupted), Choice of Projections

PROJECT REPORT /GEOGRAPHICAL TOUR

The project will be selected by candidates in consultation with the Head of the Department and the study report, duly approved by the teacher(s) concerned, is to be submitted along with the Practical Record.

The geographical tour and study and field tour or execution of typical areas with particular attention to any one of the following aspects: Structure, terrain and geomorphology; Drainage and river valley development; Vegetation forms, Agricultural Industrial land use; Communication, Regional synthesis and analysis of physical and cultural landscape

RECOMMENDED READINGS

Monkhouse, F.J. and Wilkinson, H.R. : Maps and Diagrams, Methuen & Co., London

Raisze, E. : General Cartography, McGraw Hill, New York, 1960

Streets, J.A. : Maps Projections

Gregory, S : Statistical Methods and the Geographers, Methuen & Co., London, 1971

Singh R.L. : Elements of Practical Geography, Kalyani Publishers, New Delhi, 1979

Robinson, A.H. : Elements of Cartography, Chapman and Hall, London

Lawrence, G.R.P. : Cartographic methods, Methuen & Co., London 1971

Singh R. and Kanujia, L.R.S. : Map Work and Practical Geography, Allahabad

J. Kellaway : Map Projections

SKILL COURSE II (GSC 202): BASICS IN GEOGRAPHY

Objectives : To develop an understanding of Basics in Geography and Environmental Issues

Syllabus Content-

Unit I: Elementary knowledge of Remote Sensing, GIS, GPS and Satellite Imagery, Directions: Cardinal Directions, Primary Inter-Cardinal, and Secondary Inter-Cardinal.

Unit II: Geographic Locations: Continents and Oceans; Nation-State Capitals, Metropolitan Cities of the World, Mountains and Rivers.

Unit III: Motions of Earth: Rotation and Revolution of Earth and their effects, Dimension of Earth, Shape & Size, Geoids, Spheroid and Ellipsoid.

Unit IV: Locational system, dates and time: Latitude, Longitude and Graticule; Time Zones and International Date Line

Books recommended

Gautam, Alka. 2004. *Climatology and Oceanography*. Rastogi Publication-Meerut, UP.

Singh, Savindera. 2009. *Physical Geography*. Vasundhra Publications, Gorkhpur, UP.

Goh Cheng Leong.1995. *Certificate Physical and Human Geography*, Oxford University press, New Delhi



**JAI NARAIAN VYAS UNIVERSITY JODHPUR
(RAJASTHAN)**

**FACULTY OF ARTS, EDUCATION AND SOCIAL SCIENCES
SYLLABI
FOR**

M.A. GEOGRAPHY (SEMESTER SCHEME)

(SEMESTER I AND SEMESTER II) EXAMINATIONS 2018-2019

&

(SEMESTER III AND SEMESTER IV) EXAMINATIONS 2018-2019

DETAIL EXAMINATION SCHEME FOR CHOICE BASED CREDIT SYSTEM

GUIDELINES

Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete **four skill courses:** two within the Department and two from other Department within JNV University or the Universities approved by JNV University
3. **Course:** Usually referred to, as 'papers' is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period of teaching (lecture or tutorial) or two periods of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.
12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/ December and even semester from December/January to May.
Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May. The Department shall conduct the Practical examination of odd and even semesters as per the Panel of Examiners approved by the University. Each Board of examiners shall consist for one external Examiner from other University/Institute and another from the Department.
13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Arts, Education & Social Sciences resolves the following:

- a. All internal assessments shall on term test and seminar. Attendance shall carry the prescribed marks in all papers.
- b. In each semester two out of four theoretical components of the University examinations shall be undertaken by external examiners from outside JNV University, who may be appointed by the competent authorities.

Grievances and Redressal Mechanism

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head of the Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.
- b) The appeal will be assessed by the Chairman and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Dean, Faculty of Arts, Education & Social Sciences comprising of the HOD of the concerned Department and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	'O'	Outstanding	10
2	'A+'	Excellent	9
3	'A'	Very Good	8
4	'B+'	Good	7
5	'B'	Above Average	6
6	'C'	Average	5
7	'P'	Pass	4
8	'F'	Fail	0
9	'Ab'	Absent	0

- i. A student obtaining Grade F in a paper shall be considered failed and will be required to reappear in the University End Semester examination.
- ii. For noncredit courses (Skill Courses) 'Satisfactory' or "Unsatisfactory" shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

= and > 95 % marks Grade Point 10.0
90 to less than 95 % marks Grade Point 9.5
85 to less than 90 % marks Grade Point 9.0
80 to less than 85 % marks Grade Point 8.5
75 to less than 80 % marks Grade Point 8.0
70 to less than 75 % marks Grade Point 7.5
65 to less than 70 % marks Grade Point 7.0
60 to less than 65 % marks Grade Point 6.5
55 to less than 60 % marks Grade Point 6.0
50 to less than 55 % marks Grade Point 5.5
45 to less than 50 % marks Grade Point 5.0
40 to less than 45 % marks Grade Point 4.5
35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,
i.e.

$$\text{SGPA (Si)} = \frac{\sum (C_i \times G_i)}{\sum C_i}$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,
i.e.

$$\text{CGPA} = \frac{\sum (C_i \times S_i)}{\sum C_i}$$

where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.

- iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	6	B	6	6 x 6 =36
2	Course 2	6	B+	7	6 X 7 =42
3	Course 3	6	B	6	6X 6 = 36
4	Course 4	6	O	10	6 X 10 =60
	Total	24			36+42+36+60=174

Thus, $\text{SGPA} = 174/24 = 7.25$

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	7.25	7.25	7	6.25

$$\text{CGPA} = \frac{(24 \times 7.25 + 24 \times 7.25 + 24 \times 7 + 24 \times 6.25)}{96}$$

$$666/98 = 6.94$$

Semester-wise Theory Papers/Practical / Skill component

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Semester I							
Core course 1	GCC 101		6-0-0	6	30	70	100
Core course 2	GCC 102		6-0-0	6	30	70	100
Core course 3	GCC 103		6-0-0	6	30	70	100
Core course 4	GCC 104		6-0-0	6	30	70	100
Practical Course 5	GPC 105		0-0-12	6	30	70	100
Skill Course I	GSC 101		2-0-2				
Total				30	150	350	500
Semester II							
Core course 6	GCC 201		6-0-0	6	30	70	100
Core course 7	GCC 202		6-0-0	6	30	70	100
Core course 8	GCC 203		6-0-0	6	30	70	100
Core course 9	GCC 204		6-0-0	6	30	70	100
Practical Course 10	GPC 205		0-0-12	6	30	70	100
Skill course II	GSC 202		2-0-2				
Total				30	150	350	500

Semester III							
Core course 11	GCC 301		6-0-0	6	30	70	100
Core course 12	GCC 302		6-0-0	6	30	70	100
Discipline Specific Elective 1	One Elective paper from the list of Group I GEC 303(a,b,c)		6-0-0	6-0-0	6	70	100
Discipline Specific Elective 2	One Elective paper from the list of Group II GEC 304(a,b,c)		6-0-0	6-0-0	6	70	100
Practical Course 15	GPC 305						
Skill course III	GSC 303		2-0-2				
Total				24	120	280	400
Semester IV							
Core course 16	GCC 401		6-0-0	6	30	70	100
Core course 17	GCC 402		6-0-0	6	30	70	100
Discipline Specific Elective 3	One Elective paper from the list of Group I GEC 403(a,b,c)		6-0-0	6-0-0	6	70	100
Discipline Specific Elective 4	One Elective paper from the list of Group II GEC 404(a,b,c)		6-0-0	6-0-0	6	70	100
Practical Course 20	GPC 405						
Skill course IV	GSC 404		2-0-2				
Total				24	120	280	400

*** The Department shall offer one skill course per semester from the list of skill courses approved for the Department.**

In view of the course content, the Department of Geography distributed the Periods between Theory/Tutorial/Practical as under per paper

- 6: 0 : 0 (six lectures only (no tutorial and no practical) per week) – For Theory
- 0: 0 : 12(no lecture, no tutorial and twelve practical only per week)- For practical per paper
- 2+0+2 (two lectures, no tutorial and two practical/field experimentations) - For Skill course

The Duration of the Period shall be forty five minutes. In each of these combinations, the first value stands for the same number of lecture instructions per week, whereas the last two values stand for doubles the number of tutorial/ practical instructions per week

In each practical group the number of students that can be accommodated will be fifteen.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective/ Practicals) involve an evaluation system of students that has the following two components:-

- (i) **Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
- (ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.
 - (i) **Continuous Comprehensive Assessment (CCA):** This would have the following components:
 - a. **Term Test:** One term test shall be arranged for each paper prior to End-Semester Examination; examination duration shall be of three hours; maximum marks shall be 60 (reduced to 15).
 - b. **Seminar:** Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 40 (reduced to 10). The seminar shall be completed prior to term test for all the papers.
 - c. **Classroom Attendance** – Each student will have to attend a minimum of 75% Lectures / Tutorials / Practicals. A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE). Attendance marks will be awarded by following the system proposed below:

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

75% to 80%	=	1 mark
81% to 85%	=	2 marks
86 to 90%	=	3 marks
91% to 95%	=	4 marks
96% and above	=	5 marks

Note: Compensation in classroom attendance of a student will be as per prevalent University rules.

Each student's cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Arts, Education & Social Sciences.

- d. CCA is based on open evaluation system without any bias to any student.
- e. Any grievance received in the Department from student shall be placed before the **Grievance Redressal Committee** with adjudicated comments

Each component marks will be added making it rounding as per norms.

Marking Scheme of Continuous Comprehensive Assessment (CCA)

Components	Maximum Marks	Reduced and Original Marks
Term Test	60	(reduced to 15)
Seminar	40	(reduced to 10)
Classroom Attendance	05	05
Total Marks of CCA	100	30

Note : Classroom Attendance marks will be as follows :-

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

Percentage	Marks
75% to 80%	1 mark
81% to 85%	2 marks
86 to 90%	3 marks
91% to 95%	4 marks
96% and above	5 marks

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective Department shall declare the result as "Satisfactory" or "Non-Satisfactory"; each student need to get a minimum of three "Satisfactory" declaration for the course completion

For the Term test and ESE:

Part A

Ten questions (Definitions, illustrations, functions, short explanations, etc; 25-50 words) for one mark each. 10 × 1 = 10 marks; comprising questions from each Unit; no choice in this part

Part B

Four questions of long/explanatory answer (500 words) type, one drawn from each Unit; with internal choices : 4 x 15 = 60 marks.

10+60 = 70 marks

MEDIUM

Candidates are not allowed to use any medium except Hindi or English for answering question papers. For answering papers in the subjects of English/Hindi the medium will be corresponding language only.

Qualifying for Next semester

- i. **A student acquiring minimum of 40% in total of the CCA is eligible to join next semester.**
- ii. A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as 'Fail'), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.
- iii. A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time, i.e. three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted, for additional chances examination fee shall be on additive basis.

Improvement Option:

Every student shall have the opportunity to improve Credit through University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final.

Result Declaration:

The ESE (End Semester Examination/University Examination) results shall be declared within twenty days of the last examination. The Theory Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation.

POST -GRADUTE COURSE: A DESCRIPTION

The full course is of FOUR SEMESTERS spread for TWO YEARS duration. A semester-wise list of courses to be offered is given below. In each paper there will be four units.

SEMESTER I

SEMESTER II

SEMESTER III

SEMESTER IV

Elective paper group – First – Semester III

Elective paper group – Second – Semester III

Elective paper group – First – Semester IV

Elective paper group – Second – Semester IV

Skill Courses in the respective subject

Electives would be discipline centric and only students from concerned departments can register.

ADMISSION

The details of the eligibility conditions and admission procedures are given in the admission forms and on university website. The admission would be done on the basis of merit as per university rules. Reservation for SC, ST and OBC would also be done as per J.N.V. University, Jodhpur rules. Candidates are required to attend minimum 75% of the classes in theory and practicals both.

FACILITIES

The Department of Geography possesses several sophisticated, advanced and modern equipments required for teaching and research.

Faculty Members

Professor

Dr. Irfan Mehar (Head of the Department)

Associate Professor

Dr. Rajendra Parihar

Dr. Jai Singh

Assistant Professor

Dr. Arjun Lal Meena

Dr. Asha Rathore

Mr. Govind Singh

Dr. Lalit Singh Jhala

Mr. Omprakash

Mr. Gaurav Kumar Jain

TEACHING AND EXAMINATION SCHEME

Per Semester

Course	Periods/Week	Examination hours	CCA	ESE	Total
Theory Papers/ Practicals					
Course I	6	3	30	70	100
Course II	6	3	30	70	100
Course III	6	3	30	70	100
Course IV	6	3	30	70	100
Practical Courses V	12	6	30	70	100

UNIVERSITY EXAMINATION

Each course paper shall be of three hours duration.

Note: The number of elective to be taught from each group in a particular year shall be decided by the Department. Electives offered will be announced at the beginning of the academic session. Each student shall be assigned one Elective Paper from Group ONE and the second from Group TWO. Elective papers will be allotted on merit-cum-choice basis as far as possible. In the odd semester two skill courses will be those offered by the respective departments in the even semester skill courses will be from other departments.

SCHEME OF EXAMINATION FOR M.A GEOGRAPHY (SEMESTER SYSTEM) FOR THE EXAMINATION OF 2018-19

INSTRUCTIONS FOR THE PAPER SETTERS AND THE STUDENTS

Max. Marks - 70
Min. Marks – 25

Duration – 3 hours

Note :

- (i) There shall be 9 questions in all. Five questions have to be attempted.
- (ii) The first question shall be short answer type containing 10 short questions spread over the whole syllabus to be answered in about 30 words each. It shall carry 10 marks and shall be a compulsory question.
- (iii) Rest of the paper shall contain 8 questions with internal choice. The entire syllabus has been divided into four units. Each unit shall have two questions and the candidates shall be given internal choice i.e. the candidate shall attempt one question from each unit.

SCHEME OF EXAMINATION FOR M.A GEOGRAPHY (SEMESTER SYSTEM) FOR THE EXAMINATION OF 2018-19

SEMESTER III

1. THEORY PAPERS/ Practical (Core Papers)	ESE	CCA	Total	Lecture- Tutorial- Practical/Week	Credits
Paper- XI (GCC 301)Research Metho	70	30	100	6-0-0	6
Paper –XII (GCC 302) Population Geography	70	30	100	6-0-0	6
<u>ELECTIVE PAPERS</u>					
Paper- XIII (GEC 303) Choose any one of the following- (a) Advanced Geomorphology (b) Geoinformatics (c) Fundamentals of Agricultural Geography	70	30	100	6-0-0	6
Paper- XIV (GEC 304)					

Choose any one of the following- **70 30 100 6-0-0 6**
 (a) Fundamentals Industrial Geography
 (b) Land use Planning and Rural Development
 (c) Quantitative Techniques in Geography

Paper- XV (GPC 305)Practical (cartography and projec)	70	30	100	0-0-12	6
			-----		-----
	Grand Total		500 Marks		30 Credits
				
	Total marks of Semester III		500	and	30 Credits

Skill Course-III(GSC 303) (for Students of the Deptt.) 2-0-2

**M.A GEOGRAPHY
 M.A (SEMESTER III), 2018-19**

PAPER XI (GCC 301)

RESEARCH METHODOLOGY

- Unit 1:- Problem Of Geographical Research, Identification Of Problems Of Regional and Systematic Geography. Nature And Source Of Data To Be Used Hypothesis, Models
- Unit 2:- Preparation of Research Project and Report Writing, Cartographic Representation Of Agricultural, Transport, Marketing And Industrial Data. Selected Techniques Of Spatial Analysis, Methods Of Measurement Of Concentration And Dispersion Of Economic Activities
- Unit 3:- Nearest Neighbor Analysis With Examples, Regional Interaction Analysis
- Unit 4:- Regional population analysis – population projection, population migration projection, network analysis with examples. Delimiting urban and market spheres of influence.

Recommended Readings:

1. David Unwin : Introductory Spatial Analysis, Methuen, London, 1981.
2. Gregory, S. : Statistical Methods And The Geographer, Langman , London 1978.
3. Mahmood. A. : Statistical Methods In Geographical Studies, Delhi, 1978.
4. Maruice Yeats : An Introduction To Quantitative Analysis In Human Geogra. Phy. Mcgraw Hill New York.
5. Peter Haggett, Andrew : Location Methods Vol. I And II Edward Arnold, London.

PAPER- XII (GCC 302)

GEOGRAPHY OF POPULATION

Unit 1 : Nature And Scope Of Population Geography; Major Population Theories

Unit 2 : Components Of Population Growth, Trends And Factor Affecting Fertility, Mortality and Migration In The World; Laws Of Migration And Theories

Unit 3 : Population Structure Of India And Its Characteristics; Sex And Age Structure, Fertility And Mortality; Distribution, Density And Growth Of Population In India; Population Problems And Policies

Unit 4 : Distribution, Density And Growth Of Population In India; Population Problems And Policies

RECOMMENDED READINGS

Asha, A. Bhide and Mrs. Tara Kimitkar, : Principles of Population Studies; Himalaya Publishing House, Girgaon, Bombay

Ashish Bose & D. Gupta : Population Studies in India, Vikas Publishing House, Ansari Road, New Delhi

Agarwal, S.N. : India's Population Problems, Tata McGraw Hill, New Delhi

Chandra Shekar : Infant Mortality, Population Growth and Family Planning in India, London

Mamoria, C.B. : India's Population Problems, Ktab Mahal, Allahabad

Mehta, B.C. : Regional Population Growth : A Case Study of Rajasthan, Research Books, Tilak Nagar, Jaipur

Lal, S.K. & Nahar, U.R. : Higher Education of SC & ST in Rajasthan, Jain Sons, Publication, New Delhi

Purohit B.D.&S.D. Hand Book of reservation for SC& ST, jain sons publication, New Delhi

Singh, munshi hardaya: the castes of manivar, census report of 1891, book treasure, Sojati gate jodhpur

PAPER-XIII (GEC 303)

(a) APPLIED GEOMORPHOLOGY

Unit 1 : Earth as a member of the solar system; main theories regarding the origin of the Earth, distribution of land and sea; Isostasy and its bearing on surface configuration, Materials of the earth's crust: Minerals and rocks, classification of fold.

Unit 2 : Geological structure : Dip, Strike, Folds, formation of the earth's crust, joints, faults, tensional and compressional forces and topographic effects, Geographical time scale: Basis of division, standard time scale and the Indian equivalence.

Unit 3 : Landforms : Classification into first, second and third order, Constructional and destructional land forms and Geomorphic process : Weathering, rivers, groundwater, wind, glacier, waves, currents.

Unit 4 : Cycle concept in geography- development of the fluvial cycle in young, mature and old stages, interruptions of the fluvial cycle and their consequences, Davisian and Walter Penck system; Geomorphic cycle in deserts, limestone area, glaciated lands, volcanic plains and plateaus, domes and mountains;

RECOMMENDED READINGS

1. Thornbury, W. D. (Rep.2011): Principles of Geomorphology, John Wiley and Sons, New York.
2. Chorley, R. J., Schumm, S. A. and Sugden, D. E. (1984): Geomorphology, Methuen, London.
3. Kale, V. S. and Gupta, A. (Rep.2011): Introduction to Geomorphology, Orient Longman, Calcutta.
4. Savindra Singh (Rep. 2011): Geomorphology, Prayag Pustak Bhawan, Allahabad
5. Spark B. W. (1972): Geomorphology, Longman, New York
6. Steers, A. (1958). The Unstable Earth, Methuen, London
7. Ollier, C. D. (1981) Tectonics and Landforms, Longman , London
8. Strahler A. H and Strahler, A. N. (1992) : Modern Physical Geography, John Wiley, New York
9. Wooldridge and Morgan: Geomorphology
10. Holmes: Physical Geology
11. Fairbridge, R. W. (1968): Encyclopedia of Geomorphology, Reinholdts, New York.

PAPER-XIII (GEC 303)
(b) GEOINFORMATICS

Unit1: Remote sensing techniques: meaning and scope, development; types of imagery; Elements of interpretation, Digital cartography.

Unit 2 : Development of air photo interpretation techniques elements interpretation
Identification and mapping of natural and cultural landscape

Unit 3 : Fundamental of aerial photography system: types of photography, types of Stereoscopes;
coverage and vision; geometry of aerial photographs, photographic Resolution, parallax equation, flight planning, stereoscopic parallax

Unit 4 : Fundamental of digital image processing; geographic information system; Application of remote sensing in geography

RECOMMENDED READINGS

Burrough; P.A. : Principles of Geographical Information Systems for Land Resources Assessment, Oxford University, Clarendon Press, 1986

Chouhan, T.S. and K.N. Joshi : Applied Remote Sensing and Photo-Interpretation, Vigyan Prakashan, Jodhpur, 1955

Colwell, Robert, N. : Manual of Remote Sensing, I & II editions, Vol. I & II, American Society of Photogrammetry, 1983

Jensen, J.R. : Introductory Digital Image Precessing : A Remote Sensing Perspective, Prentice Hall, new Jersey, 1986

Lillesand, T.M. and Kiefer, R.W. : Remote Sensing and Image Interpretation, II edition, John Wiley and sons, 1987

Wolf, Paul, K. : Elements of Photogrammetry(with air photo-interpretation an remote sensing) McGraw Hill Book co., 1974

Karani, P.J. : Remote Sensing, ELBS. London, 1985

Gautam, N.C. : SPGU Technology of Geography, NRSA, Hyderabad, 1994

Survey of India: Photogrammetry : Chapter Twelve, S.O.I., Dehradun, 1972

Singh. S. : Remote Sensing Technology, Scientific Publishers, Jodhpur, 1996

PAPER-XIII (GEC 303)

(c) FUNDAMENTALS OF AGRICULTURAL GEOGRAPHY

Unit I:- The nature, subject matter and progress in agricultural geography, approaches: commodity, systematic, regional.

Unit II:- Selected agricultural concepts and their measurement –intensity of cropping ,degree of commercialization, diversification and specialization, efficiency and productivity.

Unit III:- Land-use survey and classification (British and Indian), Land capability classification (U.S. and Britain).

Unit IV:- A critical evaluation of the classification of world agriculture with special reference to Whittlesey, New perspectives in agriculture : contract farming , agri- business and food security.

RECOMMENDED READINGS :

1. Hussain, M., systematic Agricultural geography, Rawat Publications, Jaipur,1996.
2. Ilbery,B.W , Agricultural Geography ,Oxford university press ,oxford,1985.
3. Singh,J and Dhillon,S.S., Agricultural geography TATA McGraw Hill ,New delhi ,1984.
4. Singh ,Jasbir, Agricultural geography ,3rd edition, Oxford ,new delhi,2003
5. Symons ,L.,Agricultural Geography ,G.Bells ,London, 1967.
6. Alexander,j.w., economic geography ,prentice Hall ,n.j.,1968.
7. Gosal,G.S.and Krishan, Gopal, Regional disparities in levels of socio-economic development in Punjab, vishal publications,kurukshetra,1984.
8. Grigg D.B., The Agricultural systems of the world : An evolutionary approach, Cambridge university press ,Cambridge ,1978.

PAPER-XIV(GEC 304)

(a) FUNDAMENTALS OF INDUSTRIAL GEOGRAPHY

Unit 1 :Contents and scope of industrial geography: Locations of Industry: Factors of industrial location,

Theories and concepts of industrial location- the least cost school, the market area school, the marginal location school and the behavioural school

Unit 2 :The location pattern of selected industries: iron and steel, cotton textile, pulp and paper industry, petroleum refining, machinery and machine tools

Unit 3 : The Locations pattern of selected industries: automobile industry, ship building industry, cement industry, aluminum industry

Unit 4 : Manufacturing in selected regions: Kwanto plain, the Ural Region, the ruhr Basin, the New England Region, Bengal Bihar Industrial Belt

TEXT BOOKS

Reley R.C. : Industrial Geography, Charto and Winpuls, London

Smith, Daird, M. : Industrial Location, Wiley and Sons, New York

Miller, E.W. : A geography of Manufacturing Prentice Hall, New Jersey

RECOMMENDED READINGS

Jorred, A.R.: A Geography of Manufacturing, MacDonald and Evans Ltd. , London

Hunter, H.L. and Writght, A.J. : Factors of Industrial Location in Ohio, Columbus, 1969

Choudhary, M.R. : Indian Industries Development and Location, Calcutta, 197

Jarret, H.R. : Geography Manufacturing, MacDonald and Evans Ltd. London, 1964

Pounds, N.I.G. : The Geography of Iron and Steel

Smith W. : Geography of Location of Industry, Liverpool

Thoman, R.S. and Paltoh, D.H. : Focus on Geographic Activity, New York, 1964

Mountjoy, A.C. : Industrialization and Underdeveloped Counties, London, 1963

Howver, E.M. : The Location of Economic Activity, London, 1948

Alexander, J.W. : Economic Geography, Prentice Hall, New Jersey, 1963

Alexanderson, G. : Geography of Manufacturing, Prentice Hall, New Jersey, 1967

Bos, H.C.: Spatial Dispersion Activity, University Press, Rootterdam, 1965

Greenhert, M.L. : Plant Location in Theory and Practice University of North Caroline Press, Chapal Hill, 1956

Isard, W. : Location and Space Economy, MIT Press, Cambridge Mass, 1965

Losch, A. : The Economics of Location, Yale University Press, New Hevan, 1954

Eshail, LC.: Plant Location, American Research Council, New York, 1956

Estant, R.O. and Buchana, R.D. : Industrial Activity and Economic Geography Hutchinson & Co. Ltd., London, 1964

Ghose, B.C. : Industrial Location.

Britto Jh, H.H. : Regional Analysis and Economic Geography, G. Belland Sons, London,
 Carlson, A.S.: Economic Geography of The Industrial Material, Rhid Shell Pub. Corp. New York, 1965
 Mastin, J.S. : Greater London- An Industrial Geography, G. Bell and Sons, London
 Sinha, B.N. : Industrial geography of India, World Press, Calcutta Weber, Alfre: theory of Location of Industries, English edition, University of Chicago, 1929
 Aiderfer, E.B. and Midal, H.E. : Economic of American Industry, New York, 1957
 Hunder, H.L. and Wright, A.J. : Factors of Industrial Location in Ohio, Columbus, 1969
 Florence, P. Sargant : Industrial Investment, Location and Size of Plant, Cambridge, 1949
 Wilber Zelinsky : "A Method of Measuring Chage in Distribution of Manufacturing Activity"
 Economic Geography, April, 1958, pp- 94-126
 Alexander, J.W. and Linberg, James B. : Measurement of Manufacturing: Coefficients of Correlation, Journal of Regional Science, Vol. 3 1961 Pp. 71-81
 Thomson, Hohn, H. : A New Method of Measuring Manufacturing Annals of Association of American Geographers, Vol- 45, 1955, PP. 416-35
 Elliot Frncis, E. : Location Factors Affecting Industrial Plant, Economic Geography, Vol, 24, 1941m pp. 283-85

PAPER-XIV (GEC 304)

(b) LAND USE PLANNING AND RURAL DEVELOPMENT

Unit 1 :Geography and rural development; Agricultural Geography and rural development;Agricultural location theory, Rural land use; Agricultural, pastoral and forestry landuse competition. Land use and landscape, Approaches to rural development, growth centre approach, infrastructure reformist

Unit 2 : Rural settlement, Housing, population and employment, rural transport, service provision, derivation, recreation, health nutrition

Unit 3 :Rural planning and land management; Resource development and integrated rural development; Crop and soil management, livestock range and management; Water management, Ecological management, desertification – monitoring and control

Unit 4 : Rural development in Rajasthan; Major tools and techniques, Rural development schemes – Irrigation and land development schemes; Drought prone areas schemes, Desert Development programme ; integrated rural development in Rajasthan, Tribal areas development: Watershed development

REFERENCE READING

Giig, A. W. : An Introduction to Rural Geography, Edward Arnold, 1985
 Association of country Councils: Rural Deprivation London, Acc, 1979

Allan J.A. ; Remote Sensing in Landuse Studies, Geography 65, 1980

Tewari, A.K. : (ed.) : Desertification : Monitoring and Control, Scientific Pubs., Jodhpur, 1988

Anderson, J.R.L.J. : Hardarkar: Agricultural Decision Analysis, Ames: Iowa State University Press, 1977

Andreas, B. Farming Development and Space – World Agricultural Geography, New York: Water Gryter, 1981

Morgan, W.B. and R.J.G. Munom : Agricultural Geography, Methuen, London, 1971

Pacione, M.: Rural Geography, Parpur Clarks, (Ed.) and Row 1984- Register of Research in Rural Geography, Leicester : Rural Geography Study Group, 1981

BOwier, I.R. : Agricultural Geography – Profess in Human Geography-8, 1987

Newbury, P.A.R.P. : Geography of Agriculture Machonald and Evans, plymouth, 1980

Grigg, D.B. : The Agricultural Systems of the World, Cambridge university Press, 1974

Grigg, D.B. : An Introduction of Agricultural Geography, Hutchinson, London, 1984

Jones, A : Rural Housing – The Agricultural Tied College, Bell, London, 1975

Lassey, W.R. : Planning in Rural Environment, Mc Graw hill, New York,1973

Lavety, P. (ed.) ; Recreational Geography, David and Charles, Newton Abbot, 1974

Leasdale, R. Settlement Systems in Sparsely Populate Regions and Homes (ed.), Oxford, Pergamon, 1981

Menab, A. : Integrated Rural Development, Gloucester Collage of Arts, 1984

PAPER-XIV (GEC 304)

(c) QUANTITATIVE TECHNIQUES IN GEOGRAPHY

Unit 1: Use of quantitative methods in Geography, Classification and tabulation of statistical data;
 Frequency distribution and graphs; Lorenz curve

Unit 2 : Simple and multiple correlation: Linear and non-linear regression; Residuals from regression:
 Significance tests; Chi-square test; students 't' test

Unit 3 : Sampling and its objective; Sampling techniques and their application to geographical
 problems; Measures of central tendency and measures of dispersion

Unit 4 : Multivariate analysis: Principal component analysis; Theory of probability and normal
 frequency distribution

RECOMMENDED READINGS

Bunge, W. : Theoretical Geography and Studies in Geography, Ser, C. General and Mathematical Geography, No. 1, Department of Geography, University of Lund, C.W.K. Gleerup, Lund, 1973

Cole, J.P. and Kin, C.A.M. : Quantitative Geography, Wiley, 1968

Dalton, R. and others: Correlation Techniques in Geography, George Phillip & Sons Ltd. London, 1972

Dixon, C. and B. Lech: sampling Methods for Geographical Research, CAMOG 17, Geo Abstracts, University of East Angila, Norwich, U.K., 1978

Duncan, O.D. : Statistical Geography- Problems in Analysing Areal Data. 1961

Elhance, D.N. : fundamentals of Statistics, Kitab Mahal, Allahabad, 1962

Fesguon, R. : Linear Regression in Geography, CATMOG, 15, Geo Abstract University of East Angila, 1981`

Gregory, S. : Statistical Methods and the Geographers, Longman, London, 1978

King, L.J. : statistical Analysis n Geography, Prentice Hall, 1960

Monkhouse, F.J. and Wilkson, H.R. : Maps and Diagrams, B.I. Publication, Bombay, 1980

Toyne, P. and Peter, T. Newby: Techniques in Human Geography, Macmillan, London, 1976

Yeastes, M. : An Introduction to Quantitative Anlysis in Human Geography, MacGraw hill Book Company , New York, 1974

Mohammed, A. : Statistical Methods in Geography, Rajesh Publications, New Delhi, 1977

David Ebon: Statistics in Geogrpahy- A Practical Approach, 1980

PAPER –XV (GPC 305)
CARTOGRAPHY AND SURVEYING

Out of 100 marks assigned for geography practical, 30 marks for CCA and 70 marks for ESE . The division of ESE marks will be as - 40 marks are reserved for Laboratory Work Test, 10 marks for the field survey/plotting and 05 marks for viva on field survey/plotting 10 marks for the evaluation of record book and 05 marks for viva on record book.

Syllabus Contents:

Unit I: Representation of geographical data by means of Graphs (Simple, Compound, Smoothed, Cumulative, Frequency and Triangular).

Unit II: Diagrams (Bar and Pie diagrams; Proportional bars, Circles, Spheres and Cubes) and Interpretation and construction of Climatic Maps :Choroschematic, Choropleth and Isoleths maps, Dot maps.

Unit III: Interpretation and construction of Climatic graphs: Rainfall distribution, variability, intensity and duration, hythograph, Climograph, Wind direction diagram, dispersion diagrams, Accessibility.

Unit IV: Surveying: Small Geographical surveys of given areas by Theodolite (verniner scale), Plane table and Prismatic compass. Leveling; Principles and method; Contouring of small areas through Dumpy level and Clinometers (Indian pattern)

Books recommended

Singh, R.L. (ed.) : Applied Geography, Proc. Summer School (1966), Deptt. Geog., B.H.U., N.G.S.I., Varanasi-5 1968

Stride, M. (ed.) : La Geographic Appique Dans Le Mondel, Applied Geography in the World, Proc Prague Meeting (1966)

I.G.U. : Commission on Applied Geography, Czechoslovak Academy of Science, Prague, 1969

Sarfalvi, B. : Research Problems in Hungarian Applied Geography, Academia Kiado, Budapest, 1969

SELECTED JOURNALS

Applied Science and Development (Published under the revised title Applied Geography and Development since Vol. 18(1980), Institute for Scientific Co-operation, Tubngen, Federal Republic of Germany ,

Bainnual Journal Beginning with Vol/ I, 1973

Geoforum : Journal of Physical, Human and Regional Geography, Pergamon press ltd. , Oxford.,, A quarterly journal beginning with Vol. I, 1970

SKILL COURSE –III (GSC 303):

INTRODUCTION TO FIELDWORK IN GEOGRAPHY

Objectives: To develop an understanding of Basic of fieldwork in Geography

Syllabus content-

Unit I: Definition, Need and Objectives of field work in Geography.

Unit II: Methods and Techniques, Stages and Equipments of field work in Geography.

Unit III: Major Problems or Limitations of field work in Geography, Preparation of Project Report

Unit IV: Socio- Economic Field Survey of the Selected Localities

Books recommended

Singh, Gopal . 2012. *Map Work and Practical Geography*. Reprinted. Vikas Publishing House, Pvt

Ltd. Noida, UP.

Singh, R.L and Rana, P.B. 2002. *Elements of Practical Geography*. Kalayani Publishers, New Delhi.

Khullar, D.R. 2000. *Essentials of Practical Geography*. New Academic Publishing Company, Jalandhar.25

Guha, P.K. 2008. *Remote Sensing for the Beginner*. East West Press Pvt. Ltd. New Delhi.

Lunsbury J.F. and Aldrich, F.T. 1979. *Introduction to Geographic Field Methods and Techniques*.

Charles E. Merrell Publishing Company, Columbus.



**JAI NARAIAN VYAS UNIVERSITY JODHPUR
(RAJASTHAN)**

FACULTY OF ARTS, EDUCATION AND SOCIAL SCIENCES

SYLLABI

FOR

M.A. GEOGRAPHY (SEMESTER SCHEME)

(SEMESTER I AND SEMESTER II) EXAMINATIONS 2018-2019

&

(SEMESTER III AND SEMESTER IV) EXAMINATIONS 2018-2019

Same IV – 1. Minor changes in paper no XVII (GEC 403) Elective Option, (C) Dissertation is deleted.

2. Minor Changes in paper no XIX (GEC 404) Elective Option, Advanced oceanography and Geography of energy resources are deleted.

(a). New elective/ option paper – Advanced systematic and regional geography of Japan is introduced.

(b) Advanced systematic and regional geography of USA is second elective paper (Already exists/ previously).

DETAIL EXAMINATION SCHEME FOR CHOICE BASED CREDIT SYSTEM

GUIDELINES

Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete **four skill courses:** two within the Department and two from other Department within JNV University or the Universities approved by JNV University
3. **Course:** Usually referred to, as ‘papers’ is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period of teaching (lecture or tutorial) or two periods of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.
12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/ December and even semester from December/January to May.
Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May. The Department shall conduct the Practical examination of odd and even semesters as per the Panel of Examiners approved by the University. Each Board of examiners shall consist for one external Examiner from other University/Institute and another from the Department.
13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student’s performance. Accordingly the Faculty of Arts, Education & Social Sciences resolves the following:

- a. All internal assessments shall on term test and seminar. Attendance shall carry the prescribed marks in all papers.
- b. In each semester two out of four theoretical components of the University examinations shall be undertaken by external examiners from outside JNV University, who may be appointed by the competent authorities.

Grievances and Redressal Mechanism

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head of the Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.
- b) The appeal will be assessed by the Chairman and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Dean, Faculty of Arts, Education & Social Sciences comprising of the HOD of the concerned Department and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	'O'	Outstanding	10
2	'A+'	Excellent	9
3	'A'	Very Good	8
4	'B+'	Good	7
5	'B'	Above Average	6
6	'C'	Average	5
7	'P'	Pass	4
8	'F'	Fail	0
9	'Ab'	Absent	0

- i. A student obtaining Grade F in a paper shall be considered failed and will be required to reappear in the University End Semester examination.
- ii. For noncredit courses (Skill Courses) 'Satisfactory' or "Unsatisfactory" shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

= and > 95 % marks Grade Point 10.0
90 to less than 95 % marks Grade Point 9.5
85 to less than 90 % marks Grade Point 9.0
80 to less than 85 % marks Grade Point 8.5
75 to less than 80 % marks Grade Point 8.0
70 to less than 75 % marks Grade Point 7.5
65 to less than 70 % marks Grade Point 7.0
60 to less than 65 % marks Grade Point 6.5
55 to less than 60 % marks Grade Point 6.0
50 to less than 55 % marks Grade Point 5.5
45 to less than 50 % marks Grade Point 5.0
40 to less than 45 % marks Grade Point 4.5
35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,
i.e.

$$\text{SGPA (Si)} = \frac{\sum (C_i \times G_i)}{\sum C_i}$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,
i.e.

$$\text{CGPA} = \frac{\sum (C_i \times S_i)}{\sum C_i}$$

where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.

- iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	6	B	6	6 x 6 =36
2	Course 2	6	B+	7	6 X 7 =42
3	Course 3	6	B	6	6X 6 = 36
4	Course 4	6	O	10	6 X 10 =60
	Total	24			36+42+36+60=174

Thus, $\text{SGPA} = 174/24 = 7.25$

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	7.25	7.25	7	6.25

$$\text{CGPA} = \frac{(24 \times 7.25 + 24 \times 7.25 + 24 \times 7 + 24 \times 6.25)}{96}$$

$$666/98 = 6.94$$

Semester-wise Theory Papers/Practical / Skill component

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Semester I							
Core course 1	GCC 101		6-0-0	6	30	70	100
Core course 2	GCC 102		6-0-0	6	30	70	100
Core course 3	GCC 103		6-0-0	6	30	70	100
Core course 4	GCC 104		6-0-0	6	30	70	100
Practical Course 5	GPC 105		0-0-12	6	30	70	100
Skill Course I	GSC 101		2-0-2				
Total				30	150	350	500
Semester II							
Core course 6	GCC 201		6-0-0	6	30	70	100
Core course 7	GCC 202		6-0-0	6	30	70	100
Core course 8	GCC 203		6-0-0	6	30	70	100
Core course 9	GCC 204		6-0-0	6	30	70	100
Practical Course 10	GPC 205		0-0-12	6	30	70	100
Skill course II	GSC 202		2-0-2				
Total				30	150	350	500

Semester III							
Core course 11	GCC 301		6-0-0	6	30	70	100
Core course 12	GCC 302		6-0-0	6	30	70	100
Discipline Specific Elective 1	One Elective paper from the list of Group I GEC 303(a,b,c)		6-0-0	6-0-0	6	70	100
Discipline Specific Elective 2	One Elective paper from the list of Group II GEC 304(a,b,c)		6-0-0	6-0-0	6	70	100
Practical Course 15	GPC 305						
Skill course III	GSC 303		2-0-2				
Total				24	120	280	400
Semester IV							
Core course 16	GCC 401		6-0-0	6	30	70	100
Core course 17	GCC 402		6-0-0	6	30	70	100
Discipline Specific Elective 3	One Elective paper from the list of Group I GEC 403(a,b,c)		6-0-0	6-0-0	6	70	100
Discipline Specific Elective 4	One Elective paper from the list of Group II GEC 404(a,b)		6-0-0	6-0-0	6	70	100
Practical Course 20	GPC 405						
Skill course IV	GSC 404		2-0-2				
Total				24	120	280	400

*** The Department shall offer one skill course per semester from the list of skill courses approved for the Department.**

In view of the course content, the Department of Geography distributed the Periods between Theory/Tutorial/Practical as under per paper

- 6: 0 : 0 (six lectures only (no tutorial and no practical) per week) – For Theory
- 0: 0 :12(no lecture, no tutorial and twelve practical only per week)- For practical per paper
- 2+0+2 (two lectures, no tutorial and two practical/field experimentations) - For Skill course

The Duration of the Period shall be forty five minutes. In each of these combinations, the first value stands for the same number of lecture instructions per week, whereas the last two values stand for doubles the number of tutorial/ practical instructions per week

In each practical group the number of students that can be accommodated will be fifteen.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective/ Practicals) involve an evaluation system of students that has the following two components:-

- (i) **Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
 - (ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.
- (i) **Continuous Comprehensive Assessment (CCA):** This would have the following components:
- a. **Term Test:** One term test shall be arranged for each paper prior to End-Semester Examination; examination duration shall be of three hours; maximum marks shall be 60 (reduced to 15).
 - b. **Seminar:** Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 40 (reduced to 10). The seminar shall be completed prior to term test for all the papers.
 - c. **Classroom Attendance** – Each student will have to attend a minimum of 75% Lectures / Tutorials / Practicals. A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE). Attendance marks will be awarded by following the system proposed below:

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

75% to 80%	=	1 mark
81% to 85%	=	2 marks
86 to 90%	=	3 marks
91% to 95%	=	4 marks
96% and above	=	5 marks

Note: Compensation in classroom attendance of a student will be as per prevalent University rules.

Each student's cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Arts, Education & Social Sciences.

- d. CCA is based on open evaluation system without any bias to any student.
- e. Any grievance received in the Department from student shall be placed before the **Grievance Redressal Committee** with adjudicated comments

Each component marks will be added making it rounding as per norms.

Marking Scheme of Continuous Comprehensive Assessment (CCA)

Components	Maximum Marks	Reduced and Original Marks
Term Test	60	(reduced to 15)
Seminar	40	(reduced to 10)
Classroom Attendance	05	05
Total Marks of CCA	100	30

Note : Classroom Attendance marks will be as follows :-

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

Percentage	Marks
75% to 80%	1 mark
81% to 85%	2 marks
86 to 90%	3 marks
91% to 95%	4 marks
96% and above	5 marks

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective Department shall declare the result as "Satisfactory" or "Non-Satisfactory"; each student need to get a minimum of three "Satisfactory" declaration for the course completion

For the Term test and ESE:

Part A

Ten questions (Definitions, illustrations, functions, short explanations, etc; 25-50 words) for one mark each. 10 × 1 = 10 marks; comprising questions from each Unit; no choice in this part

Part B

Four questions of long/explanatory answer (500 words) type, one drawn from each Unit; with internal choices : 4 x 15 = 60 marks.

10+60 = 70 marks

MEDIUM

Candidates are not allowed to use any medium except Hindi or English for answering question papers. For answering papers in the subjects of English/Hindi the medium will be corresponding language only.

Qualifying for Next semester

- i. **A student acquiring minimum of 40% in total of the CCA is eligible to join next semester.**
- ii. A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as 'Fail'), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.
- iii. A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time, i.e. three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted, for additional chances examination fee shall be on additive basis.

Improvement Option:

Every student shall have the opportunity to improve Credit through University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final.

Result Declaration:

The ESE (End Semester Examination/University Examination) results shall be declared within twenty days of the last examination. The Theory Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation.

POST -GRADUTE COURSE: A DESCRIPTION

The full course is of FOUR SEMESTERS spread for TWO YEARS duration. A semester-wise list of courses to be offered is given below. In each paper there will be four units.

SEMESTER I

SEMESTER II

SEMESTER III

SEMESTER IV

Elective paper group – First – Semester III

Elective paper group – Second – Semester III

Elective paper group – First – Semester IV

Elective paper group – Second – Semester IV

Skill Courses in the respective subject

Electives would be discipline centric and only students from concerned departments can register.

ADMISSION

The details of the eligibility conditions and admission procedures are given in the admission forms and on university website. The admission would be done on the basis of merit as per university rules. Reservation for SC, ST and OBC would also be done as per J.N.V. University, Jodhpur rules. Candidates are required to attend minimum 75% of the classes in theory and practicals both.

FACILITIES

The Department of Geography possesses several sophisticated, advanced and modern equipments required for teaching and research.

Faculty Members

Professor

Dr. Rajendra Parihar (Prof.& Head)

Dr. Irfan Mehar

Associate Professor

Dr. Jai Singh

Assistant Professor

Dr. Arjun Lal Meena

Dr. Asha Rathore

Mr. Govind Singh

Dr. Lalit Singh Jhala

Mr. Omprakash

Mr. Gaurav Kumar Jain

TEACHING AND EXAMINATION SCHEME

Per Semester

Course	Periods/Week	Examination hours	CCA	ESE	Total
Theory Papers/ Practicals					
Course I	6	3	30	70	100
Course II	6	3	30	70	100
Course III	6	3	30	70	100
Course IV	6	3	30	70	100
Practical Courses V	12	6	30	70	100

UNIVERSITY EXAMINATION

Each course paper shall be of three hours duration.

Note: The number of elective to be taught from each group in a particular year shall be decided by the Department. Electives offered will be announced at the beginning of the academic session. Each student shall be assigned one Elective Paper from Group ONE and the second from Group TWO. Elective papers will be allotted on merit-cum-choice basis as far as possible. In the odd semester two skill courses will be those offered by the respective departments in the even semester skill courses will be from other departments.

**SCHEME OF EXAMINATION FOR M.A GEOGRAPHY (SEMESTER SYSTEM) FOR
THE EXAMINATION OF 2018-19**

INSTRUCTIONS FOR THE PAPER SETTERS AND THE STUDENTS

Max. Marks - 70
Min. Marks – 25

Duration – 3 hours

Note :

- (i) There shall be 9 questions in all. Five questions have to be attempted.
- (ii) The first question shall be short answer type containing 10 short questions spread over the whole syllabus to be answered in about 30 words each. It shall carry 10 marks and shall be a compulsory question.
- (iii) Rest of the paper shall contain 8 questions with internal choice. The entire syllabus has been divided into four units. Each unit shall have two questions and the candidates shall be given internal choice i.e. the candidate shall attempt one question from each unit.

SEMESTER - IV

1. THEORY PAPERS Credits (Core)	ESE	CCA	Total	Lecture- Tutorial- Practical/Week	
Paper-XVI (GCC401)Regional planning and Development	70	30	100	6-0-0	6
Paper –XVII (GCC 402)Advanced Geography of India	70	30	100	6-0-0	6
<u>ELECTIVE PAPERS</u>					
Paper- XVIII (GEC 403) Any one of the following- (a) Climatology and Meteorology (b) Fundamentals of Natural Hazards and Disaster Management	70	30	100	6-0-0	6
Paper- XIX (GEC 404) Any one of the following- 6 (a) Advanced Systematic and Regional Geography Japan (b) Advance Systematic and Regional Geography of U.S.A	70	30	100	6-0-0	6

Paper- XX (GPC 405) Practical (Cartography and project)	70	30	100	0-0-12	6
---	-----------	-----------	------------	---------------	----------

Grand Total	500 Marks	30 Credits
--------------------	-------	------------------	-------	-------------------

.....
Total marks of Semester IV 500 Marks and 30 Credits

.....
Total marks of M.A (Semester III and IV) 1000 Marks and 60 Credits

.....
Total marks of M.A (Semester I, II, III and IV) 2000 Marks and Credits 120

Skill Course-IV (GSC404) (for Students of other Deptt.)	2-0-2
--	--------------

SEMESTER-IV PAPER – XVI (GCC 401)

REGIONAL PLANNING AND DEVELOPMENT

- Unit – I:** Regional concept in Geography, merits and limitations for application to regional planning and development; changing concept of the region
- Unit-II:** Indicators of development and disparities - case study of India. Regional development strategies
- Unit- III:** Short- term and long term planning in a national context. Regional development in India - problems and prospects..
- Unit- IV:** Planning process - sectoral, temporal and spatial dimensions, Concept of Multi-level planning : Decentralized planning; Peoples participation in the planning process;

Books Recommended :

1. Abler, R. et.al : Spatial Organisation : The Geographer's View of the World, Prentice Hall, Englewood Cliffs, N.J., 1971
2. Bhat, L.S. : Regional Planning in India, Statistical Publishing Society, Calcutta, 1973
3. Bhat, L.S. : Micro-Level Planning : A Case Study of Karnal Area, Haryana, K.B. Publications, New Delhi, 1976
- 15
4. Chorley, R.J. & Hagget, P.: Models in Geography, Methuen, London, 1967
5. Christaller, W. : Central Places in Southern Germany, Translated by C.W. Baskin, Prentice Hall, Englewood Cliffs, New jersey, 1966
6. Friedmann, J. & Alonso, W.: Regional Development Policy - A Case Study of Venezuela, M.I.T. Press Cambridge, Mass, 1966
7. Friedmann, J. & Alonso, W.: Regional Development and Planning - A Reader, M.I.T. Press Cambridge, Mass, 1967
8. Glikson, Arthur : Regional Planning and Development, Netherlands Universities

- Foundation for International Co-operation, London, 1955
9. Gosal, G.S. & Krishan, G.: Regional Disparities in Levels of Socio-Economic Development in Punjab, Vishal Publications, Kurukshetra, 1984
 10. Govt. of India, Planning Commission - Third Five Year Plan, Chapter on Regional Imbalances in Development, New Delhi, 1961
 11. Indian Council of Social Science Research - Survey of Research in Geography, Popular Prakashan, Bombay, 1972
 12. Johnson, E.A.J. : The Organisation of Space in Developing Countries, Harward University Press, Cambridge, 1970
 13. Kuklinski, A.R. (ed.) : Growth Poles and Growth Centres in Regional Planning, Mouton, The Hague, 1972
 14. Kundu, A. & Raza, Moonis: Indian Economy - The Regional Dimension, Spectrum Publishers, New Delhi, 1982
 15. Losch, A. : The Economics of Location, University Press, Yale, New Haven, 1954
 16. Misra, R.P. : Regional Planning Concepts, Techniques and Policies, University of Mysore, Mysore, 1969
 17. Misra, R.P. & Others (eds.): Regional Development Planning in India - A Strategy, Institute of Development Studies, Mysore 1974
 18. Mitra, A. : Levels of Regional Development, Census of India, Vol.I, Part1A (I) and (II) New Delhi 1965
 19. Myrdal, G : Economic Theory and under Development Regions Gereld Ducjworth, London, 1957
 20. Nangia, Sudesh : Delhi Metrololitan Region, Rajesh Publication, Delhi, 1976
 21. Richardson, H.W. : Regional Economics, Weidenfeld and Nicolson, London, 1969
 22. Sundaram, K.V. (ed.): Geography and Planning, Essays in Honour of V.L.S. Prakasa Rao, Concept Publishing Co., New Delhi, 1985
 23. Tarlok Singh : India's Development Experience, McMillan, New Delhi, India, 1974
 24. Raza Moonis (ed.) : Regional Development, Heritage Publishers, Delhi 1988
 25. Mishra, R.P. et.al : Multi - Level Planning, Heritage Publishers, Delhi, 1980

PAPER-XVII (GCC 402)

ADVANCED GEOGRAPHY OF INDIA

Unit 1 : Terrain units of India(Northern Mountain Region) and their characteristics; Drainage systems; Origin and Mechanism of Indian Monsoon; Climatic divisions

Unit 2 : Population-growth, distribution and density; Population problems and policies; Agriculture-main characteristic and problems, Agricultural regions; Major Irrigation schemes-Damodar, Bhakra Nagal and Chamal

Unit 3 : Major minerals (Iron-ore, Manganese, Mica and Copper,) and Power Resources (Coal, Petroleum, Hydro-electricity and Nuclear)- their distribution, reserves, production and conservation

Unit 4 : Transportation and trade-different modes and their functional significance; International trade composition and trends; planning regions of India

RECOMMENDED READINGS

Choudhary, M.R. : An Economic Geography of India, Oxford and IBH Publishing Co., New Delhi, 1976

Chouhan, T.S. : Bharat Ka Bhugol, Vigyan Prakashan, Jodhpur, 1997 Nag. Pub. And S. Sengupta : Geography of India, Concept Publishing Co., New Delhi, 1992

Sharma T.C. : and O. Coutinho : Economic and Commercial Geography Geography of India, Vikash Publishing Pvt. Ltd. , New Delhi, 1993

Singh J. : India-A Comprehensive Sysmatic Geography, Gyanodaya Prakashan, 234, Daudpur, Gorakhpur, 1995

Spate, O.H.K. and A.T.A. Learmouth : India, Pakistan and Ceylon, Methuen & Co., London,1967

Ramamoory and Gopalkrishan : Geography of India, Jawahar Publishers and Distributors, New Delhi, 1996

Tirtha, R. : Geography of India, Rawat Publication, Jaipur, 1996

Sharma, R.C. : Reading in General Geography and Geography of India, Jawahar Publishers and Distributors, New Delhi, 1992

Mamoria, C.B. : Economic and Commercial Geography of India, shiva lap Agarwal & Co., Agra, 1986

Despande, C.D. : India- A Regional Synthesis, new Delhi, 1996

Dutta, R. and K.P., Sundkram : Indian Economy

Tiwari, R.C. : Geography of India, Prayag Pustak Bhawan, Allahabad, 2003

PAPER-XVIII (GEC 403)

(a) CLIMATOLOGY AND METEOROLOGY

Unit 1 : Construction and use of chief meteorological instruments, physical process of atmosphere, radiation and heat balance; condensation, stability and instability

Unit 2 : Origin, Characteristics and transformation of air masses, fronts and cyclones, general circulation of atmosphere, weather forecasting, classification of climates

Unit 3 : Modification of atmosphere by surface features; evidence of climatic changes during geological and historical times and critical assessment of such evidences

Unit 4 : Reaction of man to climatic environment, modification of terrestrial climates by human agency

Recommended Readings

Benstead, C.R. : The Weather Eye

Conard, V. and Plok, L.W. : Methods in Climatology

Finch, V.C., Trewartha, G.T., Shearer and Candler: Elementary Meteorology

Geiger, H. : The Climate Near the Ground

Haynes, B.G. : Techniques of Observing the Weather

Hole, P.X. : The Restless Atmosphere

Kendrew, W.G. : Climatology

Middleton, W.G. : Meteorological Instruments

Miller, A.A. : Climatology

Petterson, S. : Introduction to Meteorology

Petterson, S. : Weather Analysis and Forecasting

Richi, H. : Tropical Meteorology

Saucier, M.J. : Principles of Meteorological Analysis

Sutton, O.G. : Micrometeorology

Tannehill, I.R. : Hurricanes

Trewartha, G.T.: An Introduction to Weather and Climate

Trewartha, G.T.: The Earth's Problem Climate, 1962

Walths, J.E.S. : Equatorial Air

Willett H.C. & Sandars, F. : Descriptive meteorology

Crowe, P.R. : Concepts in Climatology, Longmans, London, 1971

McBoyle, G.(ed.) : Climate in Review, Houghton Mifflin Comp. Boston, 1973

PAPER-XVIII (GEC 403)

(b) FUNDAMENTALS OF NATURAL HAZARDS AND DISASTER MANAGEMENT

UNIT-I: Basic Concept : Hazards, Vulnerability, Risk and Disaster; Classification/Types of Hazards/Disasters; Evolution of Disaster Studies and its Current Status

UNIT-II: Geo-Physical/Tectonic Disasters: Earthquake, Landslide and Avalanche; Hydrological Disasters: Flood, Cloud burst, Drought and desertification, Cyclone; Human Made Disasters: Chemical Disaster, Nuclear Disaster

UNIT-III: Regional Dimension of Hazards/Disasters in India. Earthquakes in India, Landslides in India, Drought in India; Disasters in Himachal Pradesh,

UNIT-IV: Disaster Management: Pre-disaster phase, Emergency phase and Post-disaster phase; Disaster Management Mechanism in India: Disaster Management Agencies

Recommended Readings:

1. Alexander, D. E.: *Natural Disasters*. London: University College London Press and; Dordrecht and Boston: Kluwer Academic Publishers, 1993.
 2. Alexander, D. E.: *Confronting Catastrophe: New Perspectives on Natural Disasters*. Harpenden, U.K: Terra Publishing, 2000.
 3. Allan, S., Adam, B. and Carter, C. (eds): *Environmental Risks and the Media*, Routledge, London, 2000.
 4. Ahmed, Shaik Iftikhar: *Disaster Management in the Wake of a Flood*, Twenty First Century Publications, Patiala, 2008.
 5. Blaikie, P. and Others: *At Risk: Natural Hazards, People's Vulnerability, and Disasters*, Routledge, London, 1994.
 6. Birkmann, J.: *Measuring Vulnerability to Natural Hazards: Towards Disaster Resilient Societies*. US: United Nations University Press, 2006.
 7. Hyndman, D. and D. Hyndman.: *Natural Hazards and Disasters*. 2nd edition. USA, Belmont: Brooks/Cole, 2009.
 8. Burton, I., Kates, R.W. and White, G.F.: *Environment as Hazard*, 2nd edition, Guilford Press, New York, 1993.
- 38 M.A. GEOGRAPHY (SEMESTER SYSTEM)
9. Hewitt, K.: *Regions of Risk: A Geographical Introduction to Disasters*, Longman, London, 1997.
 10. Kasperson, J.X., Kasperson, R.E. and Turner, B. L.: *Regions at Risk: Comparisons of Threatened Environments*, United Nation University Press, Tokyo, 1995.

PAPER-XIX (GEC 404)

(a) ADVANCED SYSTEMATIC AND REGIONAL GEOGRAPHY JAPAN

Unit I : Physiographic regions, Soil , Natural Vegetation; Natural Hazards: Volcanoes, Earthquakes, Tsunami, Typhoons, Floods

Unit II: A Agriculture - Problems and Prospects, Salient features of Agriculture and changing scenario, Agricultural Regions, Major Crops, Irrigation: Types of Irrigation and Distribution ; Minerals: Major types of minerals

Unit III: Power resources: Coal, Petroleum and Hydroelectricity, Location and distribution of Industries: Iron and Steel, Cotton Textile, Automobile; Transport: Roadways, Railways, Airways, Major ports and Seaways

Unit IV : A detailed study of Major Geographical Regions

RECOMMENDED READINGS

Association of Japanese Geographers (Ed) (1980): Geography of Japan. Teikoku Shoin

Dempster Prue (1967): Japan Advances, A Geographical Studies. Mathuen and Co. Ltd.

Woronoff (1993): Japanese Management Mystique, Reality behind the Myth. Neo Pub. Press, new Delhi

Kunio Yoshihara (1972): Japanese Economic Development : A Short Introduction, Methuen Co., London

Reischauer E.D (1946): Japan Past and Present. Alfred A Knoph, New York

Trewartha Glenn T. (1965): Japan – A physical Cultural and Regional Geography. Muthuen Co., London

Hall R.B (1970): Japan, Industrial Power of Asia, Pall Mall Press, London

Trewartha Glenn T. (1965): Japan – A physical Cultural and Regional Geography. Muthuen Co., London

PAPER- XIX (GEC 404)
(b) ADVANCED SYSTEMATIC AND REGIONAL GEOGRAPHY U.S.A.

Unit I : Physiographic regions, Soil , Natural Vegetation

Unit II: Agriculture Crops: Corn, Cotton, Wheat, Agriculture Belts; Minerals: Iron Ore, and
Atomic Minerals

Unit III: Power resources: Coal, Petroleum and Hydroelectricity, Location and distribution of
Industries:Iron and Steel, Cotton Textile, Automobile; Transport: Inland Waterways

Unit IV : A detailed study of Major Geographical Regions

RECOMMENDED READINGS

Atwood,E(ed.): The Physiographic Provinces of North America

Fenneman, N.M.: Physiography of Wstern United States

Green, C.M. : American Agriculture

Loomix, F.B.: Physiography of the United States

Monkhouse, FJ & H.R. Cair, North America, Longman

Peterson, J.H.: North America, London

White, C.L. and Foscue, F.J.: Regional Geography of Anglo-America Watson, W.: North America,
Methuen, London University Library, London, 1957

Ullman, E.L. : American Geography: Inventory and Prospects, James and C.F. Jones (editors),

Kuhn, T.E. : Public Enerprise, Economic and Transport problems, University of California Press, 1962

Ministry of Transport : Batter use of Town Roads, HMSA. London,1967

Bingham, T. : Transportation – Principles and Problems McGraw Hill, New York,

PAPER-XX (GPC 405)
CARTOGRAPHY AND SCIO-ECONOMIC SURVEY OF VILLAGE

Out of 100 marks assigned for geography practical, 30 marks for CCA and 70 marks for ESE . The division of ESE marks will be as - 40 marks are reserved for Laboratory Work Test, and 10 marks for the evaluation of record book and 05 marks for viva on record book. 20 marks for socio-economic survey of a village,(10 marks Survey Report, 05 marks viva on Survey Report).

Syllabus contents:

Unit I: Graphs showing pressure and relative humidity conditions, interpretation of air photos: Simple photo-interpretation with the help of pocket and mirror stereoscope as applied in identification and analysis of feature of landforms; geographic units, settlements, communication, vegetation and land use

Unit II: Numerical exercises pertaining to the aerial photographs; Calculation of flying height, number of strips of aerial photographs in given area, Fundamentals of digital image processing.

Unit III: Geographic information systems (GIS); Applications of remote sensing in Geography, Digital cartography, mapping organizations and services- survey of India, NATMO, NRSA ,state organizations.

Unit IV: Statistical Techniques: correlation, Spearman's rank correlation and Karl Parsons product moment correlation, Simple linear, regression, residual from regression, Chi-square test and student 't' Test

SOCIO-ECONOMIC SURVEY OF A VILLAGE

Particular focus will be on population density, distribution, Caste Structure, Literacy Rate, and Creed work force, Land holding ratio, occupation structure, income gap, poverty analysis etc. (For every 15 students one teacher shall accompany the group).

TEXT BOOKS

Monkhouse, F.J. & Wilkerson, H.R. : Maps and Diagrams, Methuen and Co. London

Raisz, E. : General Cartography, McGraw, 1977

Gregory, S. : Statistical Methods and the Geographers, Methuen and Co., 1971

Kanetkar, T.P. : Surveying and Leveling, Parts I and II

RECOMMENDED READINGS

Robinson, A.H. : Elements of Cartography, Chapman and Hall, London

Dickinson, G.C. : Statistical Mapping and the Presentation of Statistics, Edward and Arnold, 1973

Lawrence, G. RY. : Cartographic Methods, Methuen, 1971

Brich, T.W. : Maps Topographical and Statistical

Faith, EA. : Surveying- Theory and Practice

Higgins, A.L. : Elementary Survey

Hinks, A. : Maps and Surveying

Low, J.R.: Plane Table Mapping

Threlfair, H : A Text books of Surveying and Leveling

Lewis, P. : Maps and Statistics, Methuen, 1977

King, L.J. : Statistical Analysis in Geography, Prentice Hall, N.J.

Laeder D.R. : Aerial Photographic Interpretation

Sharma, J.P. : Prayogic Bhoogol, Rastogi & Co. Meerut, 1983

Unwin, D.J. and J.A. Dawson : Computer Programming for Geographers, Longman, 1986

Zuylen LVan : Computer Assistant Cartography, N.Y. , 1985

SKILL COURSE IV (GSC 404): ENVIRONMENTAL DEGRADATION, NATURAL HAZARDS AND THEIR MITIGATION

Objectives : To develop an understanding of environmental degradation, natural hazards and their mitigation

Syllabus content-

Unit I: Environmental issues: Depletion of ozone Layer, Ecological significance of ozone, protection of ozone layer; Acid rain- causes and effects.

Unit II: Global warming: Concept, Causes and effects of global warming

Unit III: Natural Hazards and their Mitigation: Meaning and Types of hazards-Earthquake, cyclones, cloud Burst, Tsunami, Flood, Avalanches and their mitigation Strategies

Unit IV: Environmental pollution: Air pollution, water pollution, soil pollution, noise pollution.

Books Recommended

Singh, Savindra. 2012. *Environmental Geography. Reprinted.* Prayag Pustak Bhawan, Allahabad

Gautam, Alka. 2010. *Environmental Geography.* Sharda Pustak Bhawan, Allahabad, UP.

Shitole, G.Y. 2012. *Environmental Degradation Issues and Challenges. Serials Publications, New Delhi*

Khullar, D.R. 2009. *India: A Comprehensive Geography.* Kalyani Publisher, New Delhi.



JAI NARAIN VYAS UNIVERSITY, JODHPUR (RAJASTHAN)

FACULTY OF ARTS, EDUCATION & SOCIAL SCIENCES

(DEPARTMENT OF HISTORY)

SYLLABI

FOR

M.A. HISTORY (SEMESTER SYSTEM I AND SEMESTER II EXAMINATION 2022-2023

M.A. HISTORY (SEMESTER SYSTEM III AND SEMESTER IV EXAMINATION 2022-2023

IMPORTANT

NOTIFICATION

In compliance of decision of the Hon'ble High Court all students are required to fulfill 75% attendance rule in each subject and there must be 75% attendance of the student before he/she could be permitted to appear in the examination.

REGISTRAR

(Academic)

FACULTY OF ARTS, EDUCATION & SOCIAL SCIENCES

MASTER OF ARTS

GENERAL INFORMATION FOR STUDENTS

The examination for the degree of Master of Arts, Education and Social Sciences shall consist of two parts with semester system : (i) The M.A. (Semester I and Semester II) , 2022-2023 and (ii) M.A. (Semester III and Semester IV), 2022-2023

The examination will be through theory papers/practical/viva. Pass marks for the semester I, semester II, semester III and semester IV examination are 36% of the aggregate marks in all the theory papers and viva/practical's and not less than 25% marks in the individual theory paper/viva/practical. A candidate is required to pass in the written and the practical/viva examination separately.

Successful candidate will be placed in the following divisions on the basis of the total marks obtained in all four semesters of M.A. (Semester I and Semester II) and (ii) M.A (Semester III and Semester IV) examinations taken together.

First division 60%,second division 48% and third division 36% no students will be permitted to register himself simultaneously for more than one post-graduate course.

ATTENDANCE

1. For all regular candidates in the faculties of arts, education and social sciences, science, law, commerce and engineering, the minimum attendance requirement shall be that a candidate should have attended at least 75% of the lecturers delivered and tutorials held taken together as well as 75% of practical and sectionals from the date of his/her admission.
2. Condonation of shortage of attendance:
The shortage of attendance up to the limits specified below may be condoned on valid reason :
 - i) Up to 6% each subject plus 5 attendances in all the aggregate subject/papers may be condoned by the Vice-chancellor on the recommendation of the Dean/Director/Principal for undergraduate students and on the recommendation of the Head of the Department for the Post-graduate classes.
 - ii) The N.C.C./N.S.S cadets sent out to parades and camps and such students who are deputed by the University to take part in games, athletics or cultural activities may, for purpose of attendance, be treated, as present for the days of their absence in connection with the aforesaid activities and that period shall be added to their subject wise attendance.

Note :

The attendance requirement will apply to each semester.

Candidates will be required to pass separately in theory and practical examinations.

Candidate's choice among the optional papers and groups would be restricted only to those paper or groups for which regular teaching is provided in the department.

MEDIUM

Candidates are not allowed to use any medium except Hindi or English for answering question papers.

For answering papers in the Subjects of English/Hindi the medium will be corresponding language only.

ADMISSION

The details of the eligibility conditions and admission procedures are given in the admission forms and on university website. The admission would be done on the basis of merit as per University rules. Reservation for SC, ST and OBC would also be done as per J.N.V. University, Jodhpur rules. Candidates are required to attend minimum 75% of the classes.

FACULTY

Professor

Dr. Sushila Shaktawat

Assistant Professor

Dr.Rashmi Meena

Dr.Bhagwan Singh Shekhawat

Dr.Bhawani Singh Rajpurohit

Dr.Dinesh Rathi

Dr. Suresh Kumar Choudhary

Dr.Pratibha Sankhla

Dr.Mahendra Purohit

Dr.Bharat Deora

Dr.Lalit Kumar Panwar

GUIDELINES FOR CHOICE BASED CREDIT SYSTEM

Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete **four skill courses:** two within the Department and two from other Department within JNV University or the Universities approved by JNV University
3. **Course:** Usually referred to, as 'papers' is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period of teaching (lecture or tutorial) or two periods of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.
12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/ December and even semester from December/January to May.
Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May.
13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Arts, Education & Social Sciences resolves the following:

- a. All internal assessments shall on term test and seminar. Attendance shall carry the prescribed marks in all papers.
- b. In each semester two out of four theoretical components of the University examinations shall be undertaken by external examiners from outside JNV University, who may be appointed by the competent authorities.

Grievances and Redressal Mechanism

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head of the Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.

- b) The appeal will be assessed by the Chairman and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Dean, Faculty of Arts, Education & Social Sciences comprising of the HOD of the concerned Department and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	'O'	Outstanding	10
2	'A+'	Excellent	9
3	'A'	Very Good	8
4	'B+'	Good	7
5	'B'	Above Average	6
6	'C'	Average	5
7	'P'	Pass	4
8	'F'	Fail	0
9	'Ab'	Absent	0

- i. A student obtaining Grade F in a paper shall be considered failed and will be required to reappear in the University End Semester examination.
- ii. For noncredit courses (Skill Courses) 'Satisfactory' or "Unsatisfactory" shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

- = and > 95 % marks Grade Point 10.0
- 90 to less than 95 % marks Grade Point 9.5
- 85 to less than 90 % marks Grade Point 9.0
- 80 to less than 85 % marks Grade Point 8.5
- 75 to less than 80 % marks Grade Point 8.0
- 70 to less than 75 % marks Grade Point 7.5
- 65 to less than 70 % marks Grade Point 7.0
- 60 to less than 65 % marks Grade Point 6.5
- 55 to less than 60 % marks Grade Point 6.0
- 50 to less than 55 % marks Grade Point 5.5
- 45 to less than 50 % marks Grade Point 5.0
- 40 to less than 45 % marks Grade Point 4.5
- 35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,
i.e.

$$SGPA (S_i) = \frac{\sum (C_i \times G_i)}{\sum C_i}$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,
i.e.

$$CGPA = \frac{\sum (C_i \times S_i)}{\sum C_i}$$

where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.

iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	6	B	6	6 x 6 =36
2	Course 2	6	B+	7	6 X 7 =42
3	Course 3	6	B	6	6X 6 = 36
4	Course 4	6	O	10	6 X 10 =60
	Total	24			36+42+36+60=174

Thus, $SGPA = 174/24 = 7.25$

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	7.25	7.25	7	6.25

$$CGPA = (24 \times 7.25 + 24 \times 7.25 + 24 \times 7 + 24 \times 6.25) / 96$$

$$666/96 = 6.94$$

Semester-wise Theory Papers/Practical / Skill component

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
SEMESTER II							
Core course 5	Hist. 201	Histeriography, Historical Concepts, Methods and Tools-II	6-0-0	6	30	70	100
Core course 6	Hist. 202	Twentieth Century World - II	6-0-0	6	30	70	100
Core course 7	Hist. 203	Cultural Profile of India - II	6-0-0	6	30	70	100
Core course 8	Hist. 204	Women In Indian History - II	6-0-0	6	30	70	100
*Skill course II		History of Rajasthan	2-0-0				
Total				24	120	280	400

***The Department of History shall offer one skill course per semester from the list of skill courses approved for the Department .**

In view of the course content, the Department of History distributed the Periods between Theory/Tutorial/~~Practical~~ as under per paper

- 6 : 0 : 0 (six lectures only (no tutorial and no practical) per week) – For Theory
- 2+0+0 (two lectures) - For Skill course

The Duration of the Period shall be forty five minutes. In each of these combinations, the first value stands for the same number of lecture instructions per week.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective) involve an evaluation system of students that has the following two components:-

- (i) **Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
- (ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.
- (i) **Continuous Comprehensive Assessment (CCA):** This would have the following components:
 - a. **Term Test:** One term test shall be arranged for each paper prior to End-Semester Examination; examination duration shall be of three hours; maximum marks shall be 60 (reduced to 15).
 - b. **Seminar:** Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 40 (reduced to 10). The seminar shall be completed prior to term test for all the papers.
 - c. **Classroom Attendance** – Each student will have to attend a minimum of 75% Lectures / Tutorials / Practicals. A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE). Attendance marks will be awarded by following the system proposed below:

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

75% to 80%	=	1 mark
81% to 85%	=	2 marks
86 to 90%	=	3 marks
91% to 95%	=	4 marks
96% and above	=	5 marks

Note : Compensation in classroom attendance of a student will be as per prevalent University rules.

Each student’s cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Arts, Education & Social Sciences.

- d. CCA is based on open evaluation system without any bias to any student.
- e. Any grievance received in the Department from student shall be placed before the **Grievance Redressal Committee** with adjudicated comments

Each component marks will be added making it rounding as per norms.

Marking Scheme of Continuous Comprehensive Assessment (CCA)

Components	Maximum Marks	Reduced and Original Marks
Term Test	60	(reduced to 15)
Seminar	40	(reduced to 10)
Classroom Attendance	05	05
Total Marks of CCA	100	30

Note : Classroom Attendance marks will be as follows :-

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

Percentage	Marks
75% to 80%	1 mark
81% to 85%	2 marks
86 to 90%	3 marks
91% to 95%	4 marks
96% and above	5 marks

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective Department shall declare the result as “Satisfactory” or “Non-Satisfactory”; each student need to get a minimum of three “Satisfactory” declaration for the course completion

For the Term test and ESE:

Part A

Ten questions (Definitions, illustrations, functions, short explanations, etc; 25-50 words) for one mark each. $10 \times 1 = 10$ marks; comprising questions from each Unit; no choice in this part

Part B

Four questions of long/explanatory answer (500 words) type, one drawn from each Unit; with internal choices : $4 \times 15 = 60$ marks.

10+60 = 70 marks

Qualifying for Next semester

1. **A student acquiring minimum of 40% in total of the CCA is eligible to join next semester.**
2. A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as ‘Fail’), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.
3. A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time, i.e. three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted, for additional chances examination fee shall be on additive basis.

Improvement Option:

Every student shall have the opportunity to improve Credit thorough University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final.

Result Declaration:

The ESE (End Semester Examination/University Examination) results shall be declared within twenty days of the last examination. The Theory Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation.

POST -GRADUTE COURSE: A DESCRIPTION

The full course is of FOUR SEMESTERS spread for TWO YEARS duration. A semester-wise list of courses to be offered is given below. In each paper there will be four unit.

SEMESTER I

SEMESTER II

SEMESTER III

SEMESTER IV

Elective paper group – First – Semester III

Elective paper group – Second – Semester III

Elective paper group – First – Semester IV

Elective paper group – Second – Semester IV

Skill Courses in the respective subject

Electives would be discipline centric and only students from concerned departments can register.

ADMISSION

The minimum qualification for admission to M.A. Course is Graduate Degree. The details of eligibility conditions and admission procedure will be as per University rules. The candidates are required to attend minimum of a 75% of classes.

TEACHING AND EXAMINATION SCHEME

Per Semester

Course	Periods/Week	Examination hours	CCA	ESE	Total
Theory Papers					
Course I	6	3	30	70	100
Course II	6	3	30	70	100
Course III	6	3	30	70	100
Course IV	6	3	30	70	100

UNIVERSITY EXAMINATION

Each course paper shall be of three hours duration.

Note: The number of elective to be taught from each group in a particular year shall be decided by the Department. Electives offered will be announced at the beginning of the academic session. Each student shall be assigned one Elective Paper from Group ONE and the second from Group TWO. Elective papers will be allotted on merit-cum-choice basis as far as possible. In the odd semester two skill courses will be those offered by the respective departments in the even semester skill courses will be from other departments.

DEPARTMENT OF HISTORY

SCHEME OF EXAMINATION FOR M.A. HISTORY (SEMESTER SYSTEM) FOR THE EXAMINATION

INSTRUCTIONS FOR THE PAPER SETTERS AND THE STUDENTS

Max. Marks - 70

Min. Marks – 25

Duration – 3 hours

Note :

- (i) There shall be 9 questions in all. Five questions have to be attempted.

(ii) The first question shall be short answer type containing 10 short questions spread over the whole syllabus to be answered in about 30 words each. It shall carry 10 marks and shall be a compulsory question.

(iii) Rest of the paper shall contain 8 questions with internal choice. The entire syllabus has been divided into four units. Each unit shall have two questions and the candidates shall be given internal choice i.e. the candidate shall attempt one question from each unit.

(iv) SEMESTER II

(v)

1. THEORY PAPERS (Four Core Papers)	ESE	CCA	Total	Lecture- Tutorial- Practical/ Week	Credits
Paper V :	70	30	100	6-0-0	6
Paper VI :	70	30	100	6-0-0	6
Paper VII :	70	30	100	6-0-0	6
Paper VIII :	70	30	100	6-0-0	6
	Grand Total		400 marks		24 credits

SEMESTER II

कोर कोर्स 05

इतिहास 201

इतिहास लेखन ,ऐतिहासिक धारणाएं, पद्धतियों तथा उपकरण-II

- इकाई 1 इतिहास की धारणाएं व दृष्टिकोण : धर्मशास्त्रीय प्राच्य, साम्राज्यवादी, राष्ट्रवादी, मार्क्सवादी, जनवादी तथा उत्तर आधुनिक, इतिहास में प्रगति की अवधारणा।
- इकाई 2 इतिहास दर्शन तथा ऐतिहासिकता। इतिहास की ऑक्सफोर्ड और कैम्ब्रिज विचारधाराएं तथा आधुनिक भारतीय इतिहासकार।
- इकाई 3 भारतीय इतिहास की प्रमुख विषयवस्तु : प्राचीन, मध्य और आधुनिक काल ; आर्थिक, श्रमिक तथा कृषक, पर्यावरण, विज्ञान और तकनीक का इतिहास लेखन।
- इकाई 4 सभ्यता एवं संस्कृति : धर्म, वर्ण, जाति, जनजाति तथा लिंग। भारत के सामाजिक और आर्थिक इतिहास के प्रतिनिधि अध्ययन के प्रमुख वाद विवाद।

सहायक पुस्तके :

- Philips, C.H.(ed.) : Historians of India, Pakistan and Ceylon.
Ghoshal, U.N. : The Beginning of Indian Historiography and Other Essays.
Devahuti, D.(ed.) : Problems of Indian Historiography.
Warder, A.K. : An Introduction to Indian Historiography, 1972.
Gardner, Patrick(ed) : Theories of History, New York, 1959.
Carr, E.H. : What is History, Penguin, 1965.
Stern, Fritz (ed.) : The Varieties of History, London, 1970.
Collingwood R.G. : The Idea of History, New York, 1957.
Sen, S.P. (ed.) : Historians and Historiography in Modern India.
Pathak, V.S. : Ancient Historians of India, 1966, Asia Publishing House.
Walsh : An Introduction to Philosophy of History, London, 1967.
Renier, G.I. : History, its Purpose and Methods, Boston, 1950.
Gooch, G.P. : History and Historians in the Nineteenth Century, Longmans, Green & Co.
Shotwell, J.T. : History of History.
Thomson, J.W. : History of Historical Writing, 1954.
Hardy, Peter : Historians of Medieval India, London, 1960.
Hasan, Mohibul : Historians of Medieval India, Meerut, 1978.
पाण्डे, जी०सी० : इतिहास : स्वरूप एवं सिद्धान्त, ग्रंथ एकेडमी, जयपुर, 1973 ।
चौबे, झारखण्ड : इतिहास दर्शन, वि०वि० प्रकाशन वाराणसी, 1999 ।
बुद्ध प्रकाश : इतिहास दर्शन, 1968 ।
पाण्डे, ललताप्रसाद : भारतीय इतिहास-दर्शन, अक्षयवट प्रकाशन वाराणसी, इलाहाबाद ।
सिंह, परमानन्द : इतिहास दर्शन, मोतीलाल बनारसीदास, दिल्ली।
खुराना-बंसल : इतिहास लेखन धारणाएँ एवं सिद्धान्त।

HISTORIOGRAPHY, HISTORICAL CONCEPTS, METHOD AND TOOLS -II

- Unit 1 Concept and Approaches of History : Theological, Orientalist, Imperialist, Nationalist, Marxist, Subaltern and Post Modernist. Concept of Progress in History.
- Unit 2 Philosophy of History and Historicism, Oxford and Cambridge School of History and Modern Indian Historians.
- Unit 3 Major Themes in Indian History : Ancient, Medieval and Modern period, Historiography of Economic, Labour and Peasant, Environment, Science and Technology.
- Unit 4 Religion, Culture and Civilization, Varna, Jati, Janajati and Gender. Representative, Study of Major Debates on the Social and Economic History of India.

Suggested books:-

- Philips, C.H.(ed.) : Historians of India, Pakistan and Ceylon.
- Ghoshal, U.N. : The Beginning of Indian Historiography and Other Essays.
- Devahuti, D.(ed.) : Problems of Indian Historiography.
- Warder, A.K. : An Introduction to Indian Historiography, 1972.
- Gardner, Patrick(ed) : Theories of History, New York, 1959.
- Carr, E.H. : What is History, Penguin, 1965.
- Stern, Fritz (ed.) : The Varieties of History, London, 1970.
- Collingwood R.G. : The Idea of History, New York, 1957.
- Sen, S.P. (ed.) : Historians and Historiography in Modern India.
- Pathak, V.S. : Ancient Historians of India, 1966, Asia Publishing House.
- Walsh : An Introduction to Philosophy of History, London, 1967.
- Renier, G.I. : History, its Purpose and Methods, Boston, 1950.
- Gooch, G.P. : History and Historians in the Nineteenth Century, Longmans, Green & Co.
- Shotwell, J.T. : History of History.
- Thomson, J.W. : History of Historical Writing, 1954.
- Hardy, Peter : Historians of Medieval India, London, 1960.
- Hasan, Mohibul : Historians of Medieval India, Meerut, 1978.
- पाण्डे, जी०सी० : इतिहास : स्वरूप एवं सिद्धान्त, ग्रंथ एकेडमी, जयपुर, 1973 ।
- चौबे, झारखण्ड : इतिहास दर्शन, वि०वि० प्रकाशन वाराणसी, 1999 ।
- बुद्ध प्रकाश : इतिहास दर्शन, 1968 ।
- पाण्डे, ललताप्रसाद : भारतीय इतिहास—दर्शन, अक्षयवट प्रकाशन वाराणसी, इलाहाबाद ।
- सिंह, परमानन्द : इतिहास दर्शन, मोतीलाल बनारसीदास, दिल्ली ।
- खुराना—बंसल : इतिहास लेखन धारणाएँ एवं सिद्धान्त ।

बीसवी शताब्दी का विश्व –II

- इकाई 1 नाटो और वारसा समझौता। राष्ट्रीय आन्दोलन : मिश्र और तुर्की, गुट निरपेक्ष आन्दोलन।
- इकाई 2 भारत की विदेश नीति, भारत-चीन संबंध, कश्मीर और फिलीस्तीन की समस्या।
- इकाई 3 नागरिक अधिकार आन्दोलन, रंगभेद नीति, समाजवादी गुट का विघटन तथा राजनीति पर उसका प्रभाव।
- इकाई 4 अन्तर्राष्ट्रीय आतंकवाद, भूमण्डलीकरण और उसके आर्थिक तथा राजनीतिक प्रभाव।

Suggested Readings:

- Koebner Richard and
Schmidt Helmut Dan : Imperialism : The Story and Significance of Political World (1840-1960) (1963).
- Muir, R. : The Expansion of Europe (1939).
- Lenin, V.I. : Imperialism, The Highest Stage of Capitalism (1918).
- Moon, P.T. : Imperialism and World Politics (1926).
- Schumpeter, A. : Capitalism, Socialism and Democracy (1950).
- Taylor, A.J.P. : Struggle for Mastery in Europe (1848-1918).
- Grant and Temperley
(ed. by Agutha) : Europe in 19th Century (1789-1905).
- Ramm : Europe in 19th Century (1905-1970), 1984.
- Hearnshaw, F.J.C. : Main Currents of European History.
- Albrecht-Canie, R. : A Diplomatic History of Europe Since the Congress of Vienna (1958).
- Sen, S.N. : Europe and the World (1789-1945), 1998 Delhi, S. Chand & Co. Ltd.
- Fay, S.B. : Origins of World War, 2 Vols. 1930.
- Stewart C, Easton : The Western Heritage (from 1500 to the present), 1966.
- Kenneth Boulding : Meaning of the Twentieth Century, 1965.
- A. Pryce-Jones (ed.) : The New Outline of Modern Knowledge, 1956.
- Gupta M.G. : International Relations, 2 Vols. (English and Hindi)
- चौहान, देवेन्द्र सिंह : यूरोप का इतिहास ।
वर्मा, दीनानाथ : आधुनिक विश्व का इतिहास ।
: अन्तर्राष्ट्रीय सम्बन्ध ।
- शर्मा, मथुरालाल : यूरोप का इतिहास (1870-1917)
- महाजन, वी0डी0 : यूरोप का इतिहास ।

TWENTIETH CENTURY WORLD -II

- Unit 1 Nato and Warsaw Pact, National Movements : Egypt and Turkey, Non – Aligned Movement.
- Unit 2 Foreign Policy of India, Indo-China Relations, Problem of Kashmir and Palestine.
- Unit 3 Civil Rights Movement, Apartheid Policy, Disintegration of Socialist Block and its impact on Politics.
- Unit 4 International Terrorism, Globalization and its economic and political impact.

Suggested Readings:

- Koebner Richard and Schmidt Helmut Dan : Imperialism : The Story and Significance of Political World (1840-1960) (1963).
- Muir, R. : The Expansion of Europe (1939).
- Lenin, V.I. : Imperialism, The Highest Stage of Capitalism (1918).
- Moon, P.T. : Imperialism and World Politics (1926).
- Schumpeter, A. : Capitalism, Socialism and Democracy (1950).
- Taylor, A.J.P. : Struggle for Mastery in Europe (1848-1918).
- Grant and Temperley (ed. by Agutha) : Europe in 19th Century (1789-1905).
- Ramm : Europe in 19th Century (1905-1970), 1984.
- Hearnshaw, F.J.C. : Main Currents of European History.
- Albrecht-Canie, R. : A Diplomatic History of Europe Since the Congress of Vienna (1958).
- Sen, S.N. : Europe and the World (1789-1945), 1998 Delhi, S. Chand & Co. Ltd.
- Fay, S.B. : Origins of World War, 2 Vols. 1930.
- Stewart C, Easton : The Western Heritage (from 1500 to the present), 1966.
- Kenneth Boulding : Meaning of the Twentieth Century, 1965.
- A. Pryce-Jones (ed.) : The New Outline of Modern Knowledge, 1956.
- Gupta M.G. : International Relations, 2 Vols. (English and Hindi)
- चौहान, देवेन्द्र सिंह : यूरोप का इतिहास ।
- वर्मा, दीनानाथ : आधुनिक विश्व का इतिहास ।
- : अन्तर्राष्ट्रीय सम्बन्ध ।
- शर्मा, मथुरालाल : यूरोप का इतिहास (1870–1917)
- महाजन, वी०डी० : यूरोप का इतिहास ।

भारतीय संस्कृति की रूपरेखा –II

- इकाई 1 गुहा एवं स्तूप स्थापत्य का विकास, गांधार और मथुरा मूर्तिकला की प्रमुख विशेषताएं। गुप्तकाल का मंदिर स्थापत्य और स्थापत्य कला।
- इकाई 2 नागर और द्रविड शैली के मंदिरों का विकास क्रम। चित्रकला: शैल चित्र, अजन्ता, बाघ।
- इकाई 3 भारत में शिक्षा के प्रमुख केन्द्र: तक्षशिला, नालन्दा, उज्जैन, काँची। संगम युग का योगदान।
- इकाई 4 भारतीय समाज को आर्यभट्ट, वराहमिहिर, राजा राम मोहन राय, दयानन्द सरस्वती और विवेकानन्द का योगदान।

Suggested Readings:

- Majumdar, R.C. and
Pusalkar, A.D. : The History and Culture of the Indian People, Vol. I, II, III, IV, IX, parts I & II (Chapters on Art, Religion and Literature only).
Lunia, B.N. : Evolution of Indian Culture.
Coomaraswamy, A.K. : History of Indian and Indonesian Art.
: Indian Architecture Vol. I & II.
Brown Percy : Indian Paintings.
Kramrisch, S. : Hindu Temple 2 Vols.
: Indian Sculpture.
, S.K. : Survey of Indian Sculpture.
Altekar, A.S. : Education in Ancient India.
Aurobindo : Foundation of Indian Culture.
Mookerjee, R.K. : Hindu View of Life.
: Cultural Heritage of India Vol. IV.
Keith, A.B. : History of Sanskrit Literature (in Hindi also).
Das Gupta, S.N.(ed.) : A History of Sanskrit Literature.
Gopal, L. &
Yadav, B.N.S. : Bhartiya Sanskriti.
Basham, A.L. : The Wonder That was India.
Jaiswal, S. : History of Vaishnavism.
Farquhar : Religious Movements in India.
गुप्ता, परमेश्वरीलाल : भारतीय वास्तुकला ।
भण्डारकर, आर०जी० : वैष्णव, शैव और अन्य धार्मिक मत ।
कीथ, ए०बी० : वैदिक धर्म के विकास का इतिहास ।
पाण्डे, जी०सी० : बौद्ध धर्म के विकास का इतिहास ।
जैन, एच०एल० : भारतीय संस्कृति को जैन धर्म का योगदान ।
भारद्वाज, कमलेश : भारतीय संस्कृति ।
गुप्त, शिवकुमार : भारतीय संस्कृति के मूल आधार ।

CULTURAL PROFILE OF INDIA - II

- Unit 1 Evolution of Cave and Stupas Architecture. Main Features of Gandhara and Mathura Sculpture. Temple Art and Architecture of Gupta Age.
- Unit 2 Evolution of Nagara and Dravida Temple Styles. Paintings : Rock Art, Ajanta, Bagha
- Unit 3 Main Centres of Learning in India : Taxila, Nalanda, Ujjain, Kanchi. Contribution of Sangam Age.
- Unit 4 Contribution of Arya Bhatt, Varaha Mihir, Raja Ram Mohan Ray, Dayanand Saraswati and Vivekanand to the Indian Society.

Suggested Readings:

- Majumdar, R.C. and
Pusalkar, A.D. : The History and Culture of the Indian People, Vol. I, II, III, IV, IX, parts I & II (Chapters on Art, Religion and Literature only).
Lunia, B.N. : Evolution of Indian Culture.
Coomaraswamy, A.K. : History of Indian and Indonesian Art.
: Indian Architecture Vol. I & II.
Brown Percy : Indian Paintings.
Kramrisch, S. : Hindu Temple 2 Vols.
: Indian Sculpture.
, S.K. : Survey of Indian Sculpture.
Altekar, A.S. : Education in Ancient India.
Aurobindo : Foundation of Indian Culture.
Mookerjee, R.K. : Hindu View of Life.
: Cultural Heritage of India Vol. IV.
Keith, A.B. : History of Sanskrit Literature (in Hindi also).
Das Gupta, S.N.(ed.) : A History of Sanskrit Literature.
Gopal, L. &
Yadav, B.N.S. : Bhartiya Sanskriti.
Basham, A.L. : The Wonder That was India.
Jaiswal, S. : History of Vaishnavism.
Farquhar : Religious Movements in India.
गुप्ता, परमेश्वरीलाल : भारतीय वास्तुकला ।
भण्डारकर, आर०जी० : वैष्णव, शैव और अन्य धार्मिक मत ।
कीथ, ए०बी० : वैदिक धर्म के विकास का इतिहास ।
पाण्डे, जी०सी० : बौद्ध धर्म के विकास का इतिहास ।
जैन, एच०एल० : भारतीय संस्कृति को जैन धर्म का योगदान ।
भारद्वाज, कमलेश : भारतीय संस्कृति ।
गुप्त, शिवकुमार : भारतीय संस्कृति के मूल आधार ।

भारतीय इतिहास में महिलाएं—II

- इकाई 1 शिक्षा और महिलाएं : प्राचीन भारत, मध्यकालीन भारत, औपनिवेशिक भारत और स्वतन्त्रोत्तर भारत ।
- इकाई 2 स्वतन्त्रोत्तर भारत में महिलाओं की राजनीतिक भागीदारी, भारत में महिलाओं के विभिन्न आन्दोलन ।
- इकाई 3 गृहकार्यों में महिलाओं का अवदान— कृषि व उद्योग ; सम्पत्ति का अधिकार ।
- इकाई 4 महिलाएं और संस्कृति : महिलाओं की साहित्य, कला, मूर्तिकला, संगीत, नृत्य, ऐतिहासिक लेखन तथा मीडिया में प्रतिनिधित्व और भागीदारी ।

Suggested Readings:

- Altekar, A.S. : The Position of Women in Hindu Civilization, Delhi, 1978.
- Basu, A. & Ray, B. : Women's Struggle : A History of the All India Women Conference 1927,1990, Delhi.
- Upadhyaya, B.S. : Women in Rigveda.
- Desai, Neera : Women in Modern India, Mumbai, 1957.
- Krishna Murty, J.(ed.) : Women in Colonial India, OUP, Delhi, 1989.
- : Essays on Survival Work and State.
- Parekh, M.C. : The Brahma Samaj.
- Majumdar, Vina : Symbols of Power : Studies on the Political Status of Women in India, Delhi, 1979.
- Mishra, Rekha : Women in Mughal India 1526-1748, Munsiram Manoharlal, Delhi, 1967.
- Nanda B.R. : Indian Women from Purdah to Modernity, Vikas, Delhi, 1976.
- Gail, Minault : The Extended Family Women and Political Participation in India and Pakistan, South Asiabooks, Columbia, 1981.
- Towards Equality : Report of Committee on the Status of Women in India, Govt. of India, Delhi, 1975.
- Ashraf, K.M. : Social and Economic Life in Medieval India.

WOMEN IN INDIAN HISTORY- II

- Unit 1 Education and Women – Ancient India, Medieval India, Colonial India,
- Unit 2 Political Participation of Women in Post Independent India, Various Movements of Women in India after Independence.
- Unit 3 Role of Women in Household Chores – Agriculture and Industry , Household Rights of Property.
- Unit 4 Women and Culture : Women Representation and Participation in Literature, Art, Sculpture, Music, Dance, Historical Writings and Media.

Suggested Readings:

- Altekar, A.S. : The Position of Women in Hindu Civilization, Delhi, 1978.
- Basu, A. & Ray, B. : Women's Struggle : A History of the All India Women Conference 1927,1990, Delhi.
- Upadhyaya, B.S. : Women in Rigveda.
- Desai, Neera : Women in Modern India, Mumbai, 1957.
- Krishna Murty, J.(ed.) : Women in Colonial India, OUP, Delhi, 1989.
- : Essays on Survival Work and State.
- Parekh, M.C. : The Brahma Samaj.
- Majumdar, Vina : Symbols of Power : Studies on the Political Status of Women in India, Delhi, 1979.
- Mishra, Rekha : Women in Mughal India 1526-1748, Munsiram Manoharlal, Delhi, 1967.
- Nanda B.R. : Indian Women from Purdah to Modernity, Vikas, Delhi, 1976.
- Gail, Minault : The Extended Family Women and Political Participation in India and Pakistan, South Asiabooks, Columbia, 1981.
- Towards Equality : Report of Committee on the Status of Women in India, Govt. of India, Delhi, 1975.
- Ashraf, K.M. : Social and Economic Life in Medieval India.

Skill Course - 02

राजस्थान का इतिहास

- इकाई –I राजस्थान के इतिहास के प्रमुख स्रोत। आहड़ व कालीबंगा। प्रमुख राजवंश : गुहिल, चौहान, गुर्जर-प्रतिहार, राठौड़ और कच्छवाहा। राजपूतों की उत्पत्ति।
- इकाई–II राजस्थान में मुस्लिम सत्ता का प्रसार। मुगल-राजपूत सम्बन्ध। महाराणा कुंभा, सांगा, प्रताप, चंद्रसेन की भूमिका व योगदान।
- इकाई –III राजस्थान में स्थापत्य : प्रमुख दुर्ग, स्मारक, नगर व मंदिर स्थापत्य। राजस्थान की चित्रकला के प्रमुख केन्द्र, प्रमुख लोक देवता व सम्प्रदाय।
- इकाई–IV ईस्ट इण्डिया कम्पनी का देशी रियासतों के साथ संबंध व प्रभाव। 1857 के विप्लव में राजस्थान का योगदान। किसान, जनजातीय व प्रजामण्डल आन्दोलन तथा राजस्थान का एकीकरण।

Suggested Readings :

- B.L. Bhadani : Peasants, Artisans and entrepreneurs- Economy of Marwar in the Seventeenth Century.
- Dasaratha Sharma : Lectures in Rajput History.
: Rajasthan through the Ages, Vol. I.
- Dilbagh Singh : State, Landlords and Peasants.
- G.D. Sharma : Rajput Polity.
- G.H. Ojha : Rajputana Ka Itihas (relevant volumes)
- G.N. Sharma : Merwar and the Mughal Emperors.
: Social Life in Medieval Rajasthan.
- James Tod : Annals and Antiquities of Rajasthan
- S.P. Gupta : Agrarian System of Eastern Rajasthan (1650-1750).
- V.S. Bhatnagar : Life and times of Sawai Jai Singh.
- Shyamal Das : Vir Vinod.
- A.C. Banerjee : Rajput Studies.
- K.S. Gupta : Mewar and Marathas
- G.C. Tikkiwal : Jaipur and the later Mughals.

Khadgawat, N.R.	:	Rajasthan's Role in Struggle of 1857.
Rathore, L.S.	:	Political Movements and Constitutional Development in Princely States of Rajasthan
Pema Ram	:	Agrarain Movements in Rajasthan.
Darda, R.S.	:	From Feudalism to Democracy.
शर्मा, गोपीनाथ	:	राजस्थान के इतिहास के स्रोत ।
रेऊ, वी.एन.	:	मारवाड़ का इतिहास भाग 1-2 ।
व्यास, आर.पी.	:	राजस्थान का बृहत इतिहास, भाग 1-2 ।
व्यास, प्रकाश	:	राजस्थान में स्वाधीनता संग्राम ।
शर्मा, पद्मजा	:	बिजोलिया आन्दोलन ।

SKILL COURSE – 02

HISTORY OF RAJASTHAN

- Unit -I** Sources of History of Rajasthan, Ahar and Kalibanga, Major Dynasties - Guhil, Chouhan, Gurjar-Pratihara, Rathore and Kachwaha, Origin of Rajputs
- Unit-II** Muslim expansion in Rajasthan Mughal-Rajput Relation, Role and contribution of Maharana Kumbha, Sanga, Pratap and Chandrasen.
- Unit -III** Architecture in Rajasthan - Major Forts, Monuments, Towns and Temple Architecture, Major centres of Rajput Paintings, Folk Gods and Religious Sects.
- Unit-IV** Relation of East India Company with Princely States and its impact, Role of Rajputana in the upheaval of 1857, Peasant, tribal and Prajamandal Movement and Integration of Rajasthan.

Suggested Readings :

- B.L. Bhadani : Peasants, Artisans and entrepreneurs- Economy of Marwar in the Seventeenth Century.
- Dasaratha Sharma : Lectures in Rajput History.
: Rajasthan through the Ages, Vol. I.
- Dilbagh Singh : State, Landlords and Peasants.
- G.D. Sharma : Rajput Polity.
- G.H. Ojha : Rajputana Ka Itihas (relevant volumes)
- G.N. Sharma : Merwar and the Mughal Emperors.
: Social Life in Medieval Rajasthan.
- James Tod : Annals and Antiquities of Rajasthan
- S.P. Gupta : Agrarian System of Eastern Rajasthan (1650-1750).
- V.S. Bhatnagar : Life and times of Sawai Jai Singh.
- Shyamal Das : Vir Vinod.
- A.C. Banerjee : Rajput Studies.
- K.S. Gupta : Mewar and Marathas
- G.C. Tikkiwal : Jaipur and the later Mughals.
- Khadgawat, N.R. : Rajasthan's Role in Struggle of 1857.
- Rathore, L.S. : Political Movements and Constitutional

Pema Ram
Darda, R.S.
शर्मा, गोपीनाथ
रेऊ, वी.एन.
व्यास, आर.पी.
व्यास, प्रकाश
शर्मा, पद्मजा

Development in Princely States of Rajasthan

- : Agrarain Movements in Rajasthan.
- : From Feudalism to Democracy.
- : राजस्थान के इतिहास के स्रोत।
- : मारवाड़ का इतिहास भाग 1-2 ।
- : राजस्थान का बृहत इतिहास, भाग 1-2 ।
- : राजस्थान में स्वाधीनता संग्राम।
- : बिजोलिया आन्दोलन।



JAI NARAIN VYAS UNIVERSITY, JODHPUR (RAJASTHAN)

FACULTY OF ARTS, EDUCATION & SOCIAL SCIENCES

(DEPARTMENT OF HISTORY)

SYLLABUS

**ONLY FOR DEPARTMENT OF HISTORY JAI NARAIN VAS UNIVERSITY
CAMPUS , SEMESTER SCHEME.**

M.A. HISTORY (SEMESTER SYSTEM I AND SEMESTER II EXAMINATION 2021

M.A. HISTORY (SEMESTER SYSTEM III AND SEMESTER IV EXAMINATION 2021

IMPORTANT

NOTIFICATION

In compliance of decision of the Hon'ble High Court all students are required to fulfill 75% attendance rule in each subject and there must be 75% attendance of the student before he/she could be permitted to appear in the examination.

REGISTRAR

(Academic)

FACULTY OF ARTS, EDUCATION & SOCIAL SCIENCES

MASTER OF ARTS

GENERAL INFORMATION FOR STUDENTS

The examination for the degree of Master of Arts, Education and Social Sciences shall consist of two parts with semester system : (i) The M.A. (Semester I and Semester II) , 2021 and (ii) M.A. (Semester III and Semester IV), 2021

The examination will be through theory papers/practical/viva. Pass marks for the semester I, semester II, semester III and semester IV examination are 36% of the aggregate marks in all the theory papers and viva/practical's and not less than 25% marks in the individual theory paper/viva/practical. A candidate is required to pass in the written and the practical/viva examination separately.

Successful candidate will be placed in the following divisions on the basis of the total marks obtained in all four semesters of M.A. (Semester I and Semester II) and (ii) M.A (Semester III and Semester IV) examinations taken together.

First division 60%,second division 48% and third division 36% no students will be permitted to register himself simultaneously for more than one post-graduate course.

ATTENDANCE

1. For all regular candidates in the faculties of arts, education and social sciences, science, law, commerce and engineering, the minimum attendance requirement shall be that a candidate should have attended at least 75% of the lecturers delivered and tutorials held taken together as well as 75% of practical and sectionals from the date of his/her admission.
2. Condonation of shortage of attendance:
The shortage of attendance up to the limits specified below may be condoned on valid reason :
 - i) Up to 6% each subject plus 5 attendances in all the aggregate subject/papers may be condoned by the Vice-chancellor on the recommendation of the Dean/Director/Principal for undergraduate students and on the recommendation of the Head of the Department for the Post-graduate classes.
 - ii) The N.C.C./N.S.S cadets sent out to parades and camps and such students who are deputed by the University to take part in games, athletics or cultural activities may, for purpose of attendance, be treated, as present for the days of their absence in connection with the aforesaid activities and that period shall be added to their subject wise attendance.

Note :

The attendance requirement will apply to each semester.

Candidates will be required to pass separately in theory and practical examinations.

Candidate's choice among the optional papers and groups would be restricted only to those paper or groups for which regular teaching is provided in the department.

MEDIUM

Candidates are not allowed to use any medium except Hindi or English for answering question papers.

For answering papers in the Subjects of English/Hindi the medium will be corresponding language only.

ADMISSION

The details of the eligibility conditions and admission procedures are given in the admission forms and on university website. The admission would be done on the basis of merit as per University rules. Reservation for SC, ST and OBC would also be done as per J.N.V. University, Jodhpur rules. Candidates are required to attend minimum 75% of the classes.

FACULTY

Professor

Dr.Arvind Parihar

Dr.(Mrs.) Vinita Parihar

Associate Professor

Dr.M.R.Gadhveer

Dr.Sushila Shaktawat

Assistant Professor

Dr.Rashmi Meena

Mr.Bhagwan Singh Shekhawat

Mr.Bhawani Singh Rajpurohit

Dr.Dinesh Rathi

Dr. Suresh Kumar Choudhary

Dr.Pratibha Sankhla

Dr.Mahendra Purohit

Dr.Bharat Deora

Mr.Lalit Kumar Panwar

GUIDELINES FOR CHOICE BASED CREDIT SYSTEM

Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete **four skill courses:** two within the Department and two from other Department within JNV University or the Universities approved by JNV University
3. **Course:** Usually referred to, as 'papers' is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period of teaching (lecture or tutorial) or two periods of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.
12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/ December and even semester from December/January to May.
Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May.
13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Arts, Education & Social Sciences resolves the following:

- a. All internal assessments shall on term test and seminar. Attendance shall carry the prescribed marks in all papers.
- b. In each semester two out of four theoretical components of the University examinations shall be undertaken by external examiners from outside JNV University, who may be appointed by the competent authorities.

Grievances and Redressal Mechanism

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head of the Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.

- b) The appeal will be assessed by the Chairman and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Dean, Faculty of Arts, Education & Social Sciences comprising of the HOD of the concerned Department and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	'O'	Outstanding	10
2	'A+'	Excellent	9
3	'A'	Very Good	8
4	'B+'	Good	7
5	'B'	Above Average	6
6	'C'	Average	5
7	'P'	Pass	4
8	'F'	Fail	0
9	'Ab'	Absent	0

- i. A student obtaining Grade F in a paper shall be considered failed and will be required to reappear in the University End Semester examination.
- ii. For noncredit courses (Skill Courses) 'Satisfactory' or "Unsatisfactory' shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

- = and > 95 % marks Grade Point 10.0
- 90 to less than 95 % marks Grade Point 9.5
- 85 to less than 90 % marks Grade Point 9.0
- 80 to less than 85 % marks Grade Point 8.5
- 75 to less than 80 % marks Grade Point 8.0
- 70 to less than 75 % marks Grade Point 7.5
- 65 to less than 70 % marks Grade Point 7.0
- 60 to less than 65 % marks Grade Point 6.5
- 55 to less than 60 % marks Grade Point 6.0
- 50 to less than 55 % marks Grade Point 5.5
- 45 to less than 50 % marks Grade Point 5.0
- 40 to less than 45 % marks Grade Point 4.5
- 35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,

i.e.

$$SGPA (S_i) = \frac{\sum (C_i \times G_i)}{\sum C_i}$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,

i.e.

$$CGPA = \frac{\sum (C_i \times S_i)}{\sum C_i}$$

where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.

iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	6	B	6	6 x 6 =36
2	Course 2	6	B+	7	6 X 7 =42
3	Course 3	6	B	6	6X 6 = 36
4	Course 4	6	O	10	6 X 10 =60
	Total	24			36+42+36+60=174

Thus, $SGPA = 174/24 = 7.25$

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	7.25	7.25	7	6.25

$CGPA = (24X 7.25 + 24X7.25 + 24 X 7+ 24 X 6.25)/ 96$

$666/96 = 6.94$

Semester-wise Theory Papers/Practical / Skill component

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Semester I							
Core course 1	Hist. 101	Historiography, Historical Concepts, Methods and Tools -I	6-0-0	6	30	70	100
Core course 2	Hist. 102	Twentieth Century World -I	6-0-0	6	30	70	100
Core course 3	Hist. 103	Cultural Profile of India - I	6-0-0	6	30	70	100
Core course 4	Hist. 104	Women In Indian History - I	6-0-0	6	30	70	100
*Skill Course I		Sources of Indian History	2-0-0				
Total				24	120	280	400

***The Department of History shall offer one skill course per semester from the list of skill courses approved for the Department .**

In view of the course content, the Department of History distributed the Periods between Theory/Tutorial/~~Practical~~ as under per paper

- 6: 0 : 0 (six lectures only (no tutorial and no practical) per week) – For Theory
- 2+0+0 (two lectures) - For Skill course

The Duration of the Period shall be forty five minutes. In each of these combinations, the first value stands for the same number of lecture instructions per week.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective) involve an evaluation system of students that has the following two components:-

- (i) **Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
- (ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.

(i) **Continuous Comprehensive Assessment (CCA):** This would have the following components:

- a. **Term Test:** One term test shall be arranged for each paper prior to End-Semester Examination; examination duration shall be of three hours; maximum marks shall be 60 (reduced to 15).
- b. **Seminar:** Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 40 (reduced to 10). The seminar shall be completed prior to term test for all the papers.
- c. **Classroom Attendance** – Each student will have to attend a minimum of 75% Lectures / Tutorials / Practicals. A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE). Attendance marks will be awarded by following the system proposed below:

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

75% to 80%	=	1 mark
81% to 85%	=	2 marks
86 to 90%	=	3 marks
91% to 95%	=	4 marks
96% and above	=	5 marks

Note : Compensation in classroom attendance of a student will be as per prevalent University rules.

Each student's cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Arts, Education & Social Sciences.

- d. CCA is based on open evaluation system without any bias to any student.
- e. Any grievance received in the Department from student shall be placed before the **Grievance Redressal Committee** with adjudicated comments

Each component marks will be added making it rounding as per norms.

Marking Scheme of Continuous Comprehensive Assessment (CCA)

Components	Maximum Marks	Reduced and Original Marks
Term Test	60	(reduced to 15)
Seminar	40	(reduced to 10)
Classroom Attendance	05	05
Total Marks of CCA	100	30

Note : Classroom Attendance marks will be as follows :-

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

Percentage	Marks
75% to 80%	1 mark
81% to 85%	2 marks
86 to 90%	3 marks
91% to 95%	4 marks
96% and above	5 marks

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective Department shall declare the result as “Satisfactory” or “Non-Satisfactory”; each student need to get a minimum of three “Satisfactory” declaration for the course completion

For the Term test and ESE:

Part A

Ten questions (Definitions, illustrations, functions, short explanations, etc; 25-50 words) for one mark each. $10 \times 1 = 10$ marks; comprising questions from each Unit; no choice in this part

Part B

Four questions of long/explanatory answer (500 words) type, one drawn from each Unit; with internal choices : $4 \times 15 = 60$ marks.

10+60 = 70 marks

Qualifying for Next semester

1. A student acquiring minimum of 40% in total of the CCA is eligible to join next semester.
2. A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as ‘Fail’), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.
3. A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time, i.e. three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted, for additional chances examination fee shall be on additive basis.

Improvement Option:

Every student shall have the opportunity to improve Credit thorough University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final.

Result Declaration:

The ESE (End Semester Examination/University Examination) results shall be declared within twenty days of the last examination. The Theory Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation.

POST -GRADUTE COURSE: A DESCRIPTION

The full course is of FOUR SEMESTERS spread for TWO YEARS duration. A semester-wise list of courses to be offered is given below. In each paper there will be four unit.

SEMESTER I

SEMESTER II

SEMESTER III

SEMESTER IV

Elective paper group – First – Semester III

Elective paper group – Second – Semester III

Elective paper group – First – Semester IV

Elective paper group – Second – Semester IV

Skill Courses in the respective subject

Electives would be discipline centric and only students from concerned departments can register.

ADMISSION

The minimum qualification for admission to M.A. Course is Graduate Degree. The details of eligibility conditions and admission procedure will be as per University rules. The candidates are required to attend minimum of a 75% of classes.

TEACHING AND EXAMINATION SCHEME

Per Semester

Course	Periods/Week	Examination hours	CCA	ESE	Total
Theory Papers					
Course I	6	3	30	70	100
Course II	6	3	30	70	100
Course III	6	3	30	70	100
Course IV	6	3	30	70	100

UNIVERSITY EXAMINATION

Each course paper shall be of three hours duration.

Note: The number of elective to be taught from each group in a particular year shall be decided by the Department. Electives offered will be announced at the beginning of the academic session. Each student shall be assigned one Elective Paper from Group ONE and the second from Group TWO. Elective papers will be allotted on merit-cum-choice basis as far as possible. In the odd semester two skill courses will be those offered by the respective departments in the even semester skill courses will be from other departments.

DEPARTMENT OF HISTORY
SCHEME OF EXAMINATION FOR M.A. HISTORY (SEMESTER SYSTEM) FOR THE
EXAMINATION

INSTRUCTIONS FOR THE PAPER SETTERS AND THE STUDENTS

Max. Marks - 70

Min. Marks – 25

Duration – 3 hours

Note :

- (i) There shall be 9 questions in all. Five questions have to be attempted.
- (ii) The first question shall be short answer type containing 10 short questions spread over the whole syllabus to be answered in about 30 words each. It shall carry 10 marks and shall be a compulsory question.
- (iii) Rest of the paper shall contain 8 questions with internal choice. The entire syllabus has been divided into four units. Each unit shall have two questions and the candidates shall be given internal choice i.e. the candidate shall attempt one question from each unit.

SEMESTER I

1.	THEORY PAPERS (Four Core Papers)	ESE	CCA	Total	Lecture- Tutorial- Practical/ Week	Credits
	Paper I :	70	30	100	6-0-0	6
	Paper II :	70	30	100	6-0-0	6
	Paper III :	70	30	100	6-0-0	6
	Paper IV :	70	30	100	6-0-0	6
	Grand Total			400 marks		24 credits

सेमेस्टर I

कोर कोर्स 1

इतिहास 101

इतिहास लेखन, ऐतिहासिक धारणाएं, पद्धतियां तथा उपकरण - I

- इकाई 1 इतिहास की प्रकृति और क्षेत्र, तथ्यों का एकत्रण तथा चयन, साक्ष्य और उसके संप्रेषण। इतिहास का उपयोग और दुरुपयोग।
- इकाई 2 ऐतिहासिक वस्तुनिष्ठता तथा इतिहास की विषय वस्तु, इतिहास में पूर्वाग्रह, इतिहास में नैतिक निर्णय, कला और विज्ञान के साथ इतिहास का संबंध।
- इकाई 3 इतिहास लेखन की परम्पराएं : अरब, ग्रीको—रोमन तथा चीनी परम्पराओं का संक्षिप्त सर्वेक्षण। भारत के प्राचीन, मध्य और आधुनिक इतिहास लेखन की नवीन प्रवृत्तियाँ।
- इकाई 4 भारतीय इतिहास के प्रति समग्र दृष्टिकोण, प्राचीन भारतीय इतिहास लेखन, मध्यकालीन इतिहास लेखन तथा आधुनिक इतिहास लेखन। इतिहास लेखन में ईसाई धर्म का प्रभाव।

Suggested books:-

- Philips, C.H.(ed.) : Historians of India, Pakistan and Ceylon.
Ghoshal, U.N. : The Beginning of Indian Historiography and Other Essays.
Devahuti, D.(ed.) : Problems of Indian Historiography.
Warder, A.K. : An Introduction to Indian Historiography, 1972.
Gardner, Patrick(ed) : Theories of History, New York, 1959.
Carr, E.H. : What is History, Penguin, 1965.
Stern, Fritz (ed.) : The Varieties of History, London, 1970.
Collingwood R.G. : The Idea of History, New York, 1957.
Sen, S.P. (ed.) : Historians and Historiography in Modern India.
Pathak, V.S. : Ancient Historians of India, 1966, Asia Publishing House.
Walsh : An Introduction to Philosophy of History, London, 1967.
Renier, G.I. : History, its Purpose and Methods, Boston, 1950.
Gooch, G.P. : History and Historians in the Nineteenth Century, Longmans, Green & Co.
Shotwell, J.T. : History of History.
Thomson, J.W. : History of Historical Writing, 1954.
Hardy, Peter : Historians of Medieval India, London, 1960.
Hasan, Mohibul : Historians of Medieval India, Meerut, 1978.
पाण्डे, जी०सी० : इतिहास : स्वरूप एवं सिद्धान्त, ग्रंथ एकेडमी, जयपुर, 1973 ।
चौबे, झारखण्ड : इतिहास दर्शन, वि०वि० प्रकाशन वाराणसी, 1999 ।
बुद्ध प्रकाश : इतिहास दर्शन, 1968 ।
पाण्डे, ललताप्रसाद : भारतीय इतिहास—दर्शन, अक्षयवट प्रकाशन वाराणसी, इलाहाबाद ।
सिंह, परमानन्द : इतिहास दर्शन, मोतीलाल बनारसीदास, दिल्ली ।

SEMESTER I

Core Course 01

History 101

Historiography, Historical Concepts, Method and Tools - I

- Unit 1 Nature and Scope of History. Collection and selection of data, evidence and its transmission. Use and Misuse of History.
- Unit 2 Historical objectivity and subject matter of History, Bias in History. Moral Judgment in History. History's relationship with Art and Science.
- Unit 3 Traditions of Historical Writings : A brief survey of Arab Graeco – Roman and Chinese Traditions. Recent trends in Ancient, Medieval and Modern Historiography of India.
- Unit 4 Integral Approach to Indian History. Ancient Indian tradition ; Medieval Historiography and Modern Historiography. The influence of Christianity on Historical Writing.

Suggested books:-

- Philips, C.H.(ed.) : Historians of India, Pakistan and Ceylon.
- Ghoshal, U.N. : The Beginning of Indian Historiography and Other Essays.
- Devahuti, D.(ed.) : Problems of Indian Historiography.
- Warder, A.K. : An Introduction to Indian Historiography, 1972.
- Gardner, Patrick(ed) : Theories of History, New York, 1959.
- Carr, E.H. : What is History, Penguin, 1965.
- Stern, Fritz (ed.) : The Varieties of History, London, 1970.
- Collingwood R.G. : The Idea of History, New York, 1957.
- Sen, S.P. (ed.) : Historians and Historiography in Modern India.
- Pathak, V.S. : Ancient Historians of India, 1966, Asia Publishing House.
- Walsh : An Introduction to Philosophy of History, London, 1967.
- Renier, G.I. : History, its Purpose and Methods, Boston, 1950.
- Gooch, G.P. : History and Historians in the Nineteenth Century, Longmans, Green & Co.
- Shotwell, J.T. : History of History.
- Thomson, J.W. : History of Historical Writing, 1954.
- Hardy, Peter : Historians of Medieval India, London, 1960.
- Hasan, Mohibul : Historians of Medieval India, Meerut, 1978.
- पाण्डे, जी०सी० : इतिहास : स्वरूप एवं सिद्धान्त, ग्रंथ एकेडमी, जयपुर, 1973 ।
- चौबे, झारखण्ड : इतिहास दर्शन, वि०वि० प्रकाशन वाराणसी, 1999 ।
- बुद्ध प्रकाश : इतिहास दर्शन, 1968 ।
- पाण्डे, ललताप्रसाद : भारतीय इतिहास—दर्शन, अक्षयवट प्रकाशन वाराणसी, इलाहाबाद ।
- सिंह, परमानन्द : इतिहास दर्शन, मोतीलाल बनारसीदास, दिल्ली ।

बीसवीं शताब्दी का विश्व - I

- इकाई 1 प्रथम विश्वयुद्ध— कारण तथा परिणाम।
पेरिस शांति समझौता और उसके प्रभाव।
बोल्शेविक क्रांति— कारण और परिणाम।
- इकाई 2 लेनिन—नई आर्थिक नीति।
राष्ट्रसंघ— उद्देश्य, उपलब्धियाँ तथा असफलता के कारण।
आर्थिक मंदी—कारण तथा प्रभाव, क्षतिपूर्ति।
- इकाई 3 फासीवाद और नाजीवाद का उदय—कारण।
द्वितीय विश्व युद्ध—कारण तथा परिणाम।
- इकाई 4 संयुक्त राष्ट्रसंघ—संगठन तथा विश्व शांति में भूमिका।
शीतयुद्ध—कारण तथा परिणाम।

Suggested Readings:

- Koebner Richard and
Schmidt Helmut Dan : Imperialism : The Story and Significance of Political World (1840-1960) (1963).
- Muir, R. : The Expansion of Europe (1939).
- Lenin, V.I. : Imperialism, The Highest Stage of Capitalism (1918).
- Moon, P.T. : Imperialism and World Politics (1926).
- Schumpeter, A. : Capitalism, Socialism and Democracy (1950).
- Taylor, A.J.P. : Struggle for Mastery in Europe (1848-1918).
- Grant and Temperley
(ed. by Agutha) : Europe in 19th Century (1789-1905).
- Ramm : Europe in 19th Century (1905-1970), 1984.
- Hearnshaw, F.J.C. : Main Currents of European History.
- Albrecht-Canle, R. : A Diplomatic History of Europe Since the Congress of Vienna (1958).
- Sen, S.N. : Europe and the World (1789-1945), 1998 Delhi, S. Chand & Co. Ltd.
- Fay, S.B. : Origins of World War, 2 Vols. 1930.
- Stewart C, Easton : The Western Heritage (from 1500 to the present), 1966.
- Kenneth Boulding : Meaning of the Twentieth Century, 1965.
- A. Pryce-Jones (ed.) : The New Outline of Modern Knowledge, 1956.
- Gupta M.G. : International Relations, 2 Vols. (English and Hindi)
- चौहान, देवेन्द्र सिंह : यूरोप का इतिहास ।
वर्मा, दीनानाथ : आधुनिक विश्व का इतिहास ।
: अन्तर्राष्ट्रीय सम्बन्ध ।
शर्मा, मथुरालाल : यूरोप का इतिहास (1870-1917) ।
महाजन, वी०डी० : यूरोप का इतिहास ।

TWENTIETH CENTURY WORLD -I

- Unit 1 First World War : Causes and Consequences.
Paris Peace Settlement and its impact.
Bolshevik Revolution : Causes and Results.
- Unit 2 Lenin - New Economic Policy.
League of Nations : Aims, Achievements and Causes of its failure.
Great Depression : Causes and impact, Reparation.
- Unit 3 Rise of Fascism and Nazism : Causes.
Second World War : Causes and Results.
- Unit 4 UNO - Organization and Role in World Peace.
Cold War : Causes and Results.

Suggested Readings:

- Koebner Richard and
Schmidt Helmut Dan : Imperialism : The Story and Significance of Political World (1840-1960) (1963).
Muir, R. : The Expansion of Europe (1939).
Lenin, V.I. : Imperialism, The Highest Stage of Capitalism (1918).
Moon, P.T. : Imperialism and World Politics (1926).
Schumpeter, A. : Capitalism, Socialism and Democracy (1950).
Taylor, A.J.P. : Struggle for Mastery in Europe (1848-1918).
Grant and Temperley
(ed. by Agutha) : Europe in 19th Century (1789-1905).
Ramm : Europe in 19th Century (1905-1970), 1984.
Hearnshaw, F.J.C. : Main Currents of European History.
Albrecht-Canie, R. : A Diplomatic History of Europe Since the Congress of Vienna (1958).
Sen, S.N. : Europe and the World (1789-1945), 1998 Delhi, S. Chand & Co. Ltd.
Fay, S.B. : Origins of World War, 2 Vols. 1930.
Stewart C, Easton : The Western Heritage (from 1500 to the present), 1966.
Kenneth Boulding : Meaning of the Twentieth Century, 1965.
A. Pryce-Jones (ed.) : The New Outline of Modern Knowledge, 1956.
Gupta M.G. : International Relations, 2 Vols. (English and Hindi)
चौहान, देवेन्द्र सिंह : यूरोप का इतिहास ।
वर्मा, दीनानाथ : आधुनिक विश्व का इतिहास ।
: अन्तर्राष्ट्रीय सम्बन्ध ।
शर्मा, मथुरालाल : यूरोप का इतिहास (1870-1917) ।
महाजन, वी०डी० : यूरोप का इतिहास ।

भारतीय संस्कृति की रूपरेखा - I

- इकाई 1 संस्कृति का अर्थ और विस्तार।
सिंधु घाटी सभ्यता – धर्म।
वैदिक युग– धर्म और समाज।
- इकाई 2 शैव धर्म, वैष्णव धर्म तथा शाक्त धर्म का विकास क्रम।
बौद्ध धर्म एवं जैन धर्म : जीवन और शिक्षाएं एवं भारतीय संस्कृति को योगदान।
- इकाई 3 साहित्यिक परिदृश्य : वैदिक साहित्य, रामायण, महाभारत तथा पुराण।
भारत के प्रतिनिधि साहित्यकार : कालीदास, बाणभट्ट, तुलसीदास, टैगोर।
- इकाई 4 मध्यकालीन भक्ति आन्दोलन के प्रमुख घटक।
भारतीय संस्कृति को इस्लाम का योगदान।

Suggested Readings:

- Majumdar, R.C. and Pusalkar, A.D. : The History and Culture of the Indian People, Vol. I, II, III, IV, IX, parts
I & II (Chapters on Art, Religion and Literature only).
Lunia, B.N. : Evolution of Indian Culture.
Coomaraswamy, A.K. : History of Indian and Indonesian Art.
: Indian Architecture Vol. I & II.
Brown Percy : Indian Paintings.
Kramrisch, S. : Hindu Temple 2 Vols.
: Indian Sculpture.
Saraswati, S.K. : Survey of Indian Sculpture.
Altekar, A.S. : Education in Ancient India.
Aurobindo : Foundation of Indian Culture.
Mookerjee, R.K. : Hindu View of Life.
: Cultural Heritage of India Vol. IV.
Keith, A.B. : History of Sanskrit Literature (in Hindi also).
Das Gupta, S.N.(ed.) : A History of Sanskrit Literature.
Gopal, L. & Yadav, B.N.S. : Bhartiya Sanskriti.
Basham, A.L. : The Wonder That was India.
Jaiswal, S. : History of Vaishnavism.
Farquhar : Religious Movements in India.
गुप्ता, परमेश्वरीलाल : भारतीय वास्तुकला ।
भण्डारकर, आर०जी० : वैष्णव, शैव और अन्य धार्मिक मत ।
कीथ, ए०बी० : वैदिक धर्म के विकास का इतिहास ।
पाण्डे, जी०सी० : बौद्ध धर्म के विकास का इतिहास ।
जैन, एच०एल० : भारतीय संस्कृति को जैन धर्म का योगदान ।
भारद्वाज, कमलेश : भारतीय संस्कृति ।
गुप्त, शिव कुमार : भारतीय संस्कृति के मूल आधार ।

CULTURAL PROFILE OF INDIA - I

- Unit 1 Meaning and Scope of Culture. Indus Civilization – Religion.
Vedic Age – Religion and Society.
- Unit 2 Evolution of Saivism, Vaishnavism and Saktism. Buddhism and
Jainism : Life and Teachings, Contribution to Indian Culture.
- Unit 3 Literary Scenario : Vedic Literature, Ramayana, Mahabharata and
Puranas. Representative Literary Figures of India : Kalidas,
Banabhatta, Tulsidas, Tagore.
- Unit 4 Main Contents of Medieval Bhakti Movement. Contribution of Islam
to Indian Culture.

Suggested Readings:

Majumdar, R.C. and Pusalkar, A.D. : The History and Culture of the Indian People, Vol. I, II, III, IV, IX,
parts

I & II (Chapters on Art, Religion and Literature only).

Lunia, B.N. : Evolution of Indian Culture.

Coomaraswamy, A.K. : History of Indian and Indonesian Art.
: Indian Architecture Vol. I & II.

Brown Percy : Indian Paintings.

Kramrisch, S. : Hindu Temple 2 Vols.

: Indian Sculpture.

Saraswati, S.K. : Survey of Indian Sculpture.

Altekar, A.S. : Education in Ancient India.

Aurobindo : Foundation of Indian Culture.

Mookerjee, R.K. : Hindu View of Life.

: Cultural Heritage of India Vol. IV.

Keith, A.B. : History of Sankrit Literature (in Hindi also).

Das Gupta, S.N.(ed.) : A History of Sanskrit Literature.

Gopal, L. & Yadav, B.N.S. : Bhartiya Sanskriti.

Basham, A.L. : The Wonder That was India.

Jaiswal, S. : History of Vaishnavism.

Farquhar : Religious Movements in India.

गुप्ता, परमेश्वरीलाल : भारतीय वास्तुकला ।

भण्डारकर, आर०जी० : वैष्णव, शैव और अन्य धार्मिक मत ।

कीथ, ए०बी० : वैदिक धर्म के विकास का इतिहास ।

पाण्डे, जी०सी० : बौद्ध धर्म के विकास का इतिहास ।

जैन, एच०एल० : भारतीय संस्कृति को जैन धर्म का योगदान ।

भारद्वाज, कमलेश : भारतीय संस्कृति ।

गुप्त, शिव कुमार : भारतीय संस्कृति के मूल आधार ।

भारतीय इतिहास में महिलाएं - I

- इकाई 1 अध्ययन के स्रोत— अभिलेखीय और अ-अभिलेखीय : सरकारी फाइलें, जनगणना प्रतिवेदन व्यक्तिगत दस्तावेज, आत्मकथाएं।
- इकाई 2 महिलाओं के विषय में विभिन्न दृष्टिकोण—उदारवादी, मार्क्सवादी, समाजवादी तथा अतिवादी। धर्म और महिलाएं— ब्राह्मण धर्म, जैन धर्म, बौद्ध धर्म, ईसाई धर्म, इस्लाम धर्म और सिक्ख धर्म।
- इकाई 3 सुधार आन्दोलन और महिलाएं— भक्ति आन्दोलन, ब्रह्म समाज, आर्य समाज तथा अलीगढ़ आन्दोलन।
- इकाई 4 महिलाओं की पारम्परिक तथा वैधानिक अवस्था— प्राचीन भारत, मध्यकालीन भारत, औपनिवेशिक भारत, स्वातंत्र्योत्तर काल तथा जनजातीय समाज।

Suggested Readings:

- Altekar, A.S. : The Position of Women in Hindu Civilization, Delhi, 1978.
- Basu, A. & Ray, B. : Women's Struggle : A History of the All India Women Conference 1927,1990, Delhi.
- Upadhyaya, B.S. : Women in Rigveda.
- Desai, Neera : Women in Modern India, Mumbai, 1957.
- Krishna Murty, J.(ed.) : Women in Colonial India, OUP, Delhi, 1989.
- : Essays on Survival Work and State.
- Parekh, M.C. : The Brahma Samaj.
- Majumdar, Vina : Symbols of Power : Studies on the Political Status of Women in India, Delhi, 1979.
- Mishra, Rekha : Women in Mughal India 1526-1748, Munsiram Manoharlal, Delhi, 1967.
- Nanda B.R. : Indian Women from Purdah to Modernity, Vikas, Delhi, 1976.
- Gail, Minault : The Extended Family Women and Political Participation in India and Pakistan, South Asiabooks, Columbia, 1981.
- Towards Equality : Report of Committee on the Status of Women in India, Govt. of India, Delhi, 1975.
- Ashraf, K.M. : Social and Economic Life in Medieval India.

WOMEN IN INDIAN HISTORY – I

- Unit 1 Sources of Study : Archival and Non-archival. Govt. Files, Census Reports, Private Papers, Auto – biographies.
- Unit 2 Various approaches about Women Liberal, Marxist, Socialist and Radical. Religion and Women : Brahminical, Jainism, Buddhism, Christianities, Islam and Sikhism.
- Unit 3 Reforms Movement and Women : Bhakti Movement, Brahma Samaj, Arya Samaj and Aligarh Movement.
- Unit 4 Customary and Legal Status of Women : Ancient India, Medieval India, Colonial India, Post Independence and Tribal Societies.

Suggested Readings:

- Altekar, A.S. : The Position of Women in Hindu Civilization, Delhi, 1978.
- Basu, A. & Ray, B. : Women's Struggle : A History of the All India Women Conference 1927,1990, Delhi.
- Upadhyaya, B.S. : Women in Rigveda.
- Desai, Neera : Women in Modern India, Mumbai, 1957.
- Krishna Murty, J.(ed.) : Women in Colonial India, OUP, Delhi, 1989.
: Essays on Survival Work and State.
- Parekh, M.C. : The Brahma Samaj.
- Majumdar, Vina : Symbols of Power : Studies on the Political Status of Women in India, Delhi, 1979.
- Mishra, Rekha : Women in Mughal India 1526-1748, Munsiram Manoharlal, Delhi, 1967.
- Nanda B.R. : Indian Women from Purdah to Modernity, Vikas, Delhi, 1976.
- Gail, Minault : The Extended Family Women and Political Participation in India and Pakistan, South Asiabooks, Columbia, 1981.
- Towards Equality : Report of Committee on the Status of Women in India, Govt. of India, Delhi, 1975.
- Ashraf, K.M. : Social and Economic Life in Medieval India.

SKILL COURSE - I

भारतीय इतिहास के स्रोत

- इकाई 1 प्राचीन भारत के इतिहास के स्रोतों का सामान्य सर्वेक्षण : अभिलेख, सिक्के, मूर्तिकला, चित्रकला, स्मारक, वैदिक, जैन और बौद्ध साहित्य, राष्ट्रीय अभिलेखागार नई दिल्ली में पुरातात्विक रिकॉर्ड की समीक्षा।
- इकाई 2 सल्तनतकालीन भारत के इतिहास के स्रोतों का सामान्य सर्वेक्षण : अभिलेख और सिक्के, मिनहास—उस—सिराज, अमीर खुसरो, जियाउद्दीन बरनी, इसामी।
- इकाई 3 मुगलकालीन भारतीय इतिहास के स्रोतों का सामान्य सर्वेक्षण : बाबरनामा, हुमायूँनामा, अबुल – फजल, कबीर, मीरा, तुकाराम।
- इकाई 4 विदेशी यात्रियों के वृत्तांत का सामान्य सर्वेक्षण : इब्नबतूता, निकोलो डी कॉन्टी, मनुची, फ्रेंकोइस बर्नियर, जे.बी. ट्रेविनयर, लुई रूसेलट्।

सहायक पुस्तके :

Winternitz, M.	:	History of Indian literature .
Gupta, P.L.	:	Coins.
Goyal, S.R.	:	The Coinage of Ancient India.
Shukla, D.C.	:	Rajasthan Ki Bhakti Parampara evam Sanskriti.
	:	Spiritual Heritage of Rajasthan.
गोयल, एस.आर.	:	प्राचीन भारतीय अभिलेख संग्रह, भाग प्रथम। गुप्तकालीन अभिलेख, भाग द्वितीय। प्राचीन भारतीय अभिलेख संग्रह, भाग तृतीय।
गुप्ता, पी.एल.	:	प्राचीन भारतीय अभिलेख संग्रह, भाग द्वितीय
राव, राजवन्त	:	प्राचीन मुद्राएं।
जोशी, एम.सी.	:	युग—युगीन भारतीय कला।
अग्रवाल, पी.के.	:	प्राचीन भारतीय वास्तुकला।
शुक्ला, डी.सी.	:	राजस्थान की भक्ति परम्परा एवं संस्कृति।

SKILL COURSE – I

SOURCES OF INDIAN HISTORY - I

- Unit 1 A general survey of sources of History of Ancient India : Inscriptions, Coins, Sculptures, Painting, Monuments, Vedic, Jain and Buddhist Literature, general review of archival records preserved in National Archives, New Delhi.
- Unit 2 A general survey of sources of History of Sultanate period : Inscriptions and Coins, Minhâs - us - Siraj, Amir Khusro, Zia - ud-din Barni, Isami.
- Unit 3 A general survey of sources of History of Mughal period : Babarnama, Humayunnama, Abul - Fazal, Kabir, Meera, Tukaram.
- Unit 4 A general survey of accounts of foreign travellers : Ibn - batuta, Nikolao Conti, Manuchi, Francois Bernier, J.B. Tavernier, Louis Roussellet.

सहायक पुस्तके :

- Winternitz, M : History of Indian literature.
- Gupta, P.L. : Coins.
- Goyal, S.R. : The Coinage of Ancient India.
- Shukla, D.C. : Rajasthan Ki Bhakti Parampara evam Sanskriti.
: Spiritual Heritage of Rajasthan.
- गोयल, एस.आर. : प्राचीन भारतीय अभिलेख संग्रह, भाग प्रथम।
गुप्तकालीन अभिलेख, भाग द्वितीय।
प्राचीन भारतीय अभिलेख संग्रह, भाग तृतीय।
- गुप्ता, पी.एल. : प्राचीन भारतीय अभिलेख संग्रह, भाग द्वितीय
- राव, राजवन्त : प्राचीन मुद्राएं।
- जोशी, एम.सी. : युग-युगीन भारतीय कला।
- अग्रवाल, पी.के. : प्राचीन भारतीय वास्तुकला।
- शुक्ला, डी.सी. : राजस्थान की भक्ति परम्परा एवं संस्कृति।



JAI NARAIN VYAS UNIVERSITY, JODHPUR (RAJASTHAN)

FACULTY OF ARTS, EDUCATION & SOCIAL SCIENCES

(DEPARTMENT OF HISTORY)

SYLLABI

FOR

M.A. HISTORY (SEMESTER SYSTEM I AND SEMESTER II EXAMINATION 2022-2023

M.A. HISTORY (SEMESTER SYSTEM III AND SEMESTER IV EXAMINATION 2022-2023

IMPORTANT

NOTIFICATION

In compliance of decision of the Hon'ble High Court all students are required to fulfill 75% attendance rule in each subject and there must be 75% attendance of the student before he/she could be permitted to appear in the examination.

REGISTRAR

(Academic)

FACULTY OF ARTS, EDUCATION & SOCIAL SCIENCES

MASTER OF ARTS

GENERAL INFORMATION FOR STUDENTS

The examination for the degree of Master of Arts, Education and Social Sciences shall consist of two parts with semester system : (i) The M.A. (Semester I and Semester II) , 2022-2023 and (ii) M.A. (Semester III and Semester IV), 2022-2023.

The examination will be through theory papers/practical/viva. Pass marks for the semester I, semester II, semester III and semester IV examination are 36% of the aggregate marks in all the theory papers and viva/practical's and not less than 25% marks in the individual theory paper/viva/practical. A candidate is required to pass in the written and the practical/viva examination separately.

Successful candidate will be placed in the following divisions on the basis of the total marks obtained in all four semesters of M.A. (Semester I and Semester II) and (ii) M.A (Semester III and Semester IV) examinations taken together.

First division 60%,second division 48% and third division 36% no students will be permitted to register himself simultaneously for more than one post-graduate course.

ATTENDANCE

1. For all regular candidates in the faculties of arts, education and social sciences, science, law, commerce and engineering, the minimum attendance requirement shall be that a candidate should have attended at least 75% of the lecturers delivered and tutorials held taken together as well as 75% of practical and sectionals from the date of his/her admission.
2. Condonation of shortage of attendance:
The shortage of attendance up to the limits specified below may be condoned on valid reason :
 - i) Up to 6% each subject plus 5 attendances in all the aggregate subject/papers may be condoned by the Vice-chancellor on the recommendation of the Dean/Director/Principal for undergraduate students and on the recommendation of the Head of the Department for the Post-graduate classes.
 - ii) The N.C.C./N.S.S cadets sent out to parades and camps and such students who are deputed by the University to take part in games, athletics or cultural activities may, for purpose of attendance, be treated, as present for the days of their absence in connection with the aforesaid activities and that period shall be added to their subject wise attendance.

Note :

The attendance requirement will apply to each semester.

Candidates will be required to pass separately in theory and practical examinations.

Candidate's choice among the optional papers and groups would be restricted only to those paper or groups for which regular teaching is provided in the department.

MEDIUM

Candidates are not allowed to use any medium except Hindi or English for answering question papers.

For answering papers in the Subjects of English/Hindi the medium will be corresponding language only.

ADMISSION

The details of the eligibility conditions and admission procedures are given in the admission forms and on university website. The admission would be done on the basis of merit as per University rules. Reservation for SC, ST and OBC would also be done as per J.N.V. University, Jodhpur rules. Candidates are required to attend minimum 75% of the classes.

FACULTY

Professor

Dr. Sushila Shaktawat

Assistant Professor

Dr.Rashmi Meena

Dr.Bhagwan Singh Shekhawat

Dr.Bhawani Singh Rajpurohit

Dr.Dinesh Rathi

Dr. Suresh Kumar Choudhary

Dr.Pratibha Sankhla

Dr.Mahendra Purohit

Dr.Bharat Deora

Dr.Lalit Kumar Panwar

GUIDELINES FOR CHOICE BASED CREDIT SYSTEM

Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete **four skill courses:** two within the Department and two from other Department within JNV University or the Universities approved by JNV University
3. **Course:** Usually referred to, as 'papers' is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period of teaching (lecture or tutorial) or two periods of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.
12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/ December and even semester from December/January to May.
Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May.
13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Arts, Education & Social Sciences resolves the following:

- a. All internal assessments shall on term test and seminar. Attendance shall carry the prescribed marks in all papers.
- b. In each semester two out of four theoretical components of the University examinations shall be undertaken by external examiners from outside JNV University, who may be appointed by the competent authorities.

Grievances and Redressal Mechanism

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head of the Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.

- b) The appeal will be assessed by the Chairman and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Dean, Faculty of Arts, Education & Social Sciences comprising of the HOD of the concerned Department and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	'O'	Outstanding	10
2	'A+'	Excellent	9
3	'A'	Very Good	8
4	'B+'	Good	7
5	'B'	Above Average	6
6	'C'	Average	5
7	'P'	Pass	4
8	'F'	Fail	0
9	'Ab'	Absent	0

- i. A student obtaining Grade F in a paper shall be considered failed and will be required to reappear in the University End Semester examination.
- ii. For noncredit courses (Skill Courses) 'Satisfactory' or "Unsatisfactory' shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

- = and > 95 % marks Grade Point 10.0
- 90 to less than 95 % marks Grade Point 9.5
- 85 to less than 90 % marks Grade Point 9.0
- 80 to less than 85 % marks Grade Point 8.5
- 75 to less than 80 % marks Grade Point 8.0
- 70 to less than 75 % marks Grade Point 7.5
- 65 to less than 70 % marks Grade Point 7.0
- 60 to less than 65 % marks Grade Point 6.5
- 55 to less than 60 % marks Grade Point 6.0
- 50 to less than 55 % marks Grade Point 5.5
- 45 to less than 50 % marks Grade Point 5.0
- 40 to less than 45 % marks Grade Point 4.5
- 35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,

i.e.

$$SGPA (S_i) = \Sigma (C_i \times G_i) / \Sigma C_i$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,

i.e.

$$CGPA = \Sigma (C_i \times S_i) / \Sigma C_i$$

where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.

iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	6	B	6	6 x 6 =36
2	Course 2	6	B+	7	6 X 7 =42
3	Course 3	6	B	6	6X 6 = 36
4	Course 4	6	O	10	6 X 10 =60
	Total	24			36+42+36+60=174

Thus, $SGPA = 174/24 = 7.25$

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	7.25	7.25	7	6.25

$CGPA = (24 \times 7.25 + 24 \times 7.25 + 24 \times 7 + 24 \times 6.25) / 96$

$666/96 = 6.94$

Semester-wise Theory Papers/Practical / Skill component

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
SEMESTER III							
Core course 9	Hist. 301	Political History of India - I	6-0-0	6	30	70	100
Core course 10	Hist. 302	Political History of Rajasthan - I	6-0-0	6	30	70	100
Discipline Specific Elective/s 1	Elective papers 303		6-0-0	6-0-0	6	70	100
	Hist. 303 A	Social & Cultural History of Ancient India - I					
	303 B	Introduction of India Archeology, Epigraphy and Numismatic - I					
	303 C	Social and Cultural History of Medieval India - I					
	303 D	Social and Cultural History of Medieval Rajasthan - I					
Discipline Specific Elective/s 2	Elective papers Hist. 304		6-0-0	6-0-0	6	70	100
	Hist. 304 A	Social and Cultural History of Modern India - I					
	304 B	History of National Movement of India – I					
	304 C	History of Constitutional					

		Development in India - I				
	304 D	Research Methodology - I				
*Skill course III		Sources of History of Rajasthan	2-0-0			
Total				24	120	280
					400	

***The Department of History shall offer one skill course per semester from the list of skill courses approved for the Department .**

In view of the course content, the Department of History distributed the Periods between Theory/Tutorial/~~Practical~~ as under per paper

- 6: 0 : 0 (six lectures only (no tutorial and no practical) per week) – For Theory
- 2+0+0 (two lectures) - For Skill course

The Duration of the Period shall be forty five minutes. In each of these combinations, the first value stands for the same number of lecture instructions per week.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective) involve an evaluation system of students that has the following two components:-

(i) **Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and

(ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.

(i) **Continuous Comprehensive Assessment (CCA):** This would have the following components:

- Term Test:** One term test shall be arranged for each paper prior to End-Semester Examination; examination duration shall be of three hours; maximum marks shall be 60 (reduced to 15).
- Seminar:** Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 40 (reduced to 10). The seminar shall be completed prior to term test for all the papers.
- Classroom Attendance** – Each student will have to attend a minimum of 75% Lectures / Tutorials / Practicals. A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE). Attendance marks will be awarded by following the system proposed below:

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

75% to 80%	=	1 mark
81% to 85%	=	2 marks
86 to 90%	=	3 marks
91% to 95%	=	4 marks
96% and above	=	5 marks

Note : Compensation in classroom attendance of a student will be as per prevalent University rules.

Each student's cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Arts, Education & Social Sciences.

- CCA is based on open evaluation system without any bias to any student.
- Any grievance received in the Department from student shall be placed before the **Grievance Redressal Committee** with adjudicated comments

Each component marks will be added making it rounding as per norms.

Marking Scheme of Continuous Comprehensive Assessment (CCA)

Components	Maximum Marks	Reduced and Original Marks
Term Test	60	(reduced to 15)
Seminar	40	(reduced to 10)

Classroom Attendance	05	05
Total Marks of CCA	100	30

Note : Classroom Attendance marks will be as follows :-

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

Percentage	Marks
75% to 80%	1 mark
81% to 85%	2 marks
86 to 90%	3 marks
91% to 95%	4 marks
96% and above	5 marks

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective Department shall declare the result as “Satisfactory” or “Non-Satisfactory”; each student need to get a minimum of three “Satisfactory” declaration for the course completion

For the Term test and ESE:

Part A

Ten questions (Definitions, illustrations, functions, short explanations, etc; 25-50 words) for one mark each. $10 \times 1 = 10$ marks; comprising questions from each Unit; no choice in this part

Part B

Four questions of long/explanatory answer (500 words) type, one drawn from each Unit; with internal choices : $4 \times 15 = 60$ marks.

10+60 = 70 marks

Qualifying for Next semester

- 1. A student acquiring minimum of 40% in total of the CCA is eligible to join next semester.**
- A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as ‘Fail’), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.
- A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time, i.e. three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted, for additional chances examination fee shall be on additive basis.

Improvement Option:

Every student shall have the opportunity to improve Credit thorough University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final.

Result Declaration:

The ESE (End Semester Examination/University Examination) results shall be declared within twenty days of the last examination. The Theory Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation.

POST -GRADUTE COURSE: A DESCRIPTION

The full course is of FOUR SEMESTERS spread for TWO YEARS duration. A semester-wise list of courses to be

offered is given below. In each paper there will be four unit.

SEMESTER I

SEMESTER II

SEMESTER III

SEMESTER IV

Elective paper group – First – Semester III

Elective paper group – Second – Semester III

Elective paper group – First – Semester IV

Elective paper group – Second – Semester IV

Skill Courses in the respective subject

Electives would be discipline centric and only students from concerned departments can register.

ADMISSION

The minimum qualification for admission to M.A. Course is Graduate Degree. The details of eligibility conditions and admission procedure will be as per University rules. The candidates are required to attend minimum of a 75% of classes.

TEACHING AND EXAMINATION SCHEME

Per Semester

Course	Periods/Week	Examination hours	CCA	ESE	Total
Theory Papers					
Course I	6	3	30	70	100
Course II	6	3	30	70	100
Course III	6	3	30	70	100
Course IV	6	3	30	70	100

UNIVERSITY EXAMINATION

Each course paper shall be of three hours duration.

Note: The number of elective to be taught from each group in a particular year shall be decided by the Department. Electives offered will be announced at the beginning of the academic session. Each student shall be assigned one Elective Paper from Group ONE and the second from Group TWO. Elective papers will be allotted on merit-cum-choice basis as far as possible. In the odd semester two skill courses will be those offered by the respective departments in the even semester skill courses will be from other departments.

DEPARTMENT OF HISTORY

SCHEME OF EXAMINATION FOR M.A. HISTORY (SEMESTER SYSTEM) FOR THE EXAMINATION

INSTRUCTIONS FOR THE PAPER SETTERS AND THE STUDENTS

Max. Marks - 70

Min. Marks – 25

Duration – 3 hours

Note :

- (i) There shall be 9 questions in all. Five questions have to be attempted.
- (ii) The first question shall be short answer type containing 10 short questions spread over the whole syllabus to be answered in about 30 words each. It shall carry 10 marks and shall be a compulsory question.
- (iii) Rest of the paper shall contain 8 questions with internal choice. The entire syllabus has been divided into four units. Each unit shall have two questions and the candidates shall be given internal choice i.e. the candidate shall attempt one question from each unit.

SEMESTER III

1. THEORY PAPERS (Core/Elective Papers)	ESE	CCA	Total	Lecture- Tutorial- Practical/ Week	Credits
Paper IX :	70	30	100	6-0-0	6
Paper X :	70	30	100	6-0-0	6
Paper XI : Any one of the following a) b) c)	70	30	100	6-0-0	6
Paper XII : Any one of the following a) b) c)	70	30	100	6-0-0	6
Grand Total			400 marks		24 credits

SEMESTER-III

Core Course 9

Hist. 301

भारत का राजनीतिक इतिहास 1950 तक - I

- इकाई 1** : प्राचीन भारतीय इतिहास के स्रोत, प्रागैतिहासिक युग, हड़प्पा सभ्यता—नगर—नियोजन के विशेष सन्दर्भ में, वैदिक राजनय।
- इकाई 2** : जनपद, महाजनपद, नन्द एवं मौर्य, शुंग, कण्व, भारतीय—यवन, शक, पहलव, सातवाहन, पश्चिमी क्षत्रप तथा कुषाण।
- इकाई 3** : साम्राज्यिक गुप्त, वाकाटक और वर्द्धन, स्वर्णकाल की कपोल—कल्पना की समस्या।
- इकाई 4** : चोल, चालुक्य, पल्लव, सर्वोच्चता के लिये त्रिकोणीय संघर्ष, मिहिरभोज प्रतिहार, पृथ्वीराज चौहान तृतीय, मुस्लिम आक्रमण।

Suggested Readings:

- Thapar, Romila : A History of India Vol. I.
Sastri, K.A.N. : A History of South India.
Basham, A. L. : The Wonder that was India.
Majumdar, R.C. (ed.) : History and Culture of the Indian Peoples, Vols. I – V.
Majumdar, R. C. and Altekar, A. S. : The Vakataka Gupta Age.
Thapar, Romila : Penguin History of Early India.
Majumdar, R.C. : Ancient India.
Naraian, A. K. : The Indo-Greeks.
Raychaudhuri, H. C. : Political History of Ancient India (revised edn.)
Thapar, Romila : Asoka and the Decline of the Mauryas.
Maity, S. K. : The Imperial Guptas and their Times.
Shastri, A. M. : The Vakatakas—Sources and History.
Devahuti, D. : Harsha : A Political Study.
Goyal, S.R. : The Imperial Guptas : A Multidisciplinary Political Study.

- शास्त्री, के.एन. : चन्द्रगुप्तमौर्य युगीन भारत।
थापर, रोमिला : अशोक और मौर्य साम्राज्य का पतन।
पाण्डे, जी.सी. : वैदिक संस्कृति।
मजूमदार, आर. सी. : श्रेण्य युग।
ओम प्रकाश : प्राचीन भारत का इतिहास।
पाण्डेय, राजबली : प्राचीन भारत।
थापर, रोमिला : भारत का इतिहास, भाग-1।
गोयल, श्रीराम : प्राचीन भारत का इतिहास (तीन भागों में)।

SEMESTER-III

Core Course 9

Hist. 301

Political History of India up to 1950 - I

- Unit I** Sources of Ancient Indian History, Prehistoric Period, Harappan Civilization with special reference to Urban Planning, Vedic Polity.
- Unit II** The Janapadas, Mahajanapadas, Nandas and Mauryas, Sungas, Kanvas, Indo-Greeks, Sakas, Pallavas, Satavahanas, Western Kshatrapas and Kushanas.
- Unit III** The Imperial Guptas, Vakatakas and Vardhanas, Problem of the Myth of the Golden age.
- Unit IV** The Cholas, Chalukyas, Pallavas, Tripartite Struggle for Supremacy, Mihirbhoj Pratihara, Prithviraja Chahmana III, Muslim invasions.

Suggested Readings :

- Thapar, Romila : A History of India Vol. I.
Sastri, K.A.N. : A History of South India.
Basham, A. L. : The Wonder that was India.
Majumdar, R.C. (ed.) : History and Culture of the Indian Peoples, Vols. I – V.
Majumdar, R. C. and Altekar, A. S. : The Vakataka Gupta Age.
Thapar, Romila : Penguin History of Early India.
Majumdar, R.C. : Ancient India.
Naraian, A. K. : The Indo-Greeks.
Raychaudhuri, H. C. : Political History of Ancient India (revised edn.)
Thapar, Romila : Asoka and the Decline of the Mauryas.
Maity, S. K. : The Imperial Guptas and their Times.
Shastri, A. M. : The Vakatakas—Sources and History.
Devahuti, D. : Harsha : A Political Study.
Goyal, S.R. : The Imperial Guptas : A Multidisciplinary Political Study
शास्त्री, के.ए.न. : चन्द्रगुप्तमौर्य युगीन भारत।
थापर, रोमिला : अशोक और मौर्य साम्राज्य का पतन।
पाण्डे, जी.सी. : वैदिक संस्कृति।
मजूमदार, आर. सी. : श्रेष्ठ युग।
ओम प्रकाश : प्राचीन भारत का इतिहास।
पाण्डेय, राजबली : प्राचीन भारत।
थापर, रोमिला : भारत का इतिहास, भाग-1।
गोयल श्रीराम : प्राचीन भारत का इतिहास (तीन भागों में)।

सेमेस्टर—III

कोर कोर्स—10

इतिहास—302

राजस्थान का राजनीतिक इतिहास - I

- इकाई—I** : राजपूत उत्पत्ति से पूर्व राजस्थान का प्रारम्भिक इतिहास। राजस्थान इतिहास जानने के स्रोत : पुरातात्विक व साहित्यिक स्रोत, राजपूत उत्पत्ति से सम्बन्धित मत, मण्डोर के प्रतिहार ।
- इकाई—II** : गुर्जर प्रतिहार : नागभट्ट द्वितीय व मिहिरभोज ; मेवाड़ के गुहिल प्रारम्भ से मोकल तक ; शाकम्भरी के चौहान : अर्णोराज, विग्रहराज-IV व पृथ्वीराज-III; परमारों का अधिवासन व राज्य विस्तार (8वीं से 13वीं सदी तक) : आबू, जालोर, किराड़ू, मालवा व बागड़ के परमार ।
- इकाई—III** : राजस्थान में मुस्लिम सत्ता का प्रसार ; कुम्भा, सांगा व राजसिंह प्रथम के अधीन मेवाड़ का उदय ; जोधा व मालदेव के अधीन मारवाड़ का उदय ; राजस्थान में सामन्तवाद ।
- इकाई—IV** : मुगलों के साथ प्रतिरोध व सहयोग : आमेर — मानसिंह प्रथम, मिर्जा राजा जयसिंह, सवाई जयसिंह ; मेवाड़ — प्रताप ; मारवाड़—चन्द्रसेन, जसवंत सिंह प्रथम, दुर्गादास ; बीकानेर — रायसिंह ।

Suggested Readings :

Sharma, Dasaratha	:	Lectures in Rajput History.
	:	Rajasthan through the Ages, Vol. I.
Singh, Dilbagh	:	State, Landlords and Peasants.
Sharma, G.D.	:	Rajput Polity.
Sharma, G.N.	:	Mewar and the Mughal Emperors.
	:	Social Life in Medieval Rajasthan.
Tod, James	:	Annals and Antiquities of Rajasthan
Gupta, S.P.	:	Agrarian System of Eastern Rajasthan (1650-1750).
Bhatnagar, V.S.	:	Life and times of Sawai Jai Singh.
Das, Shyamal	:	Vir Vinod.
Banerjee, A.C.	:	Rajput Studies.

Gupta, K.S.	:	Mewar and Marathas
Tikkiwal, G.C.	:	Jaipur and the later Mughals.
Khadgawat, N.R.	:	Rajasthan's Role in Struggle of 1857.
Rathore, L.S.	:	Political Movements and Constitutional Development in Princely States of Rajasthan
Pema Ram	:	Agrarain Movements in Rajasthan.
Darda, R.S.	:	From Feudalism to Democracy.
शर्मा, गोपीनाथ	:	राजस्थान के इतिहास के स्रोत । राजस्थान का इतिहास । राजस्थान का स्वतंत्रता संग्राम ।
वी.एन. रेऊ	:	मारवाड़ का इतिहास भाग 1-2 ।
व्यास, आर.पी.	:	राजस्थान का बृहत इतिहास, भाग 1-2 ।
व्यास, प्रकाश	:	राजस्थान में स्वाधीनता संग्राम ।
शर्मा, पद्मजा	:	बिजोलिया आन्दोलन ।
ओझा, गौरी शंकर	:	राजपूताना का इतिहास

SEMESTER-III

CORE COURSE – 10

HISTORY : 302

POLITICAL HISTORY OF RAJASTHAN - I

- UNIT-I** : Early History of Rajasthan before origin of Rajputs, Sources of Rajasthan History : Archaeological and Literary sources ; Opinion of Rajput Origin ; Pratihars of Mandore.
- UNIT-II** : Gurjar Pratihars : Nagbhatt II and Mihir Bhoj, Guhils of Mewar from earliest to Mokal, Chauhan of Sakambari – Arnoraj, Vighraha Raj IV, Prithviraj III, Dominion and Expansion of Parmars, (8th century to 13th Century)- Abu, Jalore, Kiradu, Malwa and Parmars of Baghar.
- UNIT-III** : Muslim Expansion in Rajasthan, Rise of Mewar under Kumbha, Sanga and Raj Singh I. Rise of Marwar Under Jodha and Maldeo. Fedulism in Rajasthan.
- UNIT-IV** : Resistance and collaboration with Mughals; Amber – Man Singh-I, Mirza Raja Jai Singh, Sawai Jai Singh; Mewar- Pratap; Marwar-Chandra Sen, Jaswant Singh I, Durgadas, Bikaner – Raj Singh.

Suggested Readings :

- B.L. Bhadani : Peasants, Artisans and entrepreneurs-Economy of Marwar in the Seventeenth Century.
- Dasaratha Sharma : Lectures in Rajput History.
- Dilbagh Singh : Rajasthan through the Ages, Vol. I.
- G.D. Sharma : State, Landlords and Peasants.
- G.H. Ojha : Rajput Polity.
- G.N. Sharma : Rajputana Ka Itihas (relevant volumes)
- James Tod : Merwar and the Mughal Emperors.
- S.P. Gupta : Social Life in Medieval Rajasthan.
- S.P. Gupta : Annals and Antiquities of Rajasthan
- V.S. Bhatnagar : Agrarian System of Eastern Rajasthan (1650-1750).
- Shyamal Das : Life and times of Sawai Jai Singh.
- A.C. Banerjee : Vir Vinod.
- K.S. Gupta : Rajput Studies.
- G.C. Tikkiwal : Mewar and Marathas
- G.C. Tikkiwal : Jaipur and the later Mughals.

Khadgawat, N.R.	:	Rajasthan's Role in Struggle of 1857.
Rathore, L.S.	:	Political Movements and Constitutional Development in Princely States of Rajasthan
Pema Ram	:	Agrarain Movements in Rajasthan.
Darda, R.S.	:	From Feudalism to Democracy.
गोपीनाथ शर्मा	:	राजस्थान के इतिहास के स्रोत ।
वी.एन. रेऊ	:	मारवाड़ का इतिहास भाग 1-2 ।
व्यास, आर.पी.	:	राजस्थान का बृहत इतिहास, भाग 1-2 ।
व्यास, प्रकाश	:	राजस्थान में स्वाधीनता संग्राम ।
शर्मा, पद्मजा	:	बिजोलिया आन्दोलन ।

प्राचीन भारत का सामाजिक एवं सांस्कृतिक इतिहास —I

- इकाई 1 भारतीय सामाजिक इतिहास के स्रोत : साहित्यिक, पुरातात्विक, विदेशी लेखकों एवं यात्रियों का विवरण। भारतीय संस्कृति की प्राचीनता, सहिष्णुता एवं स्थायित्व। सैन्धव घाटी सभ्यता का सामाजिक एवं धार्मिक जीवन। वैदिक कालीन समाज, धर्म एवं साहित्य।
- इकाई 2 भारतीय समाज का विभाजन : वर्ण व्यवस्था, जाति व्यवस्था, आश्रम व्यवस्था एवं संस्कार। सामाजिक जीवन में कुटुम्ब की अवधारणा एवं संयुक्त परिवार। हिन्दू विवाह व्यवस्था। प्राचीन भारतीय समाज में स्त्रियों की स्थिति।
- इकाई 3 जैन धर्म, बौद्ध धर्म। शिक्षा का स्वरूप, विकास एवं प्रमुख केन्द्र। महाकाव्य— रामायण एवं महाभारत। गीता का चिन्तन एवं दर्शन। अवतारवाद की पृष्ठभूमि— वैष्णव धर्म, शैव धर्म एवं शाक्त उपासना।
- इकाई 4 पाषाणयुगीन भारतीय कला, सैन्धव कला, मौर्य कला, स्तूप स्थापत्य — सांची व अमरावती के स्तूप। गुहा वास्तु — चैत्य एवं विहार। उड़ीसा एवं अजन्ता की गुफाएँ। गंधार एवं मथुरा कला।

सन्दर्भ ग्रंथः—

1. मिश्र, जयशंकर : प्राचीन भारत का सामाजिक इतिहास
2. शर्मा, व्यास : भारतीय संस्कृति के मूल आधार
3. गुप्त, शिवकुमार : भारतीय संस्कृति के मूल आधार
4. पाण्डे, विमलचन्द्र : भारत का सामाजिक इतिहास
5. शर्मा, रामशरण : पूर्वमध्यकालीन भारत में सामाजिक परिवर्तन
6. उपाध्याय, वासुदेव : प्राचीन भारतीय स्तूप, गुफा एवं मंदिर
7. जोशी महेशचन्द्र : युगयुगीन भारतीय कला
8. Shastri, A. Neelkanth : A History of South India;
9. Altekar, A.S. : The Position of Women in Hindu Civilization, Education in Ancient India;
10. Kapadia, K.M. : Marriage and Family in India;
11. Basham, A.L. : Wonder That Was India;
12. Kosambi, D.D. : The Culture and Civilization of Ancient India in Historical Outline
13. Sharma, Ramsharan : Indian Feudalism;
14. Sharma, B.N. : Social and Cultural History of Northern Indian

SEMESTER-III

Elective I

303 A

Social and Cultural History of Ancient India- I

- Unit I** Sources of Social History of Ancient India- Literary, Archaeological, Foreign Writers and Travellers' Accounts; Antiquities, Tolerance, and Stability of Indian Culture; Social and Religious life of Indus Valley Civilization; Society, Religion, and Literature in Vedic Period.
- Unit II** Division of Indian Society- Varna System, Caste System, Ashram System; Sanskar; Concept of Family in Social Life and Joint Family; Hindu Marriage System; Position of Women in Ancient Indian Society.
- Unit III** Jainism; Buddhism; Nature and Growth of Education and Main Centres of Learning; Epics- *Ramayana* and *Mahabharata*; *Gita*- Thoughts and Philosophy; Background of Reincarnation- Vaishnavism, Shaivism & Worship of *Shakti*.
- Unit IV** Indian Art in Stone Age; Indus Valley Art; Mauryan Art; *Stoop* Architecture- *Stoops* of Sanchi and Amrawati; Cave Architecture- *Chaitya* and *Vihar*, Caves of Ajanta and Odisha; Gandhaar and Mathura Art.

Suggested Readings:

1. मिश्र, जयशंकर : प्राचीन भारत का सामाजिक इतिहास
2. शर्मा, व्यास : भारतीय संस्कृति के मूल आधार
3. गुप्त, शिवकुमार : भारतीय संस्कृति के मूल आधार
4. पाण्डे, विमलचन्द्र : भारत का सामाजिक इतिहास
5. शर्मा, रामशरण : पूर्वमध्यकालीन भारत में सामाजिक परिवर्तन
6. उपाध्याय, वासुदेव : प्राचीन भारतीय स्तूप, गुफा एवं मंदिर
7. जोशी महेशचन्द्र : युगयुगीन भारतीय कला
8. Shastri, A. Neelkanth : A History of South India;
9. Altekar, A.S. : The Position of Women in Hindu Civilization, Education in Ancient India;
10. Kapadia, K.M. : Marriage and Family in India;
11. Basham, A.L. : Wonder That Was India;
12. Kosambi, D.D. : The Culture and Civilization of Ancient India in Historical Outline
13. Sharma, Ramsharan : Indian Feudalism;
14. Sharma, B.N. : Social and Cultural History of Northern Indian

SEMESTER-III

Elective I

303- B

भारतीय पुरातत्व, अभिलेख शास्त्र एवं मुद्राशास्त्र का परिचय (I)

- इकाई 1 : पुरातत्व की परिभाषा तथा कार्यक्षेत्र, भारतीय पुरातत्व का इतिहास, बदलते दृष्टिकोण तथा नवीन पद्धतियाँ, नवीन पुरातत्व की अवधारणा
- इकाई 2 : सापेक्ष तिथि निर्धारण की विधियाँ, अतीत के तिथि-निर्धारण की रेडियो-कार्बन विधि, अन्तःजलीय पुरातत्व, राजस्थान व गुजरात के प्रमुख पुरातात्विक केन्द्र
- इकाई 3 : ऐतिहासिक पुनर्निर्माण के लिये अभिलेखों का महत्त्व, भारत में लेखन-कला का उद्भव तथा प्राचीनता
- इकाई 4 : ब्राह्मी लिपि के उद्भव की समस्या, ब्राह्मी एवं खरोष्ठी लिपियाँ तिथि-निर्धारण एवं संवत् : संवत्तों की अवधारण के उदय से पूर्व की तिथि-निर्धारण पद्धतियाँ, विक्रम, शक, गुप्त तथा हर्ष संवत्

Suggested Readings :

- Sankalia, H.D. : Indian Archaeology Today
: Prehistory and Protohistory of Early India and Pakistan (revised edn.)
- Piggott, S. : Prehistoric India
- Lal, B.B. : Indian Archaeology Since Independence
- Zeuner : Dating the Past
- Mandal, G.R. : Radiocarbon Dates and Indian Archaeology
- Sankalia, H. D. et al : Excavations at Ahar, 1961-62
Archaeology in India, Government of India Publication
- Dikshit, K.N. : Archaeological Perspectives of India Since Independence
- Sankalia, H.D. : An Introduction to Archaeology
- Pandey, R.B. : Ancient Indian Historical and Literary Inscriptions
- Hultzeh : Inscriptions of Asoka
- Gupta, S.P. and Ramachandran, K.S. : The Origin of Brahmi Script
- Ramesh, K.V. : Indian Epigraphy
- वर्मा, आर. के. : भारतीय प्रागैतिहास, भाग 1-2
- पाण्डे, जे. एन. : पुरातत्व विमर्श
- जासवाल, विदुला : पुरापाषाण काल
: उत्तरपाषाण काल
- थपल्याल, के.के. : सिन्धु सभ्यता
- अग्रवाल, डी.पी. एवं पन्नालाल : पुरातिहासिक पुरातत्व
- पाण्डेय, आर.बी. : अशोक के अभिलेख
- गोयल, श्रीराम : प्राचीन भारतीय अभिलेख-संग्रह खण्ड 1
- गुप्त, परमेश्वरीलाल : प्राचीन भारतीय अभिलेख, भाग 1
- ओझा, जी.एच. : प्राचीन लिपिमाला

SEMESTER-III

Elective I

303 B

Introduction to Indian Archaeology, Epigraphy and Numismatics I

- Unit I** Definition and scope of archaeology, history of Indian archaeology, changing attitudes and recent trends, concept of new archaeology
- Unit II** Relative dating methods, radio-carbon method of dating the past under-water archaeology, main archaeological sites of Rajasthan and Gujarat
- Unit III** Importance of inscriptions for historical reconstruction, origin and antiquity of the art of writing in India.
- Unit IV** The problem of the origin of Brahmi script, Brahmi and Kharoshthi scripts. Dating and eras : pre-era dating methods, Vikrama, Saka, Gupta and Harsha eras.

Suggested Readings :

- Sankalia, H.D. : Indian Archaeology Today
: Prehistory and Protohistory of Early India and Pakistan
(revised edn.)
- Piggott, S. : Prehistoric India
- Lal, B.B. : Indian Archaeology Since Independence
- Zeuner : Dating the Past
- Mandal, G.R. : Radiocarbon Dates and Indian Archaeology
- Sankalia, H. D. et al : Excavations at Ahar, 1961-62
Archaeology in India, Government of India Publication
- Dikshit, K.N. : Archaeological Perspectives of India Since Independence
- Sankalia, H.D. : An Introduction to Archaeology
- Pandey, R.B. : Ancient Indian Historical and Literary Inscriptions
- Hultzeh : Inscriptions of Asoka
- Gupta, S.P. and Ramachandran, K.S. : The Origin of Brahmi Script
- Ramesh, K.V. : Indian Epigraphy
- वर्मा, आर. के. : भारतीय प्रागैतिहास, भाग 1-2
- पाण्डे, जे. एन. : पुरातत्व विमर्श
- जासवाल, विदुला : पुरापाषाण काल
: उत्तरपाषाण काल
- थपल्याल, के.के. : सिन्धु सभ्यता
- अग्रवाल, डी.पी. एवं पन्नालाल : पुरातिहासिक पुरातत्व
- पाण्डेय, आर.बी. : अशोक के अभिलेख
- गोयल, श्रीराम : प्राचीन भारतीय अभिलेख—संग्रह खण्ड 1
- गुप्त, परमेश्वरीलाल : प्राचीन भारतीय अभिलेख, भाग 1
- ओझा, जी.एच. : प्राचीन लिपिमाला

मध्यकालीन भारत का सामाजिक एवं सांस्कृतिक इतिहास –I
(1200–1750 ई.)

- इकाई –I ग्रामीण और नगरीय समाज की संरचना :
ग्रामीण समाज की संरचना और वर्गीकरण, ग्रामीण समुदाय।
नगरीय समाज की संरचना नगरीय वर्ग, समुदाय और जीवन।
ग्रामीण व नगरीय संबंध।
- इकाई –II इस्लाम : उद्भव और उसकी प्रमुख शिक्षाएँ।
सूफीवाद : उद्भव, अवधारणा और प्रमुख केन्द्र।
- इकाई–III भक्ति आंदोलन : भारत में भक्ति आंदोलन का उद्भव और विकास।
भक्ति आन्दोलन का प्रभाव व योगदान
- इकाई–IV भक्ति आन्दोलन के प्रमुख संतों का जीवन और शिक्षाएँ : कबीर,
नानक, तुलसीदास, मीराबाई, चैतन्य, नामदेव व दादू दयाल।

Suggested Readings :

- | | | |
|-----------------------------------|---|--|
| Rizvi Syed Athar Abbas | : | History of Sufism. Vol. I. |
| Yousuf Hussain | : | Glimpses of Medieval Indian Culture. |
| Mohd. Yasin | : | Social History of Islamic India. |
| Madhukar Sripat Mate | : | Early Historic fortification in the Ganga Valley, Puratatva, Pt. III, 1969-70. |
| Percy Brown | : | Indian Architecture, Vol. I and II. |
| | : | Indian Painting. |
| Rowland, B. | : | Indian Art. |
| Coomaraswamy, AK | : | History of Indian and Indonesian Art. |
| Majumadar, R.C. and Pusalkar A.D. | : | The History and Culture of Indian People, Vol. I, II, IV & IV (Chapters on Art). |
| राधेशरण | : | मध्यकालीन भारत की सांस्कृतिक संरचना। |
| घनश्यामदत्त शर्मा | : | मध्यकालीन भारतीय सामाजिक, आर्थिक एवं सामाजिक संस्थाएँ। |
| श्रीराम शर्मा | : | मुगल शासकों की धार्मिक नीति। |
| के.एम.अशरफ | : | हिन्दुस्तान के लोगों का जीवन व परिस्थितियाँ। |
| सतीश चन्द्र | : | उत्तर मुगल कालीन भारत |
| दीनानाथ दुबे | : | भारत के दुर्ग। |
| रतन लाल मिश्र | : | राजस्थान के दुर्ग। |
| गोपीनाथ शर्मा | : | राजस्थान का इतिहास। |
| हंस नोटियाल | : | देहली का किला। |

SEMESTER-III

ELECTIVE I

303- C

SOCIAL AND CULTURAL HISTORY OF MEDIEVAL INDIA (1200-1750) - I

- Unit -I** Structure of Rural and Urban Society: Composition and stratification of rural society, rural community. Structure of urban society, Urban Classes, Communities and Life, Rural-Urban relationship.
- Unit-II** Islam : origin and its main teachings, Sufism : origin, concepts and its main centers.
- Unit-III** Bhakti Movement : Origin and Development of Bhakti Movement India. Impact and Contribution of Bhakti Movement
- Unit-IV** Life and teaching of the main saints of Bhakti movement : Kabir, Nanak, Tulsidas, Meerabai, Chaitanya, Namdev & Dadudayal.

Suggested Readings :

- B.L. Bhadani : Peasants, Artisans and entrepreneurs- Economy of Marwar in the Seventeenth Century.
- Dasaratha Sharma : Lectures in Rajput History.
: Rajasthan through the Ages, Vol. I.
- Dilbagh Singh : State, Landlords and Peasants.
- G.D. Sharma : Rajput Polity.
- G.H. Ojha : Rajputana Ka Itihas (relevant volumes)
- G.N. Sharma : Merwar and the Mughal Emperors.
: Social Life in Medieval Rajasthan.
- James Tod : Annals and Antiquities of Rajasthan
- S.P. Gupta : Agrarian System of Eastern Rajasthan (1650-1750).
- V.S. Bhatnagar : Life and times of Sawai Jai Singh.
- Shyamal Das : Vir Vinod.
- A.C. Banerjee : Rajput Studies.
- K.S. Gupta : Mewar and Marathas
- G.C. Tikkiwal : Jaipur and the later Mughals.
- Khadgawat, N.R. : Rajasthan's Role in Struggle of 1857.
- Rathore, L.S. : Political Movements and Constitutional Development in Princely States of Rajasthan
- Pema Ram : Agrarian Movements in Rajasthan.
- Darda, R.S. : From Feudalism to Democracy.
- गोपीनाथ शर्मा : राजस्थान के इतिहास के स्रोत ।
- वी.एन. रेऊ : मारवाड़ का इतिहास भाग 1-2 ।
- व्यास, आर.पी. : राजस्थान का बृहत इतिहास, भाग 1-2 ।
- व्यास, प्रकाश : राजस्थान में स्वाधीनता संग्राम ।
- शर्मा, पद्मजा : बिजोलिया आन्दोलन ।

राजस्थान का सामाजिक एवं सांस्कृतिक इतिहास – I

- इकाई-1 राजस्थान के सामाजिक एवं सांस्कृतिक इतिहास के स्रोत, राजस्थान की जातियां एवं जनजातियां।
- इकाई-2 राजस्थान का समाज एवं इसकी संरचना, शिक्षा का विकास : ब्रिटिश शासन, ईसाई मिशनरी एवं जातीय संस्थाओं के विशेष संदर्भ में।
- इकाई-3 विधायन द्वारा समाज सुधार : सती प्रथा, कन्या वध, डाकन प्रथा, समाधि प्रथा, बाल विवाह के विशेष संदर्भ में, वाल्टर कृत राजपूत हितकारिणी सभा।
- इकाई-4 सामाजिक एवं धार्मिक सुधार में आर्य समाज का योगदान, राजस्थान में गांधीजी के रचनात्मक कार्यों का प्रभाव।

संदर्भ ग्रंथ

- Sharma, Dasharath : Rajasthan through the Ages-III, Rajasthan state Archives, Bikaner.
- व्यास, आर.पी. : राजस्थान का वृहत् इतिहास, भाग-I एवं II, राजस्थान हिन्दी ग्रंथ अकादमी, जयपुर।
- नीरज, जयशंकर एवं शर्मा, भगवती लाल : राजस्थान की सांस्कृतिक परम्परा, राजस्थान हिन्दी ग्रंथ अकादमी, जयपुर।
- शर्मा, गोपीनाथ : राजस्थान का सांस्कृतिक इतिहास, राजस्थान हिन्दी ग्रंथ अकादमी, जयपुर।
- शर्मा, कालूराम : उन्नीसवीं सदी में राजस्थान का सामाजिक तथा आर्थिक जीवन।
- गोस्वामी, प्रेमचन्द्र : राजस्थान संस्कृति, कला एवं साहित्य; राजस्थान हिन्दी ग्रंथ अकादमी, जयपुर।
- जैन, हुकमचन्द्र, माली नारायणलाल (सम्पादित) : राजस्थान का इतिहास, कला, संस्कृति, परम्परा एवं विरासत; राजस्थान हिन्दी ग्रंथ अकादमी, जयपुर।

SEMESTER-III

Elective I

303 D

SOCIAL AND CULTURAL HISTORY OF RAJASTHAN – I

- Unit-1 Sources of Social and Cultural History of Rajasthan, Castes and Tribes of Rajasthan.
- Unit-2 Society of Rajasthan and It's Structure, Progress of Education with Special Reference to British Government, Christian Missionaries and Castes Association.
- Unit-3 Social Reforms Through Legislation with Special Referance of Sati System, Female infanticide, witch Craft, Samadhi, Child Marriage; Walter Krit Rajput Hitkarini Sabha.
- Unit-4 Contribution of Arya Samaj in the Socio-Religious Reforms, Impact of Gandhi's Constructive Programme in Rajasthan.

Recommended Readings

- Sharma, Dasharath : Rajasthan through the Ages-III, Rajasthan state Archives, Bikaner.
- व्यास, आर.पी. : राजस्थान का वृहत् इतिहास, भाग-I एवं II, राजस्थान हिन्दी ग्रंथ अकादमी, जयपुर।
- नीरज, जयशंकर एवं शर्मा, भगवती लाल शर्मा, गोपीनाथ : राजस्थान की सांस्कृतिक परम्परा, राजस्थान हिन्दी ग्रंथ अकादमी, जयपुर।
- शर्मा, कालूराम : राजस्थान का सांस्कृतिक इतिहास, राजस्थान हिन्दी ग्रंथ अकादमी, जयपुर।
- शर्मा, कालूराम : उन्नीसवीं सदी में राजस्थान का सामाजिक तथा आर्थिक जीवन।
- गोस्वामी, प्रेमचन्द्र : राजस्थान संस्कृति, कला एवं साहित्य; राजस्थान हिन्दी ग्रंथ अकादमी, जयपुर।
- जैन, हुकमचन्द्र, माली नारायणलाल (सम्पादित) : राजस्थान का इतिहास, कला, संस्कृति, परम्परा एवं विरासत; राजस्थान हिन्दी ग्रंथ अकादमी, जयपुर।

आधुनिक भारत का सामाजिक एवं आर्थिक इतिहास -I

- इकाई -1 ब्रिटिशों के आगमन पर भारत की सामाजिक और आर्थिक स्थिति, भारत में ईसाई मिशनरियों की गतिविधियाँ, भारतीय पुनर्जागरण कारण, राजा राम मोहन राय, दयानन्द सरस्वती और विवेकानन्द के सामाजिक-धार्मिक सुधार।
- इकाई -2 लार्ड विलियम बैंटिंक के सामाजिक सुधार, इस्लामी सुधार आंदोलन : अलीगढ़ एवं देवबंद के विशेष संदर्भ में, दलित वर्ग आंदोलन : ज्योतिबा फूले व अम्बेडकर की भूमिका।
- इकाई -3 किसान आंदोलन : नील आंदोलन, पाबना आंदोलन, दक्कन विद्रोह एवं मोपला विद्रोह। जनजातीय आंदोलन : संथाल विद्रोह, मुण्डा विद्रोह एवं ताना भगत आंदोलन।
- इकाई -4 18वीं शताब्दी के उत्तरार्द्ध में स्त्रियों की स्थिति में सुधार के लिए प्रयास, पाश्चात्य शिक्षा का विकास, भारत में समाचार पत्रों का विकास, आधुनिक मातृभाषा साहित्य का उदय, पाश्चात्य सभ्यता का भारतीय समाज एवं संस्कृति पर प्रभाव।

संदर्भ ग्रंथ :

- Das, M.N. : Studies in Economic and Social Development of Modern India.
Singh, V.B. : Economic History of India 1857-1956.
Baden, Powell : Land System in British India Vol. I, II & III.
Dutta, R.C. : Economic History of India.
Tara Chand : History of Freedom Movement in India.
Ray Chaoudhary, S.C. : Social, Cultural and Economic History of India.
Manjumdar, R.C. : History of India British Paramountcy and Indian Renaissance.
चन्द्र, बिपिन : भारत में आर्थिक राष्ट्रवाद का उद्भव और विकास।
नागर-पुरुषोत्तम : आधुनिक भारतीय राजनीतिक विचारक।
प्रताप सिंह : आधुनिक भारत का सामाजिक व आर्थिक इतिहास।
गौतम, पी.एल. : आधुनिक भारत का इतिहास एवं विरासत।
रॉबर्ट्स, पी.ई. : ब्रिटिश कालीन भारत का इतिहास।
राय, सत्या एम. : भारत में उपनिवेशवाद एवं राष्ट्रवाद।
भट्टाचार्य, सब्यसाची : आधुनिक भारत का आर्थिक इतिहास।
मित्तल, डॉ. सतीश चन्द्र : भारत का सामाजिक-आर्थिक इतिहास (1758ई.-1947ई.)।
देसाई, ए.आर. : भारतीय राष्ट्रवाद की सामाजिक पृष्ठभूमि।

SEMESTER-III

Elective 2

304- A

Social and Economic History of Modern India- I

- Unit 1 Social and Economic Condition of India at the Advent of the Britishers. Activities of Christian Missionaries in India. Indian Renaissance : Causes, Socio-Religious Reforms of Raja Ram Mohan Roy, Dayanand Saraswati and Vivekanand.
- Unit 2 Social Reforms of Lord William Bentinck. Islamic Reform Movements : With Special Reference to Aligarh and Devbandh Movements. Depressed Class Movements : The Role of Jyotiba Phule and Ambedkar.
- Unit 3 Peasant Movements : Indigo Movement, Pabana Movement, Deccan Revolt and Malabar Rebellion. Tribal Movements : Santhal Rebellion, Munda Revolt and Tana Bhagat Movement.
- Unit 4 Efforts to Improve Women's Status in the later Half of 18th Century. The Growth of Western Education, the Development of Newspapers in India, the Rise of Modern Vernacular Literature, the Impact of Western Civilization on the Indian Society and Culture.

Suggested Readings :

- Das, M.N. : Studies in Economic and Social Development of Modern India.
Singh, V.B. : Economic History of India 1857-1956.
Baden, Powell : Land System in British India Vol. I, II & III.
Dutta, R.C. : Economic History of India.
Tara Chand : History of Freedom Movement in India.
Ray Chaoudhary, S.C.: Social, Cultural and Economic History of India.
Manjumdar, R.C. : History of India British Paramountcy and Indian Renaissance.
चन्द्र, बिपिन : भारत में आर्थिक राष्ट्रवाद का उद्भव और विकास।
नागर-पुरुषोत्तम : आधुनिक भारतीय राजनीतिक विचारक।
प्रताप सिंह : आधुनिक भारत का सामाजिक व आर्थिक इतिहास।
गौतम, पी.एल. : आधुनिक भारत का इतिहास एवं विरासत।
रॉबर्ट्स, पी.ई. : ब्रिटिश कालीन भारत का इतिहास।
राय, सत्या एम. : भारत में उपनिवेशवाद एवं राष्ट्रवाद।
भट्टाचार्य, सब्यसाची : आधुनिक भारत का आर्थिक इतिहास।
मित्तल, डॉ. सतीश चन्द्र : भारत का सामाजिक-आर्थिक इतिहास (1758ई.-1947ई.)।
देसाई, ए.आर. : भारतीय राष्ट्रवाद की सामाजिक पृष्ठभूमि।

SEMESTER-III

इलेक्टिव 2

304-ब

भारतीय राष्ट्रीय आन्दोलन का इतिहास – I

- इकाई-1 भारत में राष्ट्रीयता का उदय, प्रारम्भिक राजनीतिक संस्थाएं, भारतीय राष्ट्रीय कांग्रेस की स्थापना एवं इसके उद्देश्य।
- इकाई -2 भारतीय राष्ट्रीय कांग्रेस की स्थापना से सम्बंधित विभिन्न अवधारणाएं, भारतीय राष्ट्रीय कांग्रेस के प्रति ब्रिटिश दृष्टिकोण, उदारवादियों की विचारधारा एवं उपलब्धियाँ।
- इकाई -3 बंगाल का विभाजन, स्वदेशी आन्दोलन, सूरत फूट, उग्रवाद के उदय के कारण।
- इकाई -4 उग्रवादियों की विचारधारा एवं उपलब्धियाँ, क्रांतिकारी आन्दोलन, होमरूल आन्दोलन, भारतीय राजनीति में महात्मा गाँधी का प्रवेश।

सन्दर्भ :

- Sarkar, Sumit : Modern India-1885.
Tara Chand : History of Freedom Movement.
Mehrotra, S.R. : Emergence of Indian National Congress.
Grover, B.L. : British Policy towards Indian National Congress.
Hasan Mushirul : Nationalism and Communal Politics in India 1885-1930.
Grover B.L and S.Grover : Modern Indian History.
Chandra, Bipan : India's Struggle for Independence.
चन्द्र, बिपिन : भारत का स्वतंत्रता संघर्ष।
शुक्ल, आर.एल. : आधुनिक भारत का इतिहास।
यशपाल, बी.एल
एवं ग्रोवर : आधुनिक भारत का इतिहास।
जैन, एम.एस. : आधुनिक भारत का इतिहास।
राय, सत्या एम. : भारत में उपनिवेशवाद एवं राष्ट्रवाद।
बंद्योपाध्याय; शेखर : पलासी से विभाजन तक।

SEMESTER-III

Elective 2

304 -B

HISTORY OF NATIONAL MOVEMENT OF INDIA – I

- Unit-1 Rise of Nationalism in India, Early Political Associations, Establishment of Indian National Congress and Its Objective.
- Unit-2 Theories Regarding Establishment of Indian National Congress, Attitude of British Government Towards Indian National Congress, Ideology and Achievements of Moderates.
- Unit-3 Partition of Bengal, Swadeshi Movement, Surat Split. Causes of Rise of Extremist.
- Unit-4 Ideology and Achievements of Extremists, Revolutionary Movement, Home Rule Movement. Entrance of Mahatma Gandhi in Indian Politics.

Recommended Readings

- Sarkar, Sumit : Modern India-1885.
Tara Chand : History of Freedom Movement.
Mehrotra, S.R. : Emergence of Indian National Congress.
Grover, B.L. : British Policy towards Indian National Congress.
Hasan Mushirul : Nationalism and Communal Politics in India 1885-1930.
Grover B.L and S.Grover : Modern Indian History.
Chandra, Bipin : India`s Struggle for Independence.
चन्द्र, बिपिन : भारत का स्वतंत्रता संघर्ष।
शुक्ल, आर.एल. : आधुनिक भारत का इतिहास।
यशपाल, बी.एल.
एवं ग्रोवर : आधुनिक भारत का इतिहास।
जैन, एम.एस. : आधुनिक भारत का इतिहास।
राय, सत्या एम. : भारत में उपनिवेशवाद एवं राष्ट्रवाद।
बंद्योपाध्याय; शेखर : पलासी से विभाजन तक।

SEMESTER-III

इलेक्टिव 2

304—स

भारत के संवैधानिक विकास का इतिहास—I

- इकाई 1 रेग्यूलेटिंग एक्ट 1773, पिट्स इण्डिया एक्ट 1784, चार्टर एक्ट 1793।
इकाई 2 चार्टर एक्ट 1813, चार्टर एक्ट 1833, चार्टर एक्ट 1853।
इकाई 3 भारत सरकार अधिनियम, 1858।
भारत सरकार अधिनियम, 1861।
इकाई 4 भारत परिषद अधिनियम, 1892।
भारत परिषद अधिनियम, 1909।

संदर्भ ग्रंथ

- बक्शी उपेन्द्र : संवैधानिक विकास।
पांडे जय नारायण : भारत का संवैधानिक विकास।
कश्यप सुभाष : भारत का संवैधानिक विकास।
गौतम पी.एल. : आधुनिक भारत (1757—1964)
सीकरी एस.एल. : भारतीय संविधान का इतिहास
अग्रवाल आर.सी. : राष्ट्रीय आन्दोलन एवं संवैधानिक विकास
बसु डी.डी. : भारतीय संविधान
कश्यप सुभाष : हमारी संसद
बी.एल. फड़िया : भारतीय शासन व राजनीति
Keith A B : Constitutional History of India London 1936
Coupland R : The Constitutional problem of India- Oxford University Press 1945
Sikri S.L. : The History of Constitution of India
Pylee M.V. : The Constitutional History of India
Keith A.B. : A Constitutional History of India
Punniah K.V. : The Constitutional History of India
Banerjee A.C. : Indian Constitutional Documents – I,II,III,IV Volume

SEMESTER-III

Elective- 2

304- C

History of Constitutional Development in India- I

- Unit 1 Regulating Act 1773, Pitts India Act, 1784
 Charter Act, 1793
- Unit 2 Charter Act, 1813
 Charter Act, 1833
 Charter Act, 1853
- Unit 3 The Govt. of India Act, 1858
 The Indian Council Act, 1861
- Unit 4 The Indian Council Act, 1892
 The Indian Council Act, 1909

Suggested Readings

- Keith A B : Constitutional History of India London 1936
- Coupland R : The Constitutional problem of India- Oxford University Press 1945
- Sikri S.L. : The History of Constitution of India
- Pylee M.V. : The Constitutional History of India
- Keith A.B. : A Constitutional History of India
- Punniah K.V. : The Constitutional History of India
- Banerjee A.C. : Indian Constitutional Documents – I,II,III,IV Volume
- बी.एल. फड़िया : भारतीय शासन व राजनीति
- बक्शी उपेन्द्र : संवैधानिक विकास ।
- पांडे जय नारायण : भारत का संवैधानिक विकास ।
- कश्यप सुभाष : भारत का संवैधानिक विकास ।
- गौतम पी.एल. : आधुनिक भारत (1757–1964)
- सीकरी एस.एल. : भारतीय संविधान का इतिहास
- अग्रवाल आर.सी. : राष्ट्रीय आन्दोलन एवं संवैधानिक विकास
- बसु डी.डी. : भारतीय संविधान
- कश्यप सुभाष : हमारी संसद

शोध पद्धति-I

- इकाई 1 : इतिहास : अर्थ एवं परिभाषा, इतिहास का क्षेत्र इतिहास की उपयोगिता, इतिहास कला या विज्ञान, इतिहास का अन्य विषयों के साथ संबंध।
- इकाई 2 : ऐतिहासिक पद्धति, वैज्ञानिक पद्धति, इतिहास लेखन में व्याख्या एवं स्पष्टीकरण।
- इकाई 3 शोध –विषय एवं समस्या का चयन, सामग्री का संग्रहण एवं व्यवस्थीकरण, प्रतिरूप (मॉडल) एवं अभिकल्प (डिजाइन) का निर्माण।
- इकाई 4 ऐतिहासिक स्रोत की प्रकृति : प्राथमिक – पुरालेखीय एवं अपुरालेखीय, पुरातात्विक, समसायिक अभिलेख, समाचार पत्र, गोपनीय प्रतिवेदन, सार्वजनिक प्रतिवेदन, सरकारी दस्तावेज, आत्मकथाएँ, शासकीय इतिहास।

संदर्भ ग्रंथ :

Kadhirval, S. : Historical Methods.

Hookett, Home C. : The Critical Methods in Historical Research and Writings.

Srivastava, S.S. : Survey of Research Techniques.

Nilakanta Shastri and Rammanna, A.S. : Historical Methods in Relation to Indian History.

Philips, C.H.(ed.) : Historians of India, Pakistan and Ceylon.

Ghoshal, U.N. : The Beginning of Indian Historiography and Other Essays.

Devahuti, D.(ed.) : Problems of Indian Historiography.

Warder, A.K. : An Introduction to Indian Historiography, 1972.

Gardner, Patrick(ed) : Theories of History, New York, 1959.

Carr, E.H. : What is History, Penguin, 1965.

Collingwood R.G. : The Idea of History, New York, 1957.

Sen, S.P. (ed.) : Historians and Historiography in Modern India.

Pathak, V.S. : Ancient Historians of India, 1966, Asia Publishing House.

Walsh : An Introduction to Philosophy of History, London, 1967.

Renier, G.I. : History, Its Purpose and Methods, Boston, 1950.

Gooch, G.P. : History and Historians in the Nineteenth Century, Longmans, Green & Co.

Shotwell, J.T. : History of History.

Thomson, J.W. : History of Historical Writing, 1954.

Hardy, Peter : Historians of Medieval India, London, 1960.

Hasan, Mohibul : Historians of Medieval India, Meerut, 1978.

पांडे, जी सी : इतिहास : स्वरूप एवं सिद्धान्त, ग्रंथ एकेडमी, जयपुर, 1973

चौबे, झारखण्ड : इतिहास दर्शन, वि० वि० प्रकाशन

बुद्ध प्रकाश : इतिहास दर्शन, 1968

SEMESTER-III

Elective-2

304 D

Research Methodology-1

- Unit 1 History : Meaning and Definition, Scope of History, Uses of History, History Arts or Science, Relation of History with other subject.
- Unit 2 Historical Method, Scientific Method, Interpretation and explanation in History Writing.
- Unit 3 Choosing of the research topic and the problem, collection and arrangement of material, preparation of Design and Model.
- Unit 4 Nature of Historical Sources : Primary Sources-Archival, Non-Archival, Contemporary Archeological records, newspapers, Confidential Reports, Public Reports, Government Documents, Autobiographies, Official History.

Suggested Readings :

- Kadhirval, S. : Historical Methods
Hookett, Home C. : The Critical Methods in Historical Research and Writigs
Srivastava, S.S. : Survey of Research Techniques
Nilakanta Shastri and
Rammanna, A.S. : Historical Methods in Relation to Indian History
Philips, C.H.(ed.) : Historians of India, Pakistan and Ceylon.
Goshal, U.N. : The Beginning of Indian Historiography and other Essays
Devahuti, D.(ed.) : Problems of Indian Historiography.
पांडे, जी सी : इतिहास : स्वरूप एवं सिद्धान्त , ग्रंथ एकेडमी , जयपुर, 1973
चौबे, झारखण्ड : इतिहास दर्शन, वि० वि० प्रकाशन
बुद्ध प्रकाश : इतिहास दर्शन, 1968

SKILL COURSE – 03

राजस्थान के इतिहास के स्रोत

- Unit I.** पुरातात्विक स्रोत : प्राचीन सभ्यताएं – कालीबंगा एवं आहड़, सिक्के – प्राचीन एवं मध्यकालीन सिक्के, अभिलेख– बैराठ एवं राज प्रशस्ति ।
- Unit II** साहित्यिक – समराईकच्छ, कान्हड़दे प्रबन्ध, फारसी स्रोत, चचनामा ।
- Unit III** राजपूताना की भिन्न–भिन्न चित्र शैलियां, राजस्थान राज्य अभिलेखागार बीकानेर में संरक्षित आधुनिक राजस्थान के रिकॉर्ड का सामान्य सर्वेक्षण ।
- Unit IV** बीसवीं सदी के समाचार–पत्र : सामाजिक एवं राजनीतिक इतिहास के स्रोत के रूप में, जेम्स टॉड का यात्रा वृतांत ।

सन्दर्भ ग्रंथः–

शर्मा, गोपीनाथ	:	राजस्थान के इतिहास के स्रोत, भाग–प्रथम ।
वशिष्ठ, निलिमा	:	राजस्थान की मूर्तिकला परम्परा ।
थपलियाल	:	पुरातत्व परिचय ।
मनोहर डॉ. राघवेन्द्र सिंह	:	राजस्थान के प्रमुख दुर्ग ।
मिश्र, रतनलाल	:	राजस्थान के दुर्ग ।
	:	राजस्थान के अभिलेख ।
जायसवाल, विदुला	:	पुरापाषाण काल ।
वर्मा, आर.के.	:	भारतीय प्रागैतिहास, भाग प्रथम–द्वितीय ।
श्रीमाली, गोवन्दि लाल	:	राजस्थान के अभिलेख ।
पुरोहित, एस. के.	:	राजस्थान के प्रमुख अभिलेख ।
मांगीलाल “मयंक”	:	राजस्थान के अभिलेख ।
व्यास, एस.पी.	:	राजस्थान के अभिलेखों का सांस्कृतिक अध्ययन (700–1200 ई.)

Skill Course - 03

Sources of History of Rajasthan

- Unit 1. Archaeological sources-Ancient Civilization-Kalibanga and Ahar. Coins - Coins of Ancient and Medieval periods. Incriptions-Bairath inscription, Rajprashasti inscription.**
- Unit 2 Literature – Samraichkachchha, Kanharde Prabandh, Persian Sources, Chachnama.**
- Unit 3 Different schools of Painting of Rajputana, General survey of records of Modern Rajasthan preserved in Rajasthan State Archives, Bikaner.**
- Unit 4 News paper of 20th century as a sources of Social and Political History. Travellers Account – James Tod.**

सन्दर्भ ग्रंथः—

शर्मा गोपीनाथ	:	राजस्थान के इतिहास के स्रोत, भाग—प्रथम।
वशिष्ठ निलिमा	:	राजस्थान की मूर्तिकला परम्परा।
थपलियाल	:	पुरातत्व परिचय।
मनोहर डॉ. राघवेन्द्र सिंह	:	राजस्थान के प्रमुख दुर्ग।
मिश्र रतनलाल	:	राजस्थान के दुर्ग।
	:	राजस्थान के अभिलेख।
जायसवाल विदुला	:	पुरापाषाण काल।
वर्मा आर.के.	:	भारतीय प्रागैतिहास, भाग प्रथम—द्वितीय।
श्रीमाली गोवन्दि लाल	:	राजस्थान के अभिलेख।
पुरोहित एस. के.	:	राजस्थान के प्रमुख अभिलेख।
मांगीलाल “मयंक”	:	राजस्थान के अभिलेख।
व्यास एस.पी.	:	राजस्थान के अभिलेखों का सांस्कृतिक अध्ययन (700—1200 ई.)



JAI NARAIN VYAS UNIVERSITY, JODHPUR (RAJASTHAN)

FACULTY OF ARTS, EDUCATION & SOCIAL SCIENCES

(DEPARTMENT OF HISTORY)

SYLLABI

FOR

M.A. HISTORY (SEMESTER SYSTEM I AND SEMESTER II EXAMINATION 2022-2023

M.A. HISTORY (SEMESTER SYSTEM III AND SEMESTER IV EXAMINATION 2022-2023

IMPORTANT

NOTIFICATION

In compliance of decision of the Hon'ble High Court all students are required to fulfill 75% attendance rule in each subject and there must be 75% attendance of the student before he/she could be permitted to appear in the examination.

REGISTRAR

(Academic)

FACULTY OF ARTS, EDUCATION & SOCIAL SCIENCES

MASTER OF ARTS

GENERAL INFORMATION FOR STUDENTS

The examination for the degree of Master of Arts, Education and Social Sciences shall consist of two parts with semester system : (i) The M.A. (Semester I and Semester II) , 2022-2023 and (ii) M.A. (Semester III and Semester IV), 2022-2023.

The examination will be through theory papers/practical/viva. Pass marks for the semester I, semester II, semester III and semester IV examination are 36% of the aggregate marks in all the theory papers and viva/practical's and not less than 25% marks in the individual theory paper/viva/practical. A candidate is required to pass in the written and the practical/viva examination separately.

Successful candidate will be placed in the following divisions on the basis of the total marks obtained in all four semesters of M.A. (Semester I and Semester II) and (ii) M.A (Semester III and Semester IV) examinations taken together.

First division 60%,second division 48% and third division 36% no students will be permitted to register himself simultaneously for more than one post-graduate course.

ATTENDANCE

1. For all regular candidates in the faculties of arts, education and social sciences, science, law, commerce and engineering, the minimum attendance requirement shall be that a candidate should have attended at least 75% of the lecturers delivered and tutorials held taken together as well as 75% of practical and sectionals from the date of his/her admission.
2. Condonation of shortage of attendance:
The shortage of attendance up to the limits specified below may be condoned on valid reason :
 - i) Up to 6% each subject plus 5 attendances in all the aggregate subject/papers may be condoned by the Vice-chancellor on the recommendation of the Dean/Director/Principal for undergraduate students and on the recommendation of the Head of the Department for the Post-graduate classes.
 - ii) The N.C.C./N.S.S cadets sent out to parades and camps and such students who are deputed by the University to take part in games, athletics or cultural activities may, for purpose of attendance, be treated, as present for the days of their absence in connection with the aforesaid activities and that period shall be added to their subject wise attendance.

Note :

The attendance requirement will apply to each semester.

Candidates will be required to pass separately in theory and practical examinations.

Candidate's choice among the optional papers and groups would be restricted only to those paper or groups for which regular teaching is provided in the department.

MEDIUM

Candidates are not allowed to use any medium except Hindi or English for answering question papers.

For answering papers in the Subjects of English/Hindi the medium will be corresponding language only.

ADMISSION

The details of the eligibility conditions and admission procedures are given in the admission forms and on university website. The admission would be done on the basis of merit as per University rules. Reservation for SC, ST and OBC would also be done as per J.N.V. University, Jodhpur rules. Candidates are required to attend minimum 75% of the classes.

FACULTY

Professor

Dr. Sushila Shaktawat

Assistant Professor

Dr.Rashmi Meena

Dr.Bhagwan Singh Shekhawat

Dr.Bhawani Singh Rajpurohit

Dr.Dinesh Rathi

Dr. Suresh Kumar Choudhary

Dr.Pratibha Sankhla

Dr.Mahendra Purohit

Dr.Bharat Deora

Dr.Lalit Kumar Panwar

GUIDELINES FOR CHOICE BASED CREDIT SYSTEM

Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete **four skill courses:** two within the Department and two from other Department within JNV University or the Universities approved by JNV University
3. **Course:** Usually referred to, as 'papers' is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period of teaching (lecture or tutorial) or two periods of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.
12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/ December and even semester from December/January to May.
Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May.
13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Arts, Education & Social Sciences resolves the following:

- a. All internal assessments shall on term test and seminar. Attendance shall carry the prescribed marks in all papers.
- b. In each semester two out of four theoretical components of the University examinations shall be undertaken by external examiners from outside JNV University, who may be appointed by the competent authorities.

Grievances and Redressal Mechanism

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head of the Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.
- b) The appeal will be assessed by the Chairman and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Dean, Faculty of Arts, Education & Social Sciences comprising of the

HOD of the concerned Department and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.

- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	'O'	Outstanding	10
2	'A+'	Excellent	9
3	'A'	Very Good	8
4	'B+'	Good	7
5	'B'	Above Average	6
6	'C'	Average	5
7	'P'	Pass	4
8	'F'	Fail	0
9	'Ab'	Absent	0

- i. A student obtaining Grade F in a paper shall be considered failed and will be required to reappear in the University End Semester examination.
- ii. For noncredit courses (Skill Courses) 'Satisfactory' or "Unsatisfactory' shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

- = and > 95 % marks Grade Point 10.0
- 90 to less than 95 % marks Grade Point 9.5
- 85 to less than 90 % marks Grade Point 9.0
- 80 to less than 85 % marks Grade Point 8.5
- 75 to less than 80 % marks Grade Point 8.0
- 70 to less than 75 % marks Grade Point 7.5
- 65 to less than 70 % marks Grade Point 7.0
- 60 to less than 65 % marks Grade Point 6.5
- 55 to less than 60 % marks Grade Point 6.0
- 50 to less than 55 % marks Grade Point 5.5
- 45 to less than 50 % marks Grade Point 5.0
- 40 to less than 45 % marks Grade Point 4.5
- 35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,

i.e.

$$SGPA (S_i) = \frac{\sum (C_i \times G_i)}{\sum C_i}$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,

i.e.

$$CGPA = \frac{\sum (C_i \times S_i)}{\sum C_i}$$

where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.

- iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	6	B	6	6 x 6 =36
2	Course 2	6	B+	7	6 X 7 =42
3	Course 3	6	B	6	6X 6 = 36
4	Course 4	6	O	10	6 X 10 =60
	Total	24			36+42+36+60=174

Thus, SGPA = 174/24 = 7.25

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	7.25	7.25	7	6.25

CGPA = (24X 7.25 + 24X7.25 + 24 X 7+ 24 X 6.25)/ 96

666/96 = 6.94

Semester-wise Theory Papers/Practical / Skill component

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
SEMESTER IV							
Core course 11	Hist. 401	Political History of India - II	6-0-0	6	30	70	100
Core course 12	Hist. 402	Political History of Rajasthan - II	6-0-0	6	30	70	100
Discipline Specific Elective/s 3	Elective paper Hist. 403		6-0-0	6-0-0	6	70	100
	403 A	Social and Cultural History of Modern India II					
	403 B	Introduction of India Archeology, Epigraphy and Numismatic - II					
	403 C	Social and Cultural History of Medieval India - II					
	403 D	Social and Cultural History of Medieval Rajasthan - II					
Discipline Specific Elective/s 4	Elective paper 404		6-0-0	6-0-0	6	70	100
	404 A	Social and Cultural History of Modern India-II					
	404 B	History of National Movement of India-II					
	404 C	History of Constitutional Development in					

		India - II					
	404 D	Research Methodology - II					
*Skill course IV	National Movement of India		2-0-0				
Total				24	120	280	400

***The Department of History shall offer one skill course per semester from the list of skill courses approved for the Department .**

In view of the course content, the Department of History distributed the Periods between Theory/Tutorial/~~Practical~~ as under per paper

- 6: 0 : 0 (six lectures only (no tutorial and no practical) per week) – For Theory
- 2+0+0 (two lectures) - For Skill course

The Duration of the Period shall be forty five minutes. In each of these combinations, the first value stands for the same number of lecture instructions per week.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective) involve an evaluation system of students that has the following two components:-

- (i) **Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
 - (ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.
- (i) **Continuous Comprehensive Assessment (CCA):** This would have the following components:
 - a. **Term Test:** One term test shall be arranged for each paper prior to End-Semester Examination; examination duration shall be of three hours; maximum marks shall be 60 (reduced to 15).
 - b. **Seminar:** Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 40 (reduced to 10). The seminar shall be completed prior to term test for all the papers.
 - c. **Classroom Attendance** – Each student will have to attend a minimum of 75% Lectures / Tutorials / Practicals. A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE). Attendance marks will be awarded by following the system proposed below:

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

75% to 80%	=	1 mark
81% to 85%	=	2 marks
86 to 90%	=	3 marks
91% to 95%	=	4 marks
96% and above	=	5 marks
- Note : Compensation in classroom attendance of a student will be as per prevalent University rules.**
- Each student’s cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Arts, Education & Social Sciences.**
- d. CCA is based on open evaluation system without any bias to any student.
 - e. Any grievance received in the Department from student shall be placed before the **Grievance Redressal Committee** with adjudicated comments

Each component marks will be added making it rounding as per norms.

Marking Scheme of Continuous Comprehensive Assessment (CCA)

Components	Maximum Marks	Reduced and Original Marks
------------	---------------	----------------------------

Term Test	60	(reduced to 15)
Seminar	40	(reduced to 10)
Classroom Attendance	05	05
Total Marks of CCA	100	30

Note : Classroom Attendance marks will be as follows :-

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

Percentage	Marks
75% to 80%	1 mark
81% to 85%	2 marks
86 to 90%	3 marks
91% to 95%	4 marks
96% and above	5 marks

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective Department shall declare the result as “Satisfactory” or “Non-Satisfactory”; each student need to get a minimum of three “Satisfactory” declaration for the course completion

For the Term test and ESE:

Part A

Ten questions (Definitions, illustrations, functions, short explanations, etc; 25-50 words) for one mark each. $10 \times 1 = 10$ marks; comprising questions from each Unit; no choice in this part

Part B

Four questions of long/explanatory answer (500 words) type, one drawn from each Unit; with internal choices : $4 \times 15 = 60$ marks.

10+60 = 70 marks

Qualifying for Next semester

- 1. A student acquiring minimum of 40% in total of the CCA is eligible to join next semester.**
- A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as ‘Fail’), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.
- A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time, i.e. three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted, for additional chances examination fee shall be on additive basis.

Improvement Option:

Every student shall have the opportunity to improve Credit through University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final.

Result Declaration:

The ESE (End Semester Examination/University Examination) results shall be declared within twenty days of the last examination. The Theory Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation.

POST -GRADUTE COURSE: A DESCRIPTION

The full course is of FOUR SEMESTERS spread for TWO YEARS duration. A semester-wise list of courses to be

offered is given below. In each paper there will be four unit.

SEMESTER I

SEMESTER II

SEMESTER III

SEMESTER IV

Elective paper group – First – Semester III

Elective paper group – Second – Semester III

Elective paper group – First – Semester IV

Elective paper group – Second – Semester IV

Skill Courses in the respective subject

Electives would be discipline centric and only students from concerned departments can register.

ADMISSION

The minimum qualification for admission to M.A. Course is Graduate Degree. The details of eligibility conditions and admission procedure will be as per University rules. The candidates are required to attend minimum of a 75% of classes.

TEACHING AND EXAMINATION SCHEME

Per Semester

Course	Periods/Week	Examination hours	CCA	ESE	Total
Theory Papers					
Course I	6	3	30	70	100
Course II	6	3	30	70	100
Course III	6	3	30	70	100
Course IV	6	3	30	70	100

UNIVERSITY EXAMINATION

Each course paper shall be of three hours duration.

Note: The number of elective to be taught from each group in a particular year shall be decided by the Department. Electives offered will be announced at the beginning of the academic session. Each student shall be assigned one Elective Paper from Group ONE and the second from Group TWO. Elective papers will be allotted on merit-cum-choice basis as far as possible. In the odd semester two skill courses will be those offered by the respective departments in the even semester skill courses will be from other departments.

DEPARTMENT OF HISTORY

SCHEME OF EXAMINATION FOR M.A. HISTORY (SEMESTER SYSTEM) FOR THE EXAMINATION

INSTRUCTIONS FOR THE PAPER SETTERS AND THE STUDENTS

Duration – 3 hours

Note :

- (i) There shall be 9 questions in all. Five questions have to be attempted.
- (ii) The first question shall be short answer type containing 10 short questions spread over the whole syllabus to be answered in about 30 words each. It shall carry 10 marks and shall be a compulsory question.
- (iii) Rest of the paper shall contain 8 questions with internal choice. The entire syllabus has been divided into four units. Each unit shall have two questions and the candidates shall be given internal choice i.e. the candidate shall attempt one question from each unit.

SEMESTER IV

1.	THEORY PAPERS (Core/Elective Papers)	ESE	CCA	Total	Lecture- Tutorial- Practical/ Week	Credits
	Paper XIII :	70	30	100	6-0-0	6
	Paper XIV :	70	30	100	6-0-0	6
	Paper XV : Any one of the following a) b) c)	70	30	100	6-0-0	6
	Paper XVI : Any one of the following a) b) c)	70	30	100	6-0-0	6
Grand Total				400 marks		24 credits

Total Marks of M.A. (Semester I, II, III & IV) 1600 marks and credit 96

भारत का राजनीतिक इतिहास 1950 तक - II

- इकाई 1 : मध्यकालीन भारतीय इतिहास के स्रोत, कुतुबुद्दीन ऐबक, इल्तुतमिश, बलबन, अलाउद्दीन खलजी, मुहम्मद बिन तुगलक, फिरोज तुगलक, तैमूर का आक्रमण।
- इकाई 2 : बाबर, हुमायूं, शेरशाह, अकबर, जहांगीर, शाहजहां, औरंगजेब।
- इकाई 3 : आधुनिक भारतीय इतिहास के स्रोत, अंग्रेजों के आगमन के समय भारत की राजनीतिक स्थिति, बंगाल में ब्रिटिश सत्ता का प्रसार, प्रथम आंग्ल-मराठा युद्ध, ब्रिटिश साम्राज्य का विस्तार, 1857 का विप्लव, राजनीतिक जागृति का विकास, उदारवादी, उग्रवादी तथा क्रांतिकारी।
- इकाई 4 : राष्ट्रीय आंदोलन में गांधी की भूमिका, 1909, 1919 और 1935 के अधिनियम, साम्प्रदायिक राजनीति तथा विभाजन, सुभाषचन्द्र बोस तथा आजाद हिन्द फौज, भारतीय संघ में देशी राज्यों का विलय एवं काश्मीर, जूनागढ़ तथा हैदराबाद की समस्या।

सन्दर्भ ग्रंथ:-

- Habib, A. M. : The Foundation of Muslim Rule in India.
Srivastava, A. L. : The Delhi Sultanate.
Lal, K. S. : History of the Khaljis.
—, Studies in Medieval Indian History.
Srivastava, A. L. : The Mughal Empire.
Mukhia, Harbans : Historians and Historiography during the Reign of Akbar.
Habib, Irfan : Akbar.
Sen, S. N. : Eighteen Fifty Seven.
Chandra, Bipan : Modern Indian History.
Tara Chand : History of Freedom Movement.
Majumdar, R. C. : Maratha Supremacy.
—, British Paramountcy and Renaissance, Vol. IX.
Dutta and Sarkar : A Text Book of Modern Indian History.
Robert, P.E. : History of British India.
Majumdar, R.C., Dutta, K. K. and Raychaudhuri, H.C. : An Advanced History of India.
सतीश चन्द्र, : मुगलकालीन भारत
—, उत्तर मुगलकालीन भारत।
श्रीवास्तव, ए.एल. : दिल्ली सल्तनत।
शर्मा, एल.पी. : मध्यकालीन भारत का इतिहास।
वर्मा, एच.सी. : मध्यकालीन भारत, भाग-1 व 2।
रॉबर्ट्स, पी.ई. : ब्रिटिशकालीन भारत का इतिहास।
जैन, एम.एस. : आधुनिक भारत का इतिहास।
चंद्र, विपीन : भारत का स्वतंत्रता संग्राम।
चतुर्वेदी, एन. के. : आधुनिक भारत का इतिहास।
शुक्ल, राम लखन : आधुनिक भारत का इतिहास।
मिश्र, जगनाथ प्रसाद : आधुनिक भारत का इतिहास।
गौतम, पी.एल. : आधुनिक भारत।

Political History of India up to 1950 - II

- Unit I** Sources of Medieval Indian history, Qutub-din-Aibak, Illtutmish, Balban, Alauddin Khalji, Muhammad Bin Tughluq, Firoz Tughlaq, Invasion of Timur.
- Unit II** Babar, Humayun, Shershah, Akbar, Jahangir, Shahjahan, Aurangzeb.
- Unit III** Sources of Modern Indian History, Political Condition of India at the advent of the Britishers, British expansion in Bengal, First Anglo-Maratha war, expansion of British empire, Revolt of 1857, Growth of Political awareness, the Moderates, Extremists and Revolutionaries.
- Unit IV** The role of Gandhi in national movement, Acts of 1909, 1919 and 1935, Communal Politics and Partition, Subhash Chandra Bose and I.N.A., Integration of the Indian States and the Problem of Kashmir, Junagarh and Hyderabad.

Suggested Readings :

- Habib, A. M. : The Foundation of Muslim Rule in India.
Srivastava, A. L. : The Delhi Sultanate.
Lal, K. S. : History of the Khaljis.
Studies in Medieval Indian History.
Srivastava, A. L. : The Mughal Empire.
Mukhia, Harbans : Historians and Historiography during the Reign of Akbar.
Habib, Irfan : Akbar.
Sen, S. N. : Eighteen Fifty Seven.
Chandra, Bipan : Modern Indian History.
Tara Chand : History of Freedom Movement.
Majumdar, R. C. : Maratha Supremacy.
British Paramountcy and Renaissance, Vol. IX.
Dutta and Sarkar : A Text Book of Modern Indian History.
Robert, P.E. : History of British India.
Majumdar, R.C., Dutta, K. K. and Raychaudhuri, H.C. : An Advanced History of India.
सतीश चन्द्र, : मुगलकालीन भारत
—, उत्तर मुगलकालीन भारत।
श्रीवास्तव, ए.एल. : दिल्ली सल्तनत।
शर्मा, एल.पी. : मध्यकालीन भारत का इतिहास।
वर्मा, एच.सी. : मध्यकालीन भारत, भाग-1 व 2।
रॉबर्ट्स, पी.ई. : ब्रिटिशकालीन भारत का इतिहास।
जैन, एम.एस. : आधुनिक भारत का इतिहास।
चंद्र, विपीन : भारत का स्वतंत्रता संग्राम।
चतुर्वेदी, एन. के. : आधुनिक भारत का इतिहास।
शुक्ल, राम लखन : आधुनिक भारत का इतिहास।
मिश्र, जगन्नाथ प्रसाद : आधुनिक भारत का इतिहास।
गौतम, पी.एल. : आधुनिक भारत।

राजस्थान का राजनीतिक इतिहास-

- इकाई-I** : राजस्थान में मराठा आक्रमण : कारण व प्रभाव ईस्ट इण्डिया कम्पनी के साथ राजपूताना के राज्यों से सन्धियों के लिए उत्तरदायी परिस्थितियाँ व उसका प्रभाव, नमक व अफीम के व्यापार पर एकाधिकार ।
- इकाई-II** : राजस्थान में 1857 का विप्लव : कारण व प्रभाव, राजपूताना में राजनीतिक जागरण, जनजाति आन्दोलन-भील व मीणा ।
- इकाई-III** : कृषक आन्दोलन : बिजौलिया, बेंगू, नीमूचाणा व शेखावाटी, राजस्थान में क्रान्तिकारी गतिविधियाँ, राजस्थान की प्रमुख रियासतों में प्रारम्भिक राजनीतिक गतिविधियाँ ।
- इकाई-IV** : भारतीय संघ व स्वतन्त्रता संग्राम के प्रति राजपूत रियासतों की नीति, जोधपुर, बीकानेर, मेवाड़ व जयपुर के सन्दर्भ में प्रजा मण्डल आन्दोलन, राजस्थान का निर्माण ।

संदर्भ ग्रंथ:-

- B.L. Bhadani : Peasants, Artisans and entrepreneurs-
Economy of Marwar in the
Seventeenth Century.
- Dasaratha Sharma : Lectures in Rajput History.
: Rajasthan through the Ages, Vol. I.
- Dilbagh Singh : State, Landlords and Peasants.
- G.D. Sharma : Rajput Polity.
- G.H. Ojha : Rajputana Ka Itihas (relevant volumes)
- G.N. Sharma : Merwar and the Mughal Emperors.
: Social Life in Medieval Rajasthan.
- James Tod : Annals and Antiquities of Rajasthan
- S.P. Gupta : Agrarian System of Eastern Rajasthan
(1650-1750).
- V.S. Bhatnagar : Life and times of Sawai Jai Singh.
- Shyamal Das : Vir Vinod.
- A.C. Banerjee : Rajput Studies.
- K.S. Gupta : Mewar and Marathas
- G.C. Tikkiwal : Jaipur and the later Mughals.
- Khadgawat, N.R. : Rajasthan's Role in Struggle of 1857.
- Rathore, L.S. : Political Movements and Constitutional

Development in Princely States of Rajasthan

- Pema Ram : Agrarain Movements in Rajasthan.
Darda, R.S. : From Feudalism to Democracy.
Mathur, V.D : States People`s Conference
गोपीनाथ शर्मा : राजस्थान का स्वतंत्रता संग्राम ।
राजस्थान का इतिहास ।
वी.एन. रेऊ : मारवाड़ का इतिहास भाग 1-2 ।
व्यास, आर.पी. : राजस्थान का बृहत इतिहास, भाग 1-2 ।
व्यास, प्रकाश : राजस्थान में स्वाधीनता संग्राम ।
शर्मा, पद्मजा : बिजौलिया आन्दोलन ।

POLITICAL HISTORY OF RAJASTHAN -II

- UNIT-I** : Maratha Incursions : Causes and Impact, circumstances leading to the treaties with east India company by states of Rajputana and their impact, Monopoly over salt and opium.
- UNIT-II** : Uprising of 1857 : causes and Impact, Political Awakening in Rajputana, Tribal movement – Bheel and Meena
- UNIT-III** : Peasant movement : Bijolia, Begu, Nimuchana and Shekhawati, Revolutionary activities in Rajasthan, Early political activities in major states of Rajasthan.
- UNIT-IV** : Policy of Rajput states towards Indian Federation and Freedom struggle; Prajamandal movement with reference to Jodhpur, Bikaner, Mewar and Jaipur, formation of Rajasthan.

Suggested Readings :

- B.L. Bhadani : Peasants, Artisans and entrepreneurs- Economy of Marwar in the Seventeenth Century.
- Dasaratha Sharma : Lectures in Rajput History.
: Rajasthan through the Ages, Vol. I.
- Dilbagh Singh : State, Landlords and Peasants.
- G.D. Sharma : Rajput Polity.
- G.H. Ojha : Rajputana Ka Itihas (relevant volumes)
- G.N. Sharma : Merwar and the Mughal Emperors.
: Social Life in Medieval Rajasthan.
- James Tod : Annals and Antiquities of Rajasthan
- S.P. Gupta : Agrarian System of Eastern Rajasthan (1650-1750).
- V.S. Bhatnagar : Life and times of Sawai Jai Singh.
- Shyamal Das : Vir Vinod.
- A.C. Banerjee : Rajput Studies.
- K.S. Gupta : Mewar and Marathas
- G.C. Tikkiwal : Jaipur and the later Mughals.
- Khadgawat, N.R. : Rajasthan's Role in Struggle of 1857.
- Rathore, L.S. : Political Movements and Constitutional Development in Princely States of Rajasthan
- Pema Ram : Agrarain Movements in Rajasthan.

Darda, R.S.
गोपीनाथ शर्मा
वी.एन. रेऊ
व्यास, आर.पी.
व्यास, प्रकाश
शर्मा, पद्मजा

: From Feudalism to Democracy.
: राजस्थान के इतिहास के स्रोत ।
: मारवाड़ का इतिहास भाग 1-2 ।
: राजस्थान का बृहत इतिहास, भाग 1-2 ।
: राजस्थान में स्वाधीनता संग्राम ।
बिजौलिया आन्दोलन ।

प्राचीन भारत का सामाजिक एवं सांस्कृतिक इतिहास –I

- इकाई 1 मौर्ययुगीन भारतीय समाज एवं संस्कृति। संगम युगीन समाज एवं संस्कृति। शक, कुषाण एवं सातवाहन युगीन भारतीय समाज एवं संस्कृति। हीनयान एवं महायान ।
- इकाई 2 गुप्तकालीन भारतीय समाज, धार्मिक जीवन, विज्ञान एवं साहित्य का विकास । चोल कालीन समाज एवं संस्कृति। भारतीय समाज में सामंतवाद का उत्थान एवं विकास।
- इकाई 3 हर्ष युगीन सामाजिक, धार्मिक एवं सांस्कृतिक जीवन। पूर्व मध्यकालीन भारतीय समाज, धर्म एवं साहित्य । शंकराचार्य एवं उनका दर्शन । विदेशों में भारतीय संस्कृति का प्रसार।
- इकाई 4 गुप्तकालीन स्थापत्य एवं मूर्तिकला । अजन्ता चित्रकला । खजुराहों की स्थापत्य एवं मूर्तिकला। दक्षिण भारत में मंदिर स्थापत्य कला । नागर, द्रविड एवं वेसर शैलियों।

सन्दर्भ ग्रंथ :-

मिश्र, जयशंकर : प्राचीन भारत का सामाजिक इतिहास

शर्मा, व्यास : भारतीय संस्कृति के मूल आधार

गुप्त, शिवकुमार : भारतीय संस्कृति के मूल आधार

पाण्डे, विमलचन्द्र : भारत का सामाजिक इतिहास

शर्मा, रामशरण : पूर्वमध्यकालीन भारत में सामाजिक परिवर्तन

उपाध्याय, वासुदेव : प्राचीन भारतीय स्तूप, गुफा एवं मंदिर

जोशी महेशचन्द्र : युगयुगीन भारतीय कला

Shastri, A. Neelkanth	:	A History of South India;
Altekar, A.S.	:	The Position of Women in Hindu Civilization, Education in Ancient India;
Kapadia, K.M.	:	Marriage and Family in India;
Basham, A.L.	:	Wonder That Was India;
Kosambi, D.D.	:	The Culture and Civilization of Ancient India in Historical Outline
Sharma, Ramsharan	:	Indian Feudalism;
Sharma, B.N.	:	Social and Cultural History of Northern Indian

Social and Cultural History of Ancient India- II

Unit I Social and Cultural Life of Mauryan Era; Society and Culture of Sangam Era; Indian Society and Culture in Saka, Kushana and Satvahana Era; Hinayan and Mahayan.

Unit II Social and Religious Life and Development of Science and Literature in Gupta Era; Society and Culture during Chola Era; Feudalism in Indian Society : Emergence and Development.

Unit III Social, Religious and Cultural life in Harsha's Era; Society, Religion and Literature in Pre-Medieval India; Shankaracharya and his Philosophy; Spread of Indian Culture in Abroad.

Unit IV Architecture and Sculpture Art in Gupta Era; Ajanta Paintings; Architecture and Sculpture Art in Khajuraho; Temple Architecture in South India; Nagar, Vessar and Dravid Styles.

Suggested Readings:

1. मिश्र, जयशंकर : प्राचीन भारत का सामाजिक इतिहास
2. शर्मा, व्यास : भारतीय संस्कृति के मूल आधार
3. गुप्त, शिवकुमार : भारतीय संस्कृति के मूल आधार
4. पाण्डे, विमलचन्द्र : भारत का सामाजिक इतिहास
5. शर्मा, रामशरण : पूर्वमध्यकालीन भारत में सामाजिक परिवर्तन
6. उपाध्याय, वासुदेव : प्राचीन भारतीय स्तूप, गुफा एवं मंदिर
7. जोशी महेशचन्द्र : युगयुगीन भारतीय कला
8. Shastri, A. Neelkanth : A History of South India;
9. Altekar, A.S. : The Position of Women in Hindu Civilization, Education in Ancient India;
10. Kapadia, K.M. : Marriage and Family in India;
11. Basham, A.L. : Wonder That Was India;
12. Kosambi, D.D. : The Culture and Civilization of Ancient India in Historical Outline
13. Sharma, Ramsharan : Indian Feudalism;
14. Sharma, B.N. : Social and Cultural History of Northern Indian

भारतीय पुरातत्व, अभिलेख शास्त्र एवं मुद्रा शास्त्र का परिचय-II

- इकाई I : अशोक के अभिलेखों का महत्व, निम्नलिखित अभिलेखों का ऐतिहासिक तथा सांस्कृतिक अध्ययन : अशोक का बैराट अभिलेख, अशोक का रुम्मिनदेई स्तम्भ -लेख, खारवेल का हाथीगुम्फा-अभिलेख, रुद्रदामा का गिरनार -शिलालेख, गौतमी बलश्री का नासिक - गुहालेख।
- इकाई II : निम्नलिखित अभिलेखों का ऐतिहासिक तथा सांस्कृतिक अध्ययन : समुद्रगुप्त की प्रयाग -प्रशस्ति, चन्द्र का मेहरौली-अभिलेख, स्कन्दगुप्त का भितरी-जूनागढ़ अभिलेख, पुलकेशिन द्वितीय की ऐहोल-प्रशस्ति, हर्ष का कुरुक्षेत्र-वाराणसी अभिलेख, मण्डोर का बाउक-अभिलेख, मिहिरभोज का ग्वालियर-अभिलेख।
- इकाई III : प्राचीन इतिहास के अध्ययन के लिये मुद्राशास्त्र का महत्व, प्राचीन भारतीय इतिहास के स्रोत तथा इतिहास-लेखन, प्राचीन भारतीय मुद्राशास्त्र की सामान्य विशेषताएँ, भारतीय मुद्राशास्त्र का उद्भव तथा प्राचीनता, पंच-मार्क सिक्के, स्थानीय (जनजातीय तथा नैगम सहित) सिक्के।
- इकाई IV : भारतीय-यवन मुद्राएँ, शक, पहलव तथा पश्चिमी क्षेत्रों की मुद्राएँ, कुषाण नरेशों की मुद्राएँ, सातवाहनों की मुद्राएँ, साम्राज्यिक गुप्तों की मुद्राएँ, वाकाटक मुद्राओं की कपोल - कल्पना।

Suggested Readings :

- Pandey, R.B. : Ancient Indian Historical and Literary Inscriptions.
Sircar, D.C. : Select Inscriptions, Vols, I and II
Fleet, J.F. : Corpus Indcription Indicarum, Vols, I,II and III
Hultzeh : Incriptions of Asoka.
Ramesh. K.V. : Indian Epigraphy.
Gupta. P.L. : Coins
पाण्डेय, आर.बी. : अशोक के अभिलेख।
गुप्त, परमेश्वरीलाल: प्राचीन भारतीय अभिलेख, भाग 1 और 2।
उपाध्याय, वासुदेव : गुप्त अभिलेख।
राजवन्त राव : प्राचीन भारतीय मुद्राएँ।
परमेश्वरीलाल गुप्त : मुद्राएँ।

Introduction to Indian Archaeology, Epigraphy and Numismatics (II)

- Unit 1 Importance of Ashok Inscriptions, Historical and Cultural study of the following Inscriptions : Bairat edict of Ashok, Rummindei pillar Inscription of Ashok. Hathigumpha Inscription of Kharavela, Girnar rock Inscription of Rudradaman, Nasik cave Inscription of Gautami Balasri.
- Unit 2 Historical and Cultural Study of the following Inscriptions : Allahabad pillar Inscription of Samudragupta, Meharauli pillar Inscription of Chandra, Junagarh/ Bhitari Inscription of Skandagupta. Aihole Inscription of Pulakesin II, Kurukshetra-Varanasi Inscription of Harsha, Bauk Inscription of Mandore, Gwalior Inscription of Mihirbhoja.
- Unit 3 Importance of Numismatics for the study of Ancient History, Sources and Historiography of Ancient Indian Numismatics, general features of Ancient Indian coinage, origin and antiquity of Indian coinage, punch-marked coins, local (including tribal and naigama) coins.
- Unit 4 The Indo-Greek coinage, Coinage of the Sakas, Pallavas and Western Kshatrapas, Coinage of the Kushana Kings, Coinage of the Satavahanas, Coinage of the Imperial Guptas, the myth of the Vakataka coins.

Suggested Readings :

- Pandey, R.B. : Ancient Indian Historical and Literary Inscriptions.
Sircar, D.C. : Select Inscriptions, Vols, I and II
Fleet, J.F. : Corpus Indcription Indicarum, Vols, I,II and III
Hultzeh : Incriptions of Ashok.
Ramesh. K.V. : Indian Epigraphy.
Gupta. P.L. : Coins
पाण्डेय, आर.बी. : अशोक के अभिलेख ।
गुप्त, परमेश्वरीलाल : प्राचीन भारतीय अभिलेख, भाग 1 और 2 ।
उपाध्याय, वासुदेव : गुप्त अभिलेख ।
राजवन्त राव : प्राचीन भारतीय मुद्राएं ।
परमेश्वरीलाल गुप्त : मुद्राएं ।

मध्यकालीनभारत का सामाजिक एवं सांस्कृतिक इतिहास (1200-1750 ई.)II

- इकाई -I क्षेत्रीय समप्रत का निर्माण : जगन्नाथ सम्प्रदाय, वैष्णव आन्दोलन, सिख धर्म, मिश्रित संस्कृति का क्रमिक विकास।
- इकाई -II स्थापत्य कला : दिल्ली सल्तनत काल की स्थापत्य कला, मुगल स्थापत्य कला, हिन्दू स्थापत्य कला पर मुस्लिम स्थापत्य कला का प्रभाव।
- इकाई-III मुगल चित्रकला। राजपूत चित्रकला। प्रादेशिक चित्रकला।
- ईकाई-IV मध्यकालीन भारत में दुर्ग स्थापत्य कला। मध्यकालीन भारत में मंदिर स्थापत्य कला।

Suggested Readings :

- B.L. Bhadani : Peasants, Artisans and entrepreneurs- Economy of Marwar in the Seventeenth Century.
- Dasaratha Sharma : Lectures in Rajput History.
: Rajasthan through the Ages, Vol. I.
- Dilbagh Singh : State, Landlords and Peasants.
- G.D. Sharma : Rajput Polity.
- G.H. Ojha : Rajputana Ka Itihas (relevant volumes)
- G.N. Sharma : Merwar and the Mughal Emperors.
: Social Life in Medieval Rajasthan.
- James Tod : Annals and Antiquities of Rajasthan
- S.P. Gupta : Agrarian System of Eastern Rajasthan (1650-1750).
- V.S. Bhatnagar : Life and times of Sawai Jai Singh.
- Shyamal Das : Vir Vinod.
- A.C. Banerjee : Rajput Studies.
- K.S. Gupta : Mewar and Marathas
- G.C. Tikkiwal : Jaipur and the later Mughals.
- Khadgawat, N.R. : Rajasthan's Role in Struggle of 1857.
- Rathore, L.S. : Political Movements and Constitutional Development in Princely States of

Pema Ram	: Agrarain Movements in Rajasthan.
Darda, R.S.	: From Feudalism to Democracy.
गोपीनाथ शर्मा	: राजस्थान के इतिहास के स्रोत ।
वी.एन. रेऊ	: मारवाड़ का इतिहास भाग 1-2 ।
व्यास, आर.पी.	: राजस्थान का बृहत इतिहास, भाग 1-2 ।
व्यास, प्रकाश	: राजस्थान में स्वाधीनता संग्राम ।
शर्मा, पद्मजा	: बिजोलिया आन्दोलन ।

Semester IV

ELECTIVE-3

403 C

SOCIAL AND CULTURAL HISTORY OF MEDIEVAL INDIA (1200-1750) -

II

- Unit -I Formation of Regional Identities. Jagannath cult, Vaishnav Movement, Sikhism ; Development of Composite Culture.
- Unit-II Architecture : Architecture of the Delhi sultanate, Mughal Architecture, Impact of Muslim architecture on Hindu architecture.
- Unit-III Mughal Painting. Rajput Painting. Provincial Painting.
- Unit-IV Fort Architecture of Medieval India. Temple Architecture of Medieval India.

Suggested Readings :

- Rizvi Syed Athar Abbas : History of Sufism. Vol. I.
Yousuf Hussain : Glimpses of Medieval Indian Culture.
Mohd. Yasin : Social History of Islamic India.
Madhukar Sripat Mate : Early Historic fortification in the Ganga Valley, Puratatva, Pt. III, 1969-70.
- Percy Brown : Indian Architecture, Vol. I and II.
: Indian Painting.
- Rowland, B. : Indian Art.
Coomaraswamy, AK : History of Indian and Indonesian Art.
Majumadar, R.C. and Pusalkar : The History and Culture of Indian
A.D. : People, Vol. I, II, IV & IV (Chapters on Art).
- राधेशरण : मध्यकालीन भारत की सांस्कृतिक संरचना।
घनश्यामदत्त शर्मा : मध्यकालीन भारतीय सामाजिक, आर्थिक एवं सामाजिक संस्थाएं।
- श्रीराम शर्मा : मुगल शासकों की धार्मिक नीति।
के.एम.अशरफ : हिन्दुस्तान के लोगों का जीवन व परिस्थितियाँ।
- सतीश चन्द्र : उत्तर मुगल कालीन भारत
दीनानाथ दुबे : भारत के दुर्ग।
रतन लाल मिश्र : राजस्थान के दुर्ग।
गोपीनाथ शर्मा : राजस्थान का इतिहास।
हंस नोटियाल : देहली का किला।

राजस्थान का सामाजिक एवं सांस्कृतिक इतिहास-II

- इकाई 1 राजस्थानी संस्कृति पर भौगोलिक प्रभाव, लोक कलाएं, लोक गीत, लोक वाद्य, लोक नृत्य एवं नाट्य।
- इकाई 2 राजस्थान के प्रमुख रीति रिवाज, वेशभूषा एवं आभूषण, मेले एवं त्यौहार, राजस्थान में खान-पान।
- इकाई 3 राजस्थान में दुर्ग स्थापत्य : मेहरानगढ़, चित्तौड़, रणथम्भौर, मंदिर स्थापत्य – देलवाड़ा और रणकपुर, राजस्थानी भाषा एवं साहित्य, लोक साहित्य।
- इकाई 4 राजस्थानी चित्रकला, विभिन्न धार्मिक सम्प्रदाय, लोक देवता एवं देवियाँ, पाश्चात्य संस्कृति का राजस्थान के समाज पर प्रभाव।

संदर्भ ग्रंथ :-

Sharma, Dashrath :	Rajasthan through the Ages -III Rajasthan State Archives, Bikaner
व्यास, आर पी. नीरज, जयशंकर एवं शर्मा, भगवती लाल शर्मा, गोपीनाथ शर्मा, कालूराम गोस्वामी , प्रेमचन्द जैन, हुकमचन्द, माली नारायण लाल (सम्पादित) मनोहर, राघवेन्द्र सिंह	राजस्थान का वृहत इतिहास , भाग -I एवं II राजस्थान की सांस्कृतिक परम्परा, राजस्थान का सांस्कृतिक इतिहास उन्नीसवी सदी में राजस्थान का सामाजिक तथा आर्थिक जीवन राजस्थान संस्कृति, कला एवं साहित्य राजस्थान का इतिहास ,कला, संस्कृति परम्परा एवं विरासत राजस्थान के प्रमुख दुर्ग,

Semester IV

Elective-3

403-D

SOCIAL AND CULTURAL HISTORY OF RAJASTHAN-II

- Unit-1 Impact of Geography on Rajasthan Culture, Folk Art, Folk Songs, Folk Instruments, Folk Dances & Theatre.
- Unit-2 Major Customs, Costumes and Ornaments of Rajasthan, Fairs and Festivals, Food and Drinks of Rajasthan.
- Unit-3 Fort Architecture of Rajasthan-Mehrangarh, Chittor and Ranthambhore; Temple Architecture-Delwara and Ranakpur, Rajasthani Language & Literature, Folk Literature.
- Unit-4 Rajasthani Paintings, Various Religious sects, Folk Gods and Goddess. Impact of western culture on the society of Rajasthan.

Recommended Readings

- Sharma, Dasharath : Rajasthan through the Ages-III, Rajasthan state Archives, Bikaner.
- व्यास, आर.पी. : राजस्थान का वृहत् इतिहास, भाग-I एवं II, राजस्थान हिन्दी ग्रंथ अकादमी, जयपुर।
- नीरज, जयशंकर एवं शर्मा, भगवती लाल शर्मा, गोपीनाथ : राजस्थान की सांस्कृतिक परम्परा, राजस्थान हिन्दी ग्रंथ अकादमी, जयपुर।
- शर्मा, कालूराम : राजस्थान का सांस्कृतिक इतिहास, राजस्थान हिन्दी ग्रंथ अकादमी, जयपुर।
- शर्मा, कालूराम : उन्नीसवीं सदी में राजस्थान का सामाजिक तथा आर्थिक जीवन।
- गोस्वामी, प्रेमचन्द्र : राजस्थान संस्कृति, कला एवं साहित्य; राजस्थान हिन्दी ग्रंथ अकादमी, जयपुर।
- जैन, हुकमचन्द्र, माली नारायणलाल (सम्पादित) : राजस्थान का इतिहास, कला, संस्कृति, परम्परा एवं विरासत; राजस्थान हिन्दी ग्रंथ अकादमी, जयपुर।
- मनोहर, राघवेन्द्र सिंह : राजस्थान के प्रमुख दुर्ग, राजस्थान हिन्दी ग्रंथ अकादमी, जयपुर।

आधुनिक भारत का सामाजिक एवं आर्थिक इतिहास –II

- इकाई –1 ब्रिटिश भू-राजस्व व्यवस्था : 1765 से 1785 ई. के मध्य बंगाल का राजस्व प्रशासन, स्थाई बंदोबस्त, रैय्यतवाड़ी एवं महलवाड़ी व्यवस्थाएं ; कृषि का वाणिज्यिकरण ।
- इकाई –2 ईस्ट इण्डिया कम्पनी का व्यापारिक एकाधिकार, भारतीय कुटीर एवं हस्तशिल्प उद्योगों का पतन, मुक्त व्यापार की नीति, आधुनिक उद्योगों का विकास, रेलवे का विकास ।
- इकाई –3 अंग्रेजी उपयोगितावादी नीति एवं भारत, अकाल राहत, धन निष्कासन, भारतीय मध्यम वर्ग का उदय, श्रमिक आंदोलन एवं श्रम सुधार कानून, वामपंथी (समाजवादी एवं साम्यवादी) आंदोलन ।
- इकाई –4 भारत में साम्प्रदायिकता : साम्प्रदायिकता का अर्थ, साम्प्रदायिकता के कारण, साम्प्रदायिकता उपनिवेशवाद की देन, साम्प्रदायिक दंगे, साम्प्रदायिकता का वर्तमान स्वरूप ।

सन्दर्भ ग्रंथ:

Das, M.N. : Studies in Economic and Social Development of Modern India.

Singh, V.B. : Economic History of India 1857-1956.

Baden, Powell : Land System in British India Vol. I, II & III.

Dutta, R.C. : Economic History of India.

Tara Chand : History of Freedom Movement in India.

Ray Chaoudhary, S.C. : Social, Cultural and Economic History of India.

Manjumdar, R.C. : History of India British Paramountcy and Indian Renaissance.

चन्द्र, बिपिन : भारत में आर्थिक राष्ट्रवाद का उद्भव और विकास ।

नागर-पुरुषोत्तम : आधुनिक भारतीय राजनीतिक विचारक ।

प्रताप सिंह : आधुनिक भारत का सामाजिक व आर्थिक इतिहास ।

गौतम, पी.एल. : आधुनिक भारत का इतिहास एवं विरासत ।

रॉबर्ट्स, पी.ई. : ब्रिटिश कालीन भारत का इतिहास ।

राय, सत्या एम. : भारत में उपनिवेशवाद एवं राष्ट्रवाद ।

भट्टाचार्य, सब्यसाची : आधुनिक भारत का आर्थिक इतिहास ।

मित्तल, डॉ. सतीश चन्द्र : भारत का सामाजिक-आर्थिक इतिहास (1758ई.-1947ई.) ।

देसाई, ए.आर. : भारतीय राष्ट्रवाद की सामाजिक पृष्ठभूमि ।

Semester IV

Elective-4

404- A

Social and Economic History of Modern India – II

- Unit 1 British Land Revenue System : Revenue Administration of Bengal Between 1765 to 1785 A.D., Permanent Settlement, Ryotwari and Mahalwari System. Commercialisation of Agriculture.
- Unit 2 Trade Monopoly of the East India Company, Decline of Indian Cottage and Handicraft Industries. The Policy of Free Trade. Development of Modern Industries. Development of Railway.
- Unit 3 The English Utilitarian Policy and India, Famine Relief, Drain of Wealth, Emergence of Indian Middle Class. Workers' Movements and Labour Reforms, The Left Movements (Socialists and Communists).
- Unit 4 Communalism in India : Meaning of Communalism, Causes of Communalism, Communalism the Legacy of Colonialism, Communal Riots, Nature of Present Communalism in India.

Suggested Readings :

- Das, M.N. : Studies in Economic and Social Development of Modern India.
Singh, V.B. : Economic History of India 1857-1956.
Baden, Powell : Land System in British India Vol. I, II & III.
Dutta, R.C. : Economic History of India.
Tara Chand : History of Freedom Movement in India.
Ray Chaoudhary, S.C. : Social, Cultural and Economic History of India.
Manjumdar, R.C. : History of India British Paramountcy and Indian Renaissance.
चन्द्र, बिपिन : भारत में आर्थिक राष्ट्रवाद का उद्भव और विकास ।
नागर-पुरुषोत्तम : आधुनिक भारतीय राजनीतिक विचारक ।
प्रताप सिंह : आधुनिक भारत का सामाजिक व आर्थिक इतिहास ।
गौतम, पी.एल. : आधुनिक भारत का इतिहास एवं विरासत ।
रॉबर्ट्स, पी.ई. : ब्रिटिश कालीन भारत का इतिहास ।
राय, सत्या एम. : भारत में उपनिवेशवाद एवं राष्ट्रवाद ।
भट्टाचार्य, सब्यसाची : आधुनिक भारत का आर्थिक इतिहास ।
मित्तल, डॉ. सतीश चन्द्र : भारत का सामाजिक-आर्थिक इतिहास (1758ई.-1947ई.) ।
देसाई, ए.आर. : भारतीय राष्ट्रवाद की सामाजिक पृष्ठभूमि ।

Semester IV

इलेक्टिव-4

404 ब

भारतीय राष्ट्रीय आन्दोलन का इतिहास-II

- इकाई-1 असहयोग आन्दोलन, स्वराज दल, साइमन कमीशन, नेहरू रिपोर्ट।
- इकाई -2 सविनय अवज्ञा आन्दोलन, गोलमेज सम्मेलन, साम्प्रदायिक पंचाट एवं पूना समझौता।
- इकाई -3 मुस्लिम लीग की स्थापना, लखनऊ समझौता, खिलाफत आंदोलन, लाहौर प्रस्ताव।
- इकाई -4 भारत छोड़ो आंदोलन, भारत विभाजन के कारण, सुभाष चन्द्र बोस एवं आजाद हिन्द फौज, भारतीय स्वतन्त्रता के कारण।

सन्दर्भ :

- Sarkar, Sumit : Modern India-1885.
Tara Chand : History of Freedom Movement.
Mehrotra, S.R. : Emergence of Indian National Congress.
Grover, B.L. : British Policy towards Indian National Congress.
Hasan Mushirul : Nationalism and Communal Politics in India 1885-1930.
Grover B.L and S.Grover : Modern Indian History.
Chandra, Bipan : India's Struggle for Independence.
चन्द्र, बिपिन : भारत का स्वतंत्रता संघर्ष।
शुक्ल, आर.एल. : आधुनिक भारत का इतिहास।
यशपाल, बी.एल
एवं ग्रोवर : आधुनिक भारत का इतिहास।
जैन, एम.एस. : आधुनिक भारत का इतिहास।
राय, सत्या एम. : भारत में उपनिवेशवाद एवं राष्ट्रवाद।
बंद्योपाध्याय; शेखर : पलासी से विभाजन तक।

Semester IV

Elective-4

404B

HISTORY OF NATIONAL MOVEMENT OF INDIA-II

- Unit-1 Non-Cooperation Movement, Swarajya Party, Simon Commission, Nehru Report.
- Unit-2 Civil Disobedience Movement, Round Table Conferences, Communal Award and Poona Pact.
- Unit-3 Establishment of Muslim League, Lucknow Pact, Khilafat Movement, Lahore Resolution.
- Unit-4 Quit India Movement, Causes of Partition of India, Subhash Chandra Bose and Indian National Army, Causes of Indian Independence.

Recommended Readings

- Sarkar, Sumit : Modern India-1885.
Tara Chand : History of Freedom Movement.
Mehrotra, S.R. : Emergence of Indian National Congress.
Grover, B.L. : British Policy towards Indian National Congress.
Hasan Mushirul : Nationalism and Communal Politics in India 1885-1930.
Grover B.L and S.Grover : Modern Indian History.
Chandra, Bipan : India`s Struggle for Independence.
चन्द्र, बिपिन : भारत का स्वतंत्रता संघर्ष।
शुक्ल, आर.एल. : आधुनिक भारत का इतिहास।
यशपाल, बी.एल
एवं ग्रोवर : आधुनिक भारत का इतिहास।
जैन, एम.एस. : आधुनिक भारत का इतिहास।
राय, सत्या एम. : भारत में उपनिवेशवाद एवं राष्ट्रवाद।
बंद्योपाध्याय; शेखर : पलासी से विभाजन तक।

भारत के संवैधानिक विकास का इतिहास-II

इकाई 1	भारत सरकार अधिनियम 1919। भारत सरकार अधिनियम 1935।
इकाई 2	अगस्त प्रस्ताव, 1940। क्रिप्स मिशन, 1942। वेवेल योजना और शिमला सम्मेलन, 1945। केबिनेट मिशन, 1946।
इकाई 3	एटली घोषणा, 20 फरवरी 1947। माउण्टबेटन योजना, 23 मार्च 1947। भारत का स्वतंत्रता अधिनियम, 1947।
इकाई 4	भारतीय संविधान सभा – अर्थ एवं निर्माण। भारत के संविधान का निर्माण – प्रस्तावना एवं विशेषताएं।

संदर्भ ग्रंथ:-

बक्शी उपेन्द्र	:	संवैधानिक विकास।
पांडे जय नारायण	:	भारत का संवैधानिक विकास।
कश्यप सुभाष	:	भारत का संवैधानिक विकास।
गौतम पी.एल.	:	आधुनिक भारत (1757-1964)
सीकरी एस.एल.	:	भारतीय संविधान का इतिहास
अग्रवाल आर.सी.	:	राष्ट्रीय आन्दोलन एवं संवैधानिक विकास
बसु डी.डी.	:	भारतीय संविधान
कश्यप सुभाष	:	हमारी संसद
बी.एल. फड़िया	:	भारतीय शासन व राजनीति
Keith A B	:	Constitutional History of India London 1936
Coupland R	:	The Constitutional problem of India- Oxford University Press 1945
Sikri S.L.	:	The History of Constitution of India
Pylee M.V.	:	The Constitutional History of India
Keith A.B.	:	A Constitutional History of India
Punniah K.V.	:	The Constitutional History of India
Banerjee A.C.	:	Indian Constitutaional Documents – I,II,III,IV Volume

History of Constitutional Development in India-II

- Unit1 India Act 1919
Govt. of India Act 1935
- Unit 2 August Proposal, 1940
Cripps Mission, 1942
Wavell Plan & Simla Conference, 1945
Cabinet Mission, 1946
- Unit 3 Attlee Statement, 20 February, 1947
Mountbatten Plan, 23 March, 1947
Indian Independence Act, 1947
- Unit 4 Meaning & Formation of Indian Constituent Assembly
Making of Indian Constitution – Preamble and Salient Features

Suggested Books:-

- Keith A B : Constitutional History of Indian London 1936
Coupland R : The Constitutional problem of India- Oxford University Press 1945
Sikri S.L. : The History of Constitution of India
Pylee M.V. : The Constitutional History of India
Keith A.B. : A Constitutional History of India
Punniah K.V. : The Constitutional History of India
Banerjee A.C. : Indian Constitutional Documents – I,II,III,IV Volume
बक्शी उपेन्द्र : संवैधानिक विकास ।
पांडे जय नारायण : भारत का संवैधानिक विकास ।
कश्यप सुभाष : भारत का संवैधानिक विकास ।
गौतम पी.एल. : आधुनिक भारत (1757–1964)
सीकरी एस.एल. : भारतीय संविधान का इतिहास
अग्रवाल आर.सी. : राष्ट्रीय आन्दोलन एवं संवैधानिक विकास
बसु डी.डी. : भारतीय संविधान
कश्यप सुभाष : हमारी संसद
बी.एल. फड़िया : भारतीय शासन व राजनीति

शोध पद्धति-II

- इकाई 1 पुरालेखीय एवं अपुरालेखीय, अभिलेखीय, मुद्राशास्त्र, साहित्यिक – गेय एवं लोक वार्ता, द्वितीयक स्रोत।
- इकाई 2 बाह्य- आलोचना या प्रमाणिकता, आन्तरिक आलोचना या ऐतिहासिक साक्ष्यों की विश्वसनीयता, इतिहास में पूर्वाग्रह, दस्तावेजों की जालसाजी, ऐतिहासिक भ्रम।
- इकाई 3 इतिहास लेखन : तकनीक, अध्याय व्यवस्था, इतिहास में वस्तुनिष्ठता एवं विषयनिष्ठता, साक्ष्यों की महत्ता।
- इकाई 4 शोध उपकरण : पाद टिप्पणियाँ, संदर्भिका, सूची एवं संक्षेपण, उद्धरण के मापदंड। शोध –पत्र लेखन, शोध प्रबंध का प्रस्तुतीकरण।

संदर्भ ग्रंथ:

- Warder, A.K. : An Introduction to Indian Historiography, 1972
- Gardner, Patrick(ed) : Theories of History, New York, 1959
- Carr. E.H. : What is History, Penguin, 1965
- Collingwood R.G. : The Idea of History, New York, 1957
- Sen, S.P.(ed) : Historians and Historiography in Modern India.
- Pathak, V.S. : Ancient Historians of India, 1966, Asia Publishing House
- Walsh : An Introduction to Philosophy of History, London, 1967
- Renier, G.I. : History, its purpose and Methods, Boston, 1950
- Gooch, G.P. : History and Historians in the Nineteenth Century, Longmans, Green & Co.
- Shotwell, J.T. : History of History
- Thomson, J.W. : History of Historical Writing, 1954
- Hardy, Peter : Historians of Medieval India, London, 1960
- Hasan, Mohibul : Historians of Medieval India, Meerut, 1978.
- पांडे लालता प्रसाद : भारतीय इतिहास – दर्शन, अक्षयवट
- सिंह, परमानन्द : इतिहास दर्शन, मोतीलाल बनारसीदास, दिल्ली
- पंचाल, एच. सी. : इतिहास के सिद्धान्त एवं पद्धतियां, जयपुर
- ई. श्रीधरन : इतिहास लेखन
- कार ई.एच. : इतिहास क्या है।

Research Methodology-II

- Unit 1 Archival sources, Non-archival sources, epigraphical, numismatic, Literature-ballads and folk lore, secondary sources
- Unit 2 External Criticism or Authenticity of historical evidences, Internal Criticism or Credibility of Historical evidences, Bias in History, Forgery of Documents, Historical Fallacies
- Unit 3 Writing of History-Technique, organizing the chapters, objectivity and subjectivity in History, Significance of evidence in History Writing.
- Unit 4 Research Tools-foot notes, bibliography, Index and abbreviations, norms for quotations, writing of Research paper, Presentation of Thesis.

Suggested Readings :

- Warder, A.K. : An Introduction to Indian Historiography, 1972
- Gardner, Patrick(ed) : Theories of History, New York, 1959
- Carr. E.H. : What is History, Penguin, 1965
- Collingwood R.G. : The Idea of History, New York, 1957
- Sen, S.P.(ed) : Historians and Historiography in Modern India.
- Pathak, V.S. : Ancient Historians of India, 1966, Asia Publishing House
- Walsh : An Introduction to Philosophy of History, London, 1967
- Renier, G.I. : History, its purpose and Methods, Boston, 1950
- Gooch, G.P. : History and Historians in the Nineteenth Century, Longmans, Green & Co.
- Shotwell, J.T. : History of History
- Thomson, J.W. : History of Historical Writing, 1954
- Hardy, Peter : Historians of Medieval India, London, 1960
- Hasan, Mohibul : Historians of Medieval India, Meerut, 1978.
- पाण्डे, लालताप्रसाद : भारतीय इतिहास—दर्शन, अक्षयवट
- सिंह , परमानन्द : इतिहास दर्शन, मोतीलाल बनारसीदास, दिल्ली
- पंचाल— एच, सी, : इतिहास के सिद्धान्त एवं पद्धतियाँ , जयपुर।
- ई. श्रीधरन : इतिहास लेखन
- कार ई.एच. : इतिहास क्या है।

Semester IV
स्किल कोर्स - 04
भारत का राष्ट्रीय आंदोलन

- इकाई-1 भारतीय राष्ट्रवाद का उदय व कारण, भारतीय राष्ट्रीय कांग्रेस की स्थापना, उदारवादी विचारधारा, बंगाल विभाजन व स्वदेशी आंदोलन, मुस्लिम लीग की स्थापना।
- इकाई-2 उग्रवादी विचारधारा, होमरूल आंदोलन, खिलाफत व असहयोग आंदोलन, क्रांतिकारी गतिविधियां।
- इकाई-3 कृषक व दलित वर्ग आंदोलन, सविनय अवज्ञा आंदोलन, गोलमेज सम्मेलन, मुस्लिम राजनीति व साम्प्रदायिक पंचाट, गांधी इरविन समझौता, पूना पैक्ट।
- इकाई-4 अगस्त प्रस्ताव, क्रिप्समिशन, भारत छोड़ो आन्दोलन, कैबिनेट मिशन, सुभाष बोस का योगदान, माउंटबैटन योजना, भारतीय स्वतंत्रता अधिनियम।

संदर्भ ग्रंथ

- Sumit, Sarkar : Modern India.
Tara Chand : History of Freedom Movement Vol. I - IV.
Mehrotra, S.R. : Emergence of Indian National Congress.
Grover, B.L. : British Policy towards Indian National Congress.
Hasan Mushirul : Nationalism and Communal Politics in India 1885-1930.
विपिन चन्द्र : भारत का स्वतंत्रता संघर्ष।
शुक्ल, आर.एल. : आधुनिक भारत का इतिहास।
यशपाल, बी.एल.
एवं ग्रोवर : आधुनिक भारत का इतिहास।
जैन, एम.एस. : आधुनिक भारत का इतिहास।

Semester IV
SKILL COURSE - 04

NATIONAL MOVEMENT OF INDIA

- Unit-1 Rise of Indian Nationalism & Causes, Establishment of Indian National Congress, Moderates-Methods and Achievements ,Partition of Bengal and Swadeshi Movement, Establishment of Muslim League.
- Unit-2 Extremist Methods and Achievements , Home Rule Movement, Khilafat Movement, Non Cooperation Movement, Revolutionary Movement.
- Unit-3 Peasant & Depressed Class Movement, Disobedience Movement Round Table Conferences, Communal Politics & Communal Award, Gandhi Irwin Pact, Poona Pact.
- Unit-4 August Proposal, Cripps Mission, Quit India Movement, Cabinet Mission, Contribution of Subhash Chandra Bose, Mountbatten Plan, Indian Independence Act.

Recommended Readings

- Sumit, Sarkar : Modern India.
- Tara Chand : History of Freedom Movement Vol. I - IV.
- Mehrotra, S.R. : Emergence of Indian National Congress
- Grover, B.L. : British Policy towards Indian National Congress
- Hasan Mushirul : Nationalism and Communal Politics in India 1885-1930
- विपिन चन्द्र : भारत का स्वतंत्रता संघर्ष
- शुक्ल, आर.एल. : आधुनिक भारत का इतिहास
- यशपाल एवं ग़ोवर : आधुनिक भारत का इतिहास
- जैन, एम.एस. : आधुनिक भारत का इतिहास



**JAI NARAIN VYAS UNIVERSITY JODHPUR
(RAJASTHAN)**

FACULTY OF ARTS, EDUCATION AND SOCIAL SCIENCES

SYLLABI

FOR

**M.A. FINE ARTS AND PAINTING (SEMESTER SYSTEM SEMESTER I
AND SEMESTER II)**

EXAMINATIONS- 2023

**MA FINE ARTS AND PAINTING (SEMESTER SYSTEM SEMESTER III
AND SEMESTER IV)**

EXAMINATIONS -2024

IMPORTANT

NOTIFICATION

In compliance of decision of the Hon`ble High Court all students are required to fulfill 75% attendance rule in each subject and there must be 75% attendance of the student before he/she could be permitted to appear in the examination.

REGISTRAR

(Academic)

FACULTY OF ARTS, EDUCATION & SOCIAL SCIENCES

MASTER OF ARTS

GENERAL INFORMATION FOR STUDENTS

The examination for the degree of Master of Arts, Education and Social Sciences shall consist of two parts with semester system: (i) The M.A (Semester I and Semester III) 2023 and (ii) M.A (Semester II and Semester IV),2024.

The examination will be through theory papers/practical/viva. Pass marks for the semester I, semester II, semester III and semester IV examination are 36% of the aggregate marks in all the theory papers and viva/practicals and not less than 25% marks in the individual theory paper /viva /practical. A candidate is required to pass in the written and the practical/viva examination separately.

Successful candidates will be placed in the following divisions on the basis of the total marks obtained in in all four semesters of M.A (Semester I and Semester II) and (ii) M.A (Semester III and Semester IV) examinations taken together:

First division 60% , second division 48% and third division 36% no students will be permitted to register himself simultaneously for more than one post-graduate course.

ATTENDANCE

1. For all regular candidates in the faculties of arts, education and social sciences, science, law, commerce and engineering, the minimum attendance requirement shall be that a candidate should have attended at least 75% of the lecturers delivered and tutorials held taken together as well as 75% of practical and sectionals from the date of his/her admission.
2. Condonation of shortage of attendance:
The shortage of attendance up to the limits specified below may be condoned on valid reasons:
 - i) Up to 6% each subject plus 5 attendances in all the aggregate subject/papers may be condoned by the Vice-Chancellor on the recommendation of the Dean/Director/principal for undergraduate students and on the recommendation of the Head of the Department for the post-graduate classes.

- ii) The N.C.C./N.S.S. cadets sent out to parades and camps and such students who are deputed by the University to take part in games, athletic or cultural activities may, for purpose of attendance, be treated, as present for the days of their absence in connection with the aforesaid activities and that period shall be added to their subject wise attendance.

Note:

The attendance requirement will apply to each semester.

However, in case of practical where examination is not held at the end of the first semester but the end of the second semester, attendance will be counted at the end of the second semester taking into account attendance put in both the semesters (i.e., first and second) taken together.

Candidates will be required to pass separately in theory and practical examinations.

Candidates choice among the optional papers and groups would be restricted only to those paper or groups for which regular teaching is provided in the department.

MEDIUM

Candidates are not allowed to use any medium except Hindi or English for answering question papers.

For answering papers in the subjects of English/Hindi the medium will be corresponding language only.

ADMISSION

The details of the eligibility conditions and admission procedures are given in the admission forms and on university website. The admission would be done on the basis of merit as per university rules. Reservation for SC, ST and OBC would also be done as per J.N.V. University, Jodhpur rules. Candidates are required to attend minimum 75% of the classes in theory and practicals both.

FACILITIES

The Department of Fine Arts and Painting possesses several sophisticated, advanced and modern equipments required for teaching and research.

Academic Members of the Fine Arts and Painting Department

Head of the Department

- DR. (MRS.) RENU SHARMA, Asstt. Professor

Assistant Professor

- DR.(MRS.) RITU JOHRI
- DR. (MS.) NAMRATA SWARNAKAR

GUIDELINES FOR CHOICE BASED CREDIT SYSTEM:

Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete **four skill courses:** two within the Department and two from other Department within JNV University or the Universities approved by JNV University
3. **Course:** Usually referred to, as 'papers is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one hour of teaching (lecture or tutorial) or two hours of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.

11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.
12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/ December and even semester from December/January to May.
Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May. Each Department shall conduct the Practical examinations of Odd semester with internal examiners only; however during even semester one Examiner shall be from other University/Institute.
13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Arts Education & Social Science resolves the following:

- a. All internal assessments shall be open assessment system only and that are based on Quizzes, term test, seminar
- b. Attendance shall carry the prescribed marks in all papers and Practical examination internal assessment
- c. In each semester three out of four theoretical component University examination shall be undertaken by external examiners from outside the university conducting examination, who may be appointed by the competent authority

Grievances and Redressal Mechanism

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head/Principal of the College or the Chairperson of the University Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.
- b) The appeal will be assessed by the Chairman and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Dean, Faculty of Arts Education & Social Science comprising all HODs of the Faculty and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	'O	Outstanding	10
2	'A+	Excellent	9
3	'A	Very Good	8
4	'B+	Good	7
5	'B	Above Average	6
6	'C	Average	5
7	'P	Pass	4
8	'F	Fail	0
9	'Ab	Absent	0

- i. A student obtaining Grade F shall be considered failed and will be required to reappear in the examination.
- ii. For noncredit courses (Skill Courses) 'Satisfactory or "Unsatisfactory shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

- = and > 95 % marks Grade Point 10.0
- 90 to less than 95 % marks Grade Point 9.5
- 85 to less than 90 % marks Grade Point 9.0
- 80 to less than 85 % marks Grade Point 8.5
- 75 to less than 80 % marks Grade Point 8.0
- 70 to less than 75 % marks Grade Point 7.5
- 65 to less than 70 % marks Grade Point 7.0
- 60 to less than 65 % marks Grade Point 6.5
- 55 to less than 60 % marks Grade Point 6.0
- 50 to less than 55 % marks Grade Point 5.5
- 45 to less than 50 % marks Grade Point 5.0
- 40 to less than 45 % marks Grade Point 4.5
- 35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e

$$\text{SGPA (Si)} = \frac{\sum(C_i \times G_i)}{\sum C_i}$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme, i.e.

$$\text{CGPA} = \frac{\sum(C_i \times S_i)}{\sum C_i}$$

where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.

- iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	6	B	6	6*6=36
2	Course 2	6	B+	7	6*7= 42
3	Course 3 Practical -I	6	B	6	6*6=36
4	Course 4 Practical -II	6	O	10	6*10=60
5	Submissions work	8	O	10	8*10=80
	Total	32			254

Thus, SGPA = $254/32 = 7.93$

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	32	32	32	32
SGPA	7.93	7.25	7	6.25

$$\text{CGPA} = \frac{(32 \times 7.93 + 32 \times 7.25 + 32 \times 7 + 32 \times 6.25)}{128} \\ 1107.79/128 = 8.65$$

Semester-wise Theory Papers/Practical / Skill component

* Each Department shall offer one/two skill courses per semester from the list of skill courses approved for the Department.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective) involve an evaluation system of students that has the following two components:-

- (i) **Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
- (ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.

All students cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Arts Education & Social Science.

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective Department shall declare the result as "Satisfactory" or "Non-Satisfactory"; each student need to get a minimum of three "Satisfactory" declaration for the course completion

Qualifying for Next semester

1. A student acquiring minimum of 35% in total of the CCA is eligible to join next semester.
2. A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as 'Fail), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.
3. A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time i.e three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted. Additional chances examination fee shall be on additive basis.

Improvement Option:

Every student shall have the opportunity to improve Credit through University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final. There shall be no improvement opportunity in Practical examinations.

DEPARTMENT OF FINE ARTS AND PAINTING

Teaching and Examination Scheme

The scheme of examination will be as follows:

M.A. Ist & IInd : 4 compulsory papers in each semester, out of four, two papers (theory) two papers (practical) are of 100 marks each. 70 marks for each theory/practical and 30 marks for internal assessment/submission work.

M.A. IIIrd & IVth : 4 compulsory papers in each semester, out of four, two papers (theory) two papers (practical) are of 100 marks each. 70 marks for each theory/practical and 30 marks for internal assessment/submission work.

GUIDELINES FOR CONTIGUOUS INTERNAL ASSESMENT (30%) FOR REGULAR STUDENTS OF POST-GRADUATE COURSE IN M.A. FINE ARTS AND PAINTING (SEMESTER SYSTEM)

(Effective from the first year admission for the academic session 2017-18)

1. The D.C has approved the following guidelines mode of testing and evaluation including continuous internal assessment/CCA of students
 - (i) Terminal evaluation : 70%
 - (ii) Continuous assessment : 30%

- (iii) Continuous assessment may include return assignment, participation in discussion in the class, Project Work, Term test attendance etc.
2. Weightage of 2 marks for attendance component out of 30 marks for continuous assessment shall be available only to those students who attend 75 % and more of classroom lectures/seminars/workshop.
- The break-up of marks for attendance component for theory papers shall be under :
- | Attendance component | Mark/s for theory papers |
|-----------------------------|--------------------------|
| a. 75% and above upto 85% : | 1 |
| b. Above 85% : | 2 |
3. It shall not be compulsory to pass in contiguous internal assessment thus, whatever marks are secured by students out of 80%, i.e.the remaining marks allocated to the particular subject and, thus he/she have to secure pass marks both in the university examination as well as total of internal continuous assessment and university examinations.
4. Continuous internal assessment awards from affiliated colleges/departments must be sent to the controller of examination, by name, two week before the commencement of the particulars examination on the Performa obtained from the examination Branch.

SPECIAL NOTE

- (1) The theory paper will be of 70 marks and 30 marks will be for internal assessment.**
- (2) Skill Courses in Ist & IIIrd Semesters (Odd No.)is for departmental student &IIInd & IVth Semesters(Even No.)is open for all students.**

The examination will be through theory papers/practical/viva. Pass marks for the Semester Ist to IVth examination are 36% of the aggregate marks in all the theory papers and viva/practical and not less than 25% marks in the individual theory paper/viva/practical. A candidate is required to pass in the written and the practical/viva examination separately.

Candidate will have to pass in Theory and Practical separately.

NOTE: Practical examination will be held before Theory examination.

Successful candidates will be placed in the following division on the basis of the total marks obtained in all four semesters.

There shall be choice based credit system. The students shall have option of taking up six credit course in each semester. **Each semester shall be of 24 credits (twenty four credits for theory and practical exams.)**

First division 60% Second division 48% and Third division 36%

Scheme of Examination for M.A. (Semester System) for the Examination of Theory Papers

Instructions for the paper setters and the students

Max. Marks: 70

Min. Marks: 28

Duration: 3 Hrs.

Section A

There shall be 10 short question spread over and whole syllabus to be answered in about 30 words each. It shall carry 10 marks. All questions are compulsory.

Section B

The entire syllabus has been divided into four units. Each unit shall have two questions and the candidates shall be given internal choice i.e. the candidates shall attempt one question from each unit. Each question will carry 15 marks.

M.A. Ist Semester:

Paper	Nomenclature	No. of Period	Credits	Exam. Hours	End Semester Exam. (ESE) Univ Examination	Continuous comprehensive assessment (CCA)	Total
I	History of Eastern Art – I (India) (Theory)	6	6	3	70	30	100
II	History of Western Art – I (Theory)	6	6	3	70	30	100
III	Portrait Study-I	6	6	6	70	30	100
IV	Landscape Painting-I	6	6	6	70	30	100
	Skill Course I (Visual Expression-I)	2					

M.A. IInd Semester:

Paper	Nomenclature	No. of Period	Credits	Exam. Hours	End Semester Exam. (ESE) Univ Examination	Continuous comprehensive assessment (CCA)	Total
I	History of Eastern Art – II (Indian Sculpture)(Theory)	6	6	3	70	30	100
II	History of Western Art – II (Theory)	6	6	3	70	30	100
III	Portrait Study-II	6	6	6	70	30	100
IV	Landscape Painting-II	6	6	6	70	30	100
V	Skill Course -II (Visual Expression-II)	2					

M.A. IIIrd Semester:

Paper	Nomenclature	No. of Period	Credits	Exam. Hours	End Semester Exam. (ESE) Univ Examination	Continuous comprehensive assessment (CCA)	Total
I	History of Modern Art- I (Theory)	6	6	3	70	30	100
II	Aesthetics- I (Theory)	6	6	3	70	30	100
	Skill Course -III (Visual Expression-III)	2					
Practical (any two offered)							
III	Life study - I	6	6	10	70	30	100
IV	Composition- I	6	6	10	70	30	100
V	Graphics-I (Print making art)	6	6	10	70	30	100

M.A. IVth Semester:

Paper	Nomenclature	No. of Period	Credits	Exam. Hours	End Semester Exam. (ESE) Univ Examination	Continuous comprehensive assessment (CCA)	Total
I	History of Modern Art- II (Theory)	6	6	3	70	30	100
II	Aesthetics- II (Theory)	6	6	3	70	30	100
	Skill Course -IV (Visual Expression-IV)	2					
Practical (any two offered)							
III	Life study - II	6	6	10	70	30	100
IV	Composition- II	6	6	10	70	30	100
V	Graphics-II (Print making art)	6	6	10	70	30	100

M.A. I st Semester- 2023

**PAPER I - HISTORY OF EASTERN ART - I
(India)**

Max. Marks : 70

Min. Marks : 28

Duration : 3 Hrs.

Unit I	History of Indian Art - Pre-historic Painting, Six limbs of Indian Arts,
Unit II	Ajanta Painting, Jain School & Pal School.
Unit III	Traditions of miniature paintings – Mughal Painting
Unit IV	Rajasthani Painting & Pahari. Painting

PAPER II - HISTORY OF WESTERN ART - I

Max. Marks : 70

Min. Marks : 28

Duration : 3 Hrs.

Unit I	Pre-historic Art, Egyptian Art.
Unit II	Greek Art and Roman Art,
Unit III	Etruscan Art , Byzantine Art.
Unit IV	Romanesque Art, Gothic Art.

PAPER III- PORTRAIT STUDY - I

Max. Marks : 70

Min. Marks : 28

Duration : 10 Hrs.

Size : ½ Imp.

**Medium : Oil & Water
Pencil, charcoal & acrylic**

Sub. Work : 30 Marks

30+70=100

Option to arrange a male or female model will be given if the same can be arranged.
Emphasis will be given on correct drawing, colour scheme, light and shadows.

PAPER IV - LANDSCAPE PAINTING - I

Max. Marks : 70

Min. Marks : 28

Duration : 10 Hrs.

Size : ½ Imp.

Medium : water

Sub. work : 30 Marks

30+70=100

Landscape make from sight in water colour with proper handling of media. Study of lanes, hills, lakes and ground, trees with special effects of Perspective, environment, light and shadows.

Skill Course – I (Visual Expression-I)

Unit I	Definitions of Arts Form Ancient to Modern Period & Types of Arts
Unit II	Famous Folk Arts of the World (India, China, Japan, Africa,Europe)
Unit III	Print Making Art-(Practical-I) (Lino , Collograph, Woodcut)
Unit IV	Mixed Media Art-(Practical-II)

SUBMISSION OF PRACTICAL WORKS

(Every candidate will submit the following work)

1. 5 Sheets of portrait study.
2. 5 Sheets of Landscape.
3. 100 Sketches.
4. Project Work.
5. Lino / wood prints

There should be a project work/Assignment (As part of Internal Assessment) given to students as guided by faculty which are based on paper Ist & IInd.(According to Syllabus)

Sketch book (Portfolio) must contain more than 100 sketches, studies, lay out and drawing in addition to studio practices.

Submission work will be submitted to the HOD Fine Arts and Painting at least fifteen days before the practical examination. Submission work will be retained till the declaration of the results. If no claim is made within two months after declaration of the result, the submission will be destroyed.

एम. ए. प्रथम सेमेस्टर
प्रश्नपत्र – प्रथम
पूर्वी कला का इतिहास-।
(भारत)

अधिकतम अंक-70
न्यूनतम अंक-28
अवधि-3 घण्टे

- इकाई 1 : भारतीय कला का इतिहास – प्रागैतिहासिक कला, भारतीय चित्र कला के षडंग ।
इकाई 2: अजन्ता कला, जैन और पाल शैली ।
इकाई 3 : लघु चित्रण की परम्परा- फारसी , मुगल कला ।
इकाई 4 : राजस्थानी कला और पहाड़ी शैली ।

प्रश्नपत्र – द्वितीय
पाश्चात्य कला का इतिहास -।

अधिकतम अंक-70
न्यूनतम अंक-28
अवधि-3 घण्टे

- इकाई 1 : प्रागैतिहासिक कला, मिस्त्र की कला ।
इकाई 2: यूनान और रोमन कला, ।
इकाई 3: इट्रस्कन कला बाइजेन्टाइन कला, ।
इकाई 4 : रोमनस्क कला, गोथिक कला ।

Books Recommended:-

- : German Bangin - A concise History of Painting Part-I and II
- : G.H Gardner -Art through ages.
- : Frederick Hartt- Art, A History of painting sculpture, architecture
- : Percy Brown-Indian Painting.
- : Karl Khandalawala-Indian Sculpture and Painting.
- : Vachaspati Garrola- Indian Art.
- : Edmund Burka Feldman: Variety of visual experiences.
- : Auriceide: Basic Design: The Dynamics of Visual Form.
- : Fedgetting: Learning with colour....The Meaning and Magic of Art
- : Nathan, K. Nobler: The Visual Dialogue, Holt Rajenart and Winston New York.
- : Agarwal R.A. and Sharma, Shiv Kumar: Roop Prad Kala Ke Moolac Loyal Book Depot, Meerut – 24
- : Living art the work of art- folk artists in the 21st century.
- : Painting European Folk art- Decorative painters library andy B jhor
- : Decorative Panting- Tracy Marsh

- : *Bruce D. Kurz: Visual Imagination.*
- : *A.K.Coomaraswamy: Fundamental of Indian Art .*
- : राय कृष्णदास– भारतीय मूर्तिकला
- : राय कृष्णदास– भारतीय चित्रकला
- : अरविन्द कुमार– भारतीय चित्रकला एवं मूर्तिकला
- : अविनाश बहादुर वर्मा–भारतीय चित्रकला का इतिहास
- : चोयल एण्ड अग्रवाल : चित्र संयोजना
- : शैलेन्द्रनाथ डे :भारतीय चित्रकला की पद्धति
- : गिरिराज–किशोर – पश्चिम की कला

M.A. IInd Semester- 2023

PAPER I – HISTORY OF EASTERN ART-II (INDIAN SCULPTURE)

Max. Marks : 70
Min. Marks : 28
Duration : 3 Hrs.

Unit I	Mohanjodaro, Harappa, Mauryan
Unit II	Sanchi, Bharut, Amravati,
Unit III	Gandhara, Mathura,
Unit IV	Ellora and Elephanta.

PAPER II - HISTORY OF WESTERN ART - II

Unit I	Early Renaissance Painting.
Unit II	High Renaissance Painting-Michelangelo, Leonardo da Vinci
Unit III	High Renaissance Painting –Raphael, Mannerism Painting.
Unit IV	Baroque Painting, Rococo Painting.

PAPER III - PORTRAIT STUDY - II

Max. Mark
Min. Mark
Duration : 1
Size : 1/2
Medium : Oil & 1
Pencil, charcoal & 1
Sub. Work : 30 I
30+7

Option to arrange a male or female model will be given if the same can be arranged. Emphas be given on correct drawing, colour scheme, light and shadows.

PAPER IV - LANDSCAPE PAINTING – II

Max. Marks : 70
Min. Marks : 28
Duration : 10 Hrs.
Size : ½ Imp.
Medium : water
Sub. work : 30 Marks
30+70=100

Landscape make from sight in water colour with proper handling of media. Study of lanes, hills, lakes and ground, trees with special effects of Perspective, environment, light and shadows.

SUBMISSION OF PRACTICAL WORKS

(Every candidate will submit the following work)

1. 5 Sheets of portrait study.
2. 5 Sheets of Landscape.
3. 100 Sketches.
4. Project Work.
5. Compositions

There should be a project work/Assignment (As part of Internal Assessment) given to students as guided by faculty which are based on paper Ist & IInd.(According to Syllabus)

Sketch book (Portfolio) must contain more than 100 sketches, studies, lay out and drawing in addition to studio practices.

Submission work will be submitted to the HOD Fine Arts and Painting at least fifteen days before the practical examination. Submission work will be retained till the declaration of the results. If no claim is made within two months after declaration of the result, the submission will be destroyed.

Skill Course – II (Visual Expression-II)

Unit I	Elements of Art-(Line, form, Color, Tones, Texture, Space)
Unit II	Art And Nature.
Unit III	Basic Drawing- Sketching With Pencils, Charcoal And Colored Pencils.(Practical)
Unit IV	Technique of Oil Painting(Practical)

Submission Work :- One Sketch book contains min.10 sketches and 2 Oil paintings.

एम. ए. द्वितीय सेमेस्टर

प्रश्नपत्र – प्रथम

पूर्वी कला का इतिहास -II

(भारतीय मूर्तिकला)

अधिकतम अंक-70

न्यूनतम अंक-28

अवधि-3 घण्टे

इकाई 1 : मोहनजोदड़ो हड़प्पा मौर्य ।

इकाई 2 : सांची, भरहुत, अमरावती ।

इकाई 3 : गांधार, मथुरा ।

इकाई 4 : एलोरा और एलीफेन्टा ।

प्रश्नपत्र – द्वितीय

पाश्चात्य कला का इतिहास-II

अधिकतम अंक-70

न्यूनतम अंक-28

अवधि-3 घण्टे

इकाई 1 : आरम्भिक पुनरुत्थान काल की कला ।

इकाई 2 : उच्चपुनरुत्थान काल की कला—माइकिल एंजिलो, लियानार्डो द विंची ।

इकाई 3 : उच्चपुनरुत्थान काल की कला — राफेल, रीतिवाद कला ।

इकाई 4 : बारोक कला, रोकोको कला ।

Books Recommended :

Edmund Burka Feldman: Variety of visual experiences.

:

: Auriceide: Basic Design: The Dynamics of Visual Form.

: Fedgetting: Learning with colour....The Meaning and Magic of Art

: Nathan, K. Nobler: The Visual Dialogue, Holt Rajenart and Winston, Inc., New York.

: Agarwal R.A. and Sharma, Shiv Kumar: Roop Prad Kala Ke Mooladhara, Loyal Book Depot, Meerut – 24

: Living art the work of art- folk artists in the 21st century.

: Painting European Folk art- Decorative painters library andy B jhons.

: Decorative panting- Tracy Marsh

: Bruce D. Kurz: Visual Imagination.

: A.K.Coomaraswamy: Fundamental of Indian Art .

: Edith Tommory -History of Western & Eastern Art.

: A concise History of Painting from Giotto to Gezammei.

- : H.W. Jonson-The Story of Painting.
- : Michael Levey- A History of Western Art.
- : German Bangin - A concise History of Painting Part-I and II
- : G.H Gardner -Art through ages.
- : Frederick Hartt- Art, A History of painting sculpture, architecture
- : Percy Brown-Indian Painting.
- : Karl Khandalawala-Indian Sculpture and Painting.
- : John Stanly Balker and Thomos and Hudson-Japanese Art.
- : Maggie Garden The Chinese, Kerswick Academy, Edi. London.
- : Vachaspati Garrola- Indian Art.
- : Michal Suleman- Chinese Art.
- : राय कृष्णदास— भारतीय मूर्तिकला
- : अरविन्द कुमार— भारतीय चित्रकला एवं मूर्तिकला
- : गिरिराज —किोर अग्रवाल : पचिम की कला
- : ओक : पचिम की कला
- : ममता चतुर्वेदी : पाचात्य कला

M.A. IIIrd Semester- 2024

PAPER I - HISTORY OF MODERN ART- I

Max. Marks : 70

Min. Marks :28

Duration : 3 Hrs

Unit I	Neo-classism, Romanticism.
Unit II	Realism and Impressionism,
Unit III	Neo impressionism and Post impressionism.
Unit IV	Fauvism, Cubism, Expressionism.

PAPER II – AESTHETICS- I

Max. Marks : 70

Min. Marks : 28

Duration : 3 Hrs.

Unit I	Concept of Beauty in Vedic, Post Vedic and Puranic, Brahmin, Sutra literatures.
Unit II	Shaiva Sampradaya (Agam and Tantra)-kamasutra (Six limbs), BrahmaSampradaya, Vishnudharmottarpuran(chitrasutra), Chitralakshan, Smrangan Sutradhar, Mansar and others.
Unit III	Indian Aesthetics - concepts of Rasa –Bharat Muni.
Unit IV	All four schools Bhatt,lollata, Shankuka, Bhatt Nayak, Abhinav Gupta.

:

Skill Course –III

(Visual Expression-III)

Unit I	Role of Religions towards art.
Unit II	Modern Art trends in India, Europe & America.
Unit III	Installation Art (Practical-I)
Unit IV	Creative Composition (Practical-II)

Offered any Two Practical papers:-

PAPER III - LIFE STUDY - I

Max. Marks : 70
Min. Marks:28
Duration : 10 Hrs.
Size : Full Imp.
Medium : Oil
Sub. Work : 30 Marks
30+70=100

Study from life (full figure) showing broad masses of light and shade, clearly bringing out the modeling of the figure and drapery.

PAPER IV – PICTORIAL COMPOSITION – I

Max. Marks : 70
Min. Marks: 28
Duration : 10 Hrs.
Size : Full Imp.
Medium : Oil or any medium
Sub-Work : 30 Marks
30+70=100

Pictorial Composition based on studies from life and nature. Study of objective forms for thematic development in painting. Exploration of various possibilities of expression. There should be three figures in composition. Students choose any subject of daily life and create male and female forms in their style and colour scheme found in Rajasthan.

PAPER V – GRAPHICS- I (ETCHING, WOOD CUT AND VARIOUS TECHNIQUES)

Max. Marks : 70
Min. Marks : 28
Duration : 10 Hrs.
Size : min. 8" X 10" & max. full imp.
Sub. Work : 30 Marks
30+70=100

Design in graphic techniques based on the subjects of Visual world, use of color and Textural values. Composition based on still life, Nature, Human figures, Animals and Birds etc. Composition based on sketches and studies. Preparation of lay out.

SUBMISSION OF PRACTICAL WORKS

Marks of submission work shall be given with practical examinations by Internal and External examiners of each practical.

1.	5 Pic. Compositions (Size – full imp.) Medium- Charcoal, Pencil, Pen, Dry pastel, oil pastel, Colored pencil, Mixed-Media. OR
	5 Plates of life study (Full imp. Size) medium. – Oil and any Medium OR
2.	5 Sheets of Graphics Prints.
3.	100 Sketches.
4.	Project Work.(Part of Internal Assessment)

There should be a project work/Assignment given to students as guided by faculty which are based on paper Ist & IInd. (According to Syllabus)

Sketch book (Portfolio) must contain more than 100 sketches, studies, lay out and drawing in addition to studio practices.

Submission work will be submitted to the HOD Fine Arts and Painting at least fifteen days before the practical examination. Submission work will be retained till the declaration of the results. If no claim is made within two months after declaration of the result, the submission will be destroyed.

एम. ए. तृतीय सेमेस्टर
प्रश्नपत्र – प्रथम
आधुनिक चित्रकला का इतिहास-।

अधिकतम अंक-70
न्यूनतम अंक-28
अवधि-3 घण्टे

- इकाई 1 : नवशास्त्रीयतावाद, रोमांसवाद।
इकाई 2 : यथार्थवाद प्रभाववाद।
इकाई 3 : नव प्रभाववाद और उत्तरप्रभाववाद।
इकाई 4 : फाववाद, धनवाद, अभिव्यंजनावाद।

प्रश्नपत्र – द्वितीय
सौंदर्यशास्त्र-॥

अधिकतम अंक-70
न्यूनतम अंक-28
अवधि-3 घण्टे

- इकाई 1 : वैदिक काल में सौंदर्य की अवधारणा , उत्तरवैदिक और पौराणिक ब्राह्मण, सूत्र साहित्य।
इकाई 2 : शैव (अगम संप्रदाय और तंत्र) कामसूत्र (षडंग) ब्रह्म संप्रदाय, विष्णु धर्मोत्तर पुराण(चित्रसूत्र), चित्रलक्षण, संमरांगण सूत्राधार,मानसार और अन्य।
इकाई 3 : भारतीय सौंदर्यशास्त्र- रस सिद्धांत- भरत मुनि।
इकाई 4 : चार व्याख्याकार: भट्ट लोलट, शंकर, भट्ट नायक, अभिनव गुप्त।

Books Recommended :-

- Apollinaire G. - The cubist painters.
- Canaday J.-Mainstreams of Modern Art.
- Painting in the twentieth Century.
- Herbert R.L. - Modern Artists on Art.
- Raynal M.-Modern Painting.
- Painting in the twentieth Century.
- Herbert R.L. - Modern Artists on Art.
- K.C. Pandey : Aesthetic
- Mulk Raj Anand: The Hindu View of Arts

- G.H.Rande: Civilisation, Science and Religion
- K.S.Ramaswami Shastri: Indian concept of the Beauty
- भरतमुनि : नाट्यास्त्र
- डॉ. नगेन्द्र: सौन्दर्य शास्त्र का सिद्धांत
- डॉ. नगेन्द्र रू रस सिद्धान्त
- डॉ. नगेन्द्र : भारतीय सौन्दर्य शास्त्र की भूमिका
- डॉ. रामलखन शुक्ला : भारतीय सौन्दर्य शास्त्र का तात्त्विक विवेचन एवं ललित कलाएँ
- डॉ. हरद्वारी लाल शर्मा : सौन्दर्य शास्त्र
- डॉ. विमल कुमार : सौन्दर्य शास्त्र के तत्व
- डॉ. एस. एन. दास गुप्त : सौन्दर्य तत्व

M.A. IVth Semester- 2024

PAPER I - HISTORY OF MODERN ART- II

Max. Marks : 70

Min. Marks : 28

Duration : 3 Hrs

Unit I	Post Cubist movements-Futurism, Constructivism
Unit II	Dadaism, Surrealism, Abstract Painting
Unit III	Modern Art after 1945 Pop Art, Action Painting.
Unit IV	Contemporary Art Trends in India, Ravindra Nath Tagore, Amrta Shergil, Yamini Rai, Ram Kumar, M.F.Hussain, F.N. Souza, S.H. Raza, Tayyab Mehta, K.G. Subramanyam, M.RamChandra, K.L. Pannikar, Anjali Ela Menon, Satish Gujral, Jatin Das.

PAPER II – AESTHETICS- II

Max. Marks : 70

Min. Marks : 28

Duration : 3 Hrs

Unit I	Defination and scope of Aesthetics from ancient Greek - Plato, Aristotle, Plotinus.
Unit II	Middle ages- Saint Augustine, St. Thomas Aqvinas, middle age concept of Beauty and important artist.
Unit III	Modern Aesthetics – Alexander Baumgarten, Kant, Hegel, Croce, Tolstoy.
Unit IV	Frued, Herbert Read, Susanne langer, Comparative study of Eastern and Western Aesthetics.

Skill Course –IV

(Visual Expression-IV)

Unit I	General introduction to contemporary Art and Artists of India
Unit II	Traditional Art and Design-Mandana & Rangoli (Practical Work)
Unit III	Pottery Painting and Paper machie work (Practical Work)
Unit IV	Canvas Painting (Size min. half imperial (Practical Work)

SUBMISSION OF WORKS:- Min.6 Works

1. 2 Mandana & Rangoli design. 2. 2 Pottery Painting and Paper mache 3. 2 Canvas Paintings.

Offered any two practical papers:-

PAPER III - LIFE STUDY - II

Max. Marks :70
Min. Marks : 28
Duration : 10 Hrs.
Size : Full Imp.
Medium : Oil
Sub. Work : 30 Marks
30+70=100

Study from life (full figure) showing broad masses of light and shade, clearly bringing out the modeling of the figure and drapery.

PAPER IV – PICTORIAL COMPOSITION – II

Max. Marks : 70
Min. Marks : 28
Duration : 10 Hrs.
Size : Full Imp.
Medium : Oil or any medium
Sub-Work : 30 Marks
30+70=100

Pictorial Composition based on studies from life and nature. Study of objective forms for thematic development in painting. Exploration of various possibilities of expression. There should be three figures in composition. Students choose any subject of daily life and create male and female forms in their style and colour scheme found in Rajasthan.

PAPER V – GRAPHICS- II (ETCHING, WOOD CUT AND VARIOUS TECHNIQUES)

Max. Marks : 70
Min. Marks :28
Duration : 10 Hrs.
Size : min. 8" X 10" & max. full imp.
Sub. Work : 30 Marks
30+70=100

Design in graphic techniques based on the subjects of Visual world, use of color and Textural values. Composition based on still life, Nature, Human figures, Animals and Birds etc. Composition based on sketches and studies. Preparation of lay out.

SUBMISSION OF PRACTICAL WORKS

1	5 Pic. compositions (Size – full imp.) Medium- Charcol, Pencil, Pen, Dry pastel, oil pastel, Coloured pencil, Mixed-Media. OR
2	5 Plates of life study (Full imp. Size) medium. – Oil and any Medium. OR
	5 Sheets of Graphics Prints.
3	100 Sketches
4.	Project Work. (Part of Internal Assessment)

There should be a project work/Assignment given to students as guided by faculty which are based on paper Ist & IInd. (According to Syllabus)

Sketch book (Portfolio) must contain more than 100 sketches, studies, lay out and drawing in addition to studio practices.

Submission work will be submitted to the HOD Fine Arts and Painting at least fifteen days before the practical examination. Submission work will be retained till the declaration of the results. If no claim is made within two months after declaration of the result, the submission will be destroyed.

एम. ए. चतुर्थ सेमेस्टर

प्रश्नपत्र – प्रथम

आधुनिक चित्रकला का इतिहास-॥

अधिकतम अंक-70

न्यूनतम अंक-28

अवधि-3 घण्टे

- इकाई 1 : उत्तर घनवाद आंदोलन- भविष्यवाद, रचनावाद।
- इकाई 2 : दादावाद, अतियथार्थवाद, वस्तुनिरपेक्षकला (एब्स्ट्रेक्ट पेंटिंग)
- इकाई 3 : आधुनिक कला 1945 के पश्चात् पॉप कला, क्रियात्मक चित्रण(एक्शन पेंटिंग),
- इकाई 4 : भारतीय आधुनिक कला- रवीन्द्रनाथ टैगोर, अम्रता शेरगिल, यामिनी राय, रामकुमार, एम.एफ.हुसैन, एफ.एन.सुजा, एस.एच.रजा, तैयबमेहता, के.जी. सुब्रमन्यम, एम.रामचन्द्र, के.एल.पणिकर, एंजोली ईला मैनन, सतीश गुजराल, जतिन दास।

प्रश्नपत्र – द्वितीय

सौन्दर्यशास्त्र-॥

अधिकतम अंक-70

न्यूनतम अंक-28

अवधि-3 घण्टे

- इकाई 1 : सौन्दर्य शास्त्र की परिभाषा और क्षेत्र, प्रारंभिक पाश्चात्य युग में यूनान – प्लेटो, अरस्तू, प्लाटिनस।
- इकाई 2 : मध्ययुग-संत आगस्टाइन, संत थॉमस एक्विनास, मध्ययुग में सौन्दर्य की अवधारणा और महत्वपूर्ण कलाकार।
- इकाई 3 : आधुनिक सौन्दर्यशास्त्र एलेक्जेंडर बामगार्टन कांट, हिगेल,, क्रोचे, टालस्टॉय
- इकाई 4 : फ्रायड, हर्बर्ट रीड सुजैन लैंगर, पाश्चात्य एवं पूर्वी सौन्दर्यशास्त्र का तुलनात्मक अध्ययन।

Books Recommended:-

- : Apollinaire G. - The cubist painters.
- : Canaday J.-Mainstreams of Modern Art.
- : Raynal M.-Modern Painting.
- : V. Raghvan, Adyar : some concepts of Alankar Shastra.
- : Aristotels Theory of Poetry and Fine Art, Translated by

- : S.M Boocher, Dover Publication 1951.
- : Christian and Oriental Philosophy of Art.
- : Katherine Guilbert : History of Aesthetic.
- : Melvin Reader : Aesthetic
- : L. Alams: The Primitive Art
- : Ernest Groups: The Beginning of Arts
- : Irwin Edman: Arts and The Man
- : K.C.Pandey: Comparative Aesthetics
- : E.F.Carritik: Philosophy of Beauty
- : Golbert and Knhu: A History of Aesthetics
- : Mialvi Ruder: Modern Books of Aesthetics
- : Fauves & Fauvism: Jean Laymarie 1988
- : Cubism(eye on art): Cynthia Mines2007
- : A Modern Introduction to Indian aesthetics theory:
Barlingay
- : Indian Contemporary Art: Books,painting &
Sculptures: Neville Tuli
- : A Conscise History of Modern Paintings: Herbert
Read
- : The Story of Modern Art: Norbet Lynton
- : A concise History of Modern Paintings: Herbert
Eduard Riad
- : र.वि. सांखलकर– आधुनिक चित्रकला का इतिहास
- : सुरेन्द्र बारलिंगे : सौन्दर्य तत्व और काव्य सिद्धान्त (अनुदित)
- : आनंद प्रकाश दीक्षित : रस सिद्धान्त, स्वरूप विश्लेषण
- : सावित्री सिन्हा : पाश्चात्य काव्य शास्त्र की परम्परा
- : डॉ. वासुदेव ारण : कला और संस्कृति
- : कमल चतुर्वेदी : सौन्दर्य शास्त्र
- : आधुनिक चित्रकला के युग निर्माता : जी. के.अग्रवाल
- : ग्राफिक डिजाइन : नरेन्द्र सिंह यादव



DEPARTMENT OF JOURNALISM AND MASS COMMUNICATION

JAI NARAIN VYAS UNIVERSITY, JODHPUR

Syllabus

of

M.A.

**Journalism and Mass Communication
Semester I & II
Year 2017-2018**

एम.ए.पत्रकारिता एवं जनसंचार
समेस्टर – I 2017-18

समय सीमा : 3 घण्टे

अधिकतम अंक : 100

ESE : 70

CCA : 30

परीक्षकों एवं विद्यार्थियों के लिए निर्देश :

1. प्रत्येक प्रश्नपत्र के अंतर्गत कुल 9 प्रश्न होंगे। जिसमें से पाँच प्रश्न करने अनिवार्य हैं।
2. प्रथम प्रश्न अतिलघूत्तरी का होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे सभी दस प्रश्न हल करना अनिवार्य होगा। प्रत्येक प्रश्न एक अंक का होगा।
10X 1 = 10 अंक
3. प्रथम प्रश्न के अलावा कुल आठ प्रश्न होंगे। सम्पूर्ण पाठ्यक्रम 4 इकाइयों में विभक्त है। प्रत्येक इकाई से दो-दो प्रश्न विकल्प सहित पूछे जायेंगे जिनमें से प्रत्येक इकाई से एक प्रश्न करना होगा।
4X 15 = 60 अंक

**M.A. JOURNALISM & MASS COMMUNICATION
(SEMESTER I) 2017-18**

INSTRUCTIONS FOR THE PAPER-SETTERS AND THE STUDENTS

Duration – 3 hours

Max. Marks – 70

Note:

- (i) There shall be 9 questions in all. Five questions have to be attempted.
- (ii) The first question shall be short answer type containing 10 short questions spread over the whole syllabus to be answered in about 30 words each. Each question carries one marks . Question one therefore carries 10 marks and shall be a compulsory question.
10x1 = 10
- (iii) Rest of the paper shall contain 8 questions with internal choice. The entire syllabus has been divided into four units. Each unit shall have two questions and the candidates shall be given internal choice i.e. the candidate shall attempt one question from each unit
4x15 = 60

एम.ए.पत्रकारिता एवं जनसंचार
सेमेस्टर I सत्र-2017-18
पाठ्यक्रम संख्या MJMCC 101
संचार एवं पत्रकारिता : सिद्धान्त एवं व्यवहार

- इकाई-1.** संचार की अवधारणा, परिभाषा, संचार के विभिन्न प्रकार, संचार के विविध मॉडल, संचार शोध पद्धतियाँ एवं तकनीक
- इकाई-2.** सूचना क्रांति एवं वैश्विक चेतना, वैश्विक चेतना बनाम तकनीकी क्रांति, भारत में संचार क्रांति , संचार और सत्ता के अन्तःसंबंध, संचार एवं जनमत
- इकाई-3.** पत्रकारिता : स्वरूप, उद्देश्य, क्षेत्र एवं प्रभाव, विश्व पत्रकारिता का उदय एवं इतिहास, भारत में पत्रकारिता का उदय
- इकाई-4.** हिन्दी पत्रकारिता : उद्भव- विकास तथा काल-विभाजन का संक्षिप्त इतिहास, हिन्दी पत्रकारिता और आधुनिक चेतना के विविध आयाम

सहायक पुस्तकें-

- आधुनिक पत्रकार कला : विष्णुदत्त शुक्ल
पत्र और पत्रकार : कमलापति त्रिपाठी, पुरुषोत्तमदास टण्डन
प्रयोजनमूलक हिन्दी की नयी भूमिका : कैलाशनाथ पाण्डे
सम्प्रेषण एवं संचार साधन : मध्यप्रदेश हिन्दी ग्रंथ अकादमी
हिन्दी पत्रकारिता के नव्य आयाम : मंजुला सांगा एवं सिद्धेश्वर काश्यप

M.A.Journalism and Mass Communication

सेमेस्टर I सत्र-2017-18

पाठ्यक्रम संख्या MJMCC 101

Communicaton and Journalism : Theory and Practicals

- Unit 1.** Concept of Communication, Definition, Various Types of communication, Various models of Communication, Communication Research Methodology and Technique.
- Unit 2.** Information Revolution and global Consciousness, global Consciousness V/s Technical Revolution, Communication Revolution in India , Inter-relationship in communication and Authority, Communication and Public Opinion.
- Unit 3.** Journalism : Structure, Purpose, Area and Influence , History and Rise of World Journalism, Rise of Journalism in India.
- Unit 4.** Hindi Journalism : Origin – Brief History of the Development and Time/ Era division , Hindi Journalism and various aspects of modern consciousness.

एम.ए.पत्रकारिता एवं जनसंचार
सेमेस्टर I सत्र-2017-18

समय सीमा : 3 घण्टे

अधिकतम अंक : 100

ESE : 70

CCA : 30

पाठ्यक्रम संख्या MJMCC 102

समाचार पत्र : प्रबंधन

इकाई-1. सम्पादकीय तंत्र : संपादक, उपसंपादक एवं समाचार संपादक के गुण एवं कार्य

इकाई-2. समाचार पत्र प्रबंधन एवं व्यवस्था : वितरण प्रबंधन (कार्मिक , वित्तीय एवं भंडार प्रबंधन)

इकाई-3. विज्ञापन एवं मुद्रण प्रबंधन : स्वरूप, क्षेत्र एवं कार्य

इकाई-4. समाचार पत्र की नीति का निर्धारण, विभिन्न विभागों का समन्वय, स्वामी एवं संपादक के संबंध

सहायक पुस्तकें:

समाचार पत्र-प्रबंधन : गुलाब कोठारी

समाचार पत्र व्यवस्थापन : अनन्त गोपाल शेवड़े

समाचार पत्रों का संगठन और प्रबंध : सुकुमाल जैन

पत्रकार प्रबंध कला : पन्नालाल श्रीवास्तव

M.A.Journalism and Mass Communication

पाठ्यक्रम संख्या MJMCC 102

News Paper : Management

Unit 1. Editorial System : Excellence and work of Editor, Sub-Editor and News-Editor.

Unit 2. News Paper management and arrangement : Distribution management (Personnel, Economic and storage management)

Unit 3. Advertisement and Printing Management : Forms , Area and Work.

Unit 4. Fixation of Newspaper policy, co-ordination between different departments, relationship between the owner and the editor.

एम.ए.पत्रकारिता एवं जनसंचार
सेमेस्टर I सत्र-2017-18

समय सीमा : 3 घण्टे

अधिकतम अंक : 100

ESE : 70

CCA : 30

पाठ्यक्रम संख्या MJMCC 103

हिन्दी पत्रकारिता का इतिहास I (20वीं शताब्दी के दूसरे दशक तक)

- इकाई-1.** भारतीय पत्रकारिता की पृष्ठभूमि- इंग्लैण्ड, जर्मनी , फ्रांस, अमेरिका, रूस एवं चीन की पत्रकारिता ।
- इकाई-2.** भारतीय पत्रकारिता का इतिहास : आरंभिककाल से प्रथम स्वतंत्रता संग्राम (1857ई.) तक, जेम्स आगस्ट्स हिक्की एवं सर जेम्स बकिंघम का पत्रकारिता में योगदान, भारत में भाषायी समाचार पत्रों का विकास, राजाराम मोहनराय के पत्र एवं पत्रकारिता में उनका योगदान, पं.जुगल किशोर शुक्ल एवं 'उदन्त मार्तण्ड' , 'समाचार सुधा वर्षण', प्रथम स्वतंत्रता संग्राम में पत्रकारों की भूमिका ।
- इकाई-3** भारतेंदुयुगीन पत्रकारिता, महावीरप्रसाद द्विवेदी युगीन पत्रकारिता, स्वदेशी एवं स्वराज्य की चेतना के स्वर ।
- इकाई-4.** प्रमुख पत्रकारों - सुरेन्द्रनाथ बनर्जी, लोकमान्य तिलक, मदनमोहन मालवीय, बालमुकुन्द गुप्त का योगदान, बंग-भंग आंदोलन में पत्रकारों की भूमिका ।

सहायक पुस्तकें:

हिन्दी पत्रकारिता के विविध आयाम : वेदप्रताप वैदिक

हिन्दी भाषा के सामयिक पत्रों का इतिहास : राधाकृष्ण दास

भारतीय स्वतंत्रता और पत्रकारिता : वंशीधर लाल

हिन्दी पत्रकारिता : विविध आयाम : भंवरलाल सुराना

M.A. Journalism and Mass Communication

पाठ्यक्रम संख्या MJMCC 103

History of Hindi Journalism – I (Till 2nd decade to 20th Century)

- Unit 1.** Background of Indian Journalism – Journalism in England, Germany, France, America, Russia and China.
- Unit 2.** History of Indian Journalism : From the advent/ beginning to the first freedom fight(1857) , Contribution of James Augustus Hikki and Sir James Buckingham in Journalism. Development of linguistic newspapers in India, Contribution of Raja Ram Mohan Roy in the field of Journals/ Magazines and Journalism , Pandit Jugal Kishore Shukla and ‘ Udant Martand’ , ‘ Samachar Sudha Varshan’ , role of journalists in First Freedom Fight.
- Unit 3.** Journalism in Bharatendu Era, Journalism in Mahaveer Prasad Diwedi Era , Voice of Consciousness in Swadeshi and home rule.
- Unit 4.** Contribution of major journalists- Surendranath Banerjee, Lok Manya Tilak, Madan Mohan Malviya, Balmukund Gupt, Role of Journalists in Bang-Bhang revolution.

एम.ए.पत्रकारिता एवं जनसंचार
सेमेस्टर I सत्र-2017-18

समय सीमा : 3 घण्टे

अधिकतम अंक : 100

ESE : 70

CCA : 30

पाठ्यक्रम संख्या MJMCC 104

प्रेस -कानून

इकाई-1. प्रेस कानून : आवश्यकता, परिचय और इतिहास (स्वतंत्रतापूर्व एवं स्वतंत्रतापश्चात्)

इकाई-2. प्रेस कानून : भारतीय संविधान एवं अभिव्यक्ति की स्वतंत्रता, प्रासंगिक धाराएँ, पत्रकारों की आचार संहिता, कॉपी राइट एक्ट , लॉ ऑफ टार्टस, मानहानि एवं न्यायालय अवमानना कानून,

इकाई-3. प्रेस कौंसिल एक्ट, संसदीय विशषाधिकार, प्रेस पंजीकरण एक्ट, पुरस्कार एवं प्रतियोगिता एक्ट 1955, औषध एवं चमत्कारिक उपचार एक्ट 1954 (आक्षेपणीय विज्ञापन), भारतीय सरकारी गोपनीयता एक्ट 1923, युवकों के लिए हानिप्रद प्रकाशन अधिनियम एक्ट 1956, समाचार-पत्र : मूल्य एवं पृष्ठ कानून

इकाई-4. प्रेस आयोग एवं प्रेस परिषद् : संरचना एवं कार्य

सहायक पुस्तकें:-

पत्रकारिता : सिद्धांत और स्वरूप : संजीव कुमार जैन

प्रेस कानून और पत्रकारिता : संजीव भानावत

द न्यूज पेपर इन इंडिया : हेमेन्द्र कुमार

पत्रकारिता प्रशिक्षण : राजेन्द्र मिश्र , राकेश शर्मा

M.A.Journalism and Mass Communication

पाठ्यक्रम संख्या MJMCC 104

Press- Law

Unit 1. Press Law : Need, Introduction and History (Before and after independence).

Unit 2. Press Law : Indian Constitution and Right of Expression. relevant sections, code of conduct of Journalists, Copy Right Act, Law of Torts, Defamation and contempt of Court of Law.

Unit 3. Press Council Act 1978, Parliamentary Privileges, Press and Books Registration Act . The Prize Competition Act of 1955, The Drugs and Magic Remedies (objectionable Advertisement) Act of 1954, Indian Official Secrets Acts of 1923, The Young Persons (Harmful Publication) Act of 1956, The Indian Copyright Act 1957.

Unit 4. Press Commission and Press Council : Organization and work.

एम.ए.पत्रकारिता एवं जनसंचार
सेमेस्टर I सत्र-2017-18

पाठ्यक्रम संख्या MJMC (P-1)

व्यावहारिक कार्य

अधिकतम अंक : 100

व्यावहारिक प्रशिक्षण के दौरान विद्यार्थियों को अपने खर्च पर विभिन्न प्रिण्ट मीडिया संस्थाओं की कार्यप्रणाली का अध्ययन करना होगा और उसके आधार पर एक प्रोजेक्ट (व्यावहारिक कार्य) तैयार करना होगा। व्यावहारिक कार्य विद्यार्थी को हस्तलिखित या टंकित रूप में करना होगा। संस्थानों का चयन विभाग की अनुमति से होगा। इसका मूल्यांकन एवं मौखिकी आंतरिक परीक्षक के द्वारा किया जाएगा। 70 अंक व्यावहारिक प्रस्तुति का होगा और 30 अंक मौखिकी के लिए होगा।

**M.A.Journalism and Mass Communication
Semester I Session 2017-18**

MJMC (P-1)
Practical Work

MM : 100

During students Practical Training he/she has to undertake study of the working procedure of various Print-Media institutions and needs to prepare a Project report on the basis of his study and observations. Here it is pertinent to mention that the aforementioned study will be undertaken by the student at his/her own expense. The Project report prepared may be either hand written or typed. The choice of the institution where the study is to be undertaken will be with the permission of the Department.

The evaluation and Viva-voce of the Project work shall be done by the internal examiner. 70 Marks of Practical Presentation and 30 of vive-voce.

एम.ए.पत्रकारिता एवं जनसंचार
सेमेस्टर I सत्र-2017-18

पाठ्यक्रम संख्या MJMCSC (I) 105
कौशल पाठ्यक्रम (Skill Course): I
(विभाग के विद्यार्थियों के लिए)

पत्रकारिता एवं जनसंचार

उद्देश्य : पत्रकारिता एवं जनसंचार में फील्ड वर्क की बुनियादी जानकारी देना :

इकाई-1. पत्रकारिता एवं जनसंपर्क में फील्ड वर्क : परिभाषा , आवश्यकता एवं उद्देश्य

इकाई-2. पत्रकारिता एवं जनसंपर्क में फील्ड वर्क की विधियाँ, तकनीक एवं श्रेणी

इकाई-3 पत्रकारिता एवं जनसंपर्क में फील्ड वर्क के लिए प्रोजेक्ट रिपोर्ट तैयार करना-प्रमुख समस्याएँ एवं सीमाएँ

इकाई-4. सामाजिक, राजनीतिक , धार्मिक, आर्थिक, भौगोलिक, मनोवैज्ञानिक, क्षेत्र में चयनित फील्ड सर्वे

सहायक पुस्तकें:-

पत्रकारिता के मूल सिद्धांत : कन्हैया अगनानी

जनसंपर्क एवं संचार प्रबंधन : शैलेश सेनगुप्ता

जनसंपर्क : सिद्धांत और तकनीक : संजीव भानावत

क्षेत्रीय पत्रकारिता के ग्लोबल फलक : फ़ैसल अनुराग

M.A.Journalism and Mass Communication

पाठ्यक्रम संख्या MJMCSC (I) 105

कौशल पाठ्यक्रम (Skill Course): I
(विभाग के विद्यार्थियों के लिए)

Journalism and Mass Communication

- Unit 1.** Field work in journalism and mass communication : Definition , need and purpose.
- Unit 2.** Methods , Technique and categories of Journalism and mass communication in field work.
- Unit 3.** To prepare Project Report for field work in Journalism and Mass communication – Major problems and limitations.
- Unit 4.** Field Survey in selected areas – social, political, religious economic, geographical , Psychological.

एम.ए.पत्रकारिता एवं जनसंचार
सेमेस्टर II सत्र-2017-18

समय सीमा : 3 घण्टे

अधिकतम अंक : 100

ESE : 70

CCA : 30

परीक्षकों एवं विद्यार्थियों के लिए निर्देश :

1. प्रत्येक प्रश्नपत्र के अंतर्गत कुल 9 प्रश्न होंगे। जिनमें से पाँच प्रश्न करने अनिवार्य हैं।
2. प्रथम प्रश्न अतिलघूत्तरी का होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे सभी दस प्रश्न हल करना अनिवार्य होगा। प्रत्येक प्रश्न एक अंक का होगा।

10X 1 = 10 अंक

3. प्रथम प्रश्न के अलावा कुल आठ प्रश्न होंगे। सम्पूर्ण पाठ्यक्रम 4 इकाइयों में विभक्त है। प्रत्येक इकाई से दो-दो प्रश्न विकल्प सहित पूछे जायेंगे जिनमें से प्रत्येक इकाई से एक प्रश्न करना होगा।

4X 15 = 60 अंक

**M.A. JOURNALISM & MASS COMMUNICATION
(SEMESTER I I) 2017-18**

INSTRUCTIONS FOR THE PAPER-SETTERS AND THE STUDENTS

Duration – 3 hours

Max. Marks – 70

Note:

- (i) There shall be 9 questions in all. Five questions have to be attempted.
- (ii) The first question shall be short answer type containing 10 short questions spread over the whole syllabus to be answered in about 30 words each. Each question carries one marks . Question one therefore carries 10 marks and shall be a compulsory question.
10x1 = 10
- (iii) Rest of the paper shall contain 8 questions with internal choice. The entire syllabus has been divided into four units. Each unit shall have two questions and the candidates shall be given internal choice i.e. the candidate shall attempt one question from each unit
4x15 = 60

एम.ए.पत्रकारिता एवं जनसंचार
सेमेस्टर II सत्र-2017-18
पाठ्यक्रम संख्या MJMCC 201

पत्रकारिता की आचार संहिता और संबंधित संगठन

- इकाई-1.** पत्रकारिता की आचार संहिता : आवश्यकता और महत्व, परम्परा और परिप्रेक्ष्य, प्रेस की आचार संहिता
- इकाई-2.** भारतीय प्रेस परिषद् द्वारा निर्धारित पत्रकारिता के प्रमुख सिद्धांत , अखिल भारतीय समाचार पत्र संपादकों द्वारा पारित आचार संहिता, संपादकों की समिति द्वारा तैयार आचार संहिता
- इकाई-3.** संगठन : श्रमजीवी पत्रकारों के संगठन, गैर पत्रकारों के संगठन, संपादकों के संगठन, वेतन मण्डल
- इकाई-4.** विदेशी पत्रकार संघों की आचार संहिता : ब्रिटिश , आस्ट्रेलियन , नेशनल एण्ड पेन अमेरिकन, स्वीडन , टाइम्स समूह की आचार संहिता, आचार संहिता और विभिन्न दबाव

सहायक पुस्तकें :-

पत्रकारिता : सिद्धांत और स्वरूप : संजीव कुमार जैन

मीडिया लेखन और जनसंचार : संजीव कुमार जैन

पत्रकारिता का इतिहास तथा जनसंचार माध्यम : संजीव भानावत

M.A.Journalism and Mass Communication

पाठ्यक्रम संख्या MJMCC 201

Code of Conduct in Journalism and related organization

- Unit 1.** Code of Conduct in Journalism : Need and Importance, Tradition and context , Code of Conduct of Press.
- Unit 2.** Major Principles of Journalism as set by Indian Press Council, Code of Conduct as passed by All Indian News Editors, Code of Conduct as Prepared by committee of Editors.
- Unit 3.** Organization : Organization of Wage earner Journalists, Organization of non-journalists, organization of editors, Pay Board.
- Unit 4.** Code of Conduct of Union of foreign journalist : Code of Conduct of British, Australian, National and Pan-American, Sweden and Times group, Code of Conduct and Various Pressures.

एम.ए.पत्रकारिता एवं जनसंचार
सेमेस्टर II सत्र-2017-18

समय सीमा : 3 घण्टे

अधिकतम अंक : 100

ESE : 70

CCA : 30

पाठ्यक्रम संख्या MJMCC 202

समाचार पत्रकारिता के मूल आधार

इकाई-1. समाचार : परिभाषा, तत्व एवं प्रकार , विषयवस्तु , प्रकृति , व्याख्या, रिपोर्टिंग विधि, प्रस्तुतीकरण की विशिष्ट शैली, घटना का महत्व- घटना स्थल या क्षेत्र एवं विषय अथवा बीट के आधार पर समाचार के स्रोत

इकाई-2. समाचार सम्पादन : लेखन आर प्रस्तुति , समाचारों की भाषा , मुख्यांश (लीड तथा इण्ट्रो) , शीर्षक , समय-सीमा (डेड लाइन), प्रकाशन रोको (एम्बार्गो)

इकाई-3. संवाददाता : संवाददाता के गुण एवं कार्य , संवाददाता के विविध रूप एवं श्रेणियाँ:-

विशेष संवाददाता, मुख्य कार्यालय संवाददाता, उपमुख्य कार्यालय संवाददाता, कार्यालय संवाददाता, प्रेस क्राफेंस एवं साक्षात्कार : महत्व , विधियाँ, लेखन एवं विश्लेषण

इकाई-4. संवाद समिति : अवधारणा, उपयोगिता, कार्यप्रणाली, भारत की संवाद समितियाँ, प्रमुख अन्तरराष्ट्रीय समाचार समितियाँ

सहायक पुस्तकें :-

समाचार , फीचर-लेखन एवं सम्पादन कला : हरिमोहन

भेंटवार्ता और प्रेस क्राफेंस : नन्दकिशोर त्रिखा

संवाद समिति की पत्रकारिता : संपा. रामशरण जोशी

समाचार सम्पादन : कमल दीक्षित , महेश दर्पण

M.A. Journalism and Mass Communication

पाठ्यक्रम संख्या MJMCC 202

Basics of News Journalism

- Unit 1.** News : Definition, element and types , Subject matter (Topic) nature explanation, method of reporting, special style of presentation, Importance of incidence – Source of news on the basis of accident place/area and subject or beat.
- Unit 2.** News Editing : Writing and Presentation, Language of the news, Lead and Intro, Title, dead-line and embargo.
- Unit 3.** Reporter(Correspondent) : Merit and work of a reporter, Various types and categories of reporters :- Special reporter, Chief Press Office Reporter, Sub Press office Reporter, Press Office Reporter, Press Conference and interview : Importance, Techniques, Writing and analysis.
- Unit 4.** Communication Committee : Concept, Utility, Work Procedure, Communication Committees of India , Major International News Committees.

एम.ए.पत्रकारिता एवं जनसंचार
सेमेस्टर II सत्र-2017-18

समय सीमा : 3 घण्टे

अधिकतम अंक : 100

ESE : 70

CCA : 30

पाठ्यक्रम संख्या MJMCC 203

हिन्दी पत्रकारिता का इतिहास II (1921 से अद्यतन)

इकाई-1. बीसवीं शताब्दी के तीसरे दशक से स्वतंत्रता-प्राप्ति तक की पत्रकारिता, पत्रकार महात्मा गांधी तथा गांधी -युग की पत्रकारिता

इकाई-2. प्रमुख समाचार पत्र : आज, प्रताप , कर्मवीर , प्रभा, भारत मित्र, विशाल भारत, हंस, चाँद, विप्लव, दैनिक हिन्दुस्तान , मधुकर , स्वतंत्र, महारथी , साप्ताहिक सैनिक , नवीन राजस्थान एवं त्यागभूमि,

इकाई-3. प्रमुख पत्रकार : बाबूराव विष्णुराव पराङकर , गणेश शंकर विद्यार्थी , शिवपूजन सहाय, माखनलाल चतुर्वेदी, माधवराव सप्रे, अम्बिकाप्रसाद वाजपेयी

इकाई-4. स्वातंत्र्योत्तर हिन्दी पत्रकारिता : प्रमुख राष्ट्रीय एवं सामाजिक पत्रों का अध्ययन, साप्ताहिक, पाक्षिक, मासिक, त्रैमासिक हिन्दी पत्रिकाओं का अध्ययन

सहायक पुस्तकें :-

हिन्दी पत्रकारिता : विविध आयाम : भँवरलाल सुराना

हिन्दी पत्रकारिता : कृष्ण बिहारी मिश्र

हिन्दी पत्रकारिता का इतिहास : अर्जुन तिवारी

स्वाधीनता के बाद हिन्दी पत्रकारिता का विकास : रामचन्द्र तिवारी

M.A. Journalism and Mass Communication

पाठ्यक्रम संख्या MJMCC 203

History of Hindi Journalism II (1921 to till date)

- Unit 1.** Journalism in the third decade of the 20th Century till the freedom was obtained, Journalist Mahatma Gandhi and Journalism of Gandhian age.
- Unit 2.** Major Newspaper : Aaj, Pratap, Karmveer, Prabha, Bharat Mitra, Vishal Bharat, Hans , Chand, Viplav , Dainik Hindustan, Madhukar, Swatantra, Maharathi, Saptahik Sainik, Navin Rajasthan avam Tyagbhoomi.
- Unit 3.** Major Journalists : Baburao Vishnurao Paradkar, Ganesh Shankar Vidharthi. Shivpujan Sahay, Makhanlal Chaturvedi, Madhavrao Sapray, Ambikaprasad vajpayee
- Unit 4.** Hindi Journalism post independence : Study of major national and social journal/ magazines study of weekly, fortnight, monthly and quarterly Hindi magazines

एम.ए.पत्रकारिता एवं जनसंचार
सेमेस्टर II सत्र-2017-18

समय सीमा : 3 घण्टे

अधिकतम अंक : 100

ESE : 70

CCA : 30

पाठ्यक्रम संख्या MJMCC 204

सम्पादन-कला

- इकाई-1.** सम्पादन कला : परिभाषा, सिद्धांत और स्वरूप , समाचार पत्र संपादन : सिद्धांत एवं स्वरूप , पत्रिका संपादन : सिद्धांत एवं स्वरूप , सम्पादकीय लेखन
- इकाई-2.** सम्पादकीय विभाग की संरचना : स्वरूप एवं संगठन, कार्यप्रणाली , संरचना और वर्गीकरण, संदर्भ सामग्री
- इकाई-3.** सम्पादकीय विभाग का अन्य विभागों से संबंध, सम्पादक और सहकर्मी, सम्पादक, सहायक संपादक, ब्यूरो प्रमुख , विशेष संवाददाता, उपसंपादक, विशिष्ट पृष्ठों के संपादक
- इकाई-4.** सम्पादन के प्रतिमान : विचारधारा और दृष्टिकोण का निर्माण, निष्पक्षता और नैतिकता, तथ्यान्वेषण : वस्तुपरकता और सत्यनिष्ठा, मानवीय संवेदनशीलता

सहायक पुस्तकें :-

- सम्पादन कला : संजीव भानावत
सम्पादन कला : के.पी.नारायण
सम्पादन कला : प्रेमनाथ चतुर्वेदी
पत्रकार कला : विष्णुदत्त शुक्ल

M.A. Journalism and Mass Communication

पाठ्यक्रम संख्या MJMCC 204

Art of Editing

- Unit 1.** Art of Editing : Definition, Principle and form,
Editing of Newspaper : Principle and form,
Editing of magazine : Principle and form
Editorial writing : Principle and form
- Unit 2.** Arrangement of Editorial department : Form and Organization ,
work procedure, Arrangement and categorization, Reference
material.
- Unit 3.** Relation of Editorial department with other departments, Editor
and associates worker, Editor, Assistant Editor, Bureau Chief,
Special Correspondent, Sub-Editor, Editor of Special pages.
- Unit 4.** Standard of Edition : Construction of Ideology and point of
view, impartiality and morality, Discovery of facts: Subjectivity
and honesty , Human sensibility.

एम.ए.पत्रकारिता एवं जनसंचार
सेमेस्टर II सत्र-2017-18

पाठ्यक्रम संख्या MJMC (P- 2)

व्यावहारिक कार्य

अधिकतम अंक : 100

व्यावहारिक प्रशिक्षण के दौरान विद्यार्थियों को सैद्धांतिक प्रश्न पत्रों की परीक्षा प्रारंभ होने से पूर्व समाचार पत्र के नमूने के रूप में लगभग आठ पृष्ठों का (टेबलाइज्ड साइज में) एक हस्तलिखित/टंकित प्रारूप प्रस्तुत करना होगा। जिसे परीक्षा अनुभाग को भेजा जायेगा। समाचार पत्र का यह नमूना नितान्त मौलिक होगा। इसका मूल्यांकन एवं मौखिकी बाह्य परीक्षक के द्वारा किया जाएगा। 70 अंक व्यावहारिक प्रस्तुति का होगा और 30 अंक मौखिकी के लिए होगा।

**M.A.Journalism and Mass Communication
Semester II Session 2017-18**

MJMC (P-2)
Practical Work

MM : 100

During Practical training the student before his/her theory examination commences will have to present atleast eight pages hand-written or typed report in a **Newspaper format**.

The Periodical prepared by the student will be sent to the Examination Department. Here it is important to note that the **Newspaper prepared by the student must be his\ her Original Work**.

Evaluation and viva-voce of the aforementioned project work will be done by External Examiner.

Marking Scheme of the practical work – 70 Marks Practical Presentation and 30 viva voce.

एम.ए.पत्रकारिता एवं जनसंचार
सेमेस्टर II सत्र-2017-18

पाठ्यक्रम संख्या MJMCSC (II) 205
कौशल पाठ्यक्रम(Skill Course) : II
(अन्य विभाग के विद्यार्थियों के लिए)
पत्रकारिता प्रशिक्षण : सामान्य परिचय

- इकाई-1.** पत्रकारिता का स्वरूप एवं प्रकार , विश्व पत्रकारिता का उदय, भारत में पत्रकारिता का आरंभ, हिन्दी पत्रकारिता : विकास के विभिन्न चरण
- इकाई-2.** समाचार पत्रकारिता के मूल तत्त्व – समाचार –संकलन एवं लेखन के प्रमुख आयाम,
समाचार के विभिन्न स्रोत, संवाददाता की अर्हता, श्रेणी एवं कार्य पद्धति
- इकाई-3.** सम्पादन कला के सामान्य सिद्धांत – शीर्षकीकरण , पृष्ठ विन्यास, आमुख और समाचार पत्र की प्रस्तुति – प्रक्रिया, समाचार पत्रों के विभिन्न स्तम्भों की योजना
- इकाई-4.** पत्रकारिता से संबंधित लेखन : सम्पादकीय , फीचर , रिपोर्टाज , साक्षात्कार, खोजी समाचार, अनुवर्तन (फालोअप) आदि की प्रविधि , दृश्य-सामग्री (कार्टून , रेखाचित्र ग्राफिक्स) की व्यवस्था और फोटो पत्रकारिता

सहायक पुस्तकें :-

हिन्दी पत्रकारिता का आलोचनात्मक इतिहास : रमेश कुमार जैन
हिन्दी समाचार पत्रों का इतिहास : अम्बिका प्रसाद वाजपेयी
हिन्दी पत्रकारिता : रमेशचन्द्र त्रिपाठी
समाचार पत्र और सम्पादन-कला : अम्बिका प्रसाद वाजपेयी

M.A. Journalism and Mass Communication

पाठ्यक्रम संख्या MJMCSC (II) 205

कौशल पाठ्यक्रम(Skill Course) : II

(अन्य विभाग के विद्यार्थियों के लिए)

Journalism Training : General Information

- Unit 1.** Forms and Types of Journalism: Rise of World Journalism, Advent/ beginning of journalism in India, Hindi Journalism : Various Phases of development..
- Unit 2.** Main Principles of Newspaper Journalism- Major dimensions of news- Collection and writing, Various sources of news, Qualification of the correspondent, Category and work method.
- Unit 3.** Common principles of the art of editing : Title (Shirshakikaran) , Paper layout, Introduction and presentation of News paper – procedure, planning of different columns.



**DEPARTMENT OF JOURNALISM AND MASS
COMMUNICATION**

JAI NARAIN VYAS UNIVERSITY, JODHPUR

Syllabus

of

M.A.

**Journalism and Mass
Communication Semester III & IV
Year 2023-2024**

एम.ए. पत्रकारिता एवं जनसंचार

सेमेस्टर – III 2023

समय सीमा : 3 घंटे

अधिकतम अंक :

100

ESE : 70

CCA : 30

परीक्षकों एवं विद्यार्थियों के लिए निर्देश -

1. प्रत्येक प्रश्नपत्र के अंतर्गत कुल 9 प्रश्न होंगे। जिसमें से पाँच प्रश्न करने अनिवार्य हैं।
2. प्रथम प्रश्न अतिलघूत्तरी का होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे सभी दस प्रश्न हल करना अनिवार्य होगा। प्रत्येक प्रश्न एक अंक का होगा।

10 × 1 = 10 अंक

3. प्रथम प्रश्न के अलावा कुल आठ प्रश्न होंगे। सम्पूर्ण पाठ्यक्रम 4 इकाइयों में विभक्त है। प्रत्येक इकाई से दो-दो प्रश्न विकल्प सहित पूछे जायेंगे जिनमें से प्रत्येक इकाई से एक प्रश्न करना होगा।

4 × 15 = 60 अंक

M.A. JOURNALISM & MASS COMMUNICATION (SEMESTER III) 2023

INSTRUCTIONS FOR THE PAPER-SETTERS AND THE STUDENTS

Duration – 3 hours

Max. Marks – 70

Note:

- (i) There shall be 9 questions in all. Five questions have to be attempted.
- (ii) The first question shall be short answer type containing 10 short questions spread over the whole syllabus to be answered in about 30 words each. Each question carries one marks . Question one therefore carries 10 marks and shall be a compulsory question.

10 × 1 = 10 Marks

- (iii) Rest of the paper shall contain 8 questions with internal choice. The entire syllabus has been divided into four units. Each unit shall have two questions and the candidates shall be given internal choice i.e. the candidate shall attempt one question from each unit

4 × 15 = 60 Marks

एम.ए. पत्रकारिता एवं जनसंचार

सेमेस्टर – III सत्र : 2023

पाठ्यक्रम संख्या MJMCC 301

पृष्ठसज्जा एवं मुद्रण

समय सीमा : 3 घंटे

अधिकतम अंक : 100 (ESE = 70, CCA = 30)

- इकाई-1** पृष्ठसज्जा: सिद्धांत एवं अवधारणा, समाचार-पत्र एवं पत्रिका की पृष्ठसज्जा : सिद्धांत एवं तकनीक
- इकाई-2** पृष्ठसज्जा के विविध अंग - पृष्ठ का आकार (फॉर्मेट), सामग्री का संयोजन एवं पृष्ठ निर्माण, मुख पृष्ठ, मुख पृष्ठ के भेद, अन्य पृष्ठों की सज्जा, विशिष्ट पृष्ठों की सज्जा, शीर्षक, प्रूफ संशोधन
- इकाई-3** दृश्य सामग्री: फोटोग्राफ, कार्टून: चयन, सम्पादन एवं प्रस्तुति, रेखाचित्र, फोटो पत्रकारिता-फोटोग्राफी की तकनीक एवं संपादन, जनसंचार माध्यमों में फोटोग्राफी
- इकाई-4** मुद्रण की परम्परागत प्रणालियाँ, मुद्रण की आधुनिक प्रणालियाँ, डेस्क टॉप पब्लिशिंग (डी.टी.पी.), ऑनलाइन एडिटिंग

सहायक पुस्तकें –

- समाचार, फीचर लेखन एवं सम्पादन कला : हरिमोहन
- सम्पादन कला : के.पी. नारायण
- सम्पादन कला : संजीव भानावत
- प्रयोजनमूलक हिन्दी की नयी भूमिका : कैलाश नाथ पाण्डेय

M.A. JOURNALISM & MASS COMMUNICATION

Semester III 2023

Syllabus No. MJMCC -301

Page Designing and Printing

- Unit-1.** Page Designing : Principles and Concept, designing of newspaper and magazine : Principle and Technique
- Unit-2.** Types of page designing – Size of paper (Format), Content Combination and Page formation, Front Page, Types of Front Page, Design of other pages, design of special pages, Title, Proof reading.
- Unit-3.** Visual Content : Photographs, Cartoons : Selection, editing and presentation, word sketch, photo Journalism -- Technique and editing of photography, photography in mass media.
- Unit-4.** Traditional techniques of printing, modern technique of printing, Desk top Publishing (DTP), online editing.

एम.ए. पत्रकारिता एवं जनसंचार

सेमेस्टर – III सत्र : 2023

पाठ्यक्रम संख्या MJMCC 302

जनसंचार माध्यम

समय सीमा : 3 घंटे
30)

अधिकतम अंक : 100 (ESE = 70, CCA =

- इकाई-1** जनसंचार : अर्थ एवं स्वरूप, जनसंचार के उद्देश्य, जनसंचार की विशेषताएँ, जनसंचार और समाज
- इकाई-2** विकासशील देशों में जनसंचार की भूमिका, सामाजिक परिवर्तन में जनसंचार की भूमिका, जनसंपर्क की चुनौतियाँ
- इकाई-3** प्रिण्ट मीडिया : समाचार पत्र, पुस्तकें, इशितहार, पर्चे, समाचार समितियाँ, समाचार पत्रों की भाषा एवं लेखन कला
- इकाई-4** इलेक्ट्रॉनिक मीडिया : रेडियो, सामुदायिक रेडियो, टेलीविजन-इतिहास, प्रभाव, फिल्म-वीडियो पत्रकारिता, सेटेलाइट (उपग्रह) आधारित तकनीक, ऑनलाइन पत्रकारिता, रेडियो/टेलीविजन-समाचार-लेखन

सहायक पुस्तकें –

- जनसंचार : बदलते परिप्रेक्ष्य में : बलवीर कुन्द्रा
दृश्य-श्रव्य सम्प्रेषण और पत्रकारिता : जेम्स. एस. मूर्ति
दूरदर्शन स्वायत्तता और पत्रकारिता : सुधीश पचौरी
दृश्य-श्रव्य माध्यम लेखन : राजेन्द्र मिश्र

M.A. JOURNALISM & MASS COMMUNICATION

Semester III 2023

Course No. MJMCC -302

Mass Media

- Unit-1.** Mass Communication : Meaning and form, objects of Mass Communication, Characteristics of Mass Communication, Mass Communication and Society.
- Unit-2.** Role of Mass Communication in developing Countries, Role of Mass Communication in Social Changes, Challenges of Public Relation.
- Unit-3.** Print Media – Newspaper, books, Posters, pamphlete, News agencies, Language of News papers and Art of writing.
- Unit-4.** Electronic Media : Radio, Community Radio, Television – History, Impact, Film-Video Journalism, Satellite based Technique, online Journalism, News Writing of Radio/Television.

एम.ए. पत्रकारिता एवं जनसंचार

सेमेस्टर – III सत्र : 2023

पाठ्यक्रम संख्या MJMCC 303 (A) (वैकल्पिक)

निर्देश – किसी एक का चयन करें

A- जनसंपर्क

समय सीमा : 3 घंटे

अधिकतम अंक : 100 (ESE = 70, CCA = 30)

- इकाई-1** जनसंपर्क का अर्थ, परिभाषा, तत्त्व, जनसंपर्क के उद्देश्य, जनसंपर्क का क्षेत्र, जनसंपर्क : सिद्धांत एवं व्यवहार
- इकाई-2** जनसंपर्क : उद्भव एवं विकास, जनसंपर्क के विविध आयाम, जनसंपर्क : नयी दिशाएँ
- इकाई-3** जनसंपर्क क कार्य एवं भूमिका, केन्द्र एवं राज्यों में जनसंपर्क संस्थाएँ, प्रेस और जनसंपर्क, जनसंपर्क की चुनौतियाँ, जनसंपर्क अधिकारी : गुण एवं कार्य
- इकाई-4** सार्वजनिक एवं निजी संस्थाओं में जनसंपर्क, जनसंपर्क के उपकरण, जनसंपर्क का व्यवस्थापन, जनमत निर्माण में जनसंपर्क की उपादेयता, जनसंपर्क में कैरियर

सहायक पुस्तकें –

भारत में जनसंपर्क : बलदेवराज गुप्ता

जनसंपर्क : कालीदत्त झा

पत्रकारिता संकट और संत्रास : हेरम्ब मिश्र

M.A. JOURNALISM & MASS COMMUNICATION

Semester III 2023

Syllabus No. MJMCEC - 303(A) (Optional)

Note : Choose any one

A- Public Relation

- Unit -1.** Meaning of Public Relation, Defination, element, objects of public Relation, Area of Public Relation, Public Relation : Principles and practice.
- Unit-2.** Public Relation – Emergence and development, Different dimention of public relation, Public Relation : New Directions.
- Unit-3.** Work and Role of Public Relation, Public relation institution in states and centre, press and public relation, challenges of public relation, Public Relation Officer : Qualities and duties.
- Unit-4.** Public Relation in public and private institutions, Accessories of Public Relation, Management of Public Relation, Utility of Public Relation to creat Public opinion, Career in public Relation.

एम.ए. पत्रकारिता एवं जनसंचार

सेमेस्टर – III सत्र : 2023

पाठ्यक्रम संख्या MJMCEC 303 (B) (वैकल्पिक)

निर्देश – किसी एक का चयन करें

B- जनसंपर्क एवं विज्ञापन

समय सीमा : 3 घंटे
30)

अधिकतम अंक : 100 (ESE = 70, CCA =

- इकाई-1** जनसंपर्क : अवधारणा एवं स्वरूप, सिद्धांत एवं व्यवहार, उद्भव एवं विकास की स्थितियाँ
- इकाई-2** जनसंपर्क के विविध आयाम, जनसंपर्क के कार्य एवं भूमिका, केन्द्र एवं राज्यों में जनसंपर्क संस्थाएँ, सार्वजनिक एवं निजी संस्थाओं में जनसंपर्क, जनसंपर्क का व्यवस्थापन
- इकाई-3** विज्ञापन : अवधारणा एवं उद्देश्य, विज्ञापन : सिद्धांत एवं स्वरूप, विज्ञापन : उद्भव एवं विकास, विज्ञापन का समाजशास्त्र
- इकाई-4** विज्ञापन के माध्यम एवं तत्त्व, विज्ञापन कॉपी की प्रस्तुति, विज्ञापन अभियान, विज्ञापन का मनोविज्ञान, विज्ञापन एजेंसियाँ : संगठन एवं कार्यप्रणाली

सहायक पुस्तकें –

राज्य सरकार और जनसंपर्क : कालीदत्त झा, रघुनाथ प्रसाद तिवारी

मीडिया और बाजारवाद : रामशरण जोशी

Communication in Organizations : D. Fisher

M.A.JOURNALISM & MASS COMMUNICATION

Semester III 2023

Syllabus No. MJMCEC - 303(B) (Optional)

Note : Choose any one

B- Public Relation and Advertisement

- Unit-1.** Public Relation : Concept and forms, Principles and practice, emergence and circumstances of development.
- Unit-2.** Various dimensions of public Relation, Work and role of public relation, Public Relation institutions in State and Centre, Public Relation in Public and Private Sector, Management of Public Relation.
- Unit-3.** Advertisement : Concept and objects, Advertisement : Principles and Form, Advertisement : emergence and development, Sociology of Advertisement.
- Unit-4.** Mediums and elements of Advertisement, Presentation of Advertisement Copy, Advertisement Campaign, Psychology of Advertisement, Advertisement Agencies : Organisation and Working procedure .

एम.ए. पत्रकारिता एवं जनसंचार

सेमेस्टर – III सत्र : 2023

पाठ्यक्रम संख्या MJMCEC 304 (A) (वैकल्पिक)

निर्देश – किसी एक का चयन करें

A- कम्प्यूटर एप्लीकेशन एवं साइबर मीडिया

समय सीमा : 3 घंटे

अधिकतम अंक : 100 (ESE = 70, CCA = 30)

- इकाई-1** कम्प्यूटर तथा इसका विकास, कम्प्यूटर : संरचना एवं कार्य, मीडिया में कम्प्यूटर की भूमिका
इकाई-2 कम्प्यूटर एवं मल्टीमीडिया : इलेक्ट्रॉनिक माध्यमों एवं मुद्रित माध्यमों में
इकाई-3 वेबसाइट : तत्व, प्रकार, निर्माण एवं उपयोगिता, इंटरनेट : अवधारणा, स्वरूप एवं सेवाएँ
इकाई-4 साइबर मीडिया : अवधारणा एवं स्वरूप, वेब रेडियो एवं टेलीविजन, साइबर मीडिया का प्रबंध एवं अर्थशास्त्र, अभिव्यक्ति की आजादी और ब्लॉग, ई. सम्पादन एवं ई. प्रकाशन

सहायक पुस्तकें –

नयी सूचना व्यवस्था अथवा मनोवैज्ञानिक युग : येमरिकन ग्रचोवनी
जनसंचार : बदलते परिप्रेक्ष्य : बलवीर कुन्द्रा
मीडिया लेखन एवं जनसंचार : संजीव कुमार जैन
सम्प्रेषण एवं संचार साधन : मध्यप्रदेश ग्रंथ अकादमी

M.A. JOURNALISM & MASS COMMUNICATION

Semester III 2023

Course No. MJMCEC - 304(A) (Optional)

Note : Choose any one

A-Computer Application and Cyber Media

- Unit-1.** Computer and its development, Computer : Structure and task. Role of Computer in media.
- Unit-2.** Computer and Multimedia : in electronic media and in Print media.
- Unit-3.** Web Site : Elements, Types, Formation and utilities, Internet : Concept, Form and Services.
- Unit-4.** Cybermedia – Concept and Form, Web Radio and Television, Management and economics of cyber media, Freedom of expression and Blog, E-editing and E-Publication.

एम.ए. पत्रकारिता एवं जनसंचार

सेमेस्टर – III सत्र : 2023

पाठ्यक्रम संख्या MJMCC 304 (B) (वैकल्पिक)

निर्देश – किसी एक का चयन करें

A- विकासात्मक जनसंचार

समय सीमा : 3 घंटे

अधिकतम अंक : 100 (ESE = 70, CCA = 30)

- इकाई-1** विकासात्मक जनसंचार : अर्थ, क्षेत्र, महत्त्व, तीसरी दुनिया में विकासात्मक जनसंचार, तीसरी दुनिया में विकास की प्रक्रिया और सामाजिक परिवर्तन
- इकाई-2** तीसरी दुनिया में विकासात्मक संचार : प्रकरण अध्ययन, जनसंचार माध्यमों का विकास एवं जीवन-स्तर, पारंपरिक जनसंचार माध्यम : महत्त्व एवं उपयोग
- इकाई-3** विकासात्मक संचार, ग्रामीण विकास की समस्याएँ, जनसंचार और संस्कृति, उन्नत कृषि में जनसंचार माध्यमों का योगदान
- इकाई-4** विकासात्मक जनसंचार शोध : एक समीक्षा, शैक्षणिक तकनीकी, सूचना तकनीकी बिल

सहायक पुस्तकें –

इक्कीसवीं सदी के संकट : रामशरण जोशी

मीडियाकालीन हिन्दी : स्वरूप एवं संभावनाएँ : अर्जुन चव्हाण

सूचना प्रौद्योगिकी और समाचार पत्र : रवीन्द्र शुक्ल

The Story of Human Communication : Wilvur Schramm

Human Communication : The Basic Course : Devito A. Joseph

Communication for Development in the third World : Srinivas Mekote and H.L.Steovs

Communication and Indina Agriculture : Ranals Ostman

M.A. JOURNALISM & MASS COMMUNICATION

Semester III 2023

Course No. MJMCEC – 304 (B) (Optional)

Note : Choose any one

B-Developmental Mass Communication

- Unit-1.** Developmental Mass Communication : Meaning, Scope, Importance, Developmental Mass communication in third World, Development Process and Social Changes in third World.
- Unit-2.** Developmental Communication in Third World: Event study, Development of mass medium and Quality of life, Traditional Mass Communication : Importance and Utility.
- Unit-3.** Developmental Communication, Problems of Rural Development, Mass Communication and Culture, Role of Mass Communication in advanced agriculture.
- Unit-4.** Developmental Mass Communication Research : A Review, Academic Technology, Information technology bill.

एम.ए. पत्रकारिता एवं जनसंचार

सेमेस्टर – III सत्र : 2023

पाठ्यक्रम संख्या MJMC (P-3)

व्यवहारिक कार्य

व्यावहारिक प्रशिक्षण के दौरान विद्यार्थियों को अपने खर्च पर विभिन्न इलेक्ट्रॉनिक मीडिया संस्थाओं की कार्यप्रणाली का अध्ययन करना होगा और उसके आधार पर एक प्रोजेक्ट (व्यावहारिक कार्य) तैयार करना होगा। व्यावहारिक कार्य विद्यार्थी को हस्तलिखित या टंकित रूप में करना होगा। संस्थानों का चयन विभाग की अनुमति से होगा। इसका मूल्यांकन एवं मौखिकी दो आंतरिक परीक्षकों के द्वारा किया जाएगा। 70 अंक व्यावहारिक प्रस्तुति एवं मौखिकी के लिए होगा। 30 अंक CCA का होगा।

M.A. JOURNALISM & MASS COMMUNICATION

Semester-III 2023

Course No. MJMC – (P-3)

Practical Work

During Practical training the students have to study of working of various electronic media institutions and prepare a project on their own expense, The project should be either hand written or typed, The Selection of training institution will be with the permission of the department. The Project evaluation and viva-voce exam will be conducted by the Two internal examiner. 70 marks are allotted for project work and viva-voce. 30 Marks for CCA.

एम.ए. पत्रकारिता एवं जनसंचार

सेमेस्टर – III सत्र : 2023

पाठ्यक्रम संख्या MJMCSC 305 (III)

कौशल पाठ्यक्रम

(विभाग के विद्यार्थियों के लिए)

ग्रामीण एवं पर्यावरण पत्रकारिता

- इकाई-1** ग्रामीण जनसंचार की प्रकृति एवं क्षेत्र, लोक माध्यम, भारत के प्रमुख लोक माध्यम, मौखिक परम्पराएँ एवं लोक माध्यम
- इकाई-2** पर्यावरण की अवधारणा एवं स्वरूप, भारत में पर्यावरण एवं पर्यावरणीय समस्याएँ, पर्यावरण और जनसंचार, भारत में पर्यावरणीय आंदोलन
- इकाई-3** ग्रामीण एवं पर्यावरण पत्रकारिता, ग्रामीण क्षेत्रों में जनसंचार का योगदान, ग्रामीण जनसंचार एवं सामाजिक परिवर्तन, ग्रामीण जनसंचार एवं ग्रामीण विकास
- इकाई-4** ग्रामीण पत्रकारिता की लघु एवं मध्यम पत्र-पत्रिकाएँ, ग्रामीण जनसंचार में इलेक्ट्रॉनिक माध्यमों का योगदान, भारत में भाषायी पत्रकारिता, पर्यावरणीय कानून

सहायक पुस्तकें –

मीडिया: समकालीन सांस्कृतिक विमर्श: सुधीश पचौरी

संचार माध्यम लेखन : गौरीशंकर रैणा

उत्तर आधुनिक मीडिया विमर्श: सुधीश पचौरी

M.A. JOURNALISM & MASS COMMUNICATION

Semester III 2023

Skill Course : MJMCSC 305(III)

(For the students of M.A.(Department of Journalism & Mass Communication)

Rural and Environmental Journalism

- Unit-1.** Nature and Area of Rural Mass Communication, Public Mediums, Main Public Mediums of India, Verbal Traditions and Folk mediums.
- Unit -2.** Concept and Form of Environment, Environment and Environmental Problems in India, Environment and Mass Communication, Environmental Revolution in India.
- Unit-3.** Rural and Environmental Journalism, Contribution of Mass Communication in rural areas Rural mass Communication and Social Changes, Rural Mass Communication and rural Development.
- Unit-4.** Small and medium News papers, magazines of Rural Journalism, Contribution of electronic media in Rural Mass Communication, Regional Journalism in India, Environment's Laws.

एम.ए. पत्रकारिता एवं जनसंचार

सेमेस्टर – IV 2023-2024

समय सीमा : 3 घंटे

अधिकतम अंक :

100

ESE : 70

CCA : 30

परीक्षकों एवं विद्यार्थियों के लिए निर्देश -

1. प्रत्येक प्रश्नपत्र के अंतर्गत कुल 9 प्रश्न होंगे। जिसमें से पाँच प्रश्न करने अनिवार्य हैं।
2. प्रथम प्रश्न अतिलघूत्तरी का होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे सभी दस प्रश्न हल करना अनिवार्य होगा। प्रत्येक प्रश्न एक अंक का होगा।

10 × 1 = 10 अंक

3. प्रथम प्रश्न के अलावा कुल आठ प्रश्न होंगे। सम्पूर्ण पाठ्यक्रम 4 इकाइयों में विभक्त है। प्रत्येक इकाई से दो-दो प्रश्न विकल्प सहित पूछे जायेंगे जिनमें से प्रत्येक इकाई से एक प्रश्न करना होगा।

4 × 15 = 60 अंक

M.A. JOURNALISM & MASS COMMUNICATION (SEMESTER IV) 2023-2024

INSTRUCTIONS FOR THE PAPER-SETTERS AND THE STUDENTS

Note:

- (i) There shall be 9 questions in all. Five questions have to be attempted.
- (ii) The first question shall be short answer type containing 10 short questions spread over the whole syllabus to be answered in about 30 words each. Each question carries one marks . Question one therefore carries 10 marks and shall be a compulsory question.

10x1

= 10

- (iii) Rest of the paper shall contain 8 questions with internal choice. The entire syllabus has been divided into four units. Each unit shall have two questions and the candidates shall be given internal choice i.e. the candidate shall attempt one question from each unit

4x15 = 60

एम.ए. पत्रकारिता एवं जनसंचार

सेमेस्टर – IV सत्र : 2023-2024

पाठ्यक्रम संख्या MJMCC 401

मीडिया लेखन

- इकाई-1** समाचार: अवधारणा एवं लेखन तकनीक, साक्षात्कार, स्तम्भ लेखन, फीचर लेखन, समाचार-स्रोत एवं संकलन, मीडिया लेखन के मूल तत्व
- इकाई-2** टेलीविजन के लिए फीचर लेखन, टेलीविजन के लिए लेखन, टेलीविजन संवाददाता, नाटक-लेखन, फिल्मों के लिए लेखन, पटकथा लेखन, साइबर मीडिया के लिए लेखन
- इकाई-3** रेडियो लेखन के सिद्धांत: रेडियो के लिए लेखन, उद्घोषणा-लेखन, रेडियो के लिए समूह लेखन, व्यंग्य लेखन
- इकाई-4** संस्मरण-लेखन, भेंटवार्ता लेखन, विज्ञापन लेखन, जनसंपर्क के लिए लेखन, सृजनात्मक लेखन, आत्मकथा-लेखन, रिपोर्टाज लेखन, कला-समीक्षा, पुस्तक समीक्षा

सहायक पुस्तकें –

मीडिया लेखन और जनसंचार: संजीव कुमार जैन

फीचर लेखन: मनोहर प्रभाकर

नयी पत्रकारिता और समाचार लेखन: सविता चड्ढा

मीडिया अनुसंधान: राजेन्द्र मिश्र

टेलीविजन लेखन: राजेन्द्र मिश्र

मीडिया की बदलती भाषा: अजय कुमार सिंह

M.A. JOURNALISM AND MASS COMMUNICATION

Semester III 2023-2024

Syllabus No. MJMCC 401

MEDIA WRITING

- Unit-1.** News- Concept and writing Technique, Interview, column writing, feature writing, News-Sources and collection, Basic elements of Media Writing.
- Unit-2.** Feature Writing for Television, Writing for Television, Television Correspondent, Drama writing, Writing for films, Script-Writing, Writing for Cyber Media.
- Unit-3.** Principles of Radio Writing : Writing for Radio, Announcement-Writing, Group-Writing for Radio, satire-Writing.
- Unit-4.** Memories Writing, Interview-Writing, Advertisement Writing, Writing For Public Relation, Creative-Writing, Autobiography-Writing, Report-Writing, Art-Review, Book-Review.

एम.ए. पत्रकारिता एवं जनसंचार

सेमेस्टर – IV सत्र : 2023-2024

पाठ्यक्रम संख्या MJMCC 402

जनसंचार-शोध-प्रविधि

- इकाई-1** शोध प्रविधि: अर्थ एवं प्रकृति, शोध की प्रक्रिया, शोध अध्ययन के विविध प्रकार, शोध अध्ययन : ऐतिहासिक सर्वेक्षण, सामग्री विश्लेषण एवं प्रकरण अध्ययन
- इकाई-2** जनसंचार-शोध-विषय का चयन एवं प्रक्रिया निर्धारण, जनसंचार-शोध-अध्ययन की परिकल्पना, जनसंचार में विषयनिष्ठता की समस्या
- इकाई-3** जनसंचार-शोध-तथ्य की तकनीक (प्रश्नावली, अनुसूची, साक्षात्कार, अवलोकन और प्रक्षेपीय तकनीक), शोध परिकल्पनाएँ, सर्वेक्षण-शोध, सहसंबंध, केन्द्रीय प्रवृत्ति की मापे (मध्य, माध्यका, बहुलक)
- इकाई-4** मीडिया अनुसंधान : मीडिया अनुसंधान की परियोजना, सूचना संजाल और शोध, सेटेलाइट टेलीविजन और अनुसंधान, मीडिया अनुसंधान की चुनौतियाँ

सहायक पुस्तकें –

मीडिया अनुसंधान: राजेन्द्र मिश्र

अनुसंधान की प्रविधि और प्रक्रिया: राजेन्द्र मिश्र

भारत में जनसंचार और प्रसारण मीडिया

M.A. JOURNALISM AND MASS COMMUNICATION

Semester III 2023-2024

Syllabus No. MJMCC 402

Mass Communication –Research - Methods

- Unit-1.** Research Technique : Meaning and Nature, Research-Process ,Different types of Research Study, Research study : Historical survey, content Analysis and Subject study.
- Unit-2.** Selection of Mass Communication Research Subject and Process Assessment, Hypothesis of Mass Communication Research study, Problem of Subjectivity in Mass Communication.
- Unit-3.** Technique of Mass Communication Research-Content (Questionnaire, Schedule, Interview, Observation and Projection Technique) Research hypothesis, Co relation of Survey and Research, Measurement of Central Trade (Mean, Median , Mode)
- Unit-4.** Media Research, Media Research Project, Information network and Research, Satellite television and research , Challenges of Media Research,

एम.ए. पत्रकारिता एवं जनसंचार

सेमेस्टर – IV सत्र : 2023-2024

पाठ्यक्रम संख्या MJMEC 403 (A) (वैकल्पिक)

निर्देश – किसी एक का चयन करें

A - साहित्यिक पत्रकारिता

- इकाई-1** साहित्यिक पत्रकारिता का संक्षिप्त परिचय, उद्देश्य एवं कार्यक्षेत्र, पत्रिका संपादन की जरूरत और चुनौतियाँ
- इकाई-2** साहित्यिक पत्रकारिता का भारतेन्दु युग, भारतेन्दु मण्डल के लेखक तथा इस युग की प्रमुख पत्रिकाओं का सिंहावलोकन
- इकाई-3** साहित्यिक पत्रकारिता का मालवीय एवं द्विवेदी युग, युग की प्रवृत्तियाँ, महत्वपूर्ण साहित्यिक पत्रकार एवं उनकी पत्रिकाएँ
- इकाई-4** गांधी एवं उनका परवर्ती युग, नए युग का सूत्रपात, भाषा का परिष्कार, स्वाधीनता प्रेम, प्रमुख साहित्यिक पत्रिकाएँ एवं उनके संपादक, 21वीं सदी की चुनौतियाँ और साहित्यिक पत्रकारिता

सहायक पुस्तकें –

साहित्यिक पत्रकारिता: ज्योतिष जोशी,

भारतीय स्वतंत्रता और पत्रकारिता: वंशीधर लाल

हिन्दी पत्रकारिता का इतिहास: अर्जुन तिवारी

हिन्दी साहित्य का इतिहास: आचार्य रामचन्द्र शुक्ल

M.A. JOURNALISM AND MASS COMMUNICATION

Semester III 2023-2024

Course No. MJMCEC 403(A) (Optional)

Note : Choose any One

A-Literary Journalism

- Unit-1.** Brief introduction of Literary journalism, objects and area, needs and challenges of Magazine- editing.
- Unit-2.** Bhartendu era of Literary Journalism, Authors of Bhartende Mandal and retrospection of Prominent magazine of this era.
- Unit-3.** Literary Journalism of Malaviya and Dwivedi era, Tendencies of this era, Important Literary Journalists and their's Magazines.
- Unit-4.** Gandhi and his post era, Beginning of new era, Refinement of Language, independent-love, Prominent Literary magazines and editors, Challenges of 21st Century and Literary Journalism.

एम.ए. पत्रकारिता एवं जनसंचार

सेमेस्टर – IV सत्र : 2023-2024

पाठ्यक्रम संख्या MJMEC 403 (B) (वैकल्पिक)

निर्देश – किसी एक का चयन करें

B – मीडिया कानून और आचार संहिता

- इकाई-1** महत्वपूर्ण प्रावधान और मीडिया - भारतीय संविधान, मौलिक अधिकार, वाक् और अभिव्यक्ति की स्वतंत्रता एवं उसकी सीमाएँ, अनुच्छेद 19(1), आपातस्थिति घोषणा का प्रावधान और मीडिया पर प्रभाव, संविधान संशोधन के प्रावधान
- इकाई-2** विशेषीकृत प्रेस कानून : भारत में प्रेस कानून का संक्षिप्त इतिहास, अदालत की अवमानना अधिनियम-1971, संसद और विधायिका की अवमानना, भारतीय दंड संहिता के प्रासंगिक प्रावधान, मानहानि, निन्दा लेख और राजद्रोह से संबंधित कानून, अश्लीलता से संबंधित कानून
- इकाई-3** विशेषीकृत प्रेस कानून : शासकीय गोपनीयता अधिनियम 1923, सूचना का अधिकार अधिनियम 2005 की तुलना, प्रेस और पुस्तक पंजीयन अधिनियम, आपत्तिजनक प्रकाशन के रोकथाम का अधिनियम, पत्रकारीय कार्य संबंधी अधिनियम, सिनेमेटोग्राफी अधिनियम 1953 की विशेषताएँ, प्रसार भारती अधिनियम
- इकाई-4** मीडिया कानून एवं जिम्मेदारी: सूचना प्रौद्योगिकी बिल, साइबर कानून, केबल टेलीविजन अधिनियम की विशेषताएँ, मीडिया और जनहित याचिका, प्रतिलिप्याधिकार (कॉपी राइट) अधिनियम 1957, बौद्धिक सम्पदा अधिकार, व्यापार चिह्न (ट्रेडमार्क) अधिनियम, पेटेंट अधिनियम, मीडिया की सामाजिक जवाबदेही, प्रेस परिषद् एवं प्रेस आयोग की संहिता एवं दिशा निर्देश, रेडियो, टेलीविजन, विज्ञापन और जनसंपर्क के लिए संहिता

सहायक पुस्तकें –

प्रेस कानून और पत्रकारिता: संजीव भानावत

द न्यूज पेपर इन इंडिया: हेमेन्द्र कुमार

M.A. JOURNALISM AND MASS COMMUNICATION

Semester III 2023-2024

Course No. MJMCEC 403(B) (Optional)

Note : Choose any One

B- MEDIA LAWS AND CODE OF CONDUCT

- Unit-1.** Important Provision and Media – Indian Constitution, Fundamental Rights, Freedom of Speech and expression and its limitations, Article 19(1), Provisions of emergency declaration and effect on Media, Provisions for amendment of Constitution.
- Unit-2.** Specialised Press Law : Brief History of Press Law in India, Contempt of Court Act-1971, Contempt of Parliaments and Legislature, Relevant Provisions of Indian Penal Code, Related Law of Contempt, Condemnation, Writing and Seditious, Laws related to Obscenity.
- Unit-3.** Specialised Press Law : Official Secrets Act 1923, Comparison of Right to Information Act 2005, Press and registration of books Act, Objectionable Publication Prevention Act, Act related to Journalistic work, Characteristics of Cinematography Act 1953, Prasar Bharti Act.
- Unit-4.** Press Laws and Responsibilities : Information–Technology bill, Cyber law, Characteristics of Cable Television Act, Media and Public interest litigation, Copyright Act 1957, Intellectual Property Right, Trade Mark Act, Patent Act, Social Responsibilities of Media, Laws and direction of Press Council and Press-Commission, Code for Radio, Television, Advertisement and Public-Relation.

एम.ए. पत्रकारिता एवं जनसंचार

सेमेस्टर – IV सत्र : 2023-2024

पाठ्यक्रम संख्या MJMEC 404 (A) (वैकल्पिक)

निर्देश – किसी एक का चयन करें

A – फीचर लेखन एवं पत्रिका संपादन

- इकाई-1** फीचर: अर्थ, परिभाषा, गुण एवं प्रकार, अन्य विधाएँ एवं फीचर संरचना, अच्छे फीचर लेखन के गुण
- इकाई-2** सामाजिक फीचर लेखन, रेडियो के लिए फीचर लेखन, भारत में मुक्त लेखन, उद्योगों के लिए लेखन, कृषि के लिए लेखन, पर्यावरण के लिए लेखन, फिल्मों के लिए लेखन, बच्चों के लिए लेखन
- इकाई-3** पत्रकारिता के विविध आयाम, सामाजिक पत्रकारिता, फिल्म पत्रकारिता, बाल पत्रकारिता, विशेष-पत्रिकाएँ, नाटक समीक्षा, फिल्म समीक्षा, कला समीक्षा, पुस्तक-समीक्षा
- इकाई-4** समाचार पत्र का संपादकीय प्रबंधन, पत्रिकाओं का संपादन, पत्रिका प्रकाशन की अर्थ व्यवस्था, पत्रिका विज्ञापन एवं वितरण प्रबंध, वाणिज्य एवं व्यापारिक लेखन

सहायक पुस्तकें –

पत्रिका सम्पादन कला: रामचन्द्र तिवारी

हिन्दी बाल पत्रकारिता: उद्भव और विकास: सुरेन्द्र विक्रम

हिन्दी पत्रकारिता के विविध आयाम: वेद प्रताप वैदिक

M.A. JOURNALISM AND MASS COMMUNICATION

Semester III 2023-2024

Syllabus No. MJMCEC 404(A) (Optional)

Note : Choose any One

A- FEATURE WRITING AND MAGAZINE EDITING

- Unit-1.** Feature : Meaning, Definition, Properties and Type, Other Different Forms and Feature-Structure, Properties of a good Feature Writing.
- Unit-2.** Social Feature Writing, Feature Writing for Radio, Free Writing in India, Writing for Industries, Writing for Agriculture, writing for environment, Writing for Films, Writing for Children.
- Unit-3.** Various dimensions of Journalism, Social Journalism, Film Journalism, Child Journalism, Special Magazine, Play review, Film review, Art Review, Book Review.
- Unit-4.** Editorial management of a News Paper, Editing of Magazines, Financial system of magazines Publications, Magazine Advertisements and distribution Management, Commercial and trade writing.

एम.ए. पत्रकारिता एवं जनसंचार

सेमेस्टर – IV सत्र : 2023-2024

पाठ्यक्रम संख्या MJMEC 404 (B) (वैकल्पिक)

निर्देश – किसी एक का चयन करें

B – विश्व का समाचार जगत

- इकाई-1** समाचार-पत्रों का उद्गम और विकास, अन्तर्राष्ट्रीय समाचार-जगत, विश्व के विकसित समाचार पत्र
- इकाई-2** एशिया में जनसंचार और नई सूचना प्रौद्योगिकी : दक्षिण एशिया एवं पूर्वी एशिया
- इकाई-3** एशिया में प्रेस कानून एवं प्रेस परिषद्, अन्तरराष्ट्रीय प्रेस-कानून एवं प्रेस परिषद्, प्रेस की स्वतंत्रता : अवधारणा एवं आकलन
- इकाई-4** टेलीविजन का वैश्वीकरण (एशिया के विशेष संदर्भ में), भारत में केबल एवं सेटेलाइट टेलीविजन, विश्व में रेडियों का उद्गम और विकास

सहायक पुस्तकें –

प्रेस कानून और पत्रकारिता: संजीव भानावत

पत्रकारिता का इतिहास तथा जनसंचार माध्यम: संजीव भानावत

पत्रकारिता: सिद्धांत और स्वरूप: संजीव भानावत

मीडिया और बाजारवाद: रामशरण जोशी

जनसंचार: बदलते परिप्रेक्ष्य: बलवीर कुन्द्रा

M.A. JOURNALISM AND MASS COMMUNICATION

Semester III 2023-2024

Syllabus No. MJMCEC 404(B) (Optional)

Note : Choose any One

B- NEWS WORLD OF WORLD

- Unit-1.** Origin and Development of News paper, International News-World, Developed news Paper of World.
- Unit-2.** Mass Communication and New Information Technology : South Asia and East Asia.
- Unit-3.** Press Law and Press Council in Asia, International Press Law and Press Council, Press Freedom : Concept and estimation.
- Unit-4.** Globalization of Television (in reference of Asia), Cable and setalite Television in India, Origin and development of Radio in World.

एम.ए. पत्रकारिता एवं जनसंचार

सेमेस्टर – IV सत्र : 2023-2024

पाठ्यक्रम संख्या MJMEC 404 (C)

A-लघु शोध प्रबंध

अधिकतम अंक : 100

इस प्रश्न पत्र के अंतर्गत छात्र को पत्रकारिता एवं जनसंचार विषय एवं क्षेत्र से जुड़े किसी एक विषय पर 100 पृष्ठों का लघु शोध-प्रबंध लिखना होगा। शोध-प्रबंध टंकित होगा तथा उसकी चार प्रतियाँ विभाग में जमा करवानी होंगी। इसका मूल्यांकन बाह्य परीक्षक द्वारा किया जाएगा। CCA 30 अंक एवं लघु शोध-प्रबंध 70 अंक का होगा।

M.A. JOURNALISM AND MASS COMMUNICATION

Semester III 2023-2024

Course No. MJMCEC 404(C)

A- Desertation

In this paper students have to write a Dissertation of 100 Pages related to the subject of Journalism and Mass Communication. Dissertation must be typed and four copies will be deposited in the department. It will be evaluated by the external examiner. CCA 30 Marks and Dissertation 70 Marks .

एम.ए. पत्रकारिता एवं जनसंचार

सेमेस्टर – IV सत्र : 2023-2024

पाठ्यक्रम संख्या MJMC (P-4)

व्यवहारिक कार्य

व्यवहारिक प्रशिक्षण के दौरान विद्यार्थियों को एक प्रोजेक्ट दिया जाएगा। जिसकी रिपोर्ट तैयार कर विभाग में जमा कराना होगा। इसका मूल्यांकन एवं मौखिकी परीक्षा का कार्य एक आंतरिक एवं एक बाह्य दोनों परीक्षकों के द्वारा किया जाएगा। -70 अंक प्रोजेक्ट प्रस्तुति एवं मौखिकी के लिए होगा। 30 अंक CCA का होगा।

M.A..JOURNALISM AND MASS COMMUNICATION

Semester III 2023-2024

Course No. MJMC (P-4)

PRACTICAL WORK

Student will be given a project during practical training .The report of which will be prepared and submitted in the department. Its evaluation and Viva-Voce Examination will be done by One internal and One External examiner. 70 Marks will be of Practical Presentation and viva-voce. 30 Marks For CCA.

एम.ए. पत्रकारिता एवं जनसंचार

सेमेस्टर – IV सत्र : 2023-2024

पाठ्यक्रम संख्या MJMCSC (IV) 405

कौशल पाठ्यक्रम (Skill Course) : IV

(अन्य विभाग के विद्यार्थियों के लिए)

पत्रकारिता प्रशिक्षण : विशिष्ट रूपों का अध्ययन

- इकाई-1** इलेक्ट्रॉनिक मीडिया की पत्रकारिता - रेडियो, टी.वी., वीडियो, केबल, मल्टी मीडिया और इण्टरनेट की पत्रकारिता, प्रसार भारती तथा सूचना प्रौद्योगिकी
- इकाई-2** प्रिण्ट पत्रकारिता और मुद्रण-कला, प्रूफ शोधन, ले आउट एवं पृष्ठ सज्जा, पत्रकारिता का प्रबंधन-प्रशासनिक व्यवस्था, बिक्री तथा वितरण व्यवस्था
- इकाई-3** भारतीय संविधान में प्रदत्त मौलिक अधिकार एवं मानवाधिकार, प्रजातांत्रिक व्यवस्था में चतुर्थ स्तम्भ के रूप में पत्रकारिता का दायित्व
- इकाई-4** मुक्त प्रेस की अवधारणा, लोक सम्पर्क तथा विज्ञापन, प्रेस संबंधी प्रमुख कानून एवं आचार-संहिता

सहायक पुस्तकें:-

सम्पादन कला: के.पी.नारायण

दूरदर्शन: दशा और दिशा: सुधीश पचौरी

रेडियो लेखन: मधुकर गंगाधर

मुद्रण-कला: प्रफुल्ल चन्द्र ओझा 'युक्त

M.A. JOURNALISM AND MASS COMMUNICATION

Semester III 2023-2024

SKILL COURSE : MJMCSC 405(IV)

(FOR THE STUDENTS OF OTHER DEPARTMENTS)

Journalism-Training : Study of Different form

- Unit-1.** Journalism of electronic Media--- Radio, Television, Video, Cable, Multimedia and Internet Journalism, Prasar Bharti and Information Technology.
- Unit-2.** Print Media and Print Art, Proof-reading, Lay out and Page designing, Management of Journalism -- Administration system, Sell and Distribution system.
- Unit-3.** Fundamental Rights and Human Rights in Indian Constitution, Responsibilities of Journalism as a Forth Piller of Democratic System.
- Unit-4.** Concept Of Free-Press, Public Liason and Advertisement, Important Press Laws and Code of Conduct.

SYLLABUS
M.A. Ist SEM CBCS 2021

GUIDELINES FOR CHOICE BASED CREDIT SYSTEM

Definitions of Key Words:

Academic Year: Two consecutive (one odd + one even) semesters constitute one academic year. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select two elective papers offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete four skill courses: two within the Department and two from other Department within JNV University or the Universities approved by JNV University

Course: Usually referred to, as ‘papers’ is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.

Credit Based Semester System (CBSS): Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.

Credit Point: It is the product of grade point and number of credits for a course.

Credit: A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period of teaching (lecture or tutorial) or two periods of practical work/field work per week.

Cumulative Grade Point Average (CGPA): It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.

Grade Point: It is a numerical weight allotted to each letter grade on a 10-point scale.

Letter Grade: It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.

Programme: An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.

Semester Grade Point Average (SGPA): It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.

Semester: Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/ December and even semester from December/January to May.

Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May.

Transcript or Grade Card or Certificate: Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Arts, Education & Social Sciences resolves the following:

All internal assessments shall on term test and seminar. Attendance shall carry the prescribed marks in all papers.

In each semester two out of four theoretical components of the University examinations shall be undertaken by external examiners from outside JNV University, who may be appointed by the competent authorities.

Grievances and Redressal Mechanism

The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head of the Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.

The appeal will be assessed by the Chairman and he/she shall place before the Grievance Redressal Committee (GRC), Chaired by the Dean, Faculty of Arts, Education & Social Sciences comprising of the HOD of the concerned Department and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.

The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	=O'	Outstanding	10
2	=A+'	Excellent	9
3	=A'	Very Good	8
4	=B+'	Good	7
5	=B'	Above Average	6
6	=C'	Average	5
7	=P'	Pass	4
8	=F'	Fail	0
9	=Ab'	Absent	0

A student obtaining Grade F in a paper shall be considered failed and will be required to reappear in the University End Semester examination.

For noncredit courses (Skill Courses) ‘Satisfactory’ or ‘Unsatisfactory’ shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

= and > 95 % marks Grade Point 10.0

90 to less than 95 % marks Grade Point 9.5
 85 to less than 90 % marks Grade Point 9.0
 80 to less than 85 % marks Grade Point 8.5
 75 to less than 80 % marks Grade Point 8.0
 70 to less than 75 % marks Grade Point 7.5
 65 to less than 70 % marks Grade Point 7.0
 60 to less than 65 % marks Grade Point 6.5
 55 to less than 60 % marks Grade Point 6.0
 50 to less than 55 % marks Grade Point 5.5
 45 to less than 50 % marks Grade Point 5.0
 40 to less than 45 % marks Grade Point 4.5
 35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,

i.e.

$$SGPA (S_i) = \frac{\sum (C_i \times G_i)}{\sum C_i}$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,

i.e.

$CGPA = \frac{\sum (C_i \times S_i)}{\sum C_i}$ /where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts

Illustration for SGPA

S.No.	Course	Credit	Grade Letter	Grade Point	Credit Point (Credit x Grade)
1	Course 1	6	B	6	6 x 6 = 36
2	Course 2	6	B+	7	6 x 7 = 42

3	Course 3	6	B	6	6 x 6 = 36
4	Course 4	6	O	10	6 x 10 = 60
	Total	24			36+42+36+60+174

Thus, SGPA = $174/24 = 7.25$

Illustration for CGPA

	Semester-I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	7025	7025	7	6025

$$\text{CGPA} = \frac{(24 \times 7025 + 24 \times 7.25 + 24 \times 7 + 24 \times 6.25)}{96} = \frac{666}{98} = 6.94$$

Semester-Wise Theory Papers/Practical/Skill Component

Type of Course	Course Code	Title of the Course	Lecture-Tutorial-Practical	No. of Credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) University Examination	Total
----------------	-------------	---------------------	----------------------------	----------------	---	---	-------

Semester-I

Core Course I	Eco 101	MICRO ECONOMIC THEORY-I		6-0-0	6	30	70	100	
Core Course 2	Eco 102	MACROECONOMICS-I		6-0-0	6	30	70	100	
Core Course 3	Eco 103	ECONOMICS OF DEVELOPMENT-I		6-0-0	6	30	70	100	
Core Course 4	Eco 104	QUANTITATIVE METHODS FOR ECONOMICS-I		6-0-0	6	30	70	100	
*Skill Course I	ECONOMICS OF CAPITAL MARKET			2-0-0					
Total						24	120	280	400

*The Department shall offer one skill course per semester from the list of skill courses approved for the Department

In view of the course content, the Department of Economics.....distributed the Periods between Theory/Tutorial as under per paper

6: 0 : 0 (six lectures only (no tutorial and no practical) per week) – For

Theory

2+0+0 (two lectures) - For Skill course

The Duration of the Period shall be forty five minutes. In each of these combinations, the first value stands for the same number of lecture instructions per week

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective) involve an evaluation system of students that has the following two components:-

Continuous Comprehensive Assessment (CCA) accounting for 30% of the final grade that a student gets in a course; and End-Semester Examination (ESE) accounting for the remaining 70% of the final grade that the student gets in a course.

Continuous Comprehensive Assessment (CCA): This would have the following components:
Term Test: One term test shall be arranged for each paper prior to End-Semester Examination; examination duration shall be of three hours; maximum marks shall be 60 (reduced to 15).
Seminar: Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 40 (reduced to 10). The seminar shall be completed prior to term test for all the papers.
Classroom Attendance – Each student will have to attend a minimum of 75% Lectures / Tutorials. A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE). Attendance marks will be awarded by following the system proposed below:

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

75% to 80%	= 1 mark
81% to 85%	= 2 marks
86% to 90%	= 3 marks
91% to 95%	= 4 marks
96% and above	= 5 marks

Note : Compensation in classroom attendance of a student will be as per prevalent University rules

Each student's cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Arts, Education & Social Sciences.

CCA is based on open evaluation system without any bias to any student.

Any grievance received in the Department from student shall be placed before the Grievance Redressal Committee with adjudicated comments

Each component marks will be added making it rounding as per norms

Marking Scheme of Continuous Comprehensive Assessment (CCA)

Components	Maximum Marks	Reduced and Original Marks
Term Test	60	(reduced to 15)
Seminar	40	(reduced to 10)
Classroom Attendance	05	05
Total Marks of CCA		30

Note : Classroom Attendance marks will be as follows:-

Percentage	Marks
75% to 80%	1 Mark
81% to 85%	2 Marks
86 to 90%	3 Marks
86 to 90%	4 Marks
96% and above	5 Marks

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective

Department shall declare the result as —Satisfactory| or —Non-Satisfactory||; each student need to get a minimum of three —Satisfactory|| declaration for the course completion

For the Term test and ESE

Part A

Ten questions (Definitions, illustrations, functions, short explanations, etc; 25-50 words) for one mark each. $10 \times 1 = 10$ marks; comprising questions from each Unit; no choice in this part

Part B

Four questions of long/explanatory answer (500 words) type, one drawn from each Unit; with internal choices : $4 \times 15 = 60$ marks.

$10+60 = 70$ marks

Qualifying for Next semester

A student acquiring minimum of 40% in total of the CCA is eligible to join next semester

A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as Fail'), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.

A student who fails in one or more papers in a semester shall get three more chances to complete

the same; if he/she fails to complete the same within the prescribed time, i.e. three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted, for additional chances examination fee shall be on additive basis

Improvement Option:

Every student shall have the opportunity to improve Credit through University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final

Result Declaration:

The ESE (End Semester Examination/University Examination) results shall be declared within twenty days of the last examination. The Theory Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation

POST -GRADUATE COURSE: A DESCRIPTION

The full course is of FOUR SEMESTERS spread for TWO YEARS duration. A semester-wise list of courses to be offered is given below. In each paper there will be four unit.

SEMESTER I

SEMESTER II

SEMESTER III

SEMESTER IV

Elective paper group – First – Semester III

Elective paper group – Second – Semester III

Elective paper group – First – Semester IV

Elective paper group – Second – Semester IV

Skill Courses in the respective subject

Electives would be discipline centric and only students from concerned departments can register

ADMISSION

The minimum qualification for admission to M.A. Course is Graduate Degree. The details of eligibility conditions and admission procedure will be as per University rules. The candidates are required to attend minimum of a 75% of classes.

TEACHING AND EXAMINATION

SCHEME per Semester

Course	Periods/Week	Examination Hours	CCA	ESE	Total
Theory Papers					

Course I	6	3	30	70	100
Course II	6	3	30	70	100
Course III	6	3	30	70	100
Course IV	6	3	30	70	100

UNIVERSITY EXAMINATION

Each course paper shall be of three hours duration

Note: The number of elective to be taught from each group in a particular year shall be decided by the Department. Electives offered will be announced at the beginning of the academic session. Each student shall be assigned one Elective Paper from Group ONE and the second from Group TWO. Elective papers will be allotted on merit-cum-choice basis as far as possible. In the odd semester two skill courses will be those offered by the respective departments in the even semester skill courses will be from other departments.

SCHEME OF EXAMINATION FOR M.A. _ECONOMICS (SEMESTER SYSTEM) FOR THE EXAMINATION

INSTRUCTIONS FOR THE PAPER SETTERS AND THE STUDENTS

Max. Marks - 70

Min. Marks – 25

Duration – 3 hours

The first question shall be short answer type containing 10 short questions spread over the whole syllabus to be answered in about 30 words each. It shall carry 10 marks and shall be a compulsory question

Rest of the paper shall contain 8 questions with internal choice. The entire syllabus has been divided into four units. Each unit shall have two questions and the candidates shall be given internal choice i.e. the candidate shall attempt one question from each unit.

SEMESTER I

THEORY PAPERS

l.	THEORY PAPERS	ESE	CCA	Total	Lecture- Tutorial- Practical/ Week	Credits
	(Four Core Papers)					
	Paper I	70	30	100	6-0-0	6
	Paper II :	70	30	100	6-0-0	6
	Paper III :	70	30	100	6-0-0	6
	Paper IV :	70	30	100	6-0-0	6

		Grand Total	400 marks		24 credits
--	--	-------------	-----------	--	------------

Total Marks of M.A. (Semester I, II, III & IV) 1600 marks and credit 96

INFORMATION ABOUT THE DEPARTMENT OF ECONOMICS

S.No	Name	Designation Qualification	Qualification	Specialization
1.	Dr. Madan Mohan	Associate Professor & Head	M.A. M. Phil Ph. D.	Industrial Economics
2.	Dr.(Mrs.) Rekha Mehta	Associate Professor	M.A. M Phil NET,Ph.D	Macro Economics
3	Dr. L.L. Salvi	Assistant Professor	M.A. ,NET, Ph.D.	Econometrics
4	Mr. Parvez Ali	Assistant Professor	M.A. NET, SET	Labour Economics
5	Dr. Kanta Choudhary	Assistant Professor	M.A. NET Ph.D	Economic development
6	Mrs. Rekha	Assistant Professor	M.A. NET	Labour Economics
7	Dr. Jaya Bhandari	Assistant Professor	M.A. M. Phil Ph. D.	Industrial Economics
8	Dr. Rajni Kant Trivedi	Assistant Professor	M.A. M. Phil Ph. D.	Mathematical Economics
9	Mr.Shravan Raj	Assistant Professor	M.A. NET SLET	Agriculture Economics
10	Dr. Dev Karan Genwa	Assistant Professor	M.A. NET SLET Ph. D.	International economics

Detail Syllabus of the Papers

Core courses

SEMESTER I

Core Course –I

ECO – 101 MICRO ECONOMIC THEORY -I

Unit 1 :	Elasticity of Demand-Price, Cross and income; Elasticity of Supply; Theories of demand-utility, indifference Curves (income and substitution effects-Hicks and slutsky's methods) Theory of General equilibrium: General Equilibrium of Exchange,. General Equilibrium of Exchange and Production; General Equilibrium in a two good economy
Unit 2 :	Production Function-Short period and long period; Law of variable proportions and returns to scale; Isoquants-least cost combination of inputs, Returns to factors; Economics of Scale.

Unit 3:	Marginal analysis as an approach to Price and output determination: Perfect Competition- Short run and long run equilibrium of the firm and industry, price and output determination, supply curve. Monopoly-Short run and long run equilibrium, price discrimination. Welfare aspects, Monopoly control and regulation.
Unit 4:	Boumol Sales revenue maximization model; Williamson's model of managerial discretion; Marris's model of managerial enterprise, Maximisation of satisfaction – Scitovsky's model, Security of profit – Rothschild's model.
	<p>REQUIRED READINGS</p> <p>Gould and Lazear : Micro Economic Theory, Sixth Edition (Richard D Irwin Inc. Illinois)</p> <p>Joshi, J.M.& Joshi, Rajendra: Micro Economics</p> <p>Koutsoyiannis : Modern Micro Economics</p> <p>Hicks, J.R. : Vaule and Capital</p> <p>Friedman Milton : Price Theory</p> <p>Chamberlin : Theory of Monopolistic Competition</p> <p>Leftwich ; The Price System and Resource Allocation</p> <p>Bilas, R.A. : Micro Economic Theory</p>

Core Course II

ECO102-MACRO ECONOMIC THEORY -I

Unit 1 :	<p>General Macro Economics Concepts-Equilibrium, Exogenous and Endogenous variables, Stock and Flow. Concept of GNP: Its various components</p> <p>REQUIRED READINGS</p> <p>Demburg, T.F. and Mc Dougall, D.M. : Macro Economics 5/e, 1997 Chs 2&3</p> <p>N. Gregory Mankiw: Macro Economics, 5/e, 2006, (Herein after referred as text) chs. 2&3</p>
Unit 2 :	<p>Different forms of National income accounting- Social accounting, Input-output accounting, Flow of Funds accounting and Balance of Payments accounting, Classical Macro Economics</p> <p>REQUIRED READINGS</p> <p>Ackley, G.: Macro Economic Theory and Policy, 1987 chs 1,2,3,4,5</p>
Unit 3 :	<p>Keynes's Macro Economics, supply side Economics, IS and LM framework, _ Derivation of IS and LM Curve, Equilibrium in the Goods and Money market, Mundell-Fleming Model, Asset Markets Expectations and exchange rates, The Aggregate Supply and Aggregate Demand.</p> <p>REQUIRED READINGS</p> <p>Dornbusch, Ficher and Startz ; Macro Economics, 9/e, 2005 Chs. 5,10,'12 Tex Chs 10.11.12 and 13</p>
Unit 4 :	<p>Consumption Function : Keynes Psychological law of Consumption, short run and long-run consumption function; Income–consumption relationship-Absolute Income, Relative Income, Life Cycle and Permanent income Hypothesis,</p> <p>REQUIRED READINGS</p> <p>Dornbusch, Ficher and Startz ; Macro Economics, 9/e, 2005 Chs. 5,10,'12</p>

Core Course III**ECO 103- ECONOMICS OF DEVELOPMENT – I**

Unit 1 :	The Development Gap and Income Distribution; Per Capita Income as an Index of Development; Measuring Poverty; Tackling Poverty; Human Poverty Index (HPI) and Human Development Index (HDI); Characteristics of Underdevelopment; Stages of Development and Structural Change Rostow's Stages of Growth.
Unit 2:	Industrialisation and Growth; Kaldor's Laws of Growth; Classical Growth Theory; Schumpeter's Unstable Growth Theory; Harrod – Domar Growth Models; Neoclassical Growth Theory; Solow's Model of Growth; Production Function Approach to The Analysis of Growth.
Unit 3:	New (Endogenous) Growth Theory and the Macro Determinants of Growth; Romer's Model of Economic Growth; Factors in the Development Process-The Role of Agriculture and Surplus Labour for Industrialisation; Interdependence between Agriculture and Industry; Industrialisation and Urbanisation; the Models of Lewis; Fei-Ranis and Todaro
Unit 4 :	The Balanced Growth Doctrine: Review of Rosenstein Rodan, Nurkse and Lewis; Strategy of Unbalanced Growth: Hirschman's Version and the reconciliation of the two; Role of Capital (Physical and Human) and Role of Infrastructural Development in Economic Development REQUIRED READINGS Thirlwall, A.P. (Latest Edition) - Growth and Development, Wiley Palgrave, Mcmillan (New York) Chs: 1, 2, 3, 4, 5, 6, 9 and 10 Todaro, Michael P. And Stephen Smith C (2007): Economic Development, Eighth Edition, Pearson Education, (Singapore) Pvt. Ltd. Indian Branch, Delhi. Chs: 2, 4, 5. Jhingran, M.L. (40 th Edition): The Economics Of Development And Planning, Vrinda Publications (P) Ltd. Delhi. Chs: 22, 23, 24, 27, 28, 29, 30, 46, 47, 56. Meier, Gerald M. And James E. Rauch (2006): Leading Issues In Economic Development Eighth Edition, Oxford University Press, New York.

Core Course IV**ECO 104- QUANTITATIVE METHODS FOR ECONOMICS- I**

Unit 1 :	Linear Simultaneous Equations, Quadratic Equations, Determinants: Basic Operations and applications Matrices: Basic Properties, Elementary operations, adjoints, inversions; Simple Input output Systems.
Unit 2 :	Solution of Linear Equations through matrix inversion and determinants (Cramer's Rule), Linear Programming-Basic Concepts. Solution of Linear Programming through graphical and Simplex Methods (Maximization Problem)
Unit 3 :	Measures of Dispersion-standard Deviation, Skewness and Correlation: Karl Pearson and Spearman's Rank.
Unit 4 :	Regression: Concept of the least squares and the lines of regression, Index Numbers and Time Series Analysis.

	<p>REQUIRED READINGS David Huang : Introduction to the use of Mathematics in Economic Analysis Parry Lewis : Mathematics for Students of Economics Mehta & Madnanai : Mathematics for Economics, Part I Chiang, A.C. : Fundamental Methods of Mathematical Economics. Croxton, Cowdon and Klein : Applied General Statistics Allen, R.G.D: Mathematical Analysis for Economics : An Elementary survey Taro Yammanca : Statistics Archibald and Lisey : An Introduction to Mathematical Economics Waugh : Elements of Statistics (H.E) Ellhance, D.N. : Fundamentals of Statistics (HE), SankhyikikeMoolTatva (H) Umarji, R.R. Probability and Statistic Methods Mills, J. : Statistical Methods Heel, H, el. P.P. Introduction of Mathematical Statistics</p>
--	---

Skill Course – I

ECONOMICS OF CAPITAL MARKET

India has emerged as emerging economies. It is now the opportunities for economist to get actively involved into this - study of Economics of Capital Market and actively contribute to this emerging area. It will pave way for exploration of new thought and ideas in generating employment as well as getting to know about how the financial markets are functioning in this changing circumstance. This will make our student to become highly competitive in the financial market, labor market as well as in invention of new branch of knowledge.

Unit 1:	Capital Market - Definition - Growth - Tasks - Structure - Role of Commercial Banks
Unit 2 :	Corporate securities - Equity Shares - Preference Shares - Debentures and bonds - convertible and non-convertible debentures - fully and partly convertible debentures - Global depository receipts, Mutual Funds - open ended and close ended mutual funds.
Unit 3 :	Stock exchanges - functions services - Listing of securities - Dealers in stock exchanges - Role of Securities and Exchange Board of India (SEBI) in regulating the share market - Demat Account - Opening and Operation.
Unit 4:	<p>Public Issue of Shares - Primary Market and Secondary Market - Issue of Shares at par and at premium - Right issue of shares - Issue of bonus shares - underwriting of shares.</p> <p>REQUIRED READINGS Indian Tax Foundation: Financial Sector Reforms in India, 1991-2001 John, D Finnerty : Corporate Financial Analysis, McGraw Hill, Book Company, ISBN 0-07-021040-3 Khan & Jain : Corporation Finance, Tata MacGRaw Hill, New Delhi Kuchhal, S. C: Corporate Finance, Chaitinya Publishing House. University Road , Allahabad</p>

SYLLABUS
M.A. IInd SEM CBCS 2019-20

GUIDELINES FOR CHOICE BASED CREDIT SYSTEM

Definitions of Key Words:

Academic Year: Two consecutive (one odd + one even) semesters constitute one academic year. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select two elective papers offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete four skill courses: two within the Department and two from other Department within JNV University or the Universities approved by JNV University

Course: Usually referred to, as ‘papers’ is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.

Credit Based Semester System (CBSS): Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.

Credit Point: It is the product of grade point and number of credits for a course.

Credit: A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period of teaching (lecture or tutorial) or two periods of practical work/field work per week.

Cumulative Grade Point Average (CGPA): It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.

Grade Point: It is a numerical weight allotted to each letter grade on a 10-point scale.

Letter Grade: It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.

Programme: An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.

Semester Grade Point Average (SGPA): It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.

Semester: Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/ December and even semester from December/January to May.

Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May.

Transcript or Grade Card or Certificate: Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Arts, Education & Social Sciences resolves the following:

All internal assessments shall on term test and seminar. Attendance shall carry the prescribed marks in all papers.

In each semester two out of four theoretical components of the University examinations shall be undertaken by external examiners from outside JNV University, who may be appointed by the competent authorities.

Grievances and Redressal Mechanism

The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head of the Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.

The appeal will be assessed by the Chairman and he/she shall place before the Grievance Redressal Committee (GRC), Chaired by the Dean, Faculty of Arts, Education & Social Sciences comprising of the HOD of the concerned Department and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.

The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	=O'	Outstanding	10
2	=A+'	Excellent	9
3	=A'	Very Good	8
4	=B+'	Good	7
5	=B'	Above Average	6
6	=C'	Average	5
7	=P'	Pass	4
8	=F'	Fail	0
9	=Ab'	Absent	0

A student obtaining Grade F in a paper shall be considered failed and will be required to reappear in the University End Semester examination.

For noncredit courses (Skill Courses) ‘Satisfactory’ or ‘Unsatisfactory’ shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

= and > 95 % marks Grade Point 10.0

90 to less than 95 % marks Grade Point 9.5
 85 to less than 90 % marks Grade Point 9.0
 80 to less than 85 % marks Grade Point 8.5
 75 to less than 80 % marks Grade Point 8.0
 70 to less than 75 % marks Grade Point 7.5
 65 to less than 70 % marks Grade Point 7.0
 60 to less than 65 % marks Grade Point 6.5
 55 to less than 60 % marks Grade Point 6.0
 50 to less than 55 % marks Grade Point 5.5
 45 to less than 50 % marks Grade Point 5.0
 40 to less than 45 % marks Grade Point 4.5
 35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,

i.e.

$$\text{SGPA (Si)} = \frac{\sum (C_i \times G_i)}{\sum C_i}$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,

i.e.

$\text{CGPA} = \frac{\sum (C_i \times S_i)}{\sum C_i}$ /where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts

Illustration for SGPA

S.No.	Course	Credit	Grade Letter	Grade Point	Credit Point (Credit x Grade)
1	Course 1	6	B	6	6 x 6 = 36
2	Course 2	6	B+	7	6 x 7 = 42
3	Course 3	6	B	6	6 x 6 = 36
4	Course 4	6	O	10	6 x 10 = 60

	Total	24			36+42+36+60+174
--	-------	----	--	--	-----------------

Thus, SGPA = $174/24 = 7.25$

Illustration for CGPA

	Semester-I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	7025	7025	7	6025

$$\text{CGPA} = \frac{(24 \times 7025 + 24 \times 7.25 + 24 \times 7 + 24 \times 6.25)}{96}$$

$$666/98 = 6.94$$

Semester-Wise Theory Papers/Practical/Skill Component

Type of Course	Course Code	Title of the Course	Lecture-Tutorial-Practical	No. of Credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) University Examination	Total
----------------	-------------	---------------------	----------------------------	----------------	---	---	-------

Semester-I

Core Course I	Eco 101	MICRO ECONOMIC THEORY-I	6-0-0	6	30	70	100
Core Course 2	Eco 102	MACROECONOMICS-I	6-0-0	6	30	70	100
Core Course 3	Eco 103	ECONOMICS OF DEVELOPMENT-I	6-0-0	6	30	70	100
Core Course 4	Eco 104	QUANTITATIVE METHODS FOR ECONOMICS-I	6-0-0	6	30	70	100
*Skill Course I	ECONOMICS OF CAPITAL MARKET		2-0-0				
Total				24	120	280	400

Semester-II

Core Course 5	Eco 201	MICRO ECONOMIC THEORY-II	6-0-0	6	30	70	100
Core Course 6	Eco 202	MACROECONOMICS-II	6-0-0	6	30	70	100

Core Course 7	Eco 203	ECONOMICS OF DEVELOPMENT-II	6-0-0	6	30	70	100
Core Course 8	Eco 204	QUANTITATIVE METHODS FOR ECONOMICS-II	6-0-0	6	30	70	100
*Skill Course II	INDIAN ECONOMY		2-0-0				
TOTAL				24	120	280	400

Semester-III

Core Course 9	Eco 301	PUBLIC FINANCE-I	6-0-0	6	30	70	100
Core Course 10	Eco 302	INTERNATIONAL ECONOMICS-I	6-0-0	6	30	70	100
Discipline Specific Elective papers -Any one of the following papers							
Elective/s 1	303-A PRINCIPLES OF AGRICULTURAL ECONOMICS I 303-B ECONOMICS OF MODERN INDUSTRY- I 303-C TRADE UNIONISM AND INDUSTRIAL RELATIONS- I 303-D MATHEMATICAL ECONOMICS -I		6-0-0	6	30	70	100
Elective/s 2	304A-ECONOMIC PROBLEMS OF INIDIAN AGRICULTURE 304B-INDIAN INDUSTRY – I 304C-WAGES AND SOCIAL SECURITY-I 304 D- STATISTICAL FOUNDATIONS AND ECONOMETRICS		6-0-0	6	30	70	100
*Skill course III	DATA ANALYSIS		2-0-2				
TOTAL				24	120	280	400

Semester IV

Core course 11	Eco401	PUBLIC FINANCE-II	6-0-0	6	30	70	100
Core course 12	Eco402	INTERNATIONAL ECONOMICS -II	6-0-0	6	30	70	100
Discipline Specific	Elective paper –Any one of the following paper 403A-PRINCIPLES OF AGRICULTURAL ECONOMICS II 403B-ECONOMICS OF MODERN INDUSTRY- II 403C-TRADE UNIONISM AND INDUSTRIAL RELATIONS- II 403D- MATHEMATICAL ECONOMICS-II		6-0-0	6	30	70	100
Discipline Specific	Elective paper –Any one of the following paper 404A-ECONOMIC PROBLEMS OF INIDIAN AGRICULTURE II 404B-INDIAN INDUSTRY –II 404C- WAGES AND SOCIAL SECURITY – II 404D- STATISTICAL FOUNDATIONS AND ECONOMETRICS- II		6-0-0	6	30	70	100
*Skill course IV	RAJASTHAN ECONOMY		2-0-0				
Total				24	120	280	400

*The Department shall offer one skill course per semester from the list of skill courses approved for the Department

In view of the course content, the Department of Economics.....distributed the Periods between Theory/Tutorial as under per paper

6: 0 : 0 (six lectures only (no tutorial and no practical) per week) – For Theory
2+0+0 (two lectures) - For Skill course

The Duration of the Period shall be forty five minutes. In each of these combinations, the first value stands for the same number of lecture instructions per week

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective) involve an evaluation system of students that has the following two

components:-

Continuous Comprehensive Assessment (CCA) accounting for 30% of the final grade that a student gets in a course; and End-Semester Examination (ESE) accounting for the remaining 70% of the final grade that the student gets in a course.

Continuous Comprehensive Assessment (CCA): This would have the following components: Term Test: One term test shall be arranged for each paper prior to End-Semester Examination; examination duration shall be of three hours; maximum marks shall be 60 (reduced to 15). Seminar: Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 40 (reduced to 10). The seminar shall be completed prior to term test for all the papers. Classroom Attendance – Each student will have to attend a minimum of 75% Lectures / Tutorials. A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE). Attendance marks will be awarded by following the system proposed below:

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

75% to 80% = 1 mark
81% to 85% = 2 marks
86% to 90% = 3 marks
91% to 95% = 4 marks
96% and above = 5 marks

Note : Compensation in classroom attendance of a student will be as per prevalent University rules

Each student's cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Arts, Education & Social Sciences.

CCA is based on open evaluation system without any bias to any student.

Any grievance received in the Department from student shall be placed before the Grievance Redressal Committee with adjudicated comments

Each component marks will be added making it rounding as per norms

Marking Scheme of Continuous Comprehensive Assessment (CCA)

Components	Maximum Marks	Reduced and Original Marks
Term Test	60	(reduced to 15)
Seminar	40	(reduced to 10)
Classroom Attendance	05	05
Total Marks of CCA		30

Note : Classroom Attendance marks will be as follows:-

Percentage	Marks
75% to 80%	1 Mark
81% to 85%	2 Marks
86 to 90%	3 Marks
86 to 90%	4 Marks
96% and above	5 Marks

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective

Department shall declare the result as —Satisfactory‖ or —Non-Satisfactory‖; each student need to get a minimum of three —Satisfactory‖ declaration for the course completion

For the Term test and ESE

Part A

Ten questions (Definitions, illustrations, functions, short explanations, etc; 25-50 words) for one mark each. $10 \times 1 = 10$ marks; comprising questions from each Unit; no choice in this part

Part B

Four questions of long/explanatory answer (500 words) type, one drawn from each Unit; with internal choices : $4 \times 15 = 60$ marks.

$10+60 = 70$ marks

Qualifying for Next semester

A student acquiring minimum of 40% in total of the CCA is eligible to join next semester

A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as Fail'), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.

A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time, i.e. three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted, for additional chances examination fee shall be on additive basis

Improvement Option:

Every student shall have the opportunity to improve Credit through University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final

Result Declaration:

The ESE (End Semester Examination/University Examination) results shall be declared within twenty days of the last examination. The Theory Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation

POST -GRADUATE COURSE: A DESCRIPTION

The full course is of FOUR SEMESTERS spread for TWO YEARS duration. A semester-wise list of courses to be offered is given below. In each paper there will be four unit.

SEMESTER I

SEMESTER II

SEMESTER III

SEMESTER IV

Elective paper group – First – Semester III

Elective paper group – Second – Semester III

Elective paper group – First – Semester IV

Elective paper group – Second – Semester IV

Skill Courses in the respective subject

Electives would be discipline centric and only students from concerned departments can register

ADMISSION

The minimum qualification for admission to M.A. Course is Graduate Degree. The details of eligibility conditions and admission procedure will be as per University rules. The candidates are required to attend minimum of a 75% of classes.

TEACHING AND EXAMINATION

SCHEME per Semester

Course	Periods/Week	Examination Hours	CCA	ESE	Total
Theory Papers					
Course I	6	3	30	70	100
Course II	6	3	30	70	100
Course III	6	3	30	70	100
Course IV	6	3	30	70	100

UNIVERSITY EXAMINATION

Each course paper shall be of three hours duration

Note: The number of elective to be taught from each group in a particular year shall be decided by the Department. Electives offered will be announced at the beginning of the academic session. Each student shall be assigned one Elective Paper from Group ONE and the second from Group TWO. Elective papers

will be allotted on merit-cum-choice basis as far as possible. In the odd semester two skill courses will be those offered by the respective departments in the even semester skill courses will be from other departments.

SCHEME OF EXAMINATION FOR M.A. _ECONOMICS (SEMESTER SYSTEM) FOR THE EXAMINATION

INSTRUCTIONS FOR THE PAPER SETTERS AND THE STUDENTS

Max. Marks - 70

Min. Marks – 25

Duration – 3 hours

The first question shall be short answer type containing 10 short questions spread over the whole syllabus to be answered in about 30 words each. It shall carry 10 marks and shall be a compulsory question

Rest of the paper shall contain 8 questions with internal choice. The entire syllabus has been divided into four units. Each unit shall have two questions and the candidates shall be given internal choice i.e. the candidate shall attempt one question from each unit.

SEMESTER I

THEORY PAPERS

Sl. No.	THEORY PAPERS (Four Core Papers)	ESE	CCA	Total	Lecture- Tutorial- Practical/ Week	Credits
	Paper I :	70	30	100	6-0-0	6
	Paper II :	70	30	100	6-0-0	6
	Paper III :	70	30	100	6-0-0	6
	Paper IV :	70	30	100	6-0-0	6
	Grand Total			400 marks		24 credits

SEMESTER II

1.	THEORY PAPERS	ESE	CCA	Total	Lecture-	Credits
	(Four Core Papers)				Tutorial-	
					Practical/	
					Week	
	Paper V :	70	30	100	6-0-0	6
	Paper VI :	70	30	100	6-0-0	6
	Paper VII :	70	30	100	6-0-0	6
	Paper VIII :	70	30	100	6-0-0	6
		Grand Total		400 marks		24 credits
SEMESTER III						
1.	THEORY PAPERS	ESE	CCA	Total	Lecture-	Credits
	(Core/Elective Papers)				Tutorial-	
					Practical/	
					Week	
	Paper IX :	70	30	100	6-0-0	6
	Paper X :	70	30	100	6-0-0	6
	Paper XI : Any one of the	70	30	100	6-0-0	6
	following					
	a)					
	b)					
	c)					
	d)					
	Paper XII : Any one of the	70	30	100	6-0-0	6
	following					
	(a)					
	(b)					
	(c)					
	(d)					
Grand Total				400		24

SEMESTER IV						
1.	THEORY PAPERS (Core/Elective Papers)	ESE	CCA	Total	Lecture- Tutorial- Practical/ Week	Credits
	Paper XIII :	70	30	100	6-0-0	6
	Paper XIV :	70	30	100	6-0-0	6
	Paper XV : Any one of the following	70	30	100	6-0-0	6
	a)					
	b)					
	c)					
	d)					
	Paper XVI : Any one of the following	70	30	100	6-0-0	6
	a)					
	b)					
	c)					
	d)					
Grand Total				400		24

Total Marks of M.A. (Semester I, II, III & IV) 1600 marks and credit 96

INFORMATION ABOUT THE DEPARTMENT OF ECONOMICS

S.No	Name	Designation Qualification	Qualification	Specialization
1.	Dr. Madan Mohan	Associate Professor & Head	M.A. M. Phil Ph. D.	Industrial Economics
2.	Dr.(Mrs.) Rekha Mehta	Associate Professor	M.A. M Phil NET,Ph.D	Macro Economics
3	Dr. L.L. Salvi	Assistant Professor	M.A. ,NET, Ph.D.	Econometrics
4	Mr. Parvez Ali	Assistant Professor	M.A. NET, SET	Labour Economics
5	Dr. Kanta Choudhary	Assistant	M.A. NET	Economic development

		Professor	Ph.D	
6	Mrs. Rekha	Assistant Professor	M.A. NET	Labour Economics
7	Dr. Jaya Bhandari	Assistant Professor	M.A. M. Phil Ph. D.	Industrial Economics
8	Dr. Rajni Kant Trivedi	Assistant Professor	M.A. M. Phil Ph. D.	Mathematical Economics
9	Mr. Shraavan Raj	Assistant Professor	M.A. NET SLET	Agriculture Economics
10	Dr. Dev Karan Genwa	Assistant Professor	M.A. NET SLET Ph. D.	International economics

SEMESTER II

Core Course –II

ECO – 201 MICRO ECONOMIC THEORY II

Unit 1 :	Compensated demand curves and their application; Revealed Preference theory Consumer's choice involving risk. Hicks Version of Demand Theory. Consumer Surplus, Welfare economics: Pareto optimality, conditions for maximum welfare: New Welfare Economics; social welfare function. Theory of the second best and compensation criteria; Walras's Law.
Unit 2 ;	Elasticity of substitution; Euler's theorem; Technical Progress and Production function, Cobb-Douglas Production function, Cost Curves and Revenue Curve
Unit 3 :	Monopolistic Competition-general and Chamberlin approaches to equilibrium; equilibrium of the firm and the group with product differentiation and selling costs, excess. capacity under monopolistic competition, criticism of monopolistic competition. Oligopoly- old Classical Models of oligopoly: (Cournot, Bertrand, Edgeworth and Modern models –collusive, Non-collusive , Kinked demand curve and Stackelberg's Solution)
Unit 4 :	Marginal productivity Theory, Factor price and employment determination under Competitive and imperfectly competitive markets
	<p>REQUIRED READINGS</p> <p>Gould and Lazear : Micro Economic Theory, Sixth Edition (Richard D Irwin Inc. Illinois)</p> <p>Joshi, J.M.& Joshi, Rajendra: Micro Economics</p> <p>Koutsoyiannis : Modern Micro Economics</p> <p>Hicks, J.R. : Vaule and Capital</p> <p>Friedman Milton : Price Theory</p> <p>Chamberlin : Theory of Monopolistic Competition</p> <p>Leftwich ; The Price System and Resource Allocation</p> <p>Boumoul : Economic Theory and Operational Analysis</p> <p>Bilas, R.A. : Micro Economic Theory</p>

Core Courses- VI

ECO 202-MACRO ECONOMICS II

Unit 1 :	<p>Investment Function-Marginal efficiency of investment and level of investment; Marginal efficiency of Capital and investment; The accelerator theory of Investment; The impact of inflation. Demand for Money : Keyne’s liquidity Preference approach, post- Keynesian approaches to demand for money; Patinkin and the Real Balance effect, Approaches of Baumol and Tobin; Friedman and the modern quantity theory; Crisis in Keynesian economics and the revival of monetarism</p> <p>REQUIRED READINGS</p> <p>Tex Chs, 17 &18</p>
Unit 2 :	<p>Supply of Money; Financial intermediation a mechanistic model of bank deposit determination – A behavioral Model of money supply determination, a demand determined money supply, Process, RBI approach to money supply; High powered money and money multiplier; budget deficits and money supply; money supply and open economy; control of money supply.</p> <p>REQUIRED READINGS</p> <p>Rosalind, Leavcic and Rebmann : Macro Economics _ An Introduction to Keynesian – Neo Classical Controversies 2/e, reprint 1991, Chs. 2,3,,10 Gupta G.S. : Macro Economics- Theory and Applications, 2001</p>
Unit 3 :	<p>Theory of Inflation- classical, Keynesian and Monetarist approaches to inflation structuralize theory of inflation; Philips curve- short run and long run philips curve; Samuelson and Solow- the natural rate of unemployment hypothesis; Tobin’s modified Philips Curve; Adaptive expectations and rational expectations; Policies to Control inflation;</p> <p>REQUIRED READINGS</p> <p>Tex Chs, 13 &18</p> <p>Rosalind, Levacic and Rebmann: Chs 8,9, and 18</p>
Unit 4 :	<p>Business Cycles : Theories of Schumpeter, Kaldor Samuelson and Hicks, Real Business cycle theory and Goodwin’s Model; Control of Business Cycles- relative efficiency of Monetary and Fiscal policy. New classical Macro Economics : The new classical critique of Micro Foundation, the New classical approach</p> <p>REQUIRED READINGS</p> <p>Tex Chp. 19</p> <p>Dornbusch, Ficher and Startz : Chp. 20</p> <p>Hicks, J.R. (1950): A contribution to the theory of Trade cycle. Lucas, R. : Studies in Business Cycle Theory, 1981</p> <p>RECOMMENDED READINGS</p> <p>Taigan, R.L. : Readings In Money, National income and Stabilization Policy</p> <p>Turnovsky, S. I. : Macro Economic Analysis and stabilization Policy Heijdra, B.J. andj Derploege, F.: Founations of Modern Macro Economics Friedman, M. : The theory of Consumption Function</p> <p>Mankiw, N.G. and D. Romer (eds)(1991) New Keynesian Economics</p>

Core Courses VII

ECO 203 -ECONOMICS OF DEVELOPMENT – II

Unit 1 :	Monetary Policy and Fiscal Policy in Economic Development; Development Banks and Micro Credit Financial Intermediaries; Dualism; International Inequalities; Prebisch Model; The World Population: Determinants of Fertility, Costs and Benefits of Population Growth; Enkey's Work; Simon's Challenges; The Optimum Population; Model of Low-Level Equilibrium Trap
Unit 2 :	The Critical Minimum Efforts Theory; Environment and Economic Activities; Renewable and Non-Renewable Resources; Economic Growth and Environment; Sustainable Development; The Market Mechanism and Mechanism Failures; Role of the State in Development Plans.
Unit 3 :	Choice of Techniques; Investment Criteria (NPV, IRR) and Social Cost Benefit Analysis; Project Choice and The Social-Welfare Function; Project Appraisal: Financial Appraisal, Economic Appraisal and Social Appraisal; Shadow Prices for Factors of Production; The Social Rate of Discount and The Social Cost of Investment and Shadow Wage Rate.
Unit 4 :	<p>Globalisation; International Trade and Development; Dual-Gap Models; WTO, NIEO (New International Economic Order) and Other Plan Models Of India. Past Performance and Current Issues of Indian Planning, Role of the Foreign Aid, FDI's and MNCs in Economic Development of India.</p> <p>REQUIRED READINGS</p> <p>Thirwall A.P. (Latest Edition): Growth and Development, Palgrave Macmillan, New York. Chs: 7, 8, 9, 10, 11 and 12.</p> <p>Todaro, Michael P. And Stephen Smith C (2007): Economic Development 8th Edition. Pearson Education (Singapore) Pvt.Ltd. Indian Branch, Delhi. Chs: 6, 7, 11.</p> <p>Jhingan, M.L. (40th Edition) : The Economics Of Development And Planning, Vrinda Publications (P) Ltd. Delhi. Chs: 25, 31, 50, 51, 61, 62, 63, 65, 66, 71, 72, 76, 77, 79, 80</p> <p>Meier, Gerald M. And James E Raunch (2006): Leading Issues In Economic Development, Eighth Edition, Oxford University Press, New York.</p> <p>Solo. R.M. - Growth Theory: An Exposition, Oxford University Press Oxford</p> <p>Schumpeter, J.A.- Theory of Economic Development, Harvard University press, Cambridge, Mass</p> <p>Todaro, M.P- Development Planning: Models and Methods, Oxford University Press, Oxford</p>

. Core Course VIII

ECO 204 - QUANTITATIVE METHODS FOR ECONOMICS –II

Unit 1 :	Elementary differential calculus : Meaning, Geometrical Interpretation, Standard results and Formulae, Derivatives of higher order, functions of two or more variable.
Unit 2 :	Partial differentiation, Total Differential, Maxima Minima and Points of Inflexion, Difference equation-First and second order, Elementary Integration
Unit 3 :	Elementary Theory of Probability: Definition, marginal and Conditional Probability, Addition and multiplication Theorems, Baye’s Theorem, Density functions; Theoretical distribution: normal distribution, Poisson distribution, Binomial distribution.
Unit 4 :	Elementary Sampling Theory, Sampling distribution of mean, Properties of a good linear estimator (without Proof) ,small sample tests, chi-square, t and F Test REQUIRED READINGS David Huang : Introduction to the use of Mathematics in Economic Analysis Parry Lewis : Mathematics for Students of Economics Mehta & Madnanai : Mathematics for Economics, Part I Chiang, A.C. : Fundamental Methods of Mathematical Economics. Croxton, Cowdon and Klein : Applied General Statistics Allen, R.G.D: Mathematical Analysis for Economics : An Elementary survey Taro Yammane : Statistics Archibald and Lisey : An Introduction to Mathematical Economics Waugh : Elements of Statistics (H.E) Ellhance, D.N. : Fundamentals of Statistics (HE), SankhyikikeMoolTatva (H) Umarji, R.R. Probability and Statistic Methods Mills, J. : Statistical Methods Heel, H, el. P.P. Introduction of Mathematical Statistics

Skill Course -2

INDIAN ECONOMY

Course Description

Using appropriate analytical frameworks, this course reviews major trends in economic indicators and policy debates in India in the post-Independence period, with particular emphasis on paradigm shifts and turning points. This course examines sector-specific policies and their impact in shaping trends in key economic indicators in India. It highlights major policy debates and evaluates the Indian empirical evidence

Unit 1 :	Economic Development since Independence, Major features of the economy; growth and development under different policy regimes—goals, constraints, institutions and policy framework; Population and Human Development: Demographic trends and issues;
Unit 2 :	Planning in India Economic planning: Meaning and significance of planning, Planning Strategies in India, Broad objectives, Achievements and Failures of Planning. Current Five-Year- Plan: Objectives, Allocation and Targets, “NITI Ayog”.
Unit 3 :	Policies and Performance in Agriculture and Industry Agriculture: Growth, Productivity; Industry: Growth, Productivity, Small scale industries, FDI

Unit 4 :	<p>Growth and Distribution Trends and policies in Poverty, Inequality and unemployment, Current Budget of Economy</p> <p>REQUIRED READINGS</p> <p>Jean Dreze and Amartya Sen, 2013. <i>An Uncertain Glory: India and its Contradictions</i>, Princeton University Press.</p> <p>Pulapre Balakrishnan, 2007, The Recovery of India: Economic Growth in the Nehru Era, <i>Economic and Political Weekly</i>, November</p> <p>Rakesh Mohan, 2008, —Growth Record of Indian Economy: 1950-2008. A Story of Sustained Savings and Investment, <i>Economic and Political Weekly</i>, May.</p> <p>S.L. Shetty, 2007, —India_s Savings Performance since the Advent of Planning, in K.L. Krishna and A. Vaidyanathan, editors, <i>Institutions and Markets in India's Development</i>.</p> <p>Himanshu, 2010, —Towards New Poverty Lines for India, <i>Economic and Political Weekly</i>, January.</p> <p>Jean Dreze and Angus Deaton, 2009, —Food and Nutrition in India: Facts and Intepretations, <i>Economic and Political Weekly</i>, February</p> <p>Himanshu. 2011, —Employment Trends in India: A Re-examination, <i>Economic and Political Weekly</i>, September</p> <p>Rama Baru et al, 2010, —Inequities in Access to Health Services in India: Caste, Class and Region, <i>Economic and Political Weekly</i>, September. Dutt, Ruddar and Sundharam, KPM: Indian Economy, (Latest eds.) Mishra & Puri: Indian Economy, Himalaya Publication , Mumbai</p>
----------	---

SYLLABUS
M.A. IIIrd SEM CBCS 2021

GUIDELINES FOR CHOICE BASED CREDIT SYSTEM

Definitions of Key Words:

Academic Year: Two consecutive (one odd + one even) semesters constitute one academic year. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select two elective papers offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete four skill courses: two within the Department and two from other Department within JNV University or the Universities approved by JNV University

Course: Usually referred to, as ‘papers’ is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.

Credit Based Semester System (CBSS): Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.

Credit Point: It is the product of grade point and number of credits for a course.

Credit: A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period of teaching (lecture or tutorial) or two periods of practical work/field work per week.

Cumulative Grade Point Average (CGPA): It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.

Grade Point: It is a numerical weight allotted to each letter grade on a 10-point scale.

Letter Grade: It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.

Programme: An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.

Semester Grade Point Average (SGPA): It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.

Semester: Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/ December and even semester from December/January to May.

Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May.

Transcript or Grade Card or Certificate: Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Arts, Education & Social Sciences resolves the following:

All internal assessments shall on term test and seminar. Attendance shall carry the prescribed marks in all papers.

In each semester two out of four theoretical components of the University examinations shall be undertaken by external examiners from outside JNV University, who may be appointed by the competent authorities.

Grievances and Redressal Mechanism

The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head of the Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.

The appeal will be assessed by the Chairman and he/she shall place before the Grievance Redressal Committee (GRC), Chaired by the Dean, Faculty of Arts, Education & Social Sciences comprising of the HOD of the concerned Department and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.

The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	=O'	Outstanding	10
2	=A+'	Excellent	9
3	=A'	Very Good	8
4	=B+'	Good	7
5	=B'	Above Average	6
6	=C'	Average	5
7	=P'	Pass	4
8	=F'	Fail	0
9	=Ab'	Absent	0

A student obtaining Grade F in a paper shall be considered failed and will be required to

reappear in the University End Semester examination.

For noncredit courses (Skill Courses) ‘Satisfactory’ or ‘Unsatisfactory’ shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

= and > 95 % marks Grade Point 10.0

90 to less than 95 % marks Grade Point 9.5
85 to less than 90 % marks Grade Point 9.0
80 to less than 85 % marks Grade Point 8.5
75 to less than 80 % marks Grade Point 8.0
70 to less than 75 % marks Grade Point 7.5
65 to less than 70 % marks Grade Point 7.0
60 to less than 65 % marks Grade Point 6.5
55 to less than 60 % marks Grade Point 6.0
50 to less than 55 % marks Grade Point 5.5
45 to less than 50 % marks Grade Point 5.0
40 to less than 45 % marks Grade Point 4.5
35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,

i.e.

$$\text{SGPA (Si)} = \frac{\sum (C_i \times G_i)}{\sum C_i}$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,

i.e.

$\text{CGPA} = \frac{\sum (C_i \times S_i)}{\sum C_i}$ /where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts

Illustration for SGPA

S.No.	Course	Credit	Grade Letter	Grade Point	Credit Point (Credit x Grade)
1	Course 1	6	B	6	6 x 6 = 36
2	Course 2	6	B+	7	6 x 7 = 42
3	Course 3	6	B	6	6 x 6 = 36
4	Course 4	6	O	10	6 x 10 = 60

	Total	24			36+42+36+60+174
--	-------	----	--	--	-----------------

Thus, SGPA = $174/24 = 7.25$

Illustration for CGPA

	Semester-I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	7025	7025	7	6025

$$\text{CGPA} = \frac{(24 \times 7025 + 24 \times 7.25 + 24 \times 7 + 24 \times 6.25)}{96}$$

$$666/98 = 6.94$$

Semester-Wise Theory Papers/Practical/Skill Component

Type of Course	Course Code	Title of the Course	Lecture-Tutorial-Practical	No. of Credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) University Examination	Total
----------------	-------------	---------------------	----------------------------	----------------	---	---	-------

Semester-I

Core Course I	Eco 101	MICRO ECONOMIC THEORY-I	6-0-0	6	30	70	100
Core Course 2	Eco 102	MACROECONOMICS-I	6-0-0	6	30	70	100
Core Course 3	Eco 103	ECONOMICS OF DEVELOPMENT-I	6-0-0	6	30	70	100
Core Course 4	Eco 104	QUANTITATIVE METHODS FOR ECONOMICS-I	6-0-0	6	30	70	100
*Skill Course I	ECONOMICS OF CAPITAL MARKET		2-0-0				
Total				24	120	280	400

Semester-II

Core Course 5	Eco 201	MICRO ECONOMIC THEORY-II	6-0-0	6	30	70	100
Core Course 6	Eco 202	MACROECONOMICS-II	6-0-0	6	30	70	100

Core Course 7	Eco 203	ECONOMICS OF DEVELOPMENT-II	6-0-0	6	30	70	100
Core Course 8	Eco 204	QUANTITATIVE METHODS FOR ECONOMICS-II	6-0-0	6	30	70	100
*Skill Course II	INDIAN ECONOMY		2-0-0				
	TOTAL			24	120	280	400

Semester-III

Core Course 9	Eco 301	PUBLIC FINANCE-I	6-0-0	6	30	70	100
Core Course 10	Eco 302	INTERNATIONAL ECONOMICS-I	6-0-0	6	30	70	100
Discipline Specific Elective papers -Any one of the following papers							
Elective/s 1	303-A PRINCIPLES OF AGRICULTURAL ECONOMICS I 303-B ECONOMICS OF MODERN INDUSTRY- I 303-C TRADE UNIONISM AND INDUSTRIAL RELATIONS- I 303-D MATHEMATICAL ECONOMICS -I		6-0-0	6	30	70	100
Elective/s 2	304A-ECONOMIC PROBLEMS OF INIDIAN AGRICULTURE 304B-INDIAN INDUSTRY – I 304C-WAGES AND SOCIAL SECURITY-I 304 D- STATISTICAL FOUNDATIONS AND ECONOMETRICS		6-0-0	6	30	70	100
*Skill course III	DATA ANALYSIS		2-0-2				
	TOTAL			24	120	280	400

Semester IV

Core course 11	Eco401	PUBLIC FINANCE-II	6-0-0	6	30	70	100
Core course 12	Eco402	INTERNATIONAL ECONOMICS -II	6-0-0	6	30	70	100
Discipline Specific	Elective paper –Any one of the following paper 403A-PRINCIPLES OF AGRICULTURAL ECONOMICS II 403B-ECONOMICS OF MODERN INDUSTRY- II 403C-TRADE UNIONISM AND INDUSTRIAL RELATIONS- II 403D- MATHEMATICAL ECONOMICS-II		6-0-0	6	30	70	100
Discipline Specific	Elective paper –Any one of the following paper 404A-ECONOMIC PROBLEMS OF INIDIAN AGRICULTURE II 404B-INDIAN INDUSTRY –II 404C- WAGES AND SOCIAL SECURITY – II 404D- STATISTICAL FOUNDATIONS AND ECONOMETRICS- II		6-0-0	6	30	70	100
*Skill course IV	RAJASTHAN ECONOMY		2-0-0				
Total				24	120	280	400

*The Department shall offer one skill course per semester from the list of skill courses approved for the Department

In view of the course content, the Department of Economics.....distributed the Periods between Theory/Tutorial as under per paper

6: 0 : 0 (six lectures only (no tutorial and no practical) per week) – For Theory
2+0+0 (two lectures) - For Skill course

The Duration of the Period shall be forty five minutes. In each of these combinations, the first value stands for the same number of lecture instructions per week

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective) involve an evaluation system of students that has the following two components:-

Continuous Comprehensive Assessment (CCA) accounting for 30% of the final grade that a student gets in a course; and End-Semester Examination (ESE) accounting for the remaining 70% of the final grade that the student gets in a course.

Continuous Comprehensive Assessment (CCA): This would have the following components:
Term Test: One term test shall be arranged for each paper prior to End-Semester Examination; examination duration shall be of three hours; maximum marks shall be 60 (reduced to 15).
Seminar: Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 40 (reduced to 10). The seminar shall be completed prior to term test for all the papers.
Classroom Attendance – Each student will have to attend a minimum of 75% Lectures / Tutorials. A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE). Attendance marks will be awarded by following the system proposed below:

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

75% to 80% = 1 mark
81% to 85% = 2 marks
86% to 90% = 3 marks
91% to 95% = 4 marks
96% and above = 5 marks

Note : Compensation in classroom attendance of a student will be as per prevalent University rules

Each student's cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Arts, Education & Social Sciences.

CCA is based on open evaluation system without any bias to any student.

Any grievance received in the Department from student shall be placed before the Grievance Redressal Committee with adjudicated comments

Each component marks will be added making it rounding as per norms

Marking Scheme of Continuous Comprehensive Assessment (CCA)

Components	Maximum Marks	Reduced and Original Marks
Term Test	60	(reduced to 15)
Seminar	40	(reduced to 10)
Classroom Attendance	05	05
Total Marks of CCA		30

Note : Classroom Attendance marks will be as follows:-

Percentage	Marks
75% to 80%	1 Mark
81% to 85%	2 Marks
86 to 90%	3 Marks
86 to 90%	4 Marks
96% and above	5 Marks

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective

Department shall declare the result as —Satisfactory| or —Non-Satisfactory|; each student need to get a minimum of three —Satisfactory| declaration for the course completion

For the Term test and ESE

Part A

Ten questions (Definitions, illustrations, functions, short explanations, etc; 25-50 words) for one mark each. $10 \times 1 = 10$ marks; comprising questions from each Unit; no choice in this part

Part B

Four questions of long/explanatory answer (500 words) type, one drawn from each Unit; with internal choices : $4 \times 15 = 60$ marks.

$10+60 = 70$ marks

Qualifying for Next semester

A student acquiring minimum of 40% in total of the CCA is eligible to join next semester

A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as Fail'), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.

A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time, i.e. three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted, for additional chances examination fee shall be on additive basis

Improvement Option:

Every student shall have the opportunity to improve Credit through University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall

be final

Result Declaration:

The ESE (End Semester Examination/University Examination) results shall be declared within twenty days of the last examination. The Theory Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation

POST -GRADUATE COURSE: A DESCRIPTION

The full course is of FOUR SEMESTERS spread for TWO YEARS duration. A semester-wise list of courses to be offered is given below. In each paper there will be four unit.

SEMESTER I

SEMESTER II

SEMESTER III

SEMESTER IV

Elective paper group – First – Semester III

Elective paper group – Second – Semester III

Elective paper group – First – Semester IV

Elective paper group – Second – Semester IV

Skill Courses in the respective subject

Electives would be discipline centric and only students from concerned departments can register

ADMISSION

The minimum qualification for admission to M.A. Course is Graduate Degree. The details of eligibility conditions and admission procedure will be as per University rules. The candidates are required to attend minimum of a 75% of classes.

TEACHING AND EXAMINATION

SCHEME per Semester

Course	Periods/Week	Examination Hours	CCA	ESE	Total
Theory Papers					
Course I	6	3	30	70	100
Course II	6	3	30	70	100
Course III	6	3	30	70	100
Course IV	6	3	30	70	100

UNIVERSITY EXAMINATION

Each course paper shall be of three hours duration

Note: The number of elective to be taught from each group in a particular year shall be decided by the Department. Electives offered will be announced at the beginning of the academic session. Each student shall be assigned one Elective Paper from Group ONE and the second from Group TWO. Elective papers will be allotted on merit-cum-choice basis as far as possible. In the odd semester two skill courses will be those offered by the respective departments in the even semester skill courses will be from other departments.

SCHEME OF EXAMINATION FOR M.A. _ECONOMICS (SEMESTER SYSTEM) FOR THE EXAMINATION

INSTRUCTIONS FOR THE PAPER SETTERS AND THE STUDENTS

Max. Marks - 70

Min. Marks – 25

Duration – 3 hours

The first question shall be short answer type containing 10 short questions spread over the whole syllabus to be answered in about 30 words each. It shall carry 10 marks and shall be a compulsory question

Rest of the paper shall contain 8 questions with internal choice. The entire syllabus has been divided into four units. Each unit shall have two questions and the candidates shall be given internal choice i.e. the candidate shall attempt one question from each unit.

SEMESTER I

THEORY PAPERS

Sl. No.	THEORY PAPERS	ESE	CCA	Total	Lecture- Tutorial- Practical/ Week	Credits
	(Four Core Papers)					
	Paper I :	70	30	100	6-0-0	6
	Paper II :	70	30	100	6-0-0	6
	Paper III :	70	30	100	6-0-0	6
	Paper IV :	70	30	100	6-0-0	6

		Grand Total	400 marks		24 credits
--	--	-------------	-----------	--	------------

SEMESTER II

1.	THEORY PAPERS (Four Core Papers)	ESE	CCA	Total	Lecture- Tutorial- Practical/ Week	Credits
	Paper V :	70	30	100	6-0-0	6
	Paper VI :	70	30	100	6-0-0	6
	Paper VII :	70	30	100	6-0-0	6
	Paper VIII :	70	30	100	6-0-0	6
		Grand Total		400 marks		24 credits

SEMESTER III

1.	THEORY PAPERS (Core/Elective Papers)	ESE	CCA	Total	Lecture- Tutorial- Practical/ Week	Credits
	Paper IX :	70	30	100	6-0-0	6
	Paper X :	70	30	100	6-0-0	6
	Paper XI : Any one of the following	70	30	100	6-0-0	6
	a)					
	b)					
	c)					
	d)					
	Paper XII : Any one of the following	70	30	100	6-0-0	6

	(a)					
	(b)					
	(c)					
	(d)					

Grand Total 400 24

SEMESTER IV						
1.	THEORY PAPERS (Core/Elective Papers)	ESE	CCA	Total	Lecture- Tutorial- Practical/ Week	Credits
	Paper XIII :	70	30	100	6-0-0	6
	Paper XIV :	70	30	100	6-0-0	6
	Paper XV : Any one of the following	70	30	100	6-0-0	6
	a)					
	b)					
	c)					
	d)					
	Paper XVI : Any one of the following	70	30	100	6-0-0	6
	a)					
	b)					
	c)					
	d)					

Grand Total 400 24

Total Marks of M.A. (Semester I, II, III & IV) 1600 marks and credit 96

INFORMATION ABOUT THE DEPARTMENT OF ECONOMICS

S.No	Name	Designation Qualification	Qualification	Specialization
1.	Dr. Madan Mohan	Associate Professor & Head	M.A. M. Phil Ph. D.	Industrial Economics
2.	Dr.(Mrs.) Rekha Mehta	Associate	M.A. M Phil	Macro Economics

		Professor	NET,Ph.D	
3	Dr. L.L. Salvi	Assistant Professor	M.A. ,NET, Ph.D.	Econometrics
4	Mr. Parvez Ali	Assistant Professor	M.A. NET, SET	Labour Economics
5	Dr. Kanta Choudhary	Assistant Professor	M.A. NET Ph.D	Economic development
6	Mrs. Rekha	Assistant Professor	M.A. NET	Labour Economics
7	Dr. Jaya Bhandari	Assistant Professor	M.A. M. Phil Ph. D.	Industrial Economics
8	Dr. Rajni Kant Trivedi	Assistant Professor	M.A. M. Phil Ph. D.	Mathematical Economics
9	Mr. Shraavan Raj	Assistant Professor	M.A. NET SLET	Agriculture Economics
10	Dr. Dev Karan Genwa	Assistant Professor	M.A. NET SLET Ph. D.	International economics

SEMESTER -III**Core Courses IX****ECO -301-PUBLIC FINANCE I**

Unit 1 :	Introduction: Normative Approach to Public Finance—The Theory of Optimum Budget. Fiscal functions : Allocation function, Distribution function, stabilization function
Unit 2 :	Taxation: Principles of Taxation—Benefit approach (The Lindhal and Bowen Model), Ability to pay approach (subjective and objective Approach, Musgrave and Samuelsons’s solution).
Unit 3 :	Public Expenditure Wagner’s law of increasing state activities ; Wiseman Peacock hypothesis, Pure theory of public expenditure; Structure and growth of public expenditure; Reforms in expenditure budgeting; programme budgeting and zero base budgeting.
Unit4 :	<p>Fiscal Policy :Objectives of fiscal policy—full employment, anti inflation, economic growth, redistribution of income and wealth; Interdependence of fiscal and monetary policies; Budgetary deficits and its implications; Fiscal policy for stabilization— automatic vs. discretionary stabilization, Balanced budget multiplier</p> <p>REQUIRED READINGS</p> <p>Musgrave, R.A. 1959: —The Theory of Public Finance, McGraw Hill, Herber, B.P. 2004 —Modern Public Finance, (Fifth Edition): Richard, D. Irwin, Browning E.K. and Browning J.M. 2004: —Public Finance and the Price System, Pearson Education, Bagchi, Amaresh.2005 : —Readings in Public Finance; Oxford University Press, Govt. of India: Reports of Various Finance Commission Dutt and Sundram (Latest edition): —Indian Economy, S.Chand & Co., New Delhi. Kaushik Basu, eds (2007) : Economics in India – OUP, New Delhi. Govt. of India, Ministry of Finance: Indian Public Finance statistics Govt. of India, Ministry of Finance: Raja J. Chelliah Committee Report Govt. of India, Ministry of Finance: Kelkar Committee Report RBI Bulletins : Various Issues Economic and Political Weekly : Various Issues Musgrave, R.A.: The Theory of Public Finance, McGraw Hill Herber, B.P: Modern Public Finance Cornes, R and T. Sandler(1986) The Theory of Externalities, Public Goods and Club Goods, Cambridge University Press, Cambridge Dulf, L.(1997) : Government and Market, Orient Longman, New Delhi Bird, R. and O. Olodman(1967) : Reading in Taxation in Developing Countries, John Hopkins University Press, Baltimore Bird, R. and O. Olodman(1967) : Reading in Taxation in Developing Countries, John Hopkins University Press, Baltimore Cutt, J(1969) : Taxation and Economic Development in India, Fridrick A Pralger Publisher, New York Chelliah, Raja J (1971):Fiscal Policy in Under-developed Countries, George Allen and Unwin, Lond Stigliz, Joseph.E (2000) : Economics of Public Sector, Norton. RECOMMENDED READINGS Kaul. I. & Conceicao (Eds)2006: —The New Public Finance, Oxford University Press, New York Mishan, E.J.(1982): Cost Benefit Analysis: An Informal Introduction, George Allen and</p>

	<p>Unwin, London</p> <p>Phyrr, P(1970): Zero Base Budgeting : A Practical Management Tool for Evaluating Expenses, John Weiley, New York</p> <p>Sahni, B.S.(Ed)(1972) : Public Expenditure Analysis : Selected Readings, Rotherdam, University Press</p> <p>Barman, K (1986) : Public Debt Management in India Uppal Publishing House, New Delhi</p> <p>Peacock, A and G.K. Shaw (1976) : The Economic Theory of Fiscal Policy, George Allen and Unwin , London</p> <p>Chelliah, Raja, J et. Al. (1981): Trends and Issues in India, Federal Finance, National Institute of Public Finance and Policy, New Delhi</p> <p>Challiah, R.J.(Ed) (1997): Towards Sustainable Growth, Oxford University Press, New Delhi</p> <p>Jha Raghendra 1989: Modern Theory of Public Finance, Wiley Eastern Ltd., New Delhi</p> <p>Dutt, R (ed) (2001) : Second Generation Economic Reforms in India Deep & Deep Publication, New Delhi</p> <p>Government of India: Reports of the Tax Reforms Committee Interim and Final (Chairman:Raja J. Chelliah)</p> <p>Tyagi B.P.: Public Fiance(Latest ed) Relavant chs., Jai Prakash Nath & Co., Meerut. Govt. of India: Report of Finance Commission Economic Survey(Latest ed)</p> <p>Fiscal Responsibility and Budget Management Act, 2003</p> <p>R.B.I : Report of Currency and Finance</p> <p>Musgrave, R.A. and P.B. Musgrave (1976) : Public Finance in Theory and Practice, McGraw Hill Kogakusha, Tokyo</p> <p>Shome.P(ed) (1995) : Tax Policy Handbook, Tax Division, Fiscal affairs Department International Monetary Fund, Washington D.C.</p> <p>Bagchi, A and Stern N(Eds) (1989) : Tax Policy and Planning in Developing Countries (OUP)</p> <p>Bagchi A.(ed)2005: Readings in Public Finance, OUP</p> <p>Kaushik and Basu (2007) : Economics in India. OUP</p> <p>Mundle S. 2000: Public Finance Policy – Issues for India, Oxford University Press</p>
--	---

Core Course X
ECO 302- INTERNATIONAL ECONOMICS-I

Unit 1 :	The pure theory of International Trade : trade under absolute and comparative cost differences, opportunity cost doctrine, the specific factors model, the Heckscher- Ohlin theory, factor -price equalization theorem; Empirical testing of the Ricardian theory and the H.O. theory, Kravis and Linder’s thesis; Role of dynamic factors : Changes in tastes, technology and factor endowments; the Rybczynski Theorem, Stolper-Samuelson theorem and the Concept of immiserizing growth.
Unit 2 :	Terms of trade : Different Concepts of terms of trade, factors affecting terms of trade and importance of the concept; hypothesis of secular deterioration of terms of trade, Instruments of trade intervention : Tariffs: effects of tariffs in partial and general equilibrium, effective rate of tariff, the Optimum tariff.
U nit 3 :	Effects of Import quotas; Differences in the operation of Tariffs and quotas. The concept of equivalence between them, other non-tariff instruments of trade policy; Voluntary exports restraints and export subsidies etc Trade under imperfect competition : The effect of increased market size; economies of scale and comparative advantage, the significance of intra-industry trade.

Unit 4 :	Balance of Payments : Meaning and components, Current account and capital account, surpluses and deficits; Measures to correct disequilibrium; Automatic measures, Quasi-adjustment measures and permanent therapy. REQUIRED READINGS Krugman, P.A. and Obstfeld, M. : International Economics : Theory and Policy, 6/e Pearson Education, 2003 (Herein after referred as text), Ch.2,3,4 Chacholiades, M : International Economics, 1990, Chs. 4,5 Text : Chaps 5 and 8. Chacholiades, M : International Economics, Chs, 3,7 and 9 Text : Chs. 12,15 and 19
----------	--

**ECO -303-A
PRINCIPLES OF AGRICULTURAL ECONOMICS-I**

Unit 1 :	Nature and scope of agricultural economics. peculiarities of agriculture, problems of agriculture, role of agriculture in economic development.
Unit 2 :	Agricultural production function:- Law of returns to scale, Law of variable proportion, isoquant curve and least cost combination, cob-Douglas production function
Unit 3 :	Agricultural prices- meaning and causes of price fluctuations, measure of price stabilization, cob-web theorem, agricultural subsidies
Unit 4 :	Agriculture and state – need for state intervention, the role of state with special reference to credit, marketing, and prices, need for agricultural price policy. REAQUIRED READINGS Ahuja, Astha(2006):Agriculture and Rural Development in India. New Century Publications, New Delhi – 110002. John, W.Mellor : The Economics of Agricultural Development Choen : Economics of Agriculture. Heady, E.O. : Economics of Agricultural Production and Resources Use, Prentice Hall of India (Chaps. 1,2,3,4,5,8,12,20 and 24) Eicher and Witt : Agriculture in Economic Development, Vora & Co. Publishers Pvt. Limited, Bombay (Chaps 1,2,5, and 15), 1970 Halcrow, H.C. : Contemporary Reading in Agriculture, Mc-Graw Hill Prentice Hall, N.J., 1955 Gulati, A and T. Kelly (1999) Trade Liberalisation and Indian agriculture, Oxford University Press, New Delhi Kahlo, A.S. and Tyagi D.S.(12983): Agricultural Price Policy in India, Allied Publishers, New Delhi N.L. Aggarwal(2003): Bhartiya Krishi Ka Arth Tantra, Rajasthan Hindi Granth Academy , Jaipur (Hindi) Schultz, T.W. : Transforming Traditional Agriculture, Yale University,1964 Sadhu, A.N and Singh, A.(2000): Fundamentals of Agricultural Economics, Himalaya Publishing House, New Delhi

ECO -303B

ECONOMICS OF MODERN INDUSTRY- I

Unit 1 :	Nature and Scope of Industrial Economics. The Theory of the Industrial Firm, Profit Maximization Versus other objectives of the Industrial Firm, Economics of Scale of Plant and the Firm.
Unit 2 :	Pricing under perfect competition : Meaning, features, price determination under perfect competition- short run and long run difference between firm's and

	industry's equilibrium. Pricing under simple and discriminating monopoly; meaning. Price and Output determination under monopoly, discrimination monopoly, monopoly index- Lerner, Rothschilds and Bain
Unit 3 :	Pricing under monopolistic competition: meaning, features, price and output determination under monopolistic competition, group equilibrium, product differentiation and selling costs. Pricing under oligopoly: meaning, features, price and output determination under oligopoly. Kinked demand curve. Price leadership models and collusive, Non-collusive models.
Unit 4 :	<p>Cost Volumes - Profit the Break Even Analysis: Introduction, Meaning. Objectives, Concepts and nature, assumptions of cost volume, profit and break even analysis, three alternatives to explain break even analysis, methods of break even analysis-with help numerical example.</p> <p>REAQUIRED READINGS Robinson: E.A.G. : Structure of Competitive Industry (EH) Pasu, J.S.: Industrial Organisation Archiboids, G.C.(ed): The Theory of Firm Selected Reading Basil, S. Yamey(ed): Economics of Industrial Structure : Selected Readings Hawkins, C J and Pearce, D.W.: Capital investment Appraisal, 1971 Crucial, S.C: Financial Management : An Analytical and Conceptual Approach, 1975, R.R. Berthwal: Industrial Economics, Wiley Eastern, New Dehli. Singer, E.M.: Antitrust Economics, Leftwich, R.M.: The price system and Resources Allocation Bain, J.S: Industrial Organisation, 2nd Ed., 1958 Machlup, F: Theories of the Firm : Marginalist Behavioral, Managerial, American Economic Review March 1967,, reprinted in Readings in the Economics of Industrial Organisation, D. Needham(ed) Mehta, M M : Measurement of Industrial Productivity Walter Israd: Methods of Regional Analysis-An Introduction to Regional Science</p>

ECO -303C
TRADE UNIONISM AND INDUSTRIAL RELATIONS- I

Unit 1 :	Meaning, Concept, significance and peculiarities of labour, nature scope and importance of labour economics Characteristics of labour market in India .Paradigms of labour market-classical, neo classical and dualistic.
Unit 2 :	Labour migration-trends and effects. Absenteeism of industrial labour in India, causes, effects and remedies. Problems of labour. India's labour policy
Unit 3 :	Personnel management-concept, definition, characteristics And functions. Philosophy and principles of personnel management: Role, importance, objectives and kinds of communication in personnel management. Personnel management in India
Unit 4 :	<p>Training and Development of Human Resources, objects and importance. Methods and Procedure of training. Types, levels and principles of training</p> <p>REAQUIRED READINGS Dalt, G (1996), Bargaining Power, wages and employment: An Analysis of agricultural labour market in India, sage publications New- Delhi Hajela P.D.(1098), labour Restructuring in India; A critique of the new economic</p>

	<p>policies, common wealth publishers, New-Delhi</p> <p>Lester, R.A(1964), economics of Labour (2nd edition) Macmillan, New-Delhi)</p> <p>McConnell, C.r. and S.L. Bure (1986), Contemporary Labour Economics, Mcgrdw-Hill, New-York.</p> <p>Rosenberg M.R. (1988), Labour markets in low Income Countries in Chenery, H.B. and T.N. Srinivasan, (Eds) The Handbook of Development Economics, North-Holland, New York</p> <p>Davar, R.s Personnel management and industrial Relation Reynolds, L.G. Labour Economics and labour Relations</p> <p>Sharma, D.C. and R.C. Industrial Relations and Personnel Management</p> <p>T.N. Bhagoliwal : Labour Economics and industrial Relations (Hindi and English Edition)</p>
--	--

ECO -303D

MATHEMATICAL ECONOMICS –I

Unit 1 :	<p>The theory of consumer behaviour : Utility and indifference curve analysis; Demand functions, elasticity of demand.</p> <p>REQUIRED READING</p> <p>Henderson and Quandt : Micro Economic Theory. 3rd ed., Chaps. 2 and 3</p>
Unit 2 :	<p>Income and Leisure, Linear expenditure system, theory of Revealed preference, composite commodities; situations involving risk, behaviour under uncertainty</p> <p>REQUIRED READING</p> <p>Henderson and Quandt : Micro Economic Theory. 3rd ed., Chaps. 2 and 3</p>
Unit 3 :	<p>The Theory of Firm, Production functions- Cobb-Douglas, CES Production functions, Elasticity of substitution, input demands, cost functions, Euler’s theorem,</p> <p>REQUIRED READING</p> <p>Henderson and Quandt : Micro Economic Theory. 3rd ed., Chaps. 4 &5</p>
Unit 4 :	<p>Duality in production, production under uncertainty , Market equilibrium, commodity market equilibrium, factor market equilibrium, Existence and uniqueness of equilibrium, stability of equilibrium: Static stability, Dynamic stability</p> <p>REQUIRED READING</p> <p>Henderson and Quandt : Micro Economic Theory Chaps. ,5 and 6</p>

ECO- 304A

ECONOMIC PROBLEMS OF INDIAN AGRICULTURE- I

Unit 1 :	<p>Agricultural marketing – meaning, problems, importance and measures to improve the system of agricultural marketing process and PDS</p>
Unit 2 :	<p>Agricultural financial system – need for and problems of agricultural finance, source of agricultural finance special reference to NABARD, regional rural banks, measures to improve the agricultural finance system, rural indebtedness</p>
Unit 3 :	<p>Land reforms policy- meaning, objectives, importance and progress of land reforms during the planning, meaning and causes of sub-division and fragmentation, consolidation of holdings</p>
Unit 4 :	<p>Agricultural mechanization- definition, merits and demerits of agricultural mechanization, problems of agricultural labour, minimum wage policy</p> <p>RECOMMENDED READINGS:</p> <p>Ahuja, Astha(2006):Agriculture and Rural Development in India.New Century</p>

	<p>Publications, New Delhi – 110002 Agarwal, G.D. and Bansal, P.G.: Economic Problems of Indian Agriculture Agarwal, H.N.: Indian Agriculture (Latest edition) Chaudhari,Prमित : Problems of Change in Agriculture – The Indian Economy Misra, G.P. : Some Aspects of changes in Agrarian Structure Rao, C.H.: Technological change and the Distribution of Gains in Indian Agriculture Vakil,C.N. and Shah, C.H. : Agriculture Development of India. Mellor, J.M., Weaver, T.F., Lele, U.J. and Simon, S.R. : <i>Development of Rural India,Parts I-A and IV</i> Wadhwa, C: <i>Some Problems of India's Economic Policy</i> G.K.Chadha (Ed)(2003): WTO and Indian Economy,Deep and Deep Publisher New Delhi Gulati, Ashok and sharma, Ani (1994) — Agriculture under GATT: what it holds for India Economic and political weekly, Review of Agriculture. Govt. of India: Report of the National Commission on Agriculture (Relevant vols) <i>Govt. of India : Five Year Plans and their Progress Report .</i> PERIODICALS Indian Journal of Agricultural Economics Agricultural Situation in India Economic and Political Weekly Statistical Abstract of Rajasthan</p>
--	---

ECO -304B

INDIAN INDUSTRY – I

Unit 1 :	<p>Industrial growth in India since 1951, Rate of growth of industrial investment and output. Structure of Industrial Growth: Rates and pattern of growth, REQUIRED READINGS Malendaum, W.: Prospects for Indian Development Rosen, G.:Industrial Change in India Medhore, P.B.: The Industrial Growth since 1950-An Assessment Due,John, F. and Frielandeur: Government Finance, Economics of the Public Sector, 4th ed., Irwin,1969 Mehta, M.M.: Structure of Indian Industries Gadgil,D.R.:Industrial Evolution of India</p>
Unit 2 :	<p>Industrial Planning in India, Policies of self-reliance, Import substitution, MNCs and Foreign aid. REQUIRED READINGS Y.K.Alagh : Regional Distribution of Industry in Economics and K.K. Subrabmanyam : Economic and Political Weekly, April 10,1971 Jail Ahmed : Import Substitution Change in Indian Manufacturing Industries, 1965-66 (Mimeographed), Harvard Research Centre.</p>
Unit 3 :	<p>Impact of Privatization and Globalization on Indian industries. WTO and Indian industries. Batra, G.S. & Dangwal, R.C: Globalisation and Liberalisation(New Development) Deep & Deep Publications Pvt. Ltd. New Delhi Chadda, G.K.: WTO and Indian Industries, Deep & Deep Publications Pvt. Ltd. New Delhi. Sabade, B.R.(2001): WTO – A Threat or an opportunity.</p>

Unit 4 :	Industrial Policy: Evolution of industrial policy and its critical assessment. Industrial Sickness, Concentration of economic power (MTRA) REQUIRED READINGS P.D. Ojha : Putting Teeth into the Monopolies Act in Economic and Political Weekly, July 1971(Special No.) and other articles by the same author in EPW, Jan. 1969(Annual No and 28 th Feb. 1970.)
----------	---

ECO- 304C

WAGES AND SOCIAL SECURITY – I

Unit 1:	Wage theories: marginal productivity, demand and supply and collective bargaining, Classical, Neo classical and bargaining theories. Productivity and wage relationship.
Unit 2 :	Wages: Meaning of wages, types of wages in India, wages difference, wage Payment, Method of Wage Payment; Incentive wage payment, wage determination: minimum wage, fair wage and living wage, Systems of wage payment in India, Exploitation of Labour, Cause of wage differentials.
Unit 3 :	Labour problems and policy: Characteristics and problems of Agricultural and Industrial Labour, Policy and programmes to improve the conditions of labour, Wages of Industrial and Agricultural Workers in India, Standard of Living of Workers in India.
Unit 4:	Wage Regulation: State Regulation of wages in the U.K., U.S.A. and India. Suggested Readings REQUIRED READINGS Hajela, P.D. (1998), Labour Restructuring in India: A Critique of the New Economic Policies, Commonwealth Publisher, New Delhi. Lester, R.A. (1964), Economics of Labour, (2nd Edition), Macmillan, New York. McConnell, C.R. and S.L. Brue (1986), Contemporary Labour Economics, McGraw-Hill, New York Papola, T.S., P.P. Ghosh and A.N. Sharma (Eds.) (1993), Labour, employment and industrial Relations in India, B.R. Publishing Corporation, New Delhi. Hicks J.R. (1932), The Theory of Wages, Clarendon Press, Oxford Memoria, C.B. (1966), Labour Problems and Social Welfare in India, Kitab Mahal, Allahbad. Bhagoliwal T.N., Economics of Labour and Industrial Relations Sahitya Bhawan Publications, New Delhi

ECO-304D

STATISTICAL FOUNDATIONS AND ECONOMETRICS- I

Unit 1 :	Probability : Conditional Probability and Independence, Random Variables, Density Function-Binomial, Poisson, Normal and Gamma Distribution-Expectations and Moments.
Unit 2 :	Econometrics : Nature, Meaning and Scope of Econometrics, Simple linear regression Model- Assumptions, Estimation (through Ordinary Least Square method)
Unit 3 :	Concepts and derivation of R^2 and adjusted R^2 ; Maximum likelihood Estimates, Multiple regression analysis and its numerical application.

Unit 4 :	Nature, test, Consequences and remedial steps of problems of Heteroscedasticity, Autocorrelation and Multicollinearity. REQUIRED REQDINGS Mood, Graybill and Boes : Introduction to the theory of Statistics (3 rd ed.) Johnson : Econometric (II ed.) Gujarati, and Sangeeta : Basic Econometrics (4 th ed.) Tata McGraw Hill Publishing Co., 2007
----------	---

Skill Course- 3

DATA ANALYSIS

Course Description:

Unit 1 :	Sources of data. Population census versus sample surveys. Random sampling, Estimation of population parameters from sample data. Unbiased estimators for population mean and variance.
Unit 2 :	Uni-variate frequency distributions. Measures of central tendency: Mean median and mode; arithmetic, geometric and harmonic mean. Measures of dispersion, skewness and kurtosis.
Unit 3 :	Bi-variate frequency distribution. Correlation and regression. Rank correlation.
Unit 4 :	Introduction to probability theory. Notions of random experiment, sample space, event, probability of an event. Conditional probability. Independence of events. Random variables and probability distributions. Binomial and normal distributions REQUIRED READINGS P.H. Karmel and M. Polasek (1978), <i>Applied Statistics for Economists</i> , 4th edition, Pitman M.R. Spiegel (2003), <i>Theory and Problems of Probability and Statistics</i> (Schaum Series). Elhance, D.N. : Fundamental of Statistics Croxton and Cowden : Applied General Statistics Speegel, R.M. : Theory and Problems of Statistics Ellhance, D.N. : Fundamentals of Statistics (HE), K.N. Nagar: Statistics, Meenakshi Prakashan, Meruth

SYLLABUS M.A.IV SEM CBCS 2021

GUIDELINES FOR CHOICE BASED CREDIT SYSTEM

Definitions of Key Words:

Academic Year: Two consecutive (one odd + one even) semesters constitute one academic year. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select two elective papers offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete four skill courses: two within the Department and two from other Department within JNV University or the Universities approved by JNV University

Course: Usually referred to, as ‘papers’ is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.

Credit Based Semester System (CBSS): Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.

Credit Point: It is the product of grade point and number of credits for a course.

Credit: A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period of teaching (lecture or tutorial) or two periods of practical work/field work per week.

Cumulative Grade Point Average (CGPA): It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.

Grade Point: It is a numerical weight allotted to each letter grade on a 10-point scale.

Letter Grade: It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.

Programme: An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.

Semester Grade Point Average (SGPA): It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.

Semester: Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/ December and even semester from December/January to May.

Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May.

Transcript or Grade Card or Certificate: Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Arts, Education & Social Sciences resolves the following:

All internal assessments shall on term test and seminar. Attendance shall carry the prescribed marks in all papers.

In each semester two out of four theoretical components of the University examinations shall be undertaken by external examiners from outside JNV University, who may be appointed by the competent authorities.

Grievances and Redressal Mechanism

The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head of the Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.

The appeal will be assessed by the Chairman and he/she shall place before the Grievance Redressal Committee (GRC), Chaired by the Dean, Faculty of Arts, Education & Social Sciences comprising of the HOD of the concerned Department and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.

The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	=O'	Outstanding	10
2	=A+'	Excellent	9
3	=A'	Very Good	8
4	=B+'	Good	7
5	=B'	Above Average	6
6	=C'	Average	5
7	=P'	Pass	4
8	=F'	Fail	0
9	=Ab'	Absent	0

A student obtaining Grade F in a paper shall be considered failed and will be required to

reappear in the University End Semester examination.

For noncredit courses (Skill Courses) ‘Satisfactory’ or ‘Unsatisfactory’ shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

= and > 95 % marks Grade Point 10.0

90 to less than 95 % marks Grade Point 9.5
85 to less than 90 % marks Grade Point 9.0
80 to less than 85 % marks Grade Point 8.5
75 to less than 80 % marks Grade Point 8.0
70 to less than 75 % marks Grade Point 7.5
65 to less than 70 % marks Grade Point 7.0
60 to less than 65 % marks Grade Point 6.5
55 to less than 60 % marks Grade Point 6.0
50 to less than 55 % marks Grade Point 5.5
45 to less than 50 % marks Grade Point 5.0
40 to less than 45 % marks Grade Point 4.5
35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,

i.e.

$$\text{SGPA (Si)} = \frac{\sum (C_i \times G_i)}{\sum C_i}$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,

i.e.

$\text{CGPA} = \frac{\sum (C_i \times S_i)}{\sum C_i}$ /where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts

Illustration for SGPA

S.No.	Course	Credit	Grade Letter	Grade Point	Credit Point (Credit x Grade)
1	Course 1	6	B	6	6 x 6 = 36
2	Course 2	6	B+	7	6 x 7 = 42
3	Course 3	6	B	6	6 x 6 = 36
4	Course 4	6	O	10	6 x 10 = 60

	Total	24			36+42+36+60+174
--	-------	----	--	--	-----------------

Thus, SGPA = $174/24 = 7.25$

Illustration for CGPA

	Semester-I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	7025	7025	7	6025

$$\text{CGPA} = \frac{(24 \times 7025 + 24 \times 7.25 + 24 \times 7 + 24 \times 6.25)}{96}$$

$$666/98 = 6.94$$

Semester-Wise Theory Papers/Practical/Skill Component

Type of Course	Course Code	Title of the Course	Lecture-Tutorial-Practical	No. of Credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) University Examination	Total
----------------	-------------	---------------------	----------------------------	----------------	---	---	-------

Semester-I

Core Course I	Eco 101	MICRO ECONOMIC THEORY-I	6-0-0	6	30	70	100
Core Course 2	Eco 102	MACROECONOMICS-I	6-0-0	6	30	70	100
Core Course 3	Eco 103	ECONOMICS OF DEVELOPMENT-I	6-0-0	6	30	70	100
Core Course 4	Eco 104	QUANTITATIVE METHODS FOR ECONOMICS-I	6-0-0	6	30	70	100
*Skill Course I	ECONOMICS OF CAPITAL MARKET		2-0-0				
Total				24	120	280	400

Semester-II

Core Course 5	Eco 201	MICRO ECONOMIC THEORY-II	6-0-0	6	30	70	100
Core Course 6	Eco 202	MACROECONOMICS-II	6-0-0	6	30	70	100

Core Course 7	Eco 203	ECONOMICS OF DEVELOPMENT-II	6-0-0	6	30	70	100
Core Course 8	Eco 204	QUANTITATIVE METHODS FOR ECONOMICS-II	6-0-0	6	30	70	100
*Skill Course II	INDIAN ECONOMY		2-0-0				
TOTAL				24	120	280	400

Semester-III

Core Course 9	Eco 301	PUBLIC FINANCE-I	6-0-0	6	30	70	100
Core Course 10	Eco 302	INTERNATIONAL ECONOMICS-I	6-0-0	6	30	70	100
Discipline Specific Elective papers -Any one of the following papers							
Elective/s 1	303-A PRINCIPLES OF AGRICULTURAL ECONOMICS I 303-B ECONOMICS OF MODERN INDUSTRY- I 303-C TRADE UNIONISM AND INDUSTRIAL RELATIONS- I 303-D MATHEMATICAL ECONOMICS -I		6-0-0	6	30	70	100
Elective/s 2	304A-ECONOMIC PROBLEMS OF INIDIAN AGRICULTURE 304B-INDIAN INDUSTRY – I 304C-WAGES AND SOCIAL SECURITY-I 304 D- STATISTICAL FOUNDATIONS AND ECONOMETRICS		6-0-0	6	30	70	100
*Skill course III	DATA ANALYSIS		2-0-2				
TOTAL				24	120	280	400

Semester IV

Core course 11	Eco401	PUBLIC FINANCE-II	6-0-0	6	30	70	100
Core course 12	Eco402	INTERNATIONAL ECONOMICS -II	6-0-0	6	30	70	100
Discipline Specific	Elective paper –Any one of the following paper 403A-PRINCIPLES OF AGRICULTURAL ECONOMICS II 403B-ECONOMICS OF MODERN INDUSTRY- II 403C-TRADE UNIONISM AND INDUSTRIAL RELATIONS- II 403D- MATHEMATICAL ECONOMICS-II		6-0-0	6	30	70	100
Discipline Specific	Elective paper –Any one of the following paper 404A-ECONOMIC PROBLEMS OF INIDIAN AGRICULTURE II 404B-INDIAN INDUSTRY –II 404C- WAGES AND SOCIAL SECURITY – II 404D- STATISTICAL FOUNDATIONS AND ECONOMETRICS- II		6-0-0	6	30	70	100
*Skill course IV	RAJASTHAN ECONOMY		2-0-0				
Total				24	120	280	400

*The Department shall offer one skill course per semester from the list of skill courses approved for the Department

In view of the course content, the Department of Economics.....distributed the Periods between Theory/Tutorial as under per paper

6: 0 : 0 (six lectures only (no tutorial and no practical) per week) – For Theory
2+0+0 (two lectures) - For Skill course

The Duration of the Period shall be forty five minutes. In each of these combinations, the first value stands for the same number of lecture instructions per week

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective) involve an evaluation system of students that has the following two components:-

Continuous Comprehensive Assessment (CCA) accounting for 30% of the final grade that a student gets in a course; and End-Semester Examination (ESE) accounting for the remaining 70% of the final grade that the student gets in a course.

Continuous Comprehensive Assessment (CCA): This would have the following components:
Term Test: One term test shall be arranged for each paper prior to End-Semester Examination; examination duration shall be of three hours; maximum marks shall be 60 (reduced to 15).
Seminar: Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 40 (reduced to 10). The seminar shall be completed prior to term test for all the papers.
Classroom Attendance – Each student will have to attend a minimum of 75% Lectures / Tutorials. A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE). Attendance marks will be awarded by following the system proposed below:

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

75% to 80% = 1 mark
81% to 85% = 2 marks
86% to 90% = 3 marks
91% to 95% = 4 marks
96% and above = 5 marks

Note : Compensation in classroom attendance of a student will be as per prevalent University rules

Each student's cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Arts, Education & Social Sciences.

CCA is based on open evaluation system without any bias to any student.

Any grievance received in the Department from student shall be placed before the Grievance Redressal Committee with adjudicated comments

Each component marks will be added making it rounding as per norms

Marking Scheme of Continuous Comprehensive Assessment (CCA)

Components	Maximum Marks	Reduced and Original Marks
Term Test	60	(reduced to 15)
Seminar	40	(reduced to 10)
Classroom Attendance	05	05
Total Marks of CCA		30

Note : Classroom Attendance marks will be as follows:-

Percentage	Marks
75% to 80%	1 Mark
81% to 85%	2 Marks
86 to 90%	3 Marks
86 to 90%	4 Marks
96% and above	5 Marks

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective

Department shall declare the result as —Satisfactory| or —Non-Satisfactory|; each student need to get a minimum of three —Satisfactory| declaration for the course completion

For the Term test and ESE

Part A

Ten questions (Definitions, illustrations, functions, short explanations, etc; 25-50 words) for one mark each. $10 \times 1 = 10$ marks; comprising questions from each Unit; no choice in this part

Part B

Four questions of long/explanatory answer (500 words) type, one drawn from each Unit; with internal choices : $4 \times 15 = 60$ marks.

$10+60 = 70$ marks

Qualifying for Next semester

A student acquiring minimum of 40% in total of the CCA is eligible to join next semester

A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as Fail'), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.

A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time, i.e. three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted, for additional chances examination fee shall be on additive basis

Improvement Option:

Every student shall have the opportunity to improve Credit through University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall

be final

Result Declaration:

The ESE (End Semester Examination/University Examination) results shall be declared within twenty days of the last examination. The Theory Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation

POST -GRADUATE COURSE: A DESCRIPTION

The full course is of FOUR SEMESTERS spread for TWO YEARS duration. A semester-wise list of courses to be offered is given below. In each paper there will be four unit.

SEMESTER I

SEMESTER II

SEMESTER III

SEMESTER IV

Elective paper group – First – Semester III

Elective paper group – Second – Semester III

Elective paper group – First – Semester IV

Elective paper group – Second – Semester IV

Skill Courses in the respective subject

Electives would be discipline centric and only students from concerned departments can register

ADMISSION

The minimum qualification for admission to M.A. Course is Graduate Degree. The details of eligibility conditions and admission procedure will be as per University rules. The candidates are required to attend minimum of a 75% of classes.

TEACHING AND EXAMINATION

SCHEME per Semester

Course	Periods/Week	Examination Hours	CCA	ESE	Total
Theory Papers					
Course I	6	3	30	70	100
Course II	6	3	30	70	100
Course III	6	3	30	70	100
Course IV	6	3	30	70	100

UNIVERSITY EXAMINATION

Each course paper shall be of three hours duration

Note: The number of elective to be taught from each group in a particular year shall be decided by the Department. Electives offered will be announced at the beginning of the academic session. Each student shall be assigned one Elective Paper from Group ONE and the second from Group TWO. Elective papers will be allotted on merit-cum-choice basis as far as possible. In the odd semester two skill courses will be those offered by the respective departments in the even semester skill courses will be from other departments.

SCHEME OF EXAMINATION FOR M.A. _ECONOMICS (SEMESTER SYSTEM) FOR THE EXAMINATION

INSTRUCTIONS FOR THE PAPER SETTERS AND THE STUDENTS

Max. Marks - 70

Min. Marks – 25

Duration – 3 hours

The first question shall be short answer type containing 10 short questions spread over the whole syllabus to be answered in about 30 words each. It shall carry 10 marks and shall be a compulsory question

Rest of the paper shall contain 8 questions with internal choice. The entire syllabus has been divided into four units. Each unit shall have two questions and the candidates shall be given internal choice i.e. the candidate shall attempt one question from each unit.

SEMESTER I

THEORY PAPERS

l.	THEORY PAPERS	ESE	CCA	Total	Lecture- Tutorial- Practical/ Week	Credits
	(Four Core Papers)					
	Paper I :	70	30	100	6-0-0	6
	Paper II :	70	30	100	6-0-0	6
	Paper III :	70	30	100	6-0-0	6
	Paper IV :	70	30	100	6-0-0	6

		Grand Total	400 marks		24 credits
--	--	-------------	-----------	--	------------

SEMESTER II

1.	THEORY PAPERS (Four Core Papers)	ESE	CCA	Total	Lecture- Tutorial- Practical/ Week	Credits
	Paper V :	70	30	100	6-0-0	6
	Paper VI :	70	30	100	6-0-0	6
	Paper VII :	70	30	100	6-0-0	6
	Paper VIII :	70	30	100	6-0-0	6
		Grand Total		400 marks		24 credits

SEMESTER III

1.	THEORY PAPERS (Core/Elective Papers)	ESE	CCA	Total	Lecture- Tutorial- Practical/ Week	Credits
	Paper IX :	70	30	100	6-0-0	6
	Paper X :	70	30	100	6-0-0	6
	Paper XI : Any one of the following	70	30	100	6-0-0	6
	a)					
	b)					
	c)					
	d)					
	Paper XII : Any one of the following	70	30	100	6-0-0	6

	(a)					
	(b)					
	(c)					
	(d)					

Grand Total 400 24

SEMESTER IV						
1.	THEORY PAPERS (Core/Elective Papers)	ESE	CCA	Total	Lecture- Tutorial- Practical/ Week	Credits
	Paper XIII :	70	30	100	6-0-0	6
	Paper XIV :	70	30	100	6-0-0	6
	Paper XV : Any one of the following	70	30	100	6-0-0	6
	a)					
	b)					
	c)					
	d)					
	Paper XVI : Any one of the following	70	30	100	6-0-0	6
	a)					
	b)					
	c)					
	d)					

Grand Total 400 24

Total Marks of M.A. (Semester I, II, III & IV) 1600 marks and credit 96

INFORMATION ABOUT THE DEPARTMENT OF ECONOMICS

S.No	Name	Designation Qualification	Qualification	Specialization
1.	Dr. Madan Mohan	Associate Professor & Head	M.A. M. Phil Ph. D.	Industrial Economics
2.	Dr.(Mrs.) Rekha Mehta	Associate	M.A. M Phil	Macro Economics

		Professor	NET,Ph.D	
3	Dr. L.L. Salvi	Assistant Professor	M.A. ,NET, Ph.D.	Econometrics
4	Mr. Parvez Ali	Assistant Professor	M.A. NET, SET	Labour Economics
5	Dr. Kanta Choudhary	Assistant Professor	M.A. NET Ph.D	Economic development
6	Mrs. Rekha	Assistant Professor	M.A. NET	Labour Economics
7	Dr. Jaya Bhandari	Assistant Professor	M.A. M. Phil Ph. D.	Industrial Economics
8	Dr. Rajni Kant Trivedi	Assistant Professor	M.A. M. Phil Ph. D.	Mathematical Economics
9	Mr. Shraavan Raj	Assistant Professor	M.A. NET SLET	Agriculture Economics
10	Dr. Dev Karan Genwa	Assistant Professor	M.A. NET SLET Ph. D.	International economics

SEMESTER IV**ECO 401- PUBLIC FINANCE –II**

Unit 1 :	Role of Government in Economic Development; Private goods, Public goods and Merit goods. Market Failure – imperfections, decreasing costs and externalities.
Unit 2 :	Theory of incidence: incidence and impact of taxation, taxable capacity, excess tax burden.
Unit 3 :	Classical view of public debt; Compensatory aspect of debt policy; Burden of public debt; Sources of public debt; Principles of debt management and repayment
Unit 4 :	<p>Fiscal Federalism : Finance Commission. Devolution of resources and grants; Resource transfer from union to states—Criteria for transfer of resources; Centre States financial relations in India; Problems of State’s resources from Union and States to local bodies. Indian Public Finances : Indian tax system ; Revenue of the Union, State Government and Local bodies; Major taxes in India ; Base of taxes, direct and indirect taxes. Trends in Public expenditure and public debt. Fiscal Sector Reforms in India.</p> <p>REQUIRED READINGS</p> <p>Musgrave, R.A. 1959: —The Theory of Public Finance, McGraw Hill, Herber, B.P. 2004 —Modern Public Finance, (Fifth Edition): Richard, D. Irwin, Browning E.K. and Browning J.M. 2004: —Public Finance and the Price System, Pearson Education, Bagchi, Amaresh.2005 : —Readings in Public Finance; Oxford University Press, Govt. of India: Reports of Various Finance Commission</p> <p>Dutt and Sundram (Latest edition): —Indian Economy, S.Chand & Co., New Delhi. Kaushik Basu, eds (2007) : Economics in India – OUP, New Delhi Delhi. Kaushik Basu, eds (2007) : Economics in India – OUP, New Delhi.</p> <p>Govt. of India, Ministry of Finance: Indian Public Finance statistics</p> <p>Govt. of India, Ministry of Finance: Raja J. Challiah Committee Report</p> <p>Govt. of India, Ministry of Finance: Kelkar Committee Report</p> <p>RBI Bulletins : Various Issues</p> <p>Economic and Political Weekly : Various Issues</p> <p>Musgrave, R.A.: The Theory of Public Finance, McGraw Hill</p> <p>Herber, B.P: Modern Public Finance</p> <p>Cornes, R and T. Sandler(1986) The Theory of Externalities, Public Goods and Club Goods, Cambridge University Press, Cambridge</p> <p>Dulf, L.(1997) : Government and Market, Orient Longman, New Delhi</p>

ECO 402-**INTERNATIONAL ECONOMICS-II**

Unit 1 :	Theories of devaluation: Elasticities, absorption and Monetary approaches; Foreign Trade Multiplier with and without foreign repercussions; Exchange rate: Determination of exchange rate under floating exchange rate system, Purchasing Power Parity theory; Fixed versus Flexible exchange rates.
Unit 2 :	Forms of Economic Cooperation: the theory of Customs Union; the theory of optimum Currency areas, rationale and progress of SAARC/SAFTA and ASEAN; Regionalism versus Multilateralism, EU, NAFTA, GATT and WTO : WTO as an

	organization, TRIPS, TRIMS, Agricultural sector and Agreement on Textiles and clothing, Dispute Settlement understanding.
Unit 3 :	Role of gold, SDR : their creation; working of the SDRs system, SDR valuation, the present system of managed flexibility, IMF financial facilities, conditionality Clause of the IMF; Reforms of the International Monetary system; World Bank, IDA and IFC, Asian Development Bank, Theory of short-term Capital Movements and East-Asian crisis and lessons for developing countries.
Unit 4:	Trade Problems and Trade Policy of India : Recent Changes in the value, composition and direction of India's exports and Imports, Reforms in India's external sector since 1991, India's forex reserves; recent export-import policies REQUIRED READINGS Chacholiades, M : International Economics, Chs. 12,13,14,15,17,18 and 19 Text : Chs. 9,18,20,22 Chacholiades, M : International Economics, Chs. 10 and 20 Joshi, V. and Little, I.M.D : India's Economic Reforms 1991-2000, OUP, 1998 Verma, M.L.: International Trade, Vikas Publishing House Pvt. Ltd., New Delhi, 1995 RBI Bulletin : Various Issues Economic and Political Weekly : Various Issues, Bombay.

ECO -403A

PRINCIPLES OF AGRICULTURAL ECONOMICS -II

Unit 1 :	Role of Agriculture in Economic growth special for developing economy. interdependence between Agriculture and industry, sustainable Agriculture, need for Agriculture insurance.
Unit 2 :	Farm management:- definition, objectives, farm planning and farm budgeting, factors affecting farm budgeting
Unit 3 :	Agriculture and W.T.O- AOA specific support in India. IPRs and agriculture, effects on Indian agriculture of W.T.O, domestic support to agriculture in US & EU
Unit 4 :	Farming system:- Co-operative farming, contract farming, state farming, dryland farming, problems of agricultural labour, need for Agriculture subsidies REQUIRED READINGS Ahuja, Astha(2006):Agriculture and Rural Development in India. New Century Publications, New Delhi – 110002. John, W.Mellor : The Economics of Agricultural Development Choen : Economics of Agriculture. Heady, E.O. : Economics of Agricultural Production and Resources Use, Prentice Hall of India (Chaps. 1,2,3,4,5,8,12,20 and 24) Eicher and Witt : Agriculture in Economic Development, Vora & Co. Publishers Pvt. Limited, Bombay (Chaps 1,2,5, and 15), 1970 Halcrow, H.C. : Contemporary Reading in Agriculture, Mc-Graw Hill Prentice Hall, N.J., 1955 Gulati, A and T. Kelly (1999) Trade Liberalisation and Indian agriculture, Oxford University Press, New Delhi. Kahlo, A.S. and Tyagi D.S.(12983): Agricultural Price Policy in India, Allied Publishers, New Delhi N.L. Aggarwal(2003): Bhartiya Krishi Ka Arth Tantra, Rajasthan Hindi Granth Academy , Jaipur (Hindi) Schultz, T.W. : Transforming Traditional Agriculture, Yale University,1964 Sadhu, A.N and Singh, A.(2000): Fundamentals of Agricultural Economics,

	Himalaya Publishing House, New Delhi
--	--------------------------------------

ECO -403B

ECONOMICS OF MODERN INDUSTRY- II

Unit 1 :	Industrial Capital budgeting and financing. cost – benefit analysis: Net Present Value (NPV) and Internal Rate of Return(IRR)
Unit 2 :	Input- output analysis: meaning, features, assumptions and limitations. Techniques of input– output analysis (with help of 2x2 matrix)
Unit 3 :	Concepts of Productivity and Cost: Their measurement with numerical example. Reasons for Productivity and cost differences. Production function: linear production function
Unit 4 :	<p>Location of Industries: Meaning and Measurement of Location, Industrial concentration and policy towards industrial concentration Theories of Location Weber, Sargent florange and walter Ishard</p> <p>REQUIRED READINGS Robinson: E.A.G. : Structure of Competitive Industry (EH) Pasu, J.S.: Industrial Organisation Archiboids, G.C.(ed): The Theory of Firm Selected Reading Basil, S. Yamey(ed): Economics of Industrial Structure : Selected Readings Hawkins, C J and Pearce, D.W.: Capital investment Appraisal, 1971 Crucial, S.C: Financial Management : An Analytical and Conceptual Approach, 1975, R.R. Berthwal: Industrial Economics, Wiley Eastern, New Dehli. Singer, E.M.: Antitrust Economics, Leftwich, R.M.: The price system and Resources Allocation Bain, J.S: Industrial Organisation, 2nd Ed., 1958 Machlup, F: Theories of the Firm : Marginalist Behavioral, Managerial, American Economic Review March 1967,, reprinted in Readings in the Economics of Industrial Organisation, D. Needham(ed) Mehta, M M : Measurement of Industrial Productivity Walter Israd: Methods of Regional Analysis-An Introduction to Regional Science John, W. Kendrick: Productivity Trends in the United States, 1961, Introduction and Chap 1. Soloman, F.: A Primer on productivity Perlof, H Regions: Resources and Economic Growth Uttonm M.N.:Industrial Concentration, 1970 Chenery, H. and Clark, P. Inter Industry Economics, Chaps. 1-2 Sen, A.K. : Choice of Techniques, An Aspect of the Theory of Planing Economic Development, 3rd Ed., 1968 Sinha and Shawhney:Wages and Productivity in selected Indian Industries, 1970, Chaps. 1-3 Theil Boot and Lock: Operations, Research and Quantitative Economics Chap. 3, Input Output Analysis, pp. 53-72 Dwivedi, D.N.:Managerial Economics</p>

ECO -403C**TRADE UNIONISM AND INDUSTRIAL RELATIONS- II**

Unit 1 :	Theories of labour movement, salient features of Trade union, Types and functions of Trade union, Essentials of a sound Trade Union. Trade union and wages.
Unit 2 :	Detailed study in Trade Union movement of India Trade Unions Act-Main Provisions Employer's organizations. Collective bargaining : Meaning scope and implementation of the collective Bargaining, process of collective bargaining
Unit 3 :	Industrial Relations : Concept, nature, scope and Significance, Industrial disputes Causes, prevention and settlement strike and lockouts
Unit 4 :	Prevention and settlement of Industrial disputes in India: Works committees, Conciliation and arbitration, Grievance procedure in India. Workers participation in management Basic Reading List Paul Sultan: Labour Economics, Henry Holt Gitlow, Al : Labour and Industrial Society Pelting H: A History of British Trade Unionism Singa, G.P. and Sinha, P.R.N.: Industrial Relations and labour Legislation, Oxford, I.B.H. Pant S.C.: Indian Labour Problems. Punekar and Nadhuri : Trade Union leadership in India Horold Orouch : Trade Union and Politics in India Miller, H: the Political Role of Labour in Developing Countries. Collective Bargaining : A workers Education manual (ILO) Flanders, A (ed): Collective Bargaining Johari, C.K. : Unionism in a developing Economy Yoder, D. and Heneman: Labour Economics and Industrial Relations, South Western Publishing Company. T.N. Bhangoliwal, : labour Economics and Industrial Relations (Hindi and English edition

ECO -403D**MATHEMATICAL ECONOMICS –II**

Unit 1 :	Pricing under Monopoly : Monopsony, Monopolistic competition, Duopoly: Oligopoly and Bilateral monopoly,
Unit 2 :	General equilibrium; welfare economics Input-output model (closed as well as open
Unit 3 :	Game theory Linear Programming : Simplex method and dual,
Unit 4 :	Hicks_Samuelson model, Solow and Kaldor model (Application of difference and differential equations) REQUIRED READINGS Henderson and Quandt : Micro Economic Theory, Chaps 7&8\ Henderson and Quandt : Micro Economic Theory, Chaps 9,10,11 Dorfman , Samuelson, Solow : Linear Programming and Economic Analysis Chiang, A.C.: Fundamental Methods of Mathematical Economics R.G..D.Allen:Macro-Economics Dorfman. Samuelson and Solow : Linear Programming and Economic Analysis BOOKS RECOMMENDED Samuelson. P.A. : Foundation of Economic Analysis

	Hicks, J.R. : Value and Capital (Mathematical Appendix) Dorfman, Samuelson and Solow : Linear Programming and Economic Analysis.
--	---

ECO -404A

ECONOMIC PROBLEMS OF INDIAN AGRICULTURE- II

Unit 1 :	Agriculture in India- main characteristics, problems of agriculture, importance of Indian agriculture in economic development. Agriculture and environment
Unit 2 :	Green revolution in India – meaning, elements, achievements, economic effects and suggestions, need for new agricultural strategy, agricultural development during the five year plan
Unit 3 :	Agricultural problems in India- problems of share tenancy, size of farm, small and marginal farmers, marketed and marketable surplus, unemployment and disguised unemployment
Unit 4 :	Agricultural problems in India – Causes and measures of low production and productivity, Irrigation, problems of surplus cattle, problems of food and food security RECOMMENDED READINGS; Ahuja, Astha(2006):Agriculture and Rural Development in India. New Century Publications, New Delhi – 110002. John, W.Mellor : The Economics of Agricultural Development Choen : Economics of Agriculture. Heady, E.O. : Economics of Agricultural Production and Resources Use, Prentice Hall of India (Chaps. 1,2,3,4,5,8,12,20 and 24) Eicher and Witt : Agriculture in Economic Development, Vora & Co. Publishers Pvt. Limited, Bombay (Chaps 1,2,5, and 15), 1970 Halcrow, H.C. : Contemporary Reading in Agriculture, Mc-Graw Hill Prentice Hall, N.J., 1955 Gulati, A and T. Kelly (1999) Trade Liberalisation and Indian agriculture, Oxford University Press, New Delhi. Kahlo, A.S. and Tyagi D.S.(12983): Agricultural Price Policy in India, Allied Publishers, New Delhi N.L. Aggarwal(2003): Bhartiya Krishi Ka Arth Tantra, Rajasthan Hindi Granth Academy , Jaipur (Hindi) Schultz, T.W. : Transforming Traditional Agriculture, Yale University, 1964 Sadhu, A.N and Singh, A.(2000): Fundamentals of Agricultural Economics, Himalaya Publishing House, New Delh

ECO -404B

INDIAN INDUSTRY - II

Unit 1 :	Large scale and Micro, small and medium enterprises in private sector with particular reference to financing. RECOMMENDED REARDINGS Report R.K. Hazari, 1967, Role of Small Enterprise in Indian Economic Development Government of India: Report of Steel Control Committee(K.N.Raj.), Krishana Swami, Oct.,1966
Unit 2 :	Public sector Industries; Growth, structure problems of public Sector Management pricing and overall efficiency. Disinvestment of public sector enterprises

	<p>RECOMMENDED READINGS</p> <p>ARC Report: Public Sector Undertakings, Oct., 1967</p> <p>Hanson, A.H.: Public Enterprises and Economic Development Florence, P. Sargent: Industry and the State</p> <p>Gorawala, A.D.: Report on the Efficient Conduct of State Enterprises Ramanadhan, V.V.:Structure of Public Enterprises in India</p> <p>Raj K. Nigam (Ed.) Public Sector</p>
Unit 3 :	<p>Industrial progress in Rajasthan since 1956, Policy and Programmes to promote large and small-scale industries, Critical assessment of Industrial development during plans</p> <p>RECOMMENDED READINGS</p> <p>Eighth & Seventh Five Year Plans of Rajasthan Government of Rajasthan: Techno-Economic Survey of Rajasthan</p> <p>NCAER:Perspective Planning of Rajasthan</p> <p>Directorate of Industries and Civil Supplies: Growth potential and Prospects, July, 1970</p>
Unit 4 :	<p>Entrepreneurship: Concept of entrepreneur and Entrepreneurship, Entrepreneurship development. Need to promote the entrepreneurship small industries</p> <p>RECOMMENDED READINGS</p> <p>Entrepreneurship development-Dr. S.L. Gupta or Arun Mittil, Small Scale Entrepreneurship- Pranavi Garg, Pragati Agarwal, Industrial Economics and management- M. Mahajan</p>

ECO -404C

WAGES AND SOCIAL SECURITY – II

Unit 1 :	<p>Meaning and need of Social Security Measures, Social security of the Unorganized sector workers, Social Security: Social Security in the U.K., U.S.A. and Erstwhile-U.S.S.R. (in general) Social Security in India</p>
Unit 2 :	<p>State and Labour: State and Social Security of Labour –Concept of Social Security and its evolution; Social Assistance and Social Insurance- Labour Welfare in India; Special Problems of Labour;</p>
Unit 3 :	<p>Factory Legislation and labor Welfare; Main features of present Factory legislation in India, Housing of Labour; Problems and Policy in India, steps taken by government, Labour Welfare in India; Policy and Measures, Labour Legislation in India.</p>
Unit 4 :	<p>Methods of Labour recruitment in India; National Employment Service Organization in India employment service organization in India.</p> <p>RECOMMENDED READINGS</p> <p>Carter,A.M. : Theory of Wages and Employment.</p> <p>Gitlow, A.L. Lobour and Industrial Society Singh, V.B.(ed): Industrial Labour in India.</p> <p>Bloom and Northrup : Economics of Labour Relations</p> <p>Sunha, M.R. (ed) : The Economics of Manpower Planning</p>

	<p>Nigam. S.B.L : state Regulation of Minimum Wages. Podkar, S.A.: Problems of Wage Policy for Economic Development Dobb, M, : Wages (E and H). Johri, C.K.(ed): Issues in Indian Labour Policy. Gilbert, B: The Evaluation of National Insurance in Great Britain Yadav. S.L : Wages Policy and Social Security</p>
--	---

ECO -404D

STATISTICAL FOUNDATIONS AND ECONOMETRICS-II

Unit-1	Sampling and Sampling Distributions: Sampling, sample Mean, Law of Large Numbers, Central Limit Theorem, Sampling form the Normal Distributions.
Unit-2	Chi-Square, F and Student 'T' Distributions. Properties of Good Estimator. Testing of Hypothesis and analysis of Variance (Elementary treatment)
Unit-3	Dummy Variable technique – Testing structural Stability of regression models comparing to regression, use of dummy variables, Distributed lag models- Koyak Model, adaptive expectations and partial adjustment model.
Unit- 4	<p>Simultaneous Equation model: Need, Problem of Identification Estimation of Exactly Identified Equation-Indirect Least Squares, Estimation of over Identified Equation- Two stage least Square.</p> <p>REQUIRED REQDINGS</p> <p>Mood, Graybill and Boes : Introduction to the theory of Statistics (3rd ed.) Johnson : Econometric (II ed.) Gujarati, and Sangeeta : Basic Econometrics (4th ed.) Tata McGraw Hill Publishing Co., 2007</p>

Skill course IV

RAJASTHAN ECONOMY

Course Description:

Using appropriate analytical framework, this course reviews major trends in economic indicators and policy debates in Rajasthan. This course examines sector-specific polices and their impact in shaping trends in key economic indicators in Rajasthan. It highlights major policy debates and evaluates the Rajasthan empirical evidence.

Unit-1	Features of Economy of Rajasthan, Resource endowment - Land, Water, Minerals, Forests, Demographic Trends, Human Development Index
Unit 2 :	Trends in State income – Structural growth before and after reforms, Sources of State Finances, Targets and Achievements of Plans and current year Budget
Unit 3 :	Agriculture sector of Rajasthan: Role of Agriculture in State Domestic Product Cropping pattern, Productivity and yield of major crops, Agricultural marketing, Agricultural finance, Marginalization and Agricultural Diversification in Rajasthan, Critical evaluation of government policies on agriculture sector
Unit 4 :	Industrial and power sector of Rajasthan, Trends and patterns in industrial growth, large scale and small scale industries of Rajasthan, Trends in hydro power generation in Rajasthan, Environmental issues related to Industrialization and power projects in Rajasthan

<p>REQUIRED READINGS</p> <ol style="list-style-type: none">1. Mamoria and Hingorani (Eds.) : Industrial Potential of Rajasthan2. Govt. of Rajasthan: State Income of Rajasthan (Directorate of Statistics and Economics)3. Govt. of Rajasthan: Five Year Plans4. Govt. of Rajasthan : Budgets Studies5. Nathuramka : Bhartiya Arthavyavastha Ki Samasyain (Latest Ed.)6. NCAER; Techno-Economic Survey of Rajasthan7. Mathur, Hari Mohan: Rajasthan Ka Audhyogik Vikas, RHG Academy

M.A. (English) CBCS
2020-21
Sem I
P-I (Eng 101) : Literary Criticism I

Unit 1: **Bharat:** *Natyashastra (Chapter – 6)*

Aristotle: *Theory of Poetry and Fine Arts*

Unit 2: **Dryden:** *An Essay of Dramatic Poesy*

Wordsworth: *Preface to Lyrical Ballads*

Unit 3: **Coleridge:** *Biographia Literaria*, Chapters XIV and XVII

M. Arnold: *The Study of Poetry*

Unit 4: **T.S. Eliot:** "Tradition and the Individual Talent", "Metaphysical Poets"

I.A. Richard: "The Imagination", "The Two Uses of Language"

RECOMMENDED READINGS:

Bharat : *Natyashatra*, Manmohan Ghosh (Tr.) Kapoor, Kapil *Literary Theory*, New Delhi, 1998

Tiwari, R.S. : *A Critical Approach to Classical Indian Poetics*, Varanasi, 1984.

P-II (Eng 102) : American Literature I

Unit 1: **Whitman:** 'Song of Myself' (Sections 1-10); 'Crossing Brooklyn Ferry'; 'When Lilacs Last
in the Dooryard Bloomed.'

Emerson: *The American Scholar (Essay)*.

Autobiography: Chapter 1 from *The Autobiography of Malcolm X*.

Unit 2: **Robert Frost:** 'Mending Wall'; 'Home Burial'; 'After Apple Picking'; 'Birches';

'Stopping by Woods on a Snowy Evening'; 'Onset'; 'Fire and Ice'.

Emily Dickenson: 'I Taste a Liquor Never Brewed'; 'I Heard a Fly Buzz – When I Died—';

'There Came a Day at Summer's Full'; 'The Soul Selects Her Own Society';

'The Last Night that She Lived'; 'Because I Could Not Stop for Death'

Unit 3: **Arthur Miller:** *Death of a Salesman*.

Unit 4: **Edward Albee :** *Who's Afraid of Virginia Woolf?*

Note : Question on Poetry & Drama should be subdivided into two parts.

Part (a) Reference to Context 5 Marks

Part (b) Detailed Answer Question For 10 Marks

RECOMMENDED READINGS:

Cunliffe , Marcus. *The Literature of the United States : The American Tradition in Literature* (Shorter edition), Bradely and Beatty (ed.) Random House.Curti. *The Growth of the American Mind*.

Parrington. *Main Currents in American Literature*, Vol. II

P-III (Eng 103) : Elementary Linguistics

Unit 1: Language, its Nature (Vis-à-vis other form of Communication,
Major features of Language (7 features)

Unit 2: Phonetics: Organs of speech and their functions, Speech sounds (Major diversions: Vowels,
Consonants, Diphthongs, Consonant Clusters)

Unit 3: Phonology (Phonemes, Allophones), English speech sounds, IPA symbols (Transcription
practice), Syllables, Supra Segmentals: Stress (Stress shift, compound word stress), Intonation
(tones, pitch), Juncture

Unit 4: Morphology: Morpheme, Morph, Allomorph, Vocabulary: Word-formation (Inflection,
Derivation, Clipping, Blends, Borrowing)

Note :- Question may be subdivided into 2 or 3 parts

Recommended Reading:

Akmajian Adrian & others. *Linguistics: An Introduction to Language and Communication*. New Delhi:
Prentice-Hall of India (Fourth Edition)

Rajimwale Sharad. *Elements of General Linguistics, Vol. 1 & 2*. New Delhi: Rama Brothers

P-IV (Eng 104) : English Poetry : Chaucer to Donne

Unit 1: **Chaucer**: ‘The Prologue to the Canterbury Tales’

Unit 2: **Thomas Wyatt**: ‘I Find No Peace’; ‘My Lute Awake’.

Spenser: *The Faerie Queen*. Book I

Unit 3: **Shakespeare**: ‘They That Have Power to Hurt’; ‘When in Disgrace with Fortune’;
‘Why is My Verse So Barren of New Pride’; ‘That Time of Year Thou Mayst
in Me Behold’; My Mistress’s Eyes are Nothing like the Sun’

John Donne: ‘The Canonization’; ‘A Lecture upon the Shadow’; ‘The Good Morrow’;
‘A Valediction Forbidding Mourning’; ‘A Valediction of Weeping’;
‘At the Round Earth’s Imagined Corners’; Batter My Heart, Three Person’d God’

Unit 4: **John Milton**: *Paradise Lost*, Books I and II; Lycidas.

Note : Question on Poetry & Drama should be subdivided into two parts.

Part (a) Reference to Context 5 Marks

Part (b) Detailed Answer Question For 10 Mark

RECOMMENDED READINGS:

Bennet , H.S. : *Chaucer and the Fifteenth Century*.

C.S. Lewis : *Allegory of Love*.

Ford , Boris : *The Pelican Guide to English Literature*, Vol. I, II, III & IV.

Gardner, Helen : *Metaphysical poet*

M.A. (English) CBCS
2020-21
Sem II
P-V (Eng 201) : Literary Criticism II

Unit 1: Introduction to: Feminism, Marxism

Unit 2: Introduction to Deconstruction, Psychoanalytic Criticism

Unit 3: Introduction to Post-Colonialism, Eco- Criticism

Unit 4:Literary Appreciation of Unseen Poetry and Prose with internal choice

RECOMMENDED READINGS:

Watson ,George : *The Literary Critics*. London: Penguin, 1968.

Welleck ,Rene : *A History of Modern Criticism*, Vol. V, London: Jonathan, 1986.

Wilfred, East *et.al.* : *A Handbook to Critical Approaches to Literature*. London: OUP, 1999.

Brooks, Cleanth and Warren , Robert Penn. *Fundamentals of Good Writing* (Dobson).

Brooks and Warren. *Understanding Poetry* (Hott).

Freeman , Sarah. *Written Communication in English* (Orient Longman).

Halliday and Hasan. *Cohesion in English*.

Hooper, A.G. *An Introduction to the Study of Language and Literature*.

Read , Herbert. *English Prose Style* (Lyall Book Depot).

P-VI (Eng 202) : American Literature II

Unit 1: Tennessee Williams: *The Glass Menagerie*

Unit 2: Nathaniel Hawthorne: *The Scarlet Letter*.

Unit 3: Mark Twain: *Adventures of Huckleberry Finn*.

Unit 4: Social, historical background of the prescribed genres

Note : Question on Drama to be subdivided into a part.

Part (a) Reference to Context for 5 Marks

Part (b) Detailed Answer Question For 10 Marks

RECOMMENDED READINGS:

Chase , Richard. *The American Novel and Its Tradition*, Indian Edition (S. Chand & Co.).

Spiller , Robert, E. *Cycle of American Liter*

P-VII (Eng 203): English Grammar & Composition

Unit 1: Determiners, Verbs: Primary, Auxiliary; Finite, Non-finite; Transitive, Intransitive, Subject-verb agreement

Unit 2: Syntax: Form classes: NP, VP,
Transformation: Narration, Voice

Unit 3: Transformation: Simple-Compound-Complex, Positive-Comparative-Superlative, Assertive-Interrogative and vice-versa, Affirmative-Negative and vice-versa, Assertive-Exclamatory and vice-versa

Unit 4: Essay Writing

Note : Question may be subdivided into 2 or 3 parts.

Recommended Reading:

Quirk and Greenbaum. *A University Grammar of English*. ELBS

Thomson and Martinet. *A Practical English Grammar*. New Delhi: OUP

P-VIII (Eng 204) : Marvell to Collins

Unit 1: **Andrew Marvell**: 'The Definition of Love'; 'The Garden'; 'To His Coy Mistress'

John Dryden: *Absalom and Achitophel*

Unit 2: **Alexander Pope**: *The Rape of the Lock*

Unit 3: **Thomas Gray**: 'Elegy Written in the Country Churchyard'

William Collins: 'Ode to Passion'; 'Ode to Evening'

Unit 4: Literary and historical background of the prescribed genres

Note: Question should be subdivided into 2 parts

(A) Reference to Context for 5 Marks

(B) Detailed answer question for 10 Marks

RECOMMENDED READINGS:

Boulton, Marjorie: *The Anatomy of Poetry*.

C.S. Lewis : *Allegory of Love*.

Ford, Boris : *The Pelican Guide to English Literature*, Vol. I, II, III & IV.

**M.A. (English) CBCS
2020-21
Sem III**

P-IX (Eng 301) : Drama: Shakespeare to Restoration

Unit 1: **Shakespeare:** *Hamlet*

Unit 2: **Marlowe:** *Doctor Faustus*

Unit 3: **Ben Jonson:** *Volpone*

Unit 4: **Congreve:** *The Way of the World*

Note: Question should be subdivided into 2 parts

(A) Reference to Context for 5 Marks

(B) Detailed answer question for 10 Marks

RECOMMENDED READINGS:

Boulton , Marjorie: *The Anatomy of Drama.*

Brooks and Warren : *Understanding Drama.*

P-X (Eng 302) : English Poetry: The Romantics & Victorians

Unit 1: **William Blake:** *Songs of Innocence and Songs of Experience* from
(*The Penguin Poets*, Ed. J. Bronowski;)

P. B. Shelley: ‘Ozymandias’; ‘Ode to the West Wind’; ‘To a Skylark’

Unit 2: **Wordsworth:** ‘The French Revolution’; ‘Lines Composed a Few Miles above Tintern Abbey’
‘It is a Beauteous Evening’; ‘London 1802’; ‘Intimations of Immortality’;
‘One Summer Evening’; ‘Winander Lake’

Unit 3: **John Keats:** ‘Ode on a Grecian Urn’; ‘Ode to Nightingale’;
‘Ode on Melancholy’; ‘To Autumn’

G. M. Hopkins: ‘Felix Randal’; ‘Pied Beauty’; ‘The Windhover’;
‘The Wreck of the Deutchland’; ‘Inversnaid’

Unit 4: **Tennyson:** ‘The Lady of Shalott’; ‘*In Memoriam*’ (Stanza 1-12); ‘The Lotus Eaters’;
‘Ulysses’; ‘Crossing the Bar’

Note: Question should be subdivided into 2 parts

(A) Reference to Context for 5 Marks

(B) Detailed answer question for 10 Marks

RECOMMENDED READINGS:

Abrams , M.H.: *The English Romantic Poets.*

Boris , Ford: *Pelican Guide*, Vol. 5, From Blake to Byron.
Bowra , C.M. : *The Romantic Imagination*.
Hough , Graham : *The Romantic Poets*.
Jennifer Breea , & Noble , Macy : *Romantic Literature*, New Delhi, Atlantic, 2002.
Kermode , Frank : *The Romatic Image*, Routledge and Kegan Paul, London.
Praz , Mario : *The Romantic Agony.. Fifteen Poets*, [ELBS].

P-XI (Elective Paper) : Fiction I

Unit 1: **Daniel Defoe:** *Moll Flanders*
Henry Fielding: *Joseph Andrews*
Unit 2: **Jane Austen:** *Emma*
E. M. Forster: *A Passage to India*
Unit 3: **Charles Dickens:** *Great Expectations*
Unit 4: **Henry James:** *The Portrait of a Lady*.
Alice Walker: *Colour Purple*

RECOMMENDED READINGS:

Lubbock , Percy : *The Craft of Fiction*.
Forster , E.M. : *Aspects of the Novel*.
Stevick , Philip Ed. : *Theory of the Novel*.
Muir , Edwin : *Structure of the Novel*.
Kettle , Arnold: *Introduction to English Novel*.
Allen , Walter: *The Rise of English Novel*.
Baker , Ernest : *Origin and Growth of Fiction*.

P-XII (a) (Elective Paper) : Indian English Literature I

Unit 1: **Toru Dutt:** The Lotus ; Our Casuarina Tree; My Vocation; Baugmoree.
Sarojini Naidu: To my Fairy Fancies; Awake; If You Call Me; Bangle Sellers;
The Soul's Prayer; Palanquin Bearers; Guerdon.

Unit 2: **M.R. Anand:** *Coolie*
R.K Narayan: *The Guide*
Unit 3: **Girish Karnad:** *Tughlaq*
Mahesh Dattani: *The Final Solutions*
Unit 4: **Ram Mohan Roy:** 'Letters to Lord Amherst on Western Education'
M.K. Gandhi: 'On Socialism'
J.L. Nehru: Life's Philosophy
Radhakrishnan: Science and Religion

Note: Question should be subdivided into 2 parts

- (A) Reference to Context for 5 Marks**
- (B) Detailed answer question for 10 Marks**

RECOMMENDED READINGS:

- McCutchion , David. *Critical Essays on Indian Writing in English*. Calcutta: Writers Workshop, , 1969.
- Mukherji , Meenakshi. *Consideration*. New Delhi :Applied Publishers., 1976.
- Naik, M.K. Ed. *Critical Essays on Indian Writing in English*. 1977.
- Naik, M.K., Desai, S.K., Amur , G.S. *Critical Essays on Indian Writing in English*. Madras: Macmillan, 1972.
- Naik, M.K., Ed. *Perspectives on Indian Poetry in English*. Abhinav Publication, 1984.
- Srinivasa Iyengar , K.R. *Indian Writing in English*. Bombay: Asia Publishing House, 1973.

P-XII (b) (Elective Paper) : Post-colonial Literature in English I

Unit 1: **Naipaul: *A House for Mr. Biswas***

George Lamming: *In the Castle of My Skin*

Unit 2: **Derek Walcott: Nobel Lecture (1992).**

James Ngugi Wa Thiongo: *De Colonizing the Mind*. (Non-fiction) Essay

Unit 3: **Chinua Achebe: *Things Fall Apart***

Wole Soyinka: *A Dance of the Forests*

Unit 4: **Judith Wright: (Poems) ‘Woman to Man’; ‘From Australia’; ‘To a Child’; ‘The Cry for the Dead’.**

Les Murrey: (Poems) ‘Noonday Axeman’; ‘An Absolutely Ordinary Rainbow’; ‘The Returnees’.

RECOMMENDED READINGS:

- Ahmed , Aijaz. *In Theory* (Oxford University Press, 1994).
- Ashcroft, Tiffin, Griffiths. *The Empire Writes Back*.
- Baugh, Ed. *Critics on Caribbean Literature*.
- Bhabha , Homi K. *Location of Culture*, Routledge, London.
- Devy , G.N. *After Annesia* (Orient Longman).
- Indira , C.T. & Shivram , Meenakshi . *Post Coloniality : Reading Literature*. Vikas, 1999.
- Lessing. *The Golden Notebook*.
- McLaren, John. *Australian Literature : An Historical Introduction*, Melbourne : Longman Cheshire, 1989.

M.A. (English) CBCS
2020-21
Sem IV
P-XIII (Eng. 401) : Modern Drama

Unit 1: **G. B. Shaw:** *Pygmalion*

Unit 2: **Samuel Beckett:** *Waiting for Godot*

T. S. Eliot: *Murder in the Cathedral*

Unit 3: **Eugene O'Neill:** *Emperor Jones;*

Tom Stoppard: *Rosencrantz and Guildenstern are Dead*

Unit 4: Literary and historical background of the prescribed genres

Note: Question should be subdivided into 2 parts

(A) Reference to Context for 5 Marks

(B) Detailed answer question for 10 Marks

RECOMMENDED READINGS:

Brown, John Russell : *Modern British Dramatists : A Collection of Critical Essays*. New Delhi : Prentice-Hall India Pvt. Ltd., 1980.

Esslin, Martin. *The Theatre of Absurd*.

P-XIV (Eng. 402) : English Poetry: Victorians & Moderns

Unit 1: **R. Browning:** 'Home Thoughts from Abroad'; 'Home Thoughts from the Sea';

'The Last Ride Together'; 'Rabbi Ben Ezra'; 'Prospice'; 'My Last Duchess'

Unit 2: **M. Arnold:** 'The Scholar Gipsy'; 'Dover Beach'; 'To Marguerite'

W.B. Yeats: 'Easter 1916'; 'The Second Coming'; 'The Tower'; 'Sailing to Byzantium'

Unit 3: **T. S. Eliot:** '*The Waste Land*'; 'The Love Song of J. Alfred Prufrock'

W.H. Auden: 'In Memory of Sigmund Freud'; 'Shield of Achilles'; 'Petition'; 'In Praise of Limestone'; 'Sept. 1939'.

Unit 4: Literary and historical background of the prescribed genres

Note: Question should be subdivided into 2 parts

(A) Reference to Context for 5 Marks

(B) Detailed answer question for 10 Marks

RECOMMENDED READINGS:

Abrams , M.H. : *Mirror and the Lamp*.

Boris , Ford: *Pelican Guide*, Vol. 5, From Blake to Byron.

The Faber Book of Modern Verse : ed. By Roberts , Michael, revised by Donald Hall, Faber & Faber, 1965.

P-XV (Elective Paper) : Fiction II

Unit 1: **James Joyce:** *A Portrait of the Artist as a Young Man*.

Virginia Woolf: *A Room of One's Own*

Unit 2: **Graham Greene:** *The Power and the Glory*

E. Hemingway: *The Old Man and the Sea*

Unit 3: **D.H. Lawrence:** *The Rainbow*

Unit 4: Literary and historical background of the prescribed genres

Recommended Readings:

Sagar , Keith : *D.H. Lawrence*.

Kermode , Frank : *D.H. Lawrence*.

P-XVI (a) (Elective Paper) : Indian English Literature II

Unit 1: **R. Tagore:** Poems III, XI, XIII, XX, XXI, XLV, LXI, LXIX, LXXXII, LXVIII from *Geetanjali*.

Nissim Ezekiel: Enterprise; Marriage; Night of the Scorpion;

Very Indian Poem in Indian English; My Cat.

Unit 2: **Kamla Das:** The Dance of the Eunuchs; In Love; An Introduction; The Fancy Dress Show.

J. Mahapatra: The Moon Moments; A Kind of Happiness; Of That Love; The Vase; Indian Summer Days.

Unit 3: **Anita Desai:** *Fire on the Mountain*

Rama Mehta: *Inside the Haveli*

Unit 4: **Ved Mehta:** 'In Search of Sight'

Ambedkar: 'Caste in India'

Sahini: "The Accident" (Short-Story) from *Best Indian Short Stories* edited by Khushwant Singh, Vol. II, New Delhi : Harper Collins; 2003.

Chundawat: (Essay) "My Literary Career : For Love of Rajasthan" (*From Purdah to the People* edited by Frances Taft, Jaipur and New Delhi, Rawat Publication, 2002.)

Note: Question should be subdivided into 2 parts

(A) Reference to Context for 5 Marks

(B) Detailed answer question for 10 Marks

RECOMMENDED READINGS:

McCutchion , David. *Critical Essays on Indian Writing in English*. Calcutta: Writers Workshop, , 1969.

Naik, M.K., Desai, S.K., Amur , G.S. *Critical Essays on Indian Writing in English*. Madras: Macmillan, 1972.

Naik, M.K., Ed. *Perspectives on Indian Poetry in English*. Abhinav Publication, 1984.

Srinivasa Iyengar , K.R. *Indian Writing in English*. Bombay: Asia Publishing House, 1973.

P-XVI (b) (Elective Paper) : Post-colonial Literature in English II

Unit 1: **Patrick White:** *The Tree of Man*

Sharon Pollock: *Walsh* (Play).

Unit 2: **M. Atwood:** (essay) 'If You Can't Say Something Nice, Don't Say Anything At All'.

(From *The Language in Her Eye*, Coach House Press, 1990.)

(Poems) : 'This a photograph of me', 'Tricks with Mirrors', 'Progressive Insanities of a Pioneer'.

Ondatejee: (Poems) *The Cinnamon Peeler*, *To a Sad Daughter*.

Unit 3: **Vassanji:** *No New Land*

Bapsi Sidhwa: : *Ice-Candy Man*

Unit 4: **Rohinton Mistry:** *Such a Long Journey*

Arun Mukherjee:

(Essays) (From: *Oppositional Aesthetics : Readings from a Hyphenated Space*.)

'The Vocabulary of the "Universal"'; 'Ironies of Colour in the Great White North'

RECOMMENDED READINGS:

Baugh, Ed. *Critics on Caribbean Literature*.

Benita, Perry. *Post Colonial Readings*. OUP.

Devy , G.N. *After Annesia* (Orient Longman).

Fanon , Frantz. *The Wretched of the Earth*.

Indira , C.T. & Shivram , Meenakshi . *Post Coloniality : Reading Literature*. Vikas, 1999.

Lessing. *The Golden Notebook*.

Mohammed , Jaan. *Manichean Aesthetics*.

M.A.Hindi
Semester
I and II
2017-18
Syllabus

GUIDELINES FOR CHOICE BASED CREDIT SYSTEM

Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete **four skill courses**: two within the Department and two from other Department within JNV University or the Universities approved by JNV University
3. **Course:** Usually referred to, as 'papers' is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period of teaching (lecture or tutorial) or two periods of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.
12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/ December and even semester from December/January to May.
Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May.
13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Arts, Education & Social Sciences resolves the following:

- a. All internal assessments shall on term test and seminar. Attendance shall carry the prescribed marks in all papers.
- b. In each semester two out of four theoretical components of the University examinations shall be undertaken by external examiners from outside JNV University, who may be appointed by the competent authorities.

Grievances and Redressal Mechanism

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head of the Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.
- b) The appeal will be assessed by the Chairman and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Dean, Faculty of Arts, Education & Social Sciences comprising of the HOD of the concerned Department and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	'O'	Outstanding	10
2	'A+'	Excellent	9
3	'A'	Very Good	8
4	'B+'	Good	7
5	'B'	Above Average	6
6	'C'	Average	5
7	'P'	Pass	4
8	'F'	Fail	0
9	'Ab'	Absent	0

- i. A student obtaining Grade F in a paper shall be considered failed and will be required to reappear in the University End Semester examination.
- ii. For noncredit courses (Skill Courses) 'Satisfactory' or "Unsatisfactory" shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

- = and > 95 % marks Grade Point 10.0
- 90 to less than 95 % marks Grade Point 9.5
- 85 to less than 90 % marks Grade Point 9.0
- 80 to less than 85 % marks Grade Point 8.5
- 75 to less than 80 % marks Grade Point 8.0
- 70 to less than 75 % marks Grade Point 7.5
- 65 to less than 70 % marks Grade Point 7.0
- 60 to less than 65 % marks Grade Point 6.5
- 55 to less than 60 % marks Grade Point 6.0
- 50 to less than 55 % marks Grade Point 5.5
- 45 to less than 50 % marks Grade Point 5.0
- 40 to less than 45 % marks Grade Point 4.5
- 35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,

i.e.

$$SGPA (S_i) = \frac{\sum (C_i \times G_i)}{\sum C_i}$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,

i.e.

$$CGPA = \frac{\sum (C_i \times S_i)}{\sum C_i}$$

where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.

- iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	6	B	6	6 x 6 =36
2	Course 2	6	B+	7	6 X 7 =42
3	Course 3	6	B	6	6X 6 = 36
4	Course 4	6	O	10	6 X 10 =60
	Total	24			36+42+36+60=174

Thus, SGPA = 174/24 = 7.25

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	7.25	7.25	7	6.25

CGPA = (24X 7.25 + 24X7.25 + 24 X 7+ 24 X 6.25)/ 96

666/96 = 6.94

Semester-wise Theory Papers/Practical / Skill component

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Semester I							
Core course 1	MHINCC 101	आधुनिक काव्य (1)	6-0-0	6	30	70	100
Core course 2	MHINCC 102	कथा साहित्य	6-0-0	6	30	70	100
Core course 3	MHINCC 103	भारतीय काव्यशास्त्र एवं हिन्दी साहित्यालोचन	6-0-0	6	30	70	100
Core course 4	MHINCC 104	हिन्दी साहित्य का इतिहास : आदिकाल एवं मध्यकाल	6-0-0	6	30	70	100
Skill Course I	MHINSC 101	प्रयोजनमूलक हिन्दी	2-0-0				
Total				24	120	280	400
Semester II							
Core course 5	MHINCC 201	आधुनिक काव्य (2)	6-0-0	6	30	70	100
Core course 6	MHINCC 202	कथेतर साहित्य	6-0-0	6	30	70	100
Core course 7	MHINCC 203	पाश्चात्य काव्य-सिद्धांत एवं वाद	6-0-0	6	30	70	100
Core course 8	MHINCC 204	हिन्दी साहित्य का इतिहास : आधुनिक काल	6-0-0	6	30	70	100
Skill Course II	MHINSC 201	हिन्दी मीडिया लेखन एवं अनुवाद	2-0-0				
Total				24	120	280	400

Semester III							
Core course 9	MHINCC 301	आदिकालीन एवं निर्गुण भक्तिकाव्य	6-0-0	6	30	70	100
Core course 10	MHINCC 302	हिन्दी भाषा	6-0-0	6	30	70	100
Elective papers I (Any one)			6-0-0	6-0-0	30	70	100
	MHINEC 303 (क)	आदिकाल					
	MHINEC 303 (ख)	भक्तिकाल					
	MHINEC 303 (ग)	रीतिकाल					
Elective papers II (Any one)			6-0-0	6-0-0	30	70	100
	MHINEC 304 (क)	छायावादोत्तर काव्य					
	MHINEC 304 (ख)	हिन्दी उपन्यास					
Skill course III	MHINSC 301	राजभाषा हिन्दी	2-0-0				
Total				24	120	280	400
Semester IV							
Core course 11	MHINCC 401	सगुण भक्ति एवं रीतिकाव्य	6-0-0	6	30	70	100
Core course 12	MHINCC 402	भाषा विज्ञान	6-0-0	6	30	70	100
Elective papers I (Any one)			6-0-0	6-0-0	30	70	100
	MHINEC 403 (क)	लोक साहित्य					
	MHINEC 403 (ख)	भारतीय साहित्य					
Elective papers II (Any one)			6-0-0	6-0-0	30	70	100
	MHINEC 404 (क)	नवविमर्श					
	MHINEC 404 (ख)	हिन्दी नाटक					
Skill course IV	MHINSC 401	लोक संस्कृति	2-0-0				
Total				24	120	280	400

In view of the course content, the Department of HINDI distributed the Periods between Theory/Tutorial as under per paper

- 6 : 0 : 0 (six lectures only (no tutorial and no practical) per week) – For Theory
- 2+0+0 (two lectures) - For Skill course

The Duration of the Period shall be forty five minutes. In each of these combinations, the first value stands for the same number of lecture instructions per week.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective) involve an evaluation system of students that has the following two components:-

- Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
 - End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.
- (i) **Continuous Comprehensive Assessment (CCA):** This would have the following components:

- a. **Term Test:** One term test shall be arranged for each paper prior to End-Semester Examination; examination duration shall be of three hours; maximum marks shall be 60 (reduced to 15).
- b. **Seminar:** Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 40 (reduced to 10). The seminar shall be completed prior to term test for all the papers.
- c. **Classroom Attendance** – Each student will have to attend a minimum of 75% Lectures / Tutorials / Practicals. A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE). Attendance marks will be awarded by following the system proposed below:

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

75% to 80%	=	1 mark
81% to 85%	=	2 marks
86 to 90%	=	3 marks
91% to 95%	=	4 marks
96% and above	=	5 marks

Note : Compensation in classroom attendance of a student will be as per prevalent University rules.

Each student's cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Arts, Education & Social Sciences.

- d. CCA is based on open evaluation system without any bias to any student.
- e. Any grievance received in the Department from student shall be placed before the **Grievance Redressal Committee** with adjudicated comments

Each component marks will be added making it rounding as per norms.

Marking Scheme of Continuous Comprehensive Assessment (CCA)

Components	Maximum Marks	Reduced and Original Marks
Term Test	60	(reduced to 15)
Seminar	40	(reduced to 10)
Classroom Attendance	05	05
Total Marks of CCA	100	30

Note : Classroom Attendance marks will be as follows :-

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

Percentage	Marks
75% to 80%	1 mark
81% to 85%	2 marks
86 to 90%	3 marks
91% to 95%	4 marks
96% and above	5 marks

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective Department shall declare the result as “Satisfactory” or “Non-Satisfactory”; each student need to get a minimum of three “Satisfactory” declaration for the course completion

For the Term test and ESE:

Part A

Ten questions (Definitions, illustrations, functions, short explanations, etc; 25-50 words) for one mark each. $10 \times 1 = 10$ marks; comprising questions from each Unit; no choice in this part

Part B

Four questions of long/explanatory answer (500 words) type, one drawn from each Unit; with internal choices : $4 \times 15 = 60$ marks.

10+60 = 70 marks

Qualifying for Next semester

- 1. A student acquiring minimum of 40% in total of the CCA is eligible to join next semester.**
2. A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as 'Fail'), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.
3. A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time, i.e. three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted, for additional chances examination fee shall be on additive basis.

Improvement Option:

Every student shall have the opportunity to improve Credit through University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final.

Result Declaration:

The ESE (End Semester Examination/University Examination) results shall be declared within twenty days of the last examination. The Theory Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation.

POST -GRADUTE COURSE: A DESCRIPTION

The full course is of FOUR SEMESTERS spread for TWO YEARS duration. A semester-wise list of courses to be offered is given below. In each paper there will be four unit.

SEMESTER I

SEMESTER II

SEMESTER III

SEMESTER IV

Elective paper group – First – Semester III

Elective paper group – Second – Semester III

Elective paper group – First – Semester IV

Elective paper group – Second – Semester IV

Skill Courses in the respective subject

Electives would be discipline centric and only students from concerned departments can register.

ADMISSION

The minimum qualification for admission to M.A. Course is Graduate Degree. The details of eligibility conditions and admission procedure will be as per University rules. The candidates are required to attend minimum of a 75% of classes.

TEACHING AND EXAMINATION SCHEME

Per Semester

Course	Periods/Week	Examination hours	CCA	ESE	Total
Theory Papers					
Course I	6	3	30	70	100
Course II	6	3	30	70	100
Course III	6	3	30	70	100
Course IV	6	3	30	70	100

UNIVERSITY EXAMINATION

Each course paper shall be of three hours duration.

Note: The number of elective to be taught from each group in a particular year shall be decided by the Department. Electives offered will be announced at the beginning of the academic session. Each student shall be assigned one Elective Paper from Group ONE and the second from Group TWO. Elective papers will be allotted on merit-cum-choice basis as far as possible. In the odd semester two skill courses will be those offered by the respective departments in the even semester skill courses will be from other departments.

**SCHEME OF EXAMINATION FOR M.A. HINDI (SEMESTER SYSTEM) FOR THE EXAMINATION
2016-17**

INSTRUCTIONS FOR THE PAPER SETTERS AND THE STUDENTS

Max. Marks - 70

Min. Marks – 25

Duration – 3 hours

Note :

- (i) There shall be 9 questions in all. Five questions have to be attempted.
- (ii) The first question shall be short answer type containing 10 short questions spread over the whole syllabus to be answered in about 30 words each. It shall carry 10 marks and shall be a compulsory question.
- (iii) Rest of the paper shall contain 8 questions with internal choice. The entire syllabus has been divided into four units. Each unit shall have two questions and the candidates shall be given internal choice i.e. the candidate shall attempt one question from each unit.

SEMESTER I

1.	THEORY PAPERS (Four Core Papers)	ESE	CCA	Total	Lecture- Tutorial- Practical/ Week	Credits
	Paper I :	70	30	100	6-0-0	6
	Paper II :	70	30	100	6-0-0	6
	Paper III :	70	30	100	6-0-0	6
	Paper IV :	70	30	100	6-0-0	6
		Grand Total		400 marks		24 credits

SEMESTER II

1.	THEORY PAPERS (Four Core Papers)	ESE	CCA	Total	Lecture- Tutorial- Practical/ Week	Credits
	Paper V :	70	30	100	6-0-0	6
	Paper VI :	70	30	100	6-0-0	6
	Paper VII :	70	30	100	6-0-0	6
	Paper VIII :	70	30	100	6-0-0	6
		Grand Total		400 marks		24 credits

SEMESTER III

1.	THEORY PAPERS (Core/Elective Papers)	ESE	CCA	Total	Lecture- Tutorial- Practical/ Week	Credits
	Paper IX :	70	30	100	6-0-0	6
	Paper X :	70	30	100	6-0-0	6
	Paper XI : Any one of the following (d) ([k) (x)	70	30	100	6-0-0	6
	Paper XII : Any one of the following (d) ([k)	70	30	100	6-0-0	6
		Grand Total		400 marks		24 credits

SEMESTER IV

1.	THEORY PAPERS (Core/Elective Papers)	ESE	CCA	Total	Lecture- Tutorial- Practical/ Week	Credits
	Paper XIII :	70	30	100	6-0-0	6
	Paper XIV :	70	30	100	6-0-0	6
	Paper XV : Any one of the following (d) ([k)	70	30	100	6-0-0	6
	Paper XVI : Any one of the following (d) ([k)	70	30	100	6-0-0	6

.....
Grand Total **400 marks** **24 credits**
.....

Total Marks of M.A. (Semester I, II, III & IV) 1600 marks and credit 96

एम.ए. हिन्दी
सेमेस्टर I
सत्र 2017-18
पाठ्यक्रम संख्या MHINCC 101
आधुनिक काव्य (1)

- इकाई 1 : 'साकेत'—मैथिलीशरण गुप्त (निर्धारित काव्यांश—नवम सर्ग), साहित्य सदन , चिरगाँव, झाँसी
- इकाई 2 : 'कामायनी'—जयशंकर प्रसाद (निर्धारित सर्ग—चिंता, श्रद्धा, लज्जा और इड़ा), भारती भंडार, लीडर प्रेस, इलाहाबाद
- इकाई 3 : पल्लव — सुमित्रानंदन पंत (निर्धारित कविताएँ— मौन निमंत्रण, छाया, बादल, परिवर्तन)— राजकमल प्रकाशन, नई दिल्ली
- इकाई 4 : राग—विराग'—निराला (सं.) रामविलास शर्मा (निर्धारित कविताएँ—राम की शक्तिपूजा, सरोज स्मृति), लोक भारती, इलाहाबाद

परीक्षकों एवं विद्यार्थियों के लिए निर्देश :

1. प्रथम प्रश्न अतिलघूत्तरी होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10
2. प्रश्न होंगे , सभी दस प्रश्न हल करना अनिवार्य होगा। प्रत्येक प्रश्न एक अंक का होगा।

10X 1 = 10 अंक

3. प्रश्न संख्या 2,3,4 एवं 5 में प्रत्येक इकाई से विकल्प सहित व्याख्या एवं आलोचनात्मक प्रश्न पूछे जायेंगे। व्याख्या 7 अंक की होगी और आलोचनात्मक प्रश्न 8 अंक का होगा।

व्याख्या 4X 7 = 28 अंक

आलोचनात्मक प्रश्न 4X 8 = 32 अंक

सहायक पुस्तकें—

- साकेत : एक अध्ययन : नगेन्द्र
कामायनी का पुनर्मूल्यांकन : रामस्वरूप चतुर्वेदी
निराला की साहित्य साधना : रामविलास शर्मा
सुमित्रानन्दन पंत : नगेन्द्र
निराला : आत्महंता आस्था : दूधनाथ सिंह
छायावाद में यथार्थ तत्त्व : छोटाराम कुम्हार

पाठ्यक्रम संख्या MHINCC 102
कथा साहित्य

इकाई 1 : 'गोदान'—प्रेमचन्द

इकाई 2 : 'मैला आँचल'— फणीश्वरनाथ 'रेणु'

इकाई 3 : कहानियाँ—'एक टोकरी भर मिट्टी' (माधवराव सप्रे) 'उसने कहा था' (चन्द्रधर शर्मा गुलेरी), 'कफन' (प्रेमचन्द), 'पुरस्कार' (जयशंकर प्रसाद) 'पत्नी' (जैनेन्द्र कुमार) 'जिंदगी और जॉक' (अमरकान्त), 'चीफ की दावत' (भीष्म साहनी) 'खोई हुई दिशाएँ' (कमलेश्वर), = कुल आठ

इकाई 4: कहानियाँ— 'परिन्दे' (निर्मल वर्मा), 'मछलियाँ' (उषा प्रियंवदा), 'बादलों के घेरे' (कृष्णा सोबती), 'टूटना' (राजेन्द्र यादव), 'गुलकी बन्नो' (धर्मवीर भारती), 'यही सच है' (मन्नू भंडारी) 'संबंध' (ज्ञान रंजन), 'तिरिछ' (उदय प्रकाश) = कुल आठ

परीक्षकों एवं विद्यार्थियों के लिए निर्देश :

1. प्रथम प्रश्न अतिलघूत्तरी होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे, सभी दस प्रश्न हल करना अनिवार्य होगा। प्रत्येक प्रश्न एक अंक का होगा।

10X 1 = 10 अंक

2. प्रश्न संख्या 2,3,4 एवं 5 में प्रत्येक इकाई से विकल्प सहित व्याख्या एवं आलोचनात्मक प्रश्न पूछे जायेंगे। व्याख्या 7 अंक की होगी और आलोचनात्मक प्रश्न 8 अंक का होगा।

व्याख्या 4X 7 = 28 अंक

आलोचनात्मक प्रश्न 4X 8 = 32 अंक

सहायक पुस्तकें—

गोदान : अध्ययन की समस्याएँ : गोपालराय

कहानी : नयी कहानी : नामवर सिंह

हिन्दी उपन्यास साहित्य का अध्ययन : एस.एन. गणेशन

हिन्दी कहानी : समीक्षा और सन्दर्भ : विवेकी राय

हिन्दी का गद्य साहित्य : रामचन्द्र तिवारी

हिन्दी कहानी : सन्दर्भ और प्रकृति : देवीशंकर अवरथी

कहानी का वर्तमान : कौशलनाथ उपाध्याय

फणीश्वरनाथ रेणु का कथा संसार : सूरज पालीवाल

प्रेमचन्द का कहानी साहित्य (चरित्र चित्रण के विविध आयाम) : श्रवणकुमार मीणा

प्रेमचन्द और भारतीय किसान : रामबक्ष

फणीश्वरनाथ रेणु का कथा शिल्प : रेणु शाह

प्रेमचन्द एवं प्रसाद के कहानी साहित्य का तुलनात्मक अध्ययन : डॉ.कैलाश कौशल

पाठ्यक्रम संख्या MHINCC 103
भारतीय काव्यशास्त्र एवं हिन्दी साहित्यालोचन

- इकाई 1 : संस्कृत काव्यशास्त्र—काव्यलक्षण, काव्यहेतु, काव्य—प्रयोजन, काव्य के प्रकार।
रस—सिद्धान्त : रस का स्वरूप, रस निष्पत्ति, साधारणीकरण, सहृदय की अवधारणा
- इकाई 2 : अलंकार—सिद्धान्त : मूल स्थापनाएँ, अलंकारों का वर्गीकरण
रीति सिद्धान्त : रीति की अवधारणा, रीति—सिद्धान्त की प्रमुख स्थापनाएँ
वक्रोक्ति सिद्धान्त : वक्रोक्ति की अवधारणा, वक्रोक्ति के भेद, वक्रोक्ति एवं अभिव्यंजनावाद
- इकाई 3 : ध्वनि सिद्धान्त : ध्वनि का स्वरूप, ध्वनि—सिद्धान्त की प्रमुख स्थापनाएँ,
ध्वनिकाव्य के प्रमुख भेद, गुणीभूत व्यंग्य, चित्रकाव्य
औचित्य सिद्धान्त : प्रमुख स्थापनाएँ, औचित्य के भेद
- इकाई 4 : हिन्दी काव्यशास्त्र और आलोचना—
लक्षण—काव्य परम्परा, रीतिकालीन कवि—आचार्यों—केशव, चिन्तामणि, देव,
भिखारीदास का काव्यशास्त्रीय चिंतन।
हिन्दी आलोचना की प्रमुख प्रवृत्तियाँ—शास्त्रीय, व्यक्तिवादी, ऐतिहासिक,
तुलनात्मक, प्रभाववादी, मनोविश्लेषणवादी, सौन्दर्यशास्त्रीय, शैली वैज्ञानिक,
समाजशास्त्रीय ।

परीक्षकों एवं विद्यार्थियों के लिए निर्देश :

1. इस प्रश्नपत्र के अंतर्गत कुल 9 प्रश्न होंगे। जिनमें से पाँच प्रश्न करने अनिवार्य हैं।
2. प्रथम प्रश्न अतिलघूत्तरी होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे, सभी दस प्रश्न हल करना अनिवार्य होगा। प्रत्येक प्रश्न एक अंक का होगा।
10X 1 = 10 अंक
3. प्रथम प्रश्न के अलावा कुल आठ प्रश्न होंगे। सम्पूर्ण पाठ्यक्रम 4 इकाइयों में विभक्त है। प्रत्येक इकाई से दो-दो प्रश्न विकल्प सहित पूछे जायेंगे जिनमें से प्रत्येक इकाई से एक प्रश्न करना होगा।
4X 15 = 60 अंक

सहायक पुस्तकें—

- भारतीय साहित्यशास्त्र : बलदेव उपाध्याय
भारतीय साहित्यशास्त्र : गणेश त्र्यम्बक देशपाण्डे
रस—मीमांसा : रामचन्द्र शुक्ल
रस—सिद्धान्त : स्वरूप विश्लेषण : आनन्दप्रकाश दीक्षित
भारतीय काव्यशास्त्र एवं पाश्चात्य चिन्तन : सभापति मिश्र
हिन्दी काव्यशास्त्र का इतिहास : भगीरथ मिश्र
आधुनिक हिन्दी आलोचना के बीज शब्द : बच्चन सिंह
भारतीय काव्यशास्त्र : योगेन्द्र प्रताप सिंह

पाठ्यक्रम संख्या MHINCC 104
हिन्दी साहित्य का इतिहास : आदिकाल एवं मध्यकाल

- इकाई 1 : इतिहास—दर्शन और साहित्येतिहास, हिन्दी साहित्य के इतिहास लेखन की परम्परा, हिन्दी साहित्येतिहास के पुनर्लेखन की समस्याएँ। हिन्दी साहित्य का इतिहास—काल—विभाजन, सीमा—निर्धारण और नामकरण।
- इकाई 2 : आदिकाल की पृष्ठभूमि, सिद्ध, नाथ एवं जैन साहित्य, रासो काव्य, आदिकालीन काव्यरूप, अब्दुर्रहमान, अमीर खुसरो एवं विद्यापति का योगदान।
- इकाई 3 : पूर्व मध्यकाल (भक्तिकाल) की ऐतिहासिक पृष्ठभूमि। सांस्कृतिक चेतना एवं भक्ति आन्दोलन। प्रमुख निर्गुण सन्त कवि और काव्य—प्रवृत्तियाँ। भारत में सूफी मत का विकास तथा प्रमुख सूफी कवि और काव्य—प्रवृत्तियाँ, सूफी काव्य में भारतीय संस्कृति एवं लोकजीवन के तत्त्व। रामकाव्य—परम्परा और तुलसीदास। कृष्णकाव्य—परम्परा तथा प्रमुख कवियों का रचनागत वैशिष्ट्य।
- इकाई 4 : उत्तर मध्यकाल (रीतिकाल) की ऐतिहासिक पृष्ठभूमि, दरबारी संस्कृति और लक्षण ग्रन्थों की परम्परा, रीतिकालीन कवियों की जीवन दृष्टि, रीतिबद्ध, रीतिसिद्ध, रीतिमुक्त कवि और काव्य, प्रमुख प्रवृत्तियाँ एवं विशेषताएँ, रीतिकाल की अवान्तर काव्य धाराएँ—भक्ति, वीर और नीति काव्य।

परीक्षकों एवं विद्यार्थियों के लिए निर्देश :

1. इस प्रश्नपत्र के अंतर्गत कुल 9 प्रश्न होंगे। जिनमें से पाँच प्रश्न करने अनिवार्य हैं।
2. प्रथम प्रश्न अतिलघूत्तरी होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे, सभी दस प्रश्न हल करना अनिवार्य होगा। प्रत्येक प्रश्न एक अंक का होगा।
10X 1 = 10 अंक
3. प्रथम प्रश्न के अलावा कुल आठ प्रश्न होंगे। सम्पूर्ण पाठ्यक्रम 4 इकाइयों में विभक्त है। प्रत्येक इकाई से दो-दो प्रश्न विकल्प सहित पूछे जायेंगे जिनमें से प्रत्येक इकाई से एक प्रश्न करना होगा।

4X 15 = 60 अंक

सहायक पुस्तकें—

- साहित्य का इतिहास—दर्शन : नलिन विलोचन शर्मा
साहित्येतिहास : संरचना और स्वरूप : सुमन राजे
हिन्दी साहित्य के इतिहासों का इतिहास : किशोरीलाल गुप्त
हिन्दी साहित्य का इतिहास : रामचन्द्र शुक्ल
हिन्दी साहित्य की भूमिका : हजारी प्रसाद द्विवेदी
हिन्दी साहित्य का आलोचनात्मक इतिहास : रामकुमार वर्मा
हिन्दी साहित्य का अतीत : विश्वनाथ प्रसाद मिश्र
भक्ति—आन्दोलन और लोकसंस्कृति : कुँवरपाल सिंह
हिन्दी साहित्य का वैज्ञानिक इतिहास : गणपतिचन्द्र गुप्त
हिन्दी साहित्य में मध्ययुगीनता की अवधारणा—पूर्णदास
सिद्ध साहित्य : धर्मवीर भारती
नाथ सम्प्रदाय : हजारीप्रसाद द्विवेदी

पाठ्यक्रम संख्या MHINSC 105
कौशल पाठ्यक्रम (Skill Course): I
(विभाग के विद्यार्थियों के लिए)
प्रयोजनमूलक हिन्दी

- इकाई 1 : प्रयोजनमूलक हिन्दी से अभिप्राय । हिन्दी के विविध रूप – सम्पर्क भाषा, राष्ट्रभाषा, राजभाषा के रूप में हिन्दी ।
- इकाई 2 : पारिभाषिक शब्दावली – स्वरूप एवं महत्व, पारिभाषिक शब्दावली निर्माण के सिद्धान्त, कार्यालयी एवं प्रशासनिक शब्दावली ।
- इकाई 3: हिन्दी कम्प्यूटिंग – कम्प्यूटर– परिचय, रूपरेखा, उपयोग तथा क्षेत्र। इंटरनेट–सम्पर्क उपकरणों का परिचय। हिन्दी कम्प्यूटर टाइप की विधियाँ।
- इकाई 4 : अनुवाद का स्वरूप , क्षेत्र , प्रक्रिया एवं परिधि । पुनरीक्षण (वैटिंग), आशु अनुवाद ।

सहायक पुस्तकें

- प्रयोजनमूलक हिन्दी – नसीम-ए-आजाद
प्रयोजनपरक हिन्दी – विजय कुलश्रेष्ठ
प्रशासन में राजभाषा हिन्दी – कैलाशचन्द्र भाटिया
प्रशासनिक शब्दावली (अंग्रेजी-हिन्दी) – वैज्ञानिक तथा तकनीकी शब्दावली आयोग, नई दिल्ली
कम्प्यूटर के भाषिक अनुप्रयोग – विजय कुमार मल्होत्रा
अनुवाद विज्ञान – राजमणि शर्मा
अनुवाद : समस्याएँ और संदर्भ – गजानन चहवाण
अनुवाद सिद्धान्त की रूपरेखा – सुरेश कुमार

एम.ए. हिन्दी
सेमेस्टर II
सत्र 2017-18
पाठ्यक्रम संख्या MHINCC 201
आधुनिक काव्य (2)

इकाई: 1. आज के लोकप्रिय हिन्दी कवि –अज्ञेय–(सं.) विद्यानिवास मिश्र (निर्धारित कविताएँ—बावरा अहेरी, शब्द और सत्य, हिरोशिमा, सोन मछली, टेसू, नदी के द्वीप, असाध्य वीणा, कितनी नावों में कितनी बार), भारतीय ज्ञानपीठ प्रकाशन, दिल्ली

इकाई 2 : चाँद का मुँह टेढ़ा है—मुक्तिबोध (निर्धारित कविता—अँधेरे में), भारतीय ज्ञानपीठ प्रकाशन, नई दिल्ली

इकाई 3 : नागार्जुन : प्रतिनिधि कविताएँ (सं.) नामवर सिंह (निर्धारित कविताएँ—प्रतिबद्ध हूँ, तन गयी रीढ़, खुरदरे पैर, यह तुम थी, बादल को घिरते देखा है, बहुत दिनों के बाद, मेरी भी आभा है इसमें, फसल, प्रेत का बयान, सत्य), राजकमल प्रकाशन, नई दिल्ली

इकाई 4 : आत्मजयी : कुँवर नारायण, भारतीय ज्ञानपीठ प्रकाशन, नई दिल्ली
परीक्षकों एवं विद्यार्थियों के लिए निर्देश :

1. प्रथम प्रश्न अतिलघूत्तरी होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे, सभी दस प्रश्न हल करना अनिवार्य होगा। प्रत्येक प्रश्न एक अंक का होगा।
 $10 \times 1 = 10$ अंक
2. प्रश्न संख्या 2,3,4 एवं 5 में प्रत्येक इकाई से विकल्प सहित व्याख्या एवं आलोचनात्मक प्रश्न पूछे जायेंगे। व्याख्या 7 अंक की होगी और आलोचनात्मक प्रश्न 8 अंक का होगा।

व्याख्या $4 \times 7 = 28$ अंक

आलोचनात्मक प्रश्न $4 \times 8 = 32$ अंक

सहायक पुस्तकें—

अज्ञेय की कविता : चन्द्रकान्त बांदिबडेकर

गजानन माधव मुक्तिबोध : लक्ष्मण दत्त गौतम

कविता के नये प्रतिमान : नामवर सिंह

उत्तरशती के श्रेष्ठ हिन्दी कवि : संपा. लालचन्द गुप्त

फिलहाल : अशोक वाजपेयी

छायावादोत्तर हिन्दी काव्य : बदलते मानदण्ड एवं स्वरूप – कौशलनाथ उपाध्याय

नागार्जुन : सत्यनारायण

पाठ्यक्रम संख्या MHINCC 202
कथेतर साहित्य

इकाई 1 : निबन्ध—जबान (बालकृष्ण भट्ट), मेघदूत (महावीर प्रसाद द्विवेदी), लोभ और प्रीति (रामचन्द्र शुक्ल), कुटज (हजारी प्रसाद द्विवेदी), तुलसी साहित्य के सामंत विरोधी मूल्य (रामविलास शर्मा), हल्दी, दूब और दधि अक्षत (विद्यानिवास मिश्र), निषाद बॉसुरी (कुबेरनाथ राय) = कुल सात

इकाई 2 : आषाढ का एक दिन –मोहन राकेश

इकाई 3 : अतीत के चलचित्र –महादेवी वर्मा

इकाई 4 : क्या भूलूँ क्या याद करूँ : हरिवंश राय बच्चन

परीक्षकों एवं विद्यार्थियों के लिए निर्देश :

1. प्रथम प्रश्न अतिलघूत्तरी होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे, सभी दस प्रश्न हल करना अनिवार्य होगा। प्रत्येक प्रश्न एक अंक का होगा।
10X 1 = 10 अंक
2. प्रश्न संख्या 2,3,4 एवं 5 में प्रत्येक इकाई से विकल्प सहित व्याख्या एवं आलोचनात्मक प्रश्न पूछे जायेंगे। व्याख्या 7 अंक की होगी और आलोचनात्मक प्रश्न 8 अंक का होगा।

व्याख्या 4X 7 = 28 अंक

आलोचनात्मक प्रश्न 4X 8 = 32 अंक

सहायक पुस्तकें—

मोहन राकेश का नाट्य साहित्य : पुष्पा बंसल

हिन्दी निबंध का विकास : ओंकारनाथ शर्मा

महादेवी का गद्य : सूर्यप्रसाद दीक्षित

हिन्दी का गद्य साहित्य : रामचन्द्र तिवारी

महादेवी वर्मा : सं. परमानन्द श्रीवास्तव

गद्यकार बच्चन : जीवनप्रकाश जोशी

बच्चन : जीवन और साहित्य : सुधाबहन कनुभाई पटेल

पाठ्यक्रम संख्या MHINCC 203
पाश्चात्य काव्य-सिद्धान्त एवं वाद

- इकाई 1 : प्लेटो – काव्य संबंधी विचार ,
अरस्तू- अनुकरण और विरेचन सिद्धान्त, ट्रेजेडी –विवेचन
लॉजाइनस- उदात्त की अवधारणा, उदात्त के स्रोत
- इकाई 2 : वर्ड्सवर्थ- काव्यभाषा का सिद्धान्त, काव्य प्रयोजन एवं काव्यसत्य
कॉलरिज- कल्पना सिद्धान्त और ललित कल्पना, सौन्दर्य कल्पना
मैथ्यू आर्नल्ड – काव्य सिद्धान्त
- इकाई 3 : टी.एस. इलियट-परम्परा की परिकल्पना, निर्वैयक्तिकता का सिद्धान्त,
वस्तुनिष्ठ समीकरण
आई.ए.रिचर्ड्स-सम्प्रेषण सिद्धान्त, रागात्मक अर्थ, संवेगों का सन्तुलन,
व्यावहारिक आलोचना
- इकाई 4 : सिद्धान्त और वाद- स्वच्छन्दतावाद, अभिव्यंजनावाद, मार्क्सवाद,
मनोविश्लेषणवाद, अस्तित्ववाद, उत्तर आधुनिकतावाद,
संरचनावाद

परीक्षकों एवं विद्यार्थियों के लिए निर्देश :

1. इस प्रश्नपत्र के अंतर्गत कुल 9 प्रश्न होंगे। जिनमें से पाँच प्रश्न करने अनिवार्य हैं।
2. प्रथम प्रश्न अतिलघूत्तरी होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे, सभी दस प्रश्न हल करना अनिवार्य होगा। प्रत्येक प्रश्न एक अंक का होगा।
10X 1 = 10 अंक
3. प्रथम प्रश्न के अलावा कुल आठ प्रश्न होंगे। सम्पूर्ण पाठ्यक्रम 4 इकाइयों में विभक्त है। प्रत्येक इकाई से दो-दो प्रश्न विकल्प सहित पूछे जायेंगे जिनमें से प्रत्येक इकाई से एक प्रश्न करना होगा।
4X 15 = 60 अंक

सहायक पुस्तकें-

- पाश्चात्य काव्यशास्त्र : देवेन्द्रनाथ शर्मा
पाश्चात्य काव्यशास्त्र के सिद्धान्त : शान्तिस्वरूप गुप्त
पाश्चात्य काव्यशास्त्र : रामपूजन तिवारी

पाठ्यक्रम संख्या MHINCC 204
हिन्दी साहित्य का इतिहास : आधुनिक काल

- इकाई 1 : 1857 ई. की राज्यक्रान्ति और सांस्कृतिक पुनर्जागरण। आधुनिक काव्य—भारतेन्दु युग—प्रमुख कवि और काव्यगत विशेषताएँ। द्विवेदी युग—प्रमुख कवि और काव्यगत वैशिष्ट्य। राष्ट्रीय काव्यधारा और उसके प्रमुख कवि। छायावाद, उत्तर छायावादी काव्य,
- इकाई 2 : प्रगतिवाद, प्रयोगवाद, नई कविता, समकालीन कविता।
- इकाई 3 : हिन्दी गद्य का उद्भव तथा विकास, हिन्दी उपन्यास—विकास के प्रमुख चरण, हिन्दी कहानी का विकास और प्रमुख कहानी आन्दोलन, हिन्दी निबन्ध का विकास, हिन्दी नाटक—विकास के चरण, हिन्दी आलोचना का उद्भव और विकास।
- इकाई 4 : हिन्दी गद्य की अन्य विधाओं—एकांकी, संस्मरण, रेखाचित्र, जीवनी, आत्मकथा की विकास—यात्रा। दलित लेखन, स्त्री लेखन। हिन्दीतर क्षेत्रों में हिन्दी भाषा और साहित्य।

परीक्षकों एवं विद्यार्थियों के लिए निर्देश :

1. इस प्रश्नपत्र के अंतर्गत कुल 9 प्रश्न होंगे। जिनमें से पाँच प्रश्न करने अनिवार्य हैं।
2. प्रथम प्रश्न अतिलघूत्तरी होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे, सभी दस प्रश्न हल करना अनिवार्य होगा। प्रत्येक प्रश्न एक अंक का होगा।
10X 1 = 10 अंक
3. प्रथम प्रश्न के अलावा कुल आठ प्रश्न होंगे। सम्पूर्ण पाठ्यक्रम 4 इकाइयों में विभक्त है। प्रत्येक इकाई से दो-दो प्रश्न विकल्प सहित पूछे जायेंगे जिनमें से प्रत्येक इकाई से एक प्रश्न करना होगा।

4X 15 = 60 अंक

सहायक पुस्तकें—

- हिन्दी साहित्य का इतिहास : रामचन्द्र शुक्ल
हिन्दी साहित्य की भूमिका : हजारी प्रसाद द्विवेदी
हिन्दी साहित्य का दूसरा इतिहास : बच्चन सिंह
हिन्दी साहित्य और संवेदना का विकास : रामस्वरूप चतुर्वेदी
दलित साहित्य आन्दोलन : चन्द्र कुमार वरठे
स्त्रीत्व का मानचित्र : अनामिका
स्त्री विमर्श : भारतीय परिप्रेक्ष्य : के.एम. मालती
दलित साहित्य और समसामयिक सन्दर्भ : श्रवणकुमार मीणा

पाठ्यक्रम संख्या MHINSC 205
कौशल पाठ्यक्रम (Skill Course): II
(अन्य विभागों के विद्यार्थियों के लिए)
हिन्दी मीडिया लेखन एवं अनुवाद

- इकाई 1 : जनसंचार एवं पत्रकारिता – अर्थ , परिभाषा और स्वरूप, जनसंचार के प्रकार ।
इकाई 2 : मुद्रित माध्यम (प्रिंट मीडिया) लेखन – समाचार –लेखन, संपादकीय लेखन, फीचर लेखन । श्रव्य माध्यम (रेडियो) लेखन – समाचार – लेखन एवं वाचन ।
इकाई 3: दृश्य –श्रव्य माध्यम (टेलीविजन) लेखन– दृश्य एवं श्रव्य सामग्री का सामंजस्य, पार्श्व वाचन (वायस ओवर), विज्ञापन–लेखन ।
इकाई 4 : अनुवाद का अर्थ, परिभाषा, स्वरूप और क्षेत्र, अनुवाद के प्रकार, आशु अनुवाद, पुनरीक्षण (वैटिंग) ।

सहायक पुस्तकें–

- पत्रकारिता का इतिहास एवं जनसंचार माध्यम : संजीव भानावत
पत्रकारिता संदर्भ कोश : छविनाथ पाण्डेय
हिन्दी पत्रकारिता के विविध आयाम : वेदप्रताप वैदिक
हिन्दी पत्रकारिता : कृष्णबिहारी मिश्र
जनसंचार : बदलते परिप्रेक्ष्य में : बलवीर कुन्द्रा
मीडिया लेखन और जनसंचार – मुश्ताक अली

M.A.Hindi
Semester
III and IV
2017-18
Syllabus

एम.ए. हिन्दी
सेमेस्टर III
सत्र 2017-18

निर्देश :- इस सेमेस्टर के अंतर्गत पाठ्यक्रम इस प्रकार होगा-

- (अ) अनिवार्य प्रश्नपत्र – 1. MHINCC 301 आदिकालीन एवं निर्गुण भक्तिकाव्य
2. MHINCC 302 हिन्दी भाषा

(ब) वैकल्पिक प्रश्नपत्र – निम्नलिखित में से किसी एक का चयन करना होगा-

1. MHINCC 303 (क) आदिकालीन
2. MHINCC 303 (ख) भक्तिकाल
3. MHINCC 303 (ग) रीतिकाल

(स) वैकल्पिक प्रश्नपत्र – निम्नलिखित में से किसी एक का चयन करना होगा-

1. MHINCC 304 (क) छायावादोत्तर काव्य
2. MHINCC 304 (ख) हिन्दी उपन्यास

(द) दो अनिवार्य प्रश्नपत्र एवं दो वैकल्पिक प्रश्नपत्रों के साथ ही पाठ्यक्रम संख्या
MHINSC 301 कौशल पाठ्यक्रम (Skill Course) – III 'राजभाषा हिन्दी' विभाग के
विद्यार्थियों के लिए होगा।

एम.ए. हिन्दी

सेमेस्टर III

सत्र 2017-18

पाठ्यक्रम संख्या MHINCC 301

आदिकालीन एवं निर्गुण भक्तिकाव्य

इकाई 1 : **संक्षिप्त पृथ्वीराज रासो** (सं.), हजारीप्रसाद द्विवेदी, नामवर सिंह (निर्धारित अंश-शशिव्रता विवाह प्रस्ताव)

इकाई 2 : **विद्यापति** : लेखक-संपादक- डॉ.शिवप्रसाद सिंह , लोक भारती प्रकाशन , इलाहाबाद (निर्धारित अंश- रूप वर्णन एवं विरह)

इकाई 3 : **कबीर ग्रन्थावली**-(सं.) श्यामसुन्दरदास
निर्धारित अंश-

गुरुदेव कौ अंग, साखी 1, 2, 6, 9, 11, 22, 24, 28, 30, 31 = 10

सुमिरन कौ अंग, साखी 1, 5, 7, 9, 27, 32 = 6

विरह कौ अंग, साखी 8, 18, 20, 23, 30, 32, 35, 44 = 8

ग्यान विरह कौ अंग, साखी 3, 4, 6, 7, 8, 10 = 6

परचा कौ अंग, साखी 1, 3, 4, 8, 9, 17, 22, 23, 39, 45 = 10

लै कौ अंग, साखी 1, 2, 3 = 3

निहकर्मि पतिव्रता कौ अंग, साखी 1, 2, 4, 5, 7, 16, 17 = 7

कुल 50 साखी

पद संख्या - 1, 7, 8, 10, 11, 16, 23, 32, 39, 40, 43, 55, 64, 69, 70,

= कुल 15 पद

इकाई 4 : **पद्मावत** -जायसी (सं.) वासुदेवशरण अग्रवाल (निर्धारित अंश-सिंहलद्वीप वर्णन खण्ड, नखशिख खण्ड)

परीक्षकों एवं विद्यार्थियों के लिए निर्देश :

1. प्रथम प्रश्न अतिलघूत्तरी होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे सभी दस प्रश्न हल करना अनिवार्य होगा। प्रत्येक प्रश्न एक अंक का होगा।

10X 1 = 10 अंक

2. प्रश्न संख्या 2,3, 4 एवं 5 में प्रत्येक इकाई से विकल्प सहित व्याख्या एवं आलोचनात्मक प्रश्न पूछे जायेंगे। व्याख्या 7 अंक की होगी और आलोचनात्मक प्रश्न 8 अंक का होगा।

व्याख्या 4X 7 = 28 अंक

आलोचनात्मक प्रश्न 4X 8 = 32 अंक

सहायक पुस्तकें-

पृथ्वीराज रासो की भाषा : नामवरसिंह

कबीर : हजारीप्रसाद द्विवेदी

जायसी ग्रन्थावली (भूमिका) : रामचन्द्र शुक्ल

विद्यापति पदावली : सुरेन्द्रनाथ दीक्षित

पाठ्यक्रम संख्या MHINCC 302
हिन्दी भाषा

- इकाई 1 : हिन्दी की ऐतिहासिक पृष्ठभूमि—प्राचीन भारतीय आर्य भाषाएँ—वैदिक तथा लौकिक संस्कृत और उनकी विशेषताएँ। मध्यकालीन भारतीय आर्य भाषाएँ—पालि, प्राकृत तथा अपभ्रंश और उनकी विशेषताएँ।
- इकाई 2 : आधुनिक भारतीय आर्य भाषाएँ और उनका वर्गीकरण। हिन्दी का भौगोलिक विस्तार—हिन्दी की उपभाषाएँ—पश्चिमी हिन्दी, पूर्वी हिन्दी, राजस्थानी, बिहारी तथा पहाड़ी और उनकी बोलियाँ।
- इकाई 3 : हिन्दी का भाषिक स्वरूप—हिन्दी की स्वनिम व्यवस्था—खण्ड्य, खण्ड्येतर। हिन्दी शब्द रचना—उपसर्ग, प्रत्यय, समास। रूप रचना—लिंग, वचन और कारक व्यवस्था के सन्दर्भ में हिन्दी के संज्ञा, सर्वनाम, विशेषण और क्रिया—रूप।
- इकाई 4 : हिन्दी वाक्य—रचना—पदक्रम और अन्विति। देवनागरी लिपि—नामकरण, उद्भव और विकास, विशेषताएँ।

परीक्षकों एवं विद्यार्थियों के लिए निर्देश :

1. इस प्रश्नपत्र के अंतर्गत कुल 9 प्रश्न होंगे। जिनमें से पाँच प्रश्न करने अनिवार्य हैं।
2. प्रथम प्रश्न अतिलघूत्तरी होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे सभी दस प्रश्न हल करना अनिवार्य होगा। प्रत्येक प्रश्न एक अंक का होगा।
3. प्रथम प्रश्न के अलावा कुल आठ प्रश्न होंगे। सम्पूर्ण पाठ्यक्रम 4 इकाइयों में विभक्त है। प्रत्येक इकाई से दो-दो प्रश्न विकल्प सहित पूछे जायेंगे जिनमें से प्रत्येक इकाई से एक प्रश्न करना होगा।

10X 1 = 10 अंक

4X 15 = 60 अंक

सहायक पुस्तकें—

- भाषा (ब्लूमफील्ड) : (अनु.) विश्वनाथ प्रसाद
हिन्दी भाषा का उद्गम और विकास : उदयनारायण तिवारी
हिन्दी भाषा : भोलानाथ तिवारी
भाषा और हिन्दी भाषा का इतिहास : नरेश मिश्र
हिन्दी भाषा : हरदेव बाहरी
भाषा का समाजशास्त्र : राजेन्द्र प्रसाद सिंह

पाठ्यक्रम संख्या MHINEC 303
वैकल्पिक प्रश्नपत्र
(क) आदिकाल

इकाई 1 : गोरखबानी (सं.) पीताम्बरदत्त बड़थवाल (निर्धारित अंश— प्रथम पच्चीस सबदी)

इकाई 2 : ढोला मारु रा दूहा (सं.) रामसिंह, सूर्यकरण पारीक, नरोत्तमदास स्वामी
(निर्धारित अंश—छन्द संख्या 451 से 475 तक)

इकाई 3 : बीसलदेव रास—नरपति नाल्ह (सं.) माताप्रसाद गुप्त तथा अगरचन्द नाहटा
(निर्धारितअंश—प्रथम पच्चीस छन्द)

इकाई 4 : अमीर खुसरो (सं.) भोलानाथ तिवारी (निर्धारित अंश—गीत, कव्वाली,
फारसी—हिन्दी मिश्रित छन्द, सूफी दोहे, गज़ल)

परीक्षकों एवं विद्यार्थियों के लिए निर्देश :

1. प्रथम प्रश्न अतिलघूत्तरी होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे सभी दस प्रश्न हल करना अनिवार्य होगा। प्रत्येक प्रश्न एक अंक का होगा। $10 \times 1 = 10$ अंक
2. प्रश्न संख्या 2,3, 4 एवं 5 में प्रत्येक इकाई से विकल्प सहित व्याख्या एवं आलोचनात्मक प्रश्न पूछे जायेंगे। व्याख्या 7 अंक की होगी और आलोचनात्मक प्रश्न 8 अंक का होगा।

व्याख्या $4 \times 7 = 28$ अंक

आलोचनात्मक प्रश्न $4 \times 8 = 32$ अंक

सहायक पुस्तकें—

हिन्दी साहित्य का आदिकाल : हजारीप्रसाद द्विवेदी

सिद्ध साहित्य : धर्मवीर भारती

नाथ सम्प्रदाय : हजारीप्रसाद द्विवेदी

हिन्दी के विकास में अपभ्रंश का योग : नामवर सिंह

हिन्दी साहित्य की भूमिका : हजारीप्रसाद द्विवेदी

पाठ्यक्रम संख्या MHINEC 303
वैकल्पिक प्रश्नपत्र
(ख) भक्तिकाल

इकाई 1 : रैदास जी की बानी—बेलवीडियर प्रिण्टिंग वर्क्स, इलाहाबाद
(निर्धारित अंश—प्रथम 25 पद)

इकाई 2 : मधुमालती—मंझन, (सं.) माताप्रसाद गुप्त
(निर्धारित अंश—छन्द संख्या 26 से 50 तक)

इकाई 3 : रामचन्द्रिका—केशवदास, (सं.) लाला भगवानदीन
(निर्धारित अंश—सातवाँ प्रकाश)

इकाई 4 : मीराँ मुक्तावली—(सं.) नरोत्तमदास स्वामी (निर्धारित अंश—प्रथम 25 पद)
परीक्षकों एवं विद्यार्थियों के लिए निर्देश :

1. प्रथम प्रश्न अतिलघूत्तरी होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे सभी दस प्रश्न हल करना अनिवार्य होगा। प्रत्येक प्रश्न एक अंक का होगा।

10X 1 = 10 अंक

2. प्रश्न संख्या 2,3, 4 एवं 5 में प्रत्येक इकाई से विकल्प सहित व्याख्या एवं आलोचनात्मक प्रश्न पूछे जायेंगे। व्याख्या 7 अंक की होगी और आलोचनात्मक प्रश्न 8 अंक का होगा।

व्याख्या 4X 7 = 28 अंक

आलोचनात्मक प्रश्न 4X 8 = 32 अंक

सहायक पुस्तकें—

भक्ति का विकास : मुंशीराम शर्मा
हिन्दी काव्य में निर्गुण सम्प्रदाय : पीताम्बरदत्त बड़थवाल
भक्तिकाल की सामाजिक सांस्कृतिक चेतना : प्रेमशंकर
वैष्णव भक्ति आन्दोलन का अध्ययन : मलिक मोहम्मद
केशव की काव्यकला : कृष्णशंकर शुक्ल
मीराँ : जीवनवृत्त एवं काव्य : कल्याणसिंह शेखावत
मंझन का सौन्दर्य दर्शन : लालता प्रसाद सक्सेना

पाठ्यक्रम संख्या MHINEC 303

वैकल्पिक प्रश्नपत्र

(ग) रीतिकाल

इकाई 1 : कवित्त—रत्नाकर—सेनापति, (सं.) उमाशंकर शुक्ल, हिन्दी परिषद् प्रकाशन,
प्रयाग विश्वविद्यालय, इलाहाबाद
(निर्धारित अंश—प्रथम तरंग, छन्द संख्या 11 से 35 तक)

इकाई 2 : विरही सुभान दंपति विलास (बोधा—ग्रन्थावली), (सं.) विश्वनाथ प्रसाद
मिश्र, नागरी प्रचारिणी सभा, वाराणसी
(निर्धारित अंश—प्रथम खण्ड)

इकाई 3 : भूषण—ग्रन्थावली, (सं.) विश्वनाथ प्रसाद मिश्र
(निर्धारित अंश—प्रकीर्णक—प्रथम 25 छन्द)

इकाई 4 : नीति सतसई (वृन्द ग्रन्थावली) (सं.) जनार्दन राव चेलेर
(निर्धारित अंश—प्रथम पचास दोहे)

परीक्षकों एवं विद्यार्थियों के लिए निर्देश :

1. प्रथम प्रश्न अतिलघूत्तरी होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे सभी दस प्रश्न हल करना अनिवार्य होगा। प्रत्येक प्रश्न एक अंक का होगा।

10X 1 = 10 अंक

2. प्रश्न संख्या 2,3, 4 एवं 5 में प्रत्येक इकाई से विकल्प सहित व्याख्या एवं आलोचनात्मक प्रश्न पूछे जायेंगे। व्याख्या 7 अंक की होगी और आलोचनात्मक प्रश्न 8 अंक का होगा।

व्याख्या 4X 7 = 28 अंक

आलोचनात्मक प्रश्न 4X 8 = 32 अंक

सहायक पुस्तकें—

रीतिकाव्य की भूमिका : नगेन्द्र

हिन्दी साहित्य का अतीत (दूसरा भाग) : विश्वनाथ प्रसाद मिश्र

रीतिमुक्त स्वच्छन्द काव्यधारा : मनोहरलाल गौड़

हिन्दी नीति काव्य : भोलानाथ तिवारी

भूषण : साहित्यिक एवं ऐतिहासिक अनुशीलन : भगवानदास तिवारी

वृन्द और उनका साहित्य : जनार्दनराव चेलेर

रीतिकालीन हिन्दी वीरकाव्य : भगवानदास तिवारी

भक्तिकाल में रीतिकाव्य की प्रवृत्तियाँ और सेनापति : शम्भुनाथसिंह

पाठ्यक्रम संख्या MHINEC 304

वैकल्पिक प्रश्नपत्र

(क) छायावादोत्तर काव्य

इकाई 1 : प्रवाद पर्व—नरेश मेहता

इकाई 2: अन्धायुग—धर्मवीर भारती

इकाई 3 :संसद से सड़क तक—धूमिल (निर्धारित कविताएँ—अकालदर्शन, मोचीराम, प्रौढ़ शिक्षा, कवि 1970, पटकथा = कुल 5)

कल सुनना मुझे—धूमिल (निर्धारित कविताएँ—रोटी और संसद, अन्तर, दूसरे का घर, मैं हूँ, कविता के द्वारा हस्तक्षेप = कुल 5)

इकाई 4 : साये में धूप – दुष्यंत कुमार।

परीक्षकों एवं विद्यार्थियों के लिए निर्देश :

1. प्रथम प्रश्न अतिलघूत्तरी होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे सभी दस प्रश्न हल करना अनिवार्य होगा। प्रत्येक प्रश्न एक अंक का होगा।

10X 1 = 10 अंक

2. प्रश्न संख्या 2,3, 4 एवं 5 में प्रत्येक इकाई से विकल्प सहित व्याख्या एवं आलोचनात्मक प्रश्न पूछे जायेंगे। व्याख्या 7 अंक की होगी और आलोचनात्मक प्रश्न 8 अंक का होगा।

व्याख्या 4X 7 = 28 अंक

आलोचनात्मक प्रश्न 4X 8 = 32 अंक

सहायक पुस्तकें—

नयी कविता : सीमाएँ और सम्भावनाएँ : गिरिजाकुमार माथुर

समकालीन कविता : सुन्दरलाल कथूरिया

समकालीन कविता का व्याकरण : परमानन्द श्रीवास्तव

धूमिल और उनका काव्य संघर्ष : ब्रह्मदेव मिश्र

क्योंकि रचना बोलती है : कौशलनाथ उपाध्याय

हिन्दी ग़ज़ल के विविध आयाम : सरदार मुजावर

पाठ्यक्रम संख्या MHINEC 304

वैकल्पिक प्रश्नपत्र

(ख) हिन्दी उपन्यास

इकाई 1 : बाणभट्ट की आत्मकथा—हजारीप्रसाद द्विवेदी

इकाई 2 : शेखर एक जीवनी (भाग 1 व 2)—अज्ञेय

इकाई 3 : कब तक पुकारूँ—रांगेय राघव

इकाई 4 : आपका बंटी—मन्नू भंडारी

परीक्षकों एवं विद्यार्थियों के लिए निर्देश :

1. प्रथम प्रश्न अतिलघूत्तरी होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे सभी दस प्रश्न हल करना अनिवार्य होगा। प्रत्येक प्रश्न एक अंक का होगा।

10X 1 = 10 अंक

2. प्रश्न संख्या 2,3, 4 एवं 5 में प्रत्येक इकाई से विकल्प सहित व्याख्या एवं आलोचनात्मक प्रश्न पूछे जायेंगे। व्याख्या 7 अंक की होगी और आलोचनात्मक प्रश्न 8 अंक का होगा।

व्याख्या 4X 7 = 28 अंक

आलोचनात्मक प्रश्न 4X 8 = 32 अंक

सहायक पुस्तकें—

उपन्यास का स्वरूप : सुषमा प्रियदर्शिनी

हिन्दी उपन्यास : बदलते संदर्भ : शशिभूषण सिंहल

हिन्दी के आंचलिक उपन्यास : सिद्धान्त और समीक्षा : बंशीधर

अज्ञेय की उपन्यास यात्रा : अरविन्दाक्षन

हिन्दी उपन्यास : संबंधों के विविध आयाम : श्रवणकुमार मीणा

पाठ्यक्रम संख्या MHINSC 305
कौशल पाठ्यक्रम (Skill Course): III
(विभाग के विद्यार्थियों के लिए)
राजभाषा हिन्दी

- इकाई 1 : प्रशासन व्यवस्था और भाषा । राजभाषा (कार्यालयी हिन्दी) की प्रकृति ।
राजभाषा विषयक सांविधानिक प्रावधान – अनुच्छेद 343 से 351, राष्ट्रपति के आदेश (1952, 1955, 1960) राजभाषा अधिनियम 1963 (यथा संशोधित 1967), राजभाषा संकल्प 1968 (यथानुमोदित 1991), राजभाषा नियम 1976
- इकाई 2 : हिन्दीतर राज्यों के प्रशासनिक क्षेत्रों में हिन्दी की स्थिति, अन्तरराष्ट्रीय स्तर पर हिन्दी, हिन्दी के प्रचार-प्रसार में विभिन्न हिन्दी संस्थाओं की भूमिका, हिन्दी भाषा और देवनागरी लिपि का मानकीकरण ।
- इकाई 3 : राजभाषा का अनुप्रयोगात्मक पक्ष – प्रारूपण – पत्रलेखन, टिप्पणी, संक्षेपण, पल्लवन, कार्यालय अभिलेखों के हिन्दी अनुवाद की समस्या
- इकाई 4 : बैंकिंग, बीमा और अन्य वाणिज्यिक क्षेत्रों में हिन्दी अनुप्रयोग की स्थिति, विधिक क्षेत्र में हिन्दी, सूचना प्रौद्योगिकी (संचार माध्यमों) के परिप्रेक्ष्य में हिन्दी और देवनागरी लिपि । भूमण्डलीकरण के परिप्रेक्ष्य में हिन्दी का भविष्य ।

सहायक पुस्तकें—

- प्रशासन में राजभाषा हिन्दी : कैलाशचन्द्र भाटिया
आलेखन , प्रारूप : शिवनारायण चतुर्वेदी
टिप्पणी , प्रारूप : शिवनारायण चतुर्वेदी
सम्प्रेषण एवं बैंकिंग व्यवस्था : सुभाष गौड़
राजभाषा हिन्दी : प्रगति और प्रमाण : इकबाल अहमद
भाषा और प्रौद्योगिकी : विनोद प्रसाद

एम.ए. हिन्दी
सेमेस्टर IV
सत्र 2017-18

निर्देश :- इस सेमेस्टर के अंतर्गत पाठ्यक्रम इस प्रकार होगा-

- (अ) अनिवार्य प्रश्नपत्र – 1. MHINCC 401 सगुण भक्ति एवं रीतिकाव्य
2. MHINCC 402 भाषा विज्ञान

(ब) वैकल्पिक प्रश्नपत्र – निम्नलिखित में से किसी एक का चयन करना होगा-

1. MHINCC 403 (क) लोक साहित्य
2. MHINCC 403 (ख) भारतीय साहित्य

(स) वैकल्पिक प्रश्नपत्र – निम्नलिखित में से किसी एक का चयन करना होगा-

1. MHINCC 404 (क) नवविमर्श
2. MHINCC 404 (ख) हिन्दी नाटक

(द) दो अनिवार्य प्रश्नपत्र एवं दो वैकल्पिक प्रश्नपत्रों के साथ ही पाठ्यक्रम संख्या

MHINSC 401 कौशल पाठ्यक्रम (Skill Course)- IV 'लोक संस्कृति' अन्य विभाग के विद्यार्थियों के लिए होगा।

एम.ए. हिन्दी
सेमेस्टर IV
सत्र 2017-18
पाठ्यक्रम संख्या MHINCC 401
सगुण भक्ति एवं रीतिकाव्य

- इकाई 1 : भ्रमरगीत सार—सूरदास (सं.) रामचन्द्र शुक्ल
(निर्धारित अंश—पद संख्या 51 से 100 तक)
- इकाई 2 : रामचरितमानस—तुलसीदास, गीताप्रेस, गोरखपुर
(निर्धारित अंश—उत्तरकांड, दोहा संख्या 36 से 86 तक)
- इकाई 3 : बिहारी—रत्नाकर, (सं.) जगन्नाथदास 'रत्नाकर'
(निर्धारित अंश—दोहा संख्या 31 से 60 तक)
- इकाई 4 : घनआनन्द—कबित्त—(सं.) विश्वनाथप्रसाद मिश्र
(निर्धारित अंश—प्रथम 50 छंद)

परीक्षकों एवं विद्यार्थियों के लिए निर्देश :

1. प्रथम प्रश्न अतिलघूत्तरी होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे सभी दस प्रश्न हल करना अनिवार्य होगा। प्रत्येक प्रश्न एक अंक का होगा।

10X 1 = 10 अंक

2. प्रश्न संख्या 2,3, 4 एवं 5 में प्रत्येक इकाई से विकल्प सहित व्याख्या एवं आलोचनात्मक प्रश्न पूछे जायेंगे। व्याख्या 7 अंक की होगी और आलोचनात्मक प्रश्न 8 अंक का होगा।

व्याख्या 4X 7 = 28 अंक

आलोचनात्मक प्रश्न 4X 8 = 32 अंक

सहायक पुस्तकें—

- सूर और उनका साहित्य : हरवंशलाल शर्मा
तुलसीकाव्य मीमांसा : उदयभानुसिंह
घनानन्द काव्यवैभव : मनोहरलाल गौड़
बिहारी : विश्वनाथप्रसाद मिश्र

पाठ्यक्रम संख्या MHINCC 402
भाषा विज्ञान

- इकाई 1 : भाषा और भाषा विज्ञान—भाषा की परिभाषा और अभिलक्षण ।
भाषा विज्ञान : स्वरूप एवं व्याप्ति, अंग, अध्ययन की दिशाएँ— वर्णनात्मक, ऐतिहासिक और तुलनात्मक ।
- इकाई 2 : स्वन प्रक्रिया—स्वन एवं ध्वनि विज्ञान का स्वरूप, स्वन एवं स्वनिम की अवधारणा, वाग्यंत्र और उनके कार्य, ध्वनियों का वर्गीकरण, ध्वनि परिवर्तन के कारण और दिशाएँ ।
- इकाई 3: रूप प्रक्रिया का स्वरूप और शाखाएँ, रूपिम की अवधारणा और भेद—मुक्त—आबद्ध, अर्थदर्शी और सम्बन्धदर्शी, सम्बन्ध दर्शी रूपिम के भेद और प्रकार्य ।
- इकाई 4 : वाक्य की अवधारणा, वाक्य—परिवर्तन के कारण और दिशाएँ, वाक्य के भेद, वाक्य—विश्लेषण, निकटस्थ अवयव—विश्लेषण, गहन—संरचना और बाह्य संरचना ।
अर्थ—विज्ञान—अर्थ की अवधारणा, शब्द और अर्थ का सम्बन्ध, अर्थ—परिवर्तन के कारण और दिशाएँ ।

परीक्षकों एवं विद्यार्थियों के लिए निर्देश :

1. इस प्रश्नपत्र के अंतर्गत कुल 9 प्रश्न होंगे । जिनमें से पाँच प्रश्न करने अनिवार्य हैं ।
2. प्रथम प्रश्न अतिलघूत्तरी होगा । इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे सभी दस प्रश्न हल करना अनिवार्य होगा । प्रत्येक प्रश्न एक अंक का होगा ।
10X 1 = 10 अंक
3. प्रथम प्रश्न के अलावा कुल आठ प्रश्न होंगे । सम्पूर्ण पाठ्यक्रम 4 इकाइयों में विभक्त है । प्रत्येक इकाई से दो-दो प्रश्न विकल्प सहित पूछे जायेंगे जिनमें से प्रत्येक इकाई से एक प्रश्न करना होगा ।
4X 15 = 60 अंक

सहायक पुस्तकें—

भाषा विज्ञान की भूमिका : देवेन्द्रनाथ शर्मा

भाषा विज्ञान : भोलानाथ तिवारी

आधुनिक भाषाविज्ञान : राजमणि शर्मा

पाठ्यक्रम संख्या MHINEC 403

वैकल्पिक प्रश्नपत्र

(क) लोक साहित्य

- इकाई 1 : लोक और लोकवार्ता, लोकमानस और लोकतत्त्व। लोकसंस्कृति—अवधारणा, लोकवार्ता और लोकसंस्कृति, लोकसंस्कृति और साहित्य। लोकसाहित्य—अवधारणा, लोकसाहित्य की अध्ययन प्रक्रिया एवं संकलन की समस्याएँ,
- इकाई 2 : लोकसाहित्य के प्रमुख रूपों का वर्गीकरण—लोकगीत, लोक—नाट्य, लोककथा, लोकगाथा, लोकोक्ति साहित्य—परिभाषा एवं वर्गीकरण। कथानक रूढ़ियाँ एवं अभिप्राय, लोककथा निर्माण में अभिप्राय (MOTIF)।
- इकाई 3 : राजस्थानी लोकगीत—वर्गीकरण एवं प्रतिपाद्य, राजस्थानी प्रमुख लोककथाएँ , छोगे एवं बात बणाव। राजस्थानी लोकगाथा—वर्गीकरण, प्रमुख लोकगाथाओं—पाबूजी री पड़, बगड़ावत का परिचय।
- इकाई 4 : राजस्थानी लोकनाट्य—विविध रूपों—ख्याल, तमाशा, स्वाँग, नौटंकी, तुराकलंगी, रम्मत— का परिचयात्मक अध्ययन। राजस्थानी लोकनृत्य—घूमर, अग्निनृत्य, चरीनृत्य, तेराताली, डाण्डिया—गेर। राजस्थानी लोक कलाएँ , राजस्थानी लोकोत्सव।

परीक्षकों एवं विद्यार्थियों के लिए निर्देश :

1. इस प्रश्नपत्र के अंतर्गत कुल 9 प्रश्न होंगे। जिनमें से पाँच प्रश्न करने अनिवार्य हैं।
2. प्रथम प्रश्न अतिलघूत्तरी होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे सभी दस प्रश्न हल करना अनिवार्य होगा। प्रत्येक प्रश्न एक अंक का होगा।

10X 1 = 10 अंक

3. प्रथम प्रश्न के अलावा कुल आठ प्रश्न होंगे। सम्पूर्ण पाठ्यक्रम 4 इकाइयों में विभक्त है। प्रत्येक इकाई से दो-दो प्रश्न विकल्प सहित पूछे जायेंगे जिनमें से प्रत्येक इकाई से एक प्रश्न करना होगा।

4X 15 = 60 अंक

सहायक पुस्तकें—

लोकसाहित्य विज्ञान : सत्येन्द्र

लोकसाहित्य की भूमिका : कृष्णदेव उपाध्याय

लोकसाहित्य का अध्ययन : त्रिलोचन पाण्डेय

लोकधर्मी नाट्य परम्परा : श्याम परमार

भारतीय लोकसाहित्य की रूपरेखा : दुर्गा भागवत

हिन्दी साहित्य का वृहद् इतिहास : नागरी प्रचारिणी सभा, वाराणसी (16वाँ खण्ड)

संस्कृति के चार अध्याय : रामधारीसिंह 'दिनकर'

राजस्थानी लोकसाहित्य के अध्ययन के आयाम : रामप्रसाद दाधीच

राजस्थानी लोकगाथा : एक अध्ययन : कृष्ण कुमार शर्मा

राजस्थानी लोकसाहित्य : नानूराम संस्कर्ता

लोकगीत की सत्ता : सुरेश गौतम

पाठ्यक्रम संख्या MHINEC 403
वैकल्पिक प्रश्नपत्र

(ख) भारतीय साहित्य

- इकाई 1 : भारतीय साहित्य का स्वरूप, भारतीय साहित्य के अध्ययन की समस्याएँ, भारतीय साहित्य में आज के भारत का बिम्ब, भारतीय साहित्य में भारतीय मूल्यों की अभिव्यक्ति, भारतीय साहित्य की मूलभूत एकता।
- इकाई 2 : पांचाली शपथम् (खंडकाव्य-तमिल)– सुब्रह्मण्य भारती, रूपांतरकार –नागेश्वर सुन्दरम्, विश्वनाथ सिंह 'विश्वासी', ग्रंथ सदन, दिल्ली, प्रथम संस्करण-2007
- इकाई 3 : अग्निगर्भ (उपन्यास-बंगला) – महाश्वेता देवी, राधाकृष्ण प्रकाशन, दिल्ली, दूसरा संस्करण-2008
- इकाई 4 : घासीराम कोतवाल (नाटक-मराठी) – विजय तेन्दुलकर, अनुवादक – वसंत देव, राजकमल प्रकाशन, नई दिल्ली, पहली आवृत्ति- 2008

परीक्षकों एवं विद्यार्थियों के लिए निर्देश :

1. प्रथम प्रश्न अतिलघूत्तरी होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे सभी दस प्रश्न हल करना अनिवार्य होगा। प्रत्येक प्रश्न एक अंक का होगा।

10X 1 = 10 अंक

2. प्रश्न संख्या 2 में इकाई 1 से विकल्प सहित 2 प्रश्न पूछे जायेंगे जिनमें से एक प्रश्न हल करना होगा।
1X 15 = 15 अंक
3. प्रश्न संख्या 3, 4 एवं 5 में इकाई 2,3 एवं 4 से विकल्प सहित व्याख्या एवं आलोचनात्मक प्रश्न पूछे जायेंगे। व्याख्या 7 अंक की होगी और आलोचनात्मक प्रश्न 8 अंक का होगा।

व्याख्या 3X 7 = 21 अंक

आलोचनात्मक प्रश्न 3X 8 = 24 अंक

सहायक पुस्तकें –

- भारतीय साहित्य – भोलाशंकर व्यास
भारतीय साहित्य – (सं०) नगेन्द्र
भारतीय साहित्य के इतिहास की समस्याएँ – रामविलास शर्मा
भारतीय साहित्य – रामछबीला त्रिपाठी
भारतीय साहित्य – मूलचन्द्र गौतम
तमिल साहित्य : एक झाँकी – एम. शेषन्
तमिल नवजागरण और सुब्रह्मण्य भारती – एम. शेषन
बंगला साहित्य का इतिहास – सुकुमार सेन (अनुवादक) – निर्मला जैन
मराठी साहित्य : परिदृश्य : चन्द्रकान्त बांदिवडेकर

पाठ्यक्रम संख्या MHINEC 404

वैकल्पिक प्रश्नपत्र

(क) नवविमर्श

- इकाई 1 : सैद्धान्तिक पक्ष – स्त्री विमर्श : अर्थ एवं स्वरूप, दलित साहित्य की अवधारणा और स्वरूप, आदिवासी साहित्य : स्वरूप, और अवधारणा, प्रवासी साहित्य : स्वरूप एवं अवधारणा।
- इकाई 2 : नई सदी की पहचान : श्रेष्ठ महिला कथाकार , संपा.– ममता कालिया, लोक भारती प्रकाशन , इलाहाबाद (कुल 10 कहानियाँ– सिक्का बदल गया – कृष्णा सोबती, तीसरा हिस्सा– मन्नू भंडारी, मलबा– मंजुल भगत, तीन किलो की छोरी– मृदुला गर्ग, बन्तो– नमिता सिंह , पाँचवा बेटा– नासिरा शर्मा, एक पेड़ की मौत– अलका सरावगी, महानगर की मैथिली– सुधा अरोड़ा, सुनन्दा छोकरी की डायरी– सूर्यबाला, आपकी छोटी लड़की– ममता कालिया)
- इकाई 3 : 'जूठन' – ओमप्रकाश वाल्मीकि भाग – 1 , राधाकृष्ण प्रकाशन, नई दिल्ली
कहानियाँ : 'साजिश'–सूरजपाल चौहान, 'अपना गाँव'–मोहनदास नैमिशाराय, 'खेत' – रत्नकुमार सांभरिया, 'सिलिया'–सुशीला टाकभोरे, अस्थियों के अक्षर – श्यौराज सिंह बेचैन (कुल 05)
- इकाई 4 : जंगल–जंगल जलियांवाला – हरिराम मीणा (यात्रावृत्तान्त), शिल्पायन प्रकाशन, दिल्ली
कविताएँ: 'धरोहर' – प्रभात, 'चुड़का सोरेन से' – निर्मला पुतुल, 'आ मेरे बिरसा' – भुजंग मेश्राम, 'अघोषित उलगुलान' – अनुज लुगुन, 'हरियल जंगल में' – वाहरू सोनवणे (कुल 05)

परीक्षकों एवं विद्यार्थियों के लिए निर्देश :

1. प्रथम प्रश्न अतिलघूत्तरी होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे सभी दस प्रश्न हल करना अनिवार्य होगा। प्रत्येक प्रश्न एक अंक का होगा।
10X 1 = 10 अंक
2. प्रश्न संख्या 2 में इकाई 1 से विकल्प सहित 2 प्रश्न पूछे जायेंगे जिनमें से एक प्रश्न हल करना होगा।
1X 15 = 15 अंक
3. प्रश्न संख्या 3, 4 एवं 5 में इकाई 2,3 एवं 4 से विकल्प सहित व्याख्या एवं आलोचनात्मक प्रश्न पूछे जायेंगे। व्याख्या 7 अंक की होगी और आलोचनात्मक प्रश्न 8 अंक का होगा।

व्याख्या 3X 7 = 21 अंक

आलोचनात्मक प्रश्न 3X 8 = 24 अंक

सहायक पुस्तकें –

- स्त्री का मानचित्र : अनामिका
साहित्य के प्रतिरोधी स्वर : किशोरीलाल रैगर
स्त्री विमर्श : भारतीय परिप्रेक्ष्य – के.एम. मालती
दलित साहित्य का सौन्दर्य शास्त्र : ओमप्रकाश वाल्मीकि
दलित साहित्य का सौन्दर्य शास्त्र : शरण कुमार लिम्बाले
दलित साहित्य आंदोलन : चन्द्र कुमार बरदे
आधुनिक भारत का दलित आंदोलन : आर, चन्द्रा तथा कन्हैयालाल चन्चारिक
आदिवासी कौन – रमणिका गुप्ता
आदिवासी संघर्ष गाथा – विनोद कुमार
साहित्य चिंतन के विविध पक्ष – श्रवण कुमार मीणा
विश्व हिन्दी रचना – सं. कमल किशोर गोयनका
विश्व भाषा हिन्दी – महावीरसरन जैन

पाठ्यक्रम संख्या MHINEC 404
वैकल्पिक प्रश्नपत्र
(ख) हिन्दी नाटक

इकाई 1 : अंधेर नगरी : भारतेन्दु हरिश्चन्द्र

इकाई 2 : स्कन्दगुप्त : जयशंकर प्रसाद

इकाई 3 : मादा कैक्टस : लक्ष्मीनारायण लाल

इकाई 4 : शत्रुमुर्ग : ज्ञानदेव अग्निहोत्री

परीक्षकों एवं विद्यार्थियों के लिए निर्देश :

1. प्रथम प्रश्न अतिलघूत्तरी होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे सभी दस प्रश्न हल करना अनिवार्य होगा। प्रत्येक प्रश्न एक अंक का होगा।

10X 1 = 10 अंक

2. प्रश्न संख्या 2,3, 4 एवं 5 में प्रत्येक इकाई से विकल्प सहित व्याख्या एवं आलोचनात्मक प्रश्न पूछे जायेंगे। व्याख्या 7 अंक की होगी और आलोचनात्मक प्रश्न 8 अंक का होगा।

व्याख्या 4X 7 = 28 अंक

आलोचनात्मक प्रश्न 4X 8 = 32 अंक

सहायक पुस्तकें –

भारतेन्दु का नाट्य साहित्य : वीरेन्द्र कुमार शुक्ल

प्रसाद : नाट्य और रंगशिल्प : गोविन्द चातक,

हिन्दी नाटक : बच्चनसिंह

आज का हिन्दी नाटक : प्रगति और प्रभाव : दशरथ ओझा

अंधेर नगरी : समीक्षा की नई दृष्टि – भवदेव पाण्डेय

पाठ्यक्रम संख्या MHINSC 405
कौशल पाठ्यक्रम (Skill Course): IV
(अन्य विभाग के विद्यार्थियों के लिए)
लोक संस्कृति

- इकाई 1 : लोक संस्कृति की अवधारणा , स्वरूप
लोक साहित्य की परिभाषा और आभिजात्य साहित्य में अन्तर
लोक संस्कृति का सामाजिक विकास में योगदान
लोक संस्कृति के अध्ययन का इतिहास व उसकी विभिन्न पद्धतियाँ
(भारतीय एवं पाश्चात्य)
- इकाई 2 : लोक संस्कृति के प्रमुख अध्येता –
राहुल सांकृत्यायन , देवेन्द्र सत्यार्थी, रामनरेश त्रिपाठी , कृष्णदेव उपाध्याय,
श्याम परमार, विजयदान देथा, कोमल कोठारी, मनोहर शर्मा ,झवेरचन्द
मेघानी, विद्यानिवास मिश्र, कन्हैयालाल सहल, लक्ष्मी कुमारी चूण्डावत,
देवीलाल सांमर, जॉन डी स्मिथ।
- इकाई 3 : प्रमुख लोक साहित्य विधाएँ –
लोक गीत, लोक कथा, लोक गाथा, लोक नाट्य, लोक नृत्य, लोकोक्तियाँ,
लोक कलाएँ, प्रमुख लोक गाथाओं का परिचय : पाबूजी री पड़ , बगड़ावत ,
वीर तेजा।
- इकाई 4 : राजस्थानी लोक संस्कृति –
प्रमुख लोक देवी-देवता और उनके प्रसिद्ध स्थान, लोकोत्सव, प्रमुख त्यौहार
और मेले, लोक संगीत , लोक कलाकार, लोक व्यंजन, वेश-भूषा, लोक
कलाएँ।

सहायक ग्रन्थ –

1. लोक साहित्य विज्ञान – सत्येन्द्र
2. लोक साहित्य की भूमिका – कृष्णदेव उपाध्याय
3. लोकसाहित्य का अध्ययन – त्रिलोचन पाण्डेय
4. लोकधर्मी नाट्य परम्परा – श्याम परमार
5. हिन्दी साहित्य का वृहद इतिहास : नागरी प्रचारिणी सभा, वाराणसी (16वाँ खण्ड)
6. संस्कृति के चार अध्याय : रामधारीसिंह 'दिनकर'
7. राजस्थानी लोक साहित्य का सैद्धांतिक विवेचन : सोहनदान चारण
8. राजस्थानी लोकगाथा : एक अध्ययन : कृष्ण कुमार शर्मा
9. राजस्थानी लोकसाहित्य : नानूराम संस्कर्ता
10. लोकगीत की सत्ता : सुरेश गौतम



**JAI NARAIAN VYAS UNIVERSITY JODHPUR
(RAJASTHAN)**

FACULTY OF ARTS, EDUCATION AND SOCIAL SCIENCES

SYLLABUS

FOR

**M.A. MUSIC (VOCAL AND INSTRUMENTAL SITAR)
SEMESTER SYSTEM (SEMESTER I AND SEMESTER II)
EXAMINATIONS 2022-2023**

**M.A. MUSIC (VOCAL AND INSTRUMENTAL SITAR)
SEMESTER SYSTEM (SEMESTER III AND SEMESTER IV)
EXAMINATIONS 2022-2023**

IMPORTANT

NOTIFICATION

In compliance of decision of the Hon'ble High Court all students are required to fulfill 75% attendance rule in each subject and there must be 75% attendance of the student before he/she could be permitted to appear in the examination.

REGISTRAR

(Academic)

FACULTY OF ARTS, EDUCATION & SOCIAL SCIENCES

MASTER OF ARTS

GENERAL INFORMATION FOR STUDENTS

The examination for the degree of Master of Arts, Education and Social Sciences shall consist of two parts with semester system: (i) The M.A (Semester I and Semester II), 2020-21 and (ii) M.A (Semester III and Semester IV), 2021-22

The examination will be through theory papers/practical/viva. Pass marks for the semester I, semester II, semester III and semester IV examination are 36% of the aggregate marks in all the theory papers and viva/practical"s and not less than 25% marks in the individual theory paper /viva /practical. A candidate is required to pass in the written and the practical/viva examination separately.

Successful candidates will be placed in the following divisions on the basis of the total marks obtained in all four semesters of M.A (Semester I and Semester II) and (ii) M.A (Semester III and Semester IV) examinations taken together:

First division 60% , second division 48% and third division 36% no students will be permitted to register himself simultaneously for more than one post-graduate course.

ATTENDANCE

1. For all regular candidates in the faculties of arts, education and social sciences, science, law, commerce and engineering, the minimum attendance requirement shall be that a candidate should have attended at least 75% of the lectures delivered and tutorials held taken together as well as 75% of practical and sectionals from the date of his/her admission.
2. Condonation of shortage of attendance:
The shortage of attendance up to the limits specified below may be condoned on valid reasons:
 - i) Up to 6% each subject plus 5 attendances in all the aggregate subject/papers may be condoned by the Vice-Chancellor on the recommendation of the Dean/Director/principal for undergraduate students and on the recommendation of the Head of the Department for the post-graduate classes.
 - ii) The N.C.C./N.S.S. cadets sent out to parades and camps and such students who are deputed by the University to take part in games, athletic or cultural activities may, for purpose of attendance, be treated, as present for the days of their absence in connection with the aforesaid activities and that period shall be added to their subject wise attendance.

Note:

The attendance requirement will apply to each semester.

However, in case of practical where examination is not held at the end of the first semester but the end of the second semester, attendance will be counted at the end of the second semester taking into account attendance put in both the semesters (i.e., first and second) taken together.

Candidates will be required to pass separately in theory and practical examinations.

Candidate's choice among the optional papers and groups would be restricted only to those paper or groups for which regular teaching is provided in the department.

Use of map stencils (political outline only). Log tables and calculators are allowed in the examination.

MEDIUM

Candidates are not allowed to use any medium except Hindi or English for answering question papers.

For answering papers in the subjects of English/Hindi the medium will be corresponding language only.

Note -

The Question for the Examination will be divided in two Parts i.e. A and B as under:-

Section A- Consist 15 Questions. The candidate has to attempt any 11 questions out of 15 questions and answer of each question shall be limited up to 30 words. Each question will carry 02 Mark.

Section B - Consist 8 questions, two questions from each unit will be set and student will have internal choice to answer one question from each unit. Answer of each question shall be limited up to 500 words. Each question carries 12 Marks.

ADMISSION

The details of the eligibility conditions and admission procedures are given in the admission forms and on university website. The admission would be done on the basis of merit as per university rules. Reservation for SC, ST and OBC would also be done as per J.N.V. University, Jodhpur rules. Candidates are required to attend minimum 75% of the classes in theory and practical"s both.

FACILITIES

The Department of Music possesses several sophisticated, advanced and modern equipments required for teaching and research.

Dr. Swati Sharma (Head of the Department)

Assistant Professor

Dr. Gaurav Shukl

Dr. Bhoomika Dwivedi

GUIDELINES FOR CHOICE BASED CREDIT SYSTEM

Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete **four skill courses:** two within the Department and two from other Department within JNV University or the Universities approved by JNV University
3. **Course:** Usually referred to, as „papers“ is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement forwarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one hour of teaching (lecture or tutorial) or two hours of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.

12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/December and even semester from December/January to May.

Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May. Each Department shall conduct the Practical examinations of Odd semester with internal examiners only; however during even semester one Examiner shall be from other University/Institute.

13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Arts, edu. and social sciences resolves the following:

- a. All internal assessments shall be open assessment system only and that are based on Quizzes, term test, seminar
- b. Attendance shall carry the prescribed marks in all papers and Practical examination internal assessment
- c. In each semester three out of four theoretical component University examination shall be undertaken by external examiners from outside the university conducting examination, who may be appointed by the competent authority.

Grievances and Redressal Mechanism

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head/Principal of the College or the Chairperson of the University Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.
- b) The appeal will be assessed by the Chairman and he/she shall place before the Grievance Redressal Committee (GRC), Chaired by the Dean, Faculty of Arts, Edu. and Social sciences comprising all HODs of the Faculty and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	„O“	Outstanding	10
2	„A+“	Excellent	9
3	„A“	Very Good	8
4	„B+“	Good	7
5	„B“	Above Average	6
6	„C“	Average	5
7	„P“	Pass	4
8	„F“	Fail	0
9	„Ab“	Absent	0

- i. A student obtaining Grade F shall be considered failed and will be required to reappear in the examination.
- ii. For non-credit courses (Skill Courses) „Satisfactory“ or “Unsatisfactory“ shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

= and > 95 % marks Grade Point 10.0

90 to less than 95 % marks Grade Point 9.5

85 to less than 90 % marks Grade Point 9.0

80 to less than 85 % marks Grade Point 8.5

75 to less than 80 % marks Grade Point 8.0

70 to less than 75 % marks Grade Point 7.5

65 to less than 70 % marks Grade Point 7.0

60 to less than 65 % marks Grade Point 6.5

55 to less than 60 % marks Grade Point 6.0

50 to less than 55 % marks Grade Point 5.5

45 to less than 50 % marks Grade Point 5.0

40 to less than 45 % marks Grade Point 4.5

35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,
i.e.

$$\mathbf{SGPA (S_i) = \Sigma(C_i \times G_i) / \Sigma C_i}$$

Where **C_i** is the number of credits of the **i**th course and **G_i** is the grade point scored by the student in the **i**th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,
i.e.

$$\mathbf{CGPA = \Sigma(C_i \times S_i) / \Sigma C_i}$$

Where **S_i** is the SGPA of the **i**th semester and **C_i** is the total number of credits in that semester.

- iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	6	B	6	6*6=36
2	Course 2	6	B+	7	6*7= 42
3	Course 3 Practical-I	10 (V) or 10 (I)	B	6	10*6=60
4	Course 4 Practical - II	6	O	10	6*10=60
5	Course 5- Practical - III	04 (V) or 04 (I)	C	5	4*5=20
6	Course 6 Practical-IV	04 (V) or 04 (I)	B	6	4*6=24
	Total	36			242

Thus, **SGPA =242/32 =7.56**

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	36	36	36	36
SGPA	7.56	7.25	7	6.25

$$\text{CGPA} = (36 \times 7.56 + 36 \times 7.25 + 36 \times 7 + 36 \times 6.25) / 144$$

$$= 1010.16 / 144 = 7.01$$

Semester-wise Theory Papers/Practical/Skill component

*** Each Department shall offer two skill courses per semester from the list of skill courses approved for the Department.**

The Duration of the Period shall be 45 minutes / One hour. In each of these combinations, the first value stands for the same number of lecture instructions per week, whereas the last two values stand for double the number of tutorial / practical instructions per week.

In each practical group the number of students that can be accommodated will be decided by the respective Department Council; the general/existing pattern is 15 to 20 students in each group. The workload is to be computed accordingly.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective) involve an evaluation system of students that has the following two components:-

- (i) **Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
 - (ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.
- (i) **Continuous Comprehensive Assessment (CCA):** This would have the following components:
- a. **Term Test:** One term test shall be arranged for each theory paper prior to End-Semester Examination; examination duration shall be of three hours; maximum marks is 70
 - b. **Seminar:** Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 15. The seminar shall commence after first quiz examination and shall be completed prior to term test for all the papers.

All students' cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Science.

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective Department shall declare the result as "Satisfactory" or "Non-Satisfactory"; each student need to get a minimum of three "Satisfactory" declaration for the course completion

Qualifying for Next semester

- 1. A student acquiring minimum of 35% in total of the CCA is eligible to join next semester.**
- 2. A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as „Fail“), shall be permitted to appear in such failed course(s)“in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.**

3. A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time i.e three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted. Additional chances examination fee shall be on additive basis.

Improvement Option:

Every student shall have the opportunity to improve Credit thorough University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final. There shall be no improvement opportunity in Practical examinations.

**GUIDELINES FOR CONTINUOUS INTERNAL ASSESMENT (30%) FOR
REGULAR STUDENTS OF POST- GRADUATE COURSE in M.A. MUSIC
(SEMESTER SYSTEM)**

(Effective from the First Year Admission for the Academic session 2015-2016)

1. The D.C. has approved the following guidelines mode of testing and evaluation including continuous internal assessment of students
 - (i) End semester examination (ESE) : 70%
 - (ii) Continues Comprehensive assessment (CCA) :30%
 - (iii) Continuous Comprehensive assessment may include written assignment, participation and discussions in the class, Seminars and attendance etc.
2. Weightage of 2 marks for attendance component out of 30 marks for continuous Comprehensive Assessment shall be available only to those students who attend 75% and more of classroom lectures/seminars/workshop.

The break-up of marks for attendance component for theory papers shall be under:

Attendance Component	Mark/s for theory Papers
(a) 75% and above upto 85%	: 1
(b) Above 85%	: 2

3. It shall not be compulsory to pass in Continuous Comprehensive Assessment. Thus, whatever marks are secured by students out of 70%, i.e. the remaining marks allocated to the particular subject and, thus, he/she have to secure pass marks both in the ESE examinations as well as total of CCA and ESE Examinations.
4. Continuous Comprehensive Assessment awards from affiliated Colleges/ Departments must be sent to the Controller of Examinations, by name, two week before the commencement of the particular examination on the Performa obtained from the Examination Branch.

SPECIAL NOTE

(1) The Theory Paper will be of 70 marks and 30 marks will be for CCA SCHEME OF EXAMINATION FOR M.A. MUSIC (SEMESTER SYSTEM) FOR THE EXAMINATION OF 2015-2016

SEMESTER I (M.A. Music)

Total Marks = 400

Papers	ESE	CCA	Total	Credits	lectures Tutorials- Practicals/week
Paper I Principle of Music (Shastra)	70	30	100	6	6-0-0
Paper II History of Indian Music	70	30	100	6	6-0-0
Paper III Main Practical	35	15	50	10 (V) 10 (I)	10 (V) 10 (I)
Paper IV Practical cum viva voce	35	15	50	6	6-0-0
Paper V Stage Performance	35	15	50	04 (V) 04 (I)	04 (V) 04 (I)
Paper VI Folk Music and Semi classical Music	35	15	50	04 (V) 04 (I)	04 (V) 04 (I)

Note: V = Vocal Music

I = Instrumental Music (Sitar)

Skill Course-I (for Students of the Deptt.) ----- 6-0-0

Semester I (Theory Paper I)
PRINCIPLE OF MUSIC (SHASTRA)

Marks : 70
Time : 3 Hours

- Unit - I : (a) Shruti, Swar, Gram, Moorchna and Jaati Gamak and its varieties of use in Dhrupad & Dhamar
(b) Shruti, Swar discourses of Bharat, Sharangdev, Ahobal and Pt. Bhatkhande, Pt. Omkarnath Thakur and Lalit Kishore Singh.
- Unit - II : (a) Shuddha scale of Ahobal and Pt. Bhatkhande.
(b) Division of scale according to the number of severts and cents.
- Unit - III : (a) Hindustani and Karnatak Musical scale (Modern)
(b) General idea of Harmonic and Melodic music.
- Unit - IV : (a) Western scales (Modern)
(b) Technique, Presentation and exposition of Vrindra-Vadya and Vrinda-Gaan, New trends in Indian Vrinda-Vadya and Vrinda Gaan.

Internal Assessment : 30 Marks

Recommended Books

1. Rag tatha thaat ki Etihask Pristha bhoomi : G.N. Goswami
2. Sangeet Shastra : I to IV Pt. V.N. Bhatkhande
3. North Indian Music : Allian Damieslu
4. Bharat Ka Sangeet Siddhant : Acharya K.C.D. Brihaspati
5. Sangeet Shastra : K. Vasudeva Shastri
6. Pranav Bharati : Pt. Omkar Nath Thakur
7. Rag aur Ragini : O.C. Ganguly
8. Elements of Indian Music by E. Clamants
9. Karnatak Music : Ramchandran
10. Rages of Karnatak Music : Ramchandran
11. South Indian Music : Sambamurty
12. Bhartiya Sangeet Vadya : Dr. Lalmani Misra
13. Dhvani aur Sangeet : Lalit Kishore Singh
14. Natya Shastra : Bharat
15. Brihaddeshi : Matang
16. Sangeet Ratnakar : Sharangdev
17. Rag Tarangini : Lochan
18. Sangeet Parijat : Ahobal
19. The Music of Hindustan : Fox Strongays.
20. The Music of India : Popley
21. Music and Musical Modes of Hindus : Sir William Jones
22. Hindustani Music : G.H. Ranade
23. The Music of India : D.P. Mukherjee
24. Musical Heritage : M.R. Gautm
25. Hindustani Sangeet Ke Gharano Ki Charcha : Sushil Kumar Choubey
26. Universal History of Music : S.M. Tagore.
27. Historical Development of Indian Music : Swami Pragyanand
28. Sangeet Chintamani : Acharya Brihaspati
29. Tal Ka Udbhav aur Vikas : Aban E. Mistry
30. Bhartiya Sangeet Ka Ethiyas - Dr. S.C. Paranjpe

Semester I (Theory Paper II)
HISTORY OF INDIAN MUSIC

Marks : 70

Time : 3 Hours

- Unit - I: (a) Origin of Music - Historical evolution of Pakhawaj, Veena, Sitar, Sarod, Tabla, Flute and Sarod.
- Unit - II: (a) Evolution and development of Indian Music during ancient – Bharat, Matanga, Narad (Sangeet Makarand)
(b) Evolution and development of Indian Music during Medieval – Sarangdeva, Lochan, Ramamatya, Ahobal, Bhava Bhatt
- Unit - III: (a) Evolution and development of Indian Music during Modern Periods – Pt. Vyankatmathi, Pt. Bhatkhande and Pt. Vishnu Digambar Paluskar.
- Unit - IV: (a) General Ideas of the factors that differentiate Karnatak Music from Hindustani Music.
(b) Special study of the Trinity of South Indian Music.
(c) Comparative study of Ragas & Taals of North Indian & Karnataka Music

Internal Assessment : 30 Marks

Recommended Books

1. Brihaddeshi : Matang
2. Sangeet Ratnakar : Sharangdev
3. Rag Tarangini : Lochan
4. Sangeet Parijat : Ahobal
5. The Music of India : Popley
6. Music and musical modes of the Hindi : Sir William
7. The Hindu view of Art. Mulk Raj Anand
8. A Short History of Music : Dr. Curt Suches.
9. The Primitive Art : L. Adems.
10. The Begining of Art : Ernet Groos.
11. History of Musical Instruments : Curt Schues.
12. History of Musical Instruments : Suresh Vitthal Rai..
13. Historical Survey of the Music of Upper India : Pt. V.N. Bhatkhande.
14. A comparative study of some of the music system of 15th, 16th and 18th centuries : Pt. V.N. Bhatkhande.
15. Rise of music in the Ancient World, East and West : Curt Suches.
16. History of Indian Music : Swami Pragyand
17. Ain-E-Akbari : Abul Fazal (Translated by Girelwin)
18. Ancient Art and Ritual : C. Harrison.
19. Composers of Karnatak music : Prof. Sambmurthy
20. Music in Ancient Literature : Dr. G. Raghavan.
21. Natya Shastra : Bharat
22. Hindustani Music : G.H. Ranade
23. Music of Hindustan : Fox Strongways.
24. Indian Music of the South : R. Shrinivasan
25. Rag, Vibodh : Pt. Somnath.
26. Swar Mela Kala Nidhi : Ramamatya.
27. Bhartiya Sangeet Vadya : Dr. Lalmani Mishra.
28. Swar aur Ragon Ke Vikas me Vadyon ka yogdan : Dr. Indrani.
29. Musical Heritage : M.R. Gautam.
30. Bhartiya Sangeet Ka Ethiyas - Dr. S.C. Paranjpe

Semester I (Main Practical Paper III)

VOCAL AND INSTRUMENTAL (Sitar)

Division of Marks:

(a) Choice Raga	12 Marks
(b) Question Raga (Slow khayal of Gat)	07 Marks
(c) Question Raga in two fast khayals of Gats	06 Marks
(d) Alap	04 Marks
(e) Singing one Dhruvpad / Dhamar / Tarana	06 Marks

Or

Gats in other than Teental

Total = 35 Marks

Internal Assessment = 15 Marks

Total = 50 Marks

Compulsory Group

Yaman, Bihag, Brindavani sarang or Bageshree.

Optional Group

- i. Shyam Kalyan, Pooriya-Kalyan, Jait-Kalyan Hamsadhwani
- ii. Lalit, Pooriya, Bhatiyar, Panchyam
- iii. Shuddha-Sarang, Madhamad Sarang, Mian-ki-Sarang, Lankadahan- Sarang.
- iv. Jhinjhoti, Rageshri, Narayani, Khambavati, Malagungji

1. Candidates are required to prepare all the Ragas from the compulsory Group very thoroughly with extensive elaboration.
2. Any two Groups from the four Groups may be selected and atleast two Ragas from group may be prepared with a vilambit and Drut Khayal with extensive elaboration of a Masit Khani and Raza Khani Gat With extensive elaboration.
3. Choice is given to the candidates to select, prepare any three ragas from the above groups in which only Drut Khayal or Razakhani Gat should be prepared.
4. 7 vilambit Khyals and 10 Drut Khyals are to be prepared in all candidates who have offered Instrumental Music are required to prepare Masitkhani and Razakhani Gats.
5. Candiates should lern one composition in any Rag out of the following : Dhruvpad/ Dhamar/ Tarana.
6. For Instrumental Music one Dhun based on Raga in Tala other than Trital should be prepared.
7. Special attention should be given towards artistic presentation while preparing all the rages.
8. Variety of Tals may be kept in view for the compositions of Gats and Khyals.

Note : The practical papers will be set at the spot by the board of examiners with the internal examiner.

Semester I (Practical cum Viva-Voce Paper IV)

VOCAL AND INSTRUMENTAL (Sitar)

Division of Marks:

(a) Notation writing of any recorded song	15 Marks
(b) Viva Voce (Pertaining to general questions of Raga, Laya and Tala)	10 Marks
(c) Comparative and critical study of prescribed Ragas	10 Marks

Total	= 35 Marks
Internal Assessment	= 15 Marks
Total	= 50 Marks

Compulsory Group

Yaman, Bihag, Brindavani sarang or Bageshree.

Optional Group

- i. Shyam Kalyan, Pooriya-Kalyan, Jait-Kalyan Hamsadhwani
- ii. Lalit, Pooriya, Bhatiyar, Panchyam
- iii. Shuddha-Sarang, Madhamad Sarang, Mian-ki-Sarang, Lankadahan- Sarang.
- iv. Jhinjhoti, Rageshri, Narayani, Khambavati, Malagungji

1. Candidates are required to prepare all the Ragas from the compulsory Group very thoroughly with extensive elaboration.
2. Any two Groups from the four Groups may be selected and atleast two Ragas from group may be prepared with a vilambit and Drut Khayal with extensive elaboration of a Masit Khani and Raza Khani Gat With extensive elaboration.
3. Choice is given to the candidates to select, prepare any three ragas from the above groups in which only Drut Khayal or Razakhani Gat should be prepared.
4. 7 vilambit Khyals and 10 Drut Khyals are to be prepared in all candidates who have offered Instrumental Music are required to prepare Masitkhani and Razakhani Gats.
5. Candidates should learn one composition in any Rag out of the following : Dhruvpad/ Dhamar/ Tarana.
6. For Instrumental Music one Dhun based on Raga in Tala other than Trital should be prepared.
7. Special attention should be given towards artistic presentation while preparing all the ragas.
8. Variety of Tals may be kept in view for the compositions of Gats and Khyals.

Note : The practical papers will be set at the spot by the board of examiners with the internal examiner.

Semester I (Stage Performance Practical Paper V)

Marks 35 + 15 internal assessment = total Marks 50

Note: Performance of half an hour duration - Ragas may be selected from the list of Ragas prescribed in Paper -III

Semester I (Folk Music and Semi-Classical Music Practical Paper – VI)

Marks 35 + 15 internal assessment = total Marks 50

This paper is introduced to incorporate regional land marks in the course of study in view of the changing perspectives, in regard to link our past with the present day need.

1. A candidate is required to present two Folk Music compositions.
2. Variety of Ragas and Talas may be kept in mind while selecting compositions.
3. Variety of moods representing various occasions should be kept in mind while selecting compositions.
4. A candidate is required to give a brief account of aesthetic aspects of the songs and accompanying instruments.

For Semi-Classical - A candidate is required to collect two semi classical compositions Thumari / Bhajan / Dhun based on different Ragas / Gat in a Tal other than Teental may be presented.

Note: The concern teacher will review the work and shall allow only the reviewed compositions for final examination.

Continuous assessment shall be done every month by the teacher Concerned. Assessment of the field study will be done along with the other practical examinations.

Skill Course - I

Unit I : Swarabhyas -Alaps

Unit II : Thata (Kalyan Thata and Bhairava Thata)

Unit III : General Knowledge of the Instruments - its tuning and elementary playing: Tanpura and Table.

Unit IV : General Understanding and playing the following Tals - Teental & Ektaal.

Books Recommended for Skill Course :

1. Sangeet Visharad : Vasant
2. Raga Parichaya : Harish Chandra Shrivastava
3. Kramik Poostak Malika : Pt. Bhatkahnde
4. Vadya Shastra : Srivastava, Harish Chandra



**JAI NARAIAN VYAS UNIVERSITY JODHPUR
(RAJASTHAN)**

FACULTY OF ARTS, EDUCATION AND SOCIAL SCIENCES

SYLLABUS

FOR

**M.A. MUSIC (VOCAL AND INSTRUMENTAL SITAR)
SEMESTER SYSTEM (SEMESTER I AND SEMESTER II)
EXAMINATIONS 2022-2023**

**M.A. MUSIC (VOCAL AND INSTRUMENTAL SITAR)
SEMESTER SYSTEM (SEMESTER III AND SEMESTER IV)
EXAMINATIONS 2022-2023**

IMPORTANT

NOTIFICATION

In compliance of decision of the Hon'ble High Court all students are required to fulfill 75% attendance rule in each subject and there must be 75% attendance of the student before he/she could be permitted to appear in the examination.

REGISTRAR

(Academic)

FACULTY OF ARTS, EDUCATION & SOCIAL SCIENCES

MASTER OF ARTS

GENERAL INFORMATION FOR STUDENTS

The examination for the degree of Master of Arts, Education and Social Sciences shall consist of two parts with semester system: (i) The M.A (Semester I and Semester II), 2020-21 and (ii) M.A (Semester III and Semester IV), 2021-22

The examination will be through theory papers/practical/viva. Pass marks for the semester I, semester II, semester III and semester IV examination are 36% of the aggregate marks in all the theory papers and viva/practical"s and not less than 25% marks in the individual theory paper /viva /practical. A candidate is required to pass in the written and the practical/viva examination separately.

Successful candidates will be placed in the following divisions on the basis of the total marks obtained in all four semesters of M.A (Semester I and Semester II) and (ii) M.A (Semester III and Semester IV) examinations taken together:

First division 60% , second division 48% and third division 36% no students will be permitted to register himself simultaneously for more than one post-graduate course.

ATTENDANCE

1. For all regular candidates in the faculties of arts, education and social sciences, science, law, commerce and engineering, the minimum attendance requirement shall be that a candidate should have attended at least 75% of the lectures delivered and tutorials held taken together as well as 75% of practical and sectionals from the date of his/her admission.
2. Condonation of shortage of attendance:
The shortage of attendance up to the limits specified below may be condoned on valid reasons:
 - i) Up to 6% each subject plus 5 attendances in all the aggregate subject/papers may be condoned by the Vice-Chancellor on the recommendation of the Dean/Director/principal for undergraduate students and on the recommendation of the Head of the Department for the post-graduate classes.
 - ii) The N.C.C./N.S.S. cadets sent out to parades and camps and such students who are deputed by the University to take part in games, athletic or cultural activities may, for purpose of attendance, be treated, as present for the days of their absence in connection with the aforesaid activities and that period shall be added to their subject wise attendance.

Note:

The attendance requirement will apply to each semester.

However, in case of practical where examination is not held at the end of the first semester but the end of the second semester, attendance will be counted at the end of the second semester taking into account attendance put in both the semesters (i.e., first and second) taken together.

Candidates will be required to pass separately in theory and practical examinations.

Candidate's choice among the optional papers and groups would be restricted only to those paper or groups for which regular teaching is provided in the department.

Use of map stencils (political outline only). Log tables and calculators are allowed in the examination.

MEDIUM

Candidates are not allowed to use any medium except Hindi or English for answering question papers.

For answering papers in the subjects of English/Hindi the medium will be corresponding language only.

Note -

The Question for the Examination will be divided in two Parts i.e. A and B as under:-

Section A- Consist 15 Questions. The candidate has to attempt any 11 questions out of 15 questions and answer of each question shall be limited up to 30 words. Each question will carry 02 Mark.

Section B - Consist 8 questions, two questions from each unit will be set and student will have internal choice to answer one question from each unit. Answer of each question shall be limited up to 500 words. Each question carries 12 Marks.

ADMISSION

The details of the eligibility conditions and admission procedures are given in the admission forms and on university website. The admission would be done on the basis of merit as per university rules. Reservation for SC, ST and OBC would also be done as per J.N.V. University, Jodhpur rules. Candidates are required to attend minimum 75% of the classes in theory and practical"s both.

FACILITIES

The Department of Music possesses several sophisticated, advanced and modern equipments required for teaching and research.

Dr. Swati Sharma (Head of the Department)

Assistant Professor

Dr. Gaurav Shukl

Dr. Bhoomika Dwivedi

SEMESTER II (M.A. Music)**Total Marks = 400**

Papers	ESE	CCA	Total	Credits	lectures Tutorials- Practicals/week
Paper I Principle of Music (Shastra)	70	30	100	6	6-0-0
Paper II History of Indian Music	70	30	100	6	6-0-0
Paper III Main Practical	35	15	50	10 (V) 10 (I)	10 (V) 10 (I)
Paper IV Practical cum viva voce	35	15	50	6	6-0-0
Paper V Stage Performance	35	15	50	04 (V) 04 (I)	04 (V) 04 (I)
Paper VI Folk Music and Semi classical Music	35	15	50	04 (V) 04 (I)	04 (V) 04 (I)

Note: V = Vocal Music**I = Instrumental Music (Sitar)****Skill Course-II (for Students of other Deptt.)----- 6-0-0**

**Syllabus of M.A. Music Vocal and Instrumental (Sitar) for
semester scheme w.e.f. academic year 2015-16**

Semester I (Total Marks - 400)

S.No.	Title of the Course	Final Exam	Internal Assessment	Credits
01.	Theory Paper-I Principle of Music (Shastra)	70	30	06
02.	Theory Paper-II History of Indian Music	70	30	06
03.	Practical Paper-III Main Practical	35	15	10 (V) 10 (I)
04.	Practical Paper-IV Practical cum viva-voce	35	15	06
05.	Practical Paper-V Stage Performance	35	15	04 (V) 04 (I)
06.	Practical Paper-VI Folk Music and Semi-Classical Music	35	15	04 (V) 04 (I)

V = Vocal Music

I = Instrumental Music (Sitar)

Skill Course I

Semester II (Total Marks - 400)

S.No.	Title of the Course	Final Exam	Internal Assessment	Credits
01.	Theory Paper-I Principle of Music (Shastra)	70	30	06
02.	Theory Paper-II History of Indian Music	70	30	06
03.	Practical Paper-III Main Practical	35	15	10 (V) 10 (I)
04.	Practical Paper-IV Practical cum viva-voce	35	15	06
05.	Practical Paper-V Stage Performance	35	15	04 (V) 04 (I)
06.	Practical Paper-VI Folk Music and Semi-Classical Music	35	15	04 (V) 04 (I)

V = Vocal Music

I = Instrumental Music (Sitar)

Skill Course II

Semester II (Theory Paper I)
Principles of Music

Marks : 70
Time : 3 Hours

- | | |
|------------|--|
| Unit - I | (a) General idea of the forms of Vedic Music
(b) General idea of Giti, Vani and Prabandh |
| Unit - II | (a) Impact of folk music on classical Music and Vice-Versa.
(b) General characteristics of folk Music with special reference to Rajasthani folk Music.
(c) Use of Instruments and Talas in folk Music. |
| Unit - III | (a) Study of the technique involved in different Gharanas of Dhruvpad, Khyal, Sitar and Tabla.
(b) Study of the Main forms of Indian classical Dances |
| Unit - IV | (a) Main Musical Forms of Karnatak Music
(b) Main Musical Instruments of North Indian Music. |

Internal Assessment : 30 Marks

Recommended Books

1. Rag tatha thaat ki Etihastik Pristha bhoomi : G.N. Goswami
2. Sangeet Shastra : I to IV Pt. V.N. Bhatkhande
3. North Indian Music : Allian Damieslu
4. Bharat Ka Sangeet Siddhant : Acharya K.C.D. Brihaspati
5. Sangeet Shastra : K. Vasudeva Shastri
6. Pranav Bharati : Pt. Omkar Nath Thakur
7. Rag aur Ragini : O.C. Ganguly
8. Elements of Indian Music by E. Clamants
9. Karnatak Music : Ramchandran
10. Rages of Karnatak Music : Ramchandran
11. South Indian Music : Sambamurty
12. Bhartiya Sangeet Vadya : Dr. Lalmani Misra
13. Dhvani aur Sangeet : Lalit Kishore Singh
14. Natya Shastra : Bharat
15. Brihaddeshi : Matang
16. Sangeet Ratnakar : Sharangdev
17. Rag Tarangini : Lochan
18. Sangeet Parijat : Ahobal
19. The Music of Hindustan : Fox Strongays.
20. The Music of India : Popley
21. Music and Musical Modes of Hindus : Sir William Jones
22. Hindustani Music : G.H. Ranade
23. The Music of India : D.P. Mukherjee
24. Musical Heritage : M.R. Gautm
25. Hindustani Sangeet Ke Gharano Ki Charcha : Sushil Kumar Choubey
26. Universal History of Music : S.M. Tagore.
27. Historical Development of Indian Music : Swami Pragyand
28. Sangeet Chintamani : Acharya Brihaspati
29. Tal Ka Udbhav aur Vikas : Aban E. Mistry
30. Bhartiya Sangeet Ka Ethiyas - Dr. S.C. Paranjpe
31. Rajasthan Ke Lok Geet – Dr. Swarn Lata

Semester II (Theory Paper II)
HISTORY OF Indian Music

Marks : 70

Time : 3 Hours

Unit - I: Historical evolution of the Musical Scales of India from ancient to modern times.

Unit - II : (a) Evolution and growth of various Musical forms of Vocal Music.
(b) General Idea of Haweli Sangeet.
(c) Evolution of Gat Shaili in Instrumental Music

Unit - III : (a) Classification of Ragas.
(b) Gram Raga, Bhasha and vibhasha.
Dash-Vidha Ragas of Pt. Sharangdeva.

Unit - IV : (a) Evolution of Indian and Western Notation system

Internal Assessment : 30 Marks

Recommended Books

1. Ain-E-Akbari : Abul Fazal (Translated by Girelwin)
2. Ancient Art and Ritual : C. Harrison.
3. Composers of Karnatak music : Prof. Sambmurthy
4. Music in Ancient Literature : Dr. G. Raghavan.
5. Natya Shastra : Bharat
6. Brihaddeshi : Matang
7. Sangeet Ratnakar : Sharangdev
8. Rag Tarangini : Lochan
9. Sangeet Parijat : Ahobal
10. The Music of India : Popley
11. The Hindu View of Art. Mulk Raj Anand.
12. A Short History of Music : Dr. Curt Suches.
13. The Primitive Art : L.Adems
14. The Beginning of Art : Ernet Groos.
15. History of Musical Instruments : Curt Schues.
16. History of Musical Instruments : Surest Vital Rai.
17. Historical Survey of the Music of Upper India : Pt. V.N. Bhatkhande.
18. A comparative study of some of the music system of 15th, 16th and 18th centuries : Pt. V.N. Bhatkhande.
19. Rise of music in the Ancient World, East and West : Cuurt Suches.
20. History of Indian Music : Swami Prajyanand
21. Music and Musical modes of the Hindi : Sir William
22. Hindustani Music : G.H. Ranade
23. Music of Hindustan : Fox Strongays.
24. Indian Music of the South : R. Srinivasan
25. Rag. Vibodh : Pt. Somnath.
26. Swar Mela Kala Nidhi : Ramamatya.
27. Bharitya Sangeet Vadya : Dr. Lalmani Mishra.
28. Waraur Rangon Ke Vikas me Vadyo ka yogdan : Dr. Indrani.
29. Musical Heritage : M.R. Gautam.

Semester II (Main Practical Paper III)

VOCAL AND INSTRUMENTAL (Sitar)

Division of Marks:

(a) Choice Raga	12 Marks
(b) Question Raga (Slow khayal of Gat)	07 Marks
(c) Question Raga in two fast khayals of Gats	06 Marks
(d) Alap	04 Marks
(e) Singing one Dhruvpad / Dhamar / Tarana	06 Marks

Or

Gats in other than Teental

Total = 35 Marks

Internal Assessment = 15 Marks

Total = 50 Marks

Compulsory Group

Alhiya Bilawal, Bhairva and Darabari Kanhada or Kedar.

Optional Group

- i. Yamini-Bilawal, Devgiri Bilawal, Saraparda-Bilawa, Kukubh Bilawal.
- ii. Nayaki-Kanhada, Suha-Kanhada, Sugharayee-Kanhada, Abhogi, Shahana-Kanhada
- iii. Jogia, Vibhas, Gunakari (Bhairav Thata), Vasant-Mukhari
- iv. Jaldhar Kedar, Nat Kedar, Maluha Kedar, Hemant.

1. Candidates are required to prepare all the Ragas from the compulsory Group very thoroughly with extensive elaboration.
2. Any two Groups from the four Groups may be selected and atleast two Ragas from group may be prepared with a vilambit and Drut Khayal with extensive elaboration of a Masit Khani and Raza Khani Gat With extensive elaboration.
3. Choice is given to the candidates to select, prepare any three ragas from the above groups in which only Drut Khayal or Razakhani Gat should be prepared.
4. 7 vilambit Khyals and 10 Drut Khyals are to be prepared in all candidates who have offered Instrumental Music are required to prepare Masitkhani and Razakhani Gats.
5. Candiates should lern one composition in any Rag out of the following : Dhruvpad/ Dhamar/ Tarana.
6. For Instrumental Music one Dhun based on Raga in Tala other than Trital should be prepared.
7. Special attention should be given towards artistic presentation while preparing all the rages.
8. Variety of Tals may be kept in view for the compositions of Gats and Khyals.

Note : The practical papers will be set at the spot by the board of examiners with the internal examiner.

Semester II (Practical cum Viva-Voce Paper IV)

VOCAL AND INSTRUMENTAL (Sitar)

Division of Marks:

(a) Notation writing of any recorded song	15 Marks
(b) Viva Voce (Pertaining to general questions of Raga, Laya and Tala)	10 Marks
(c) Comparative and critical study of prescribed Ragas	10 Marks
Total	= 35 Marks
Internal Assessment	= 15 Marks
Total	= 50 Marks

Compulsory Group

Alhiya Bilawal, Bhairva and Darabari Kanhada or Kedar.

Optional Group

- i. Yamini-Bilawal, Devgiri Bilawal, Saraparda-Bilawa., Kukubh Bilawal.
- ii. Nayaki-Kanhada, Suha-Kanhada, Sugharayee-Kanhada, Abhogi, Shahana-Kanhada
- iii. Jogia, Vibhas, Gunakari (Bhairav Thata), Vasant-Mukhari
- iv. Jaldhar Kedar, Nat Kedar, Maluha Kedar, Hemant.

1. Candidates are required to prepare all the Ragas from the compulsory Group very thoroughly with extensive elaboration.
2. Any two Groups from the four Groups may be selected and atleast two Ragas from group may be prepared with a vilambit and Drut Khayal with extensive elaboration of a Masit Khani and Raza Khani Gat With extensive elaboration.
3. Choice is given to the candidates to select, prepare any three ragas from the above groups in which only Drut Khayal or Razakhani Gat should be prepared.
4. 7 vilambit Khyals and 10 Drut Khyals are to be prepared in all candidates who have offered Instrumental Music are required to prepare Masitkhani and Razakhani Gats.
5. Candiates should lern one composition in any Rag out of the following : Dhruvpad/ Dhamar/ Tarana.
6. For Instrumental Music one Dhun based on Raga in Tala other than Trital should be prepared.
7. Special attention should be given towards artistic presentation while preparing all the rages.
8. Variety of Tals may be kept in view for the compositions of Gats and Khyals.

Note : The practical papers will be set at the spot by the board of examiners with the internal examiner.

Semester II (Stage Performance Practical Paper V)

Marks 35 + 15 internal assessment = Total Marks
50

Note: Performance of half an hour duration - Ragas may be selected from the list of Ragas prescribed in Paper -III

Semester II (Folk Music and Semi-Classical Music Practical Paper – VI)

Marks 35 + 15 internal assessment = Total Marks
50

This paper is introduced to incorporate regional land marks in the course of study in view of the changing perspectives, in regard to link our past with the present day need.

1. A candidate is required to present two Folk Music compositions. (The compositions selected for this paper shall be other than the compositions selected by the candidate in Semester I)
2. Variety of Ragas and Talas may be kept in mind while selecting compositions.
3. Variety of moods representing various occasions should be kept in mind while selecting compositions.
4. A candidate is required to give a brief account of aesthetic aspects of the songs and accompanying instruments.

For Semi-Classical - A candidate is required to collect two semi classical compositions Thumari

/ Bhajan / Dhun based on different Ragas / Gat in a Tal other than Teental may be presented.

Note: The concerned teacher will review the work and shall allow only the reviewed compositions for final examination.

Continuous assessment shall be done every month by the teacher concerned. Assessment of the field study will be done along with the other practical examinations.

Skill

Course II Unit I : Knowledge of Swar (Shuddh and Vikrit) Unit II : Thata (Brief Knowledge of Main Ten Thatas)

Unit III : Knowledge of following Tals : Teental, Kehrava, Roopak,

Dadara.Unit IV : Bhajan & Folk Songs

Books Recommended for Skill Course :

1. Sangeet Visharad : Vasant
2. Raga Parichaya : Harish Chandra Shrivastava
3. Kramik Poostak Malika : Pt. Bhatkahnde
4. Vadya Shastra : Srivastava, Harish Chandra

Semester III (Theory Paper II)
PSYCHOLOGY OF MUSIC

Marks : 70
Time : 3 Hours

- Unit - I : (a) Definition and scope of psychology.
 (b) Relation of psychology with music.
- Unit - II : (a) Application of Music in Education psychology and Social psychology
 (b) Application of Music in Abnormal Psychology and Industrial Psychology
- Unit - III : (a) Taste in Music
 (b) Learning Music
- Unit - IV : (a) Importance of heredity and environment in music

Internal Assessment : 30 Marks

Recommended Books

1. Contemporary School of Psychology : Robert S. Wood Worth.
2. An outline of psychology : William Dougall.
3. Music Therapy : Edited by Edward Podolsky M.D. Department of Psychiatry. Kings Court Hospital Brooklyn, New York.
4. The Psychodynamics of every day behavior : K.L. Brown and Karl A Menninger.
5. Psychology of Musicians : Percy C. Buck.
6. Psychology of Music : Carl E. Seashore.
7. The Psychology of Society : Maris Gingsberg.
8. Fundamentals of Industrial Psychology : Albert Walton.
9. Experimental and Industrial psychology : Milto L. Blum.
10. Psychology of Industry : Norman R.G. Majer.
11. Therapeutic Value of Music : Manly P.Hill.
12. Psycho-acoustics : B.C. Deva.
13. Effect of Music : Max-Sohen and easter Gatewood.
14. Sources of Music : Eric Bloo.
15. Psychology of Music : Pole.
16. Therapeutic Quality of Music : B.Bellamy Gardner.
17. Manoviygan Ke Mool Siddhant : R.K. Tondon.
18. The Analysis of Snsation : Eames Mach.
19. The psychology of Imagination : John Paul Sartre.
20. Studies in Artistic Creativity : Manas Tai Choudhary.
21. Kala Ke Siddhant : R.G. Kalingwood.
22. 23. Dr. Ma. Shyamala Varanasi : Psychology of Music.
23. Seashore : Psychology of Music (2nd Editor)
24. Mwesell : Psychology of Music.
25. William Pole - Philosophy of Music

Semester III (Main Practical Paper III)

VOCAL AND INSTRUMENTAL (Sitar)

Division of Marks:

(a) Choice Raga	12 Marks
(b) Question Raga (Slow khayal of Gat)	07 Marks
(c) Question Raga in two fast khayals of Gats	06 Marks
(d) Alap	04 Marks
(e) Singing one Dhruvpad / Dhamar / Tarana	06 Marks
Or	
Gats in other than Teental	

Total	=	35 Marks
Internal Assessment	=	15 Marks
Total	=	50 Marks

Compulsory Group

Miyani Malhar, Gaud Malhar, Malkauns.

Optional Groups :

1. Suddha Malhar, Sur-Malhar, Ramdasi Malhar, Jayanti Malhar, Nat Malhar, Megh Malhar.
2. Jog, Jogkauns, Chandrakauns, Kaushi-Kanhara (Malkauns Ang)
3. Nat Bihag, Maru Bihag, Sawni Bihag, Pat Bihag, Nand Bihagda.
4. Gauri, Lalita-Gauri, Jaitashari, Triveni, Malavi, Poorvi.

- I. Candidates are required to prepare all the ragas from the compulsory group very thoroughly with extensive elaboration.
- II. Any two from the four groups may be selected and at least two ragas from each may be prepared with a vilambit and Drut Khayal or a Masitkhani and a Razakhani Gat should be prepared.
- III. Choice is given to the candidates to select and prepare any three ragas from the above groups in which only Drut Khayal/Tarana or Razakhani Gat should be prepared.
- IV. In all 10 ragas are to be prepared with 7 vilambit khayals or Masitkhani Gats and 10 Drut khayals or Tarana or Razakhani Gats.
- V. Candidates should learn one composition in any raga out of the following Dhruvpad/Dhamar/Chaturang/Tarana.
- VI. For instrumental Music one Dhun based on any rag in Tals other than trital should be prepared.
- VII. Special attention should be given towards artistic presentation, while preparing all the ten ragas.
- VIII. Variety of tals may be kept in view for khayal and Gat.

Note: Questions will be set at the spot by board of examiners in consultation with internal examiners.

Semester III (Practical cum Viva-Voce Paper IV)

VOCAL AND INSTRUMENTAL (Sitar)

Division of Marks:

(a) Notation writing of any recorded song	15 Marks
(b) Viva Voce (Pertaining to general questions of Raga, Laya and Tala)	10 Marks
(c) Comparative and critical study of prescribed Ragas	10 Marks

Total = 35 Marks

Internal Assessment = 15 Marks

Total = 50 Marks

Compulsory Group

Miyan Malhar, Gaud Malhar, Malkauns.

Optional Groups :

1. Suddha Malhar, Sur-Malhar, Ramdasi Malhar, Jayant Malhar, Nat Malhar, Megh Malhar.
2. Jog, Jogkauns, Chandrakauns, Kaushi-Kanhara (Malkauns Ang)
3. Nat Bihag, Maru Bihag, Sawni Bihag, Pat Bihag, Nand Bihagda.
4. Gauri, Lalita-Gauri, Jaitashari, Triveni, Malavi, Poorvi.

- I. Candidates are required to prepare all the ragas from the compulsory group very thoroughly with extensive elaboration.
- II. Any two from the four groups may be selected and at least two ragas from each may be prepared with a vilambit and Drut Khayal or a Masitkhani and a Razakhani Gat should be prepared.
- III. Choice is given to the candidates to select and prepare any three ragas from the above groups in which only Drut Khayal/Tarana or Razakhani Gat should be prepared.
- IV. In all 10 ragas are to be prepared with 7 vilambit khayals or Masitkhani Gats and 10 Drut khayals or Tarana or Razakhani Gats.
- V. Candidates should learn one composition in any raga out of the following Dhruvpad/Dhamar/Chaturang/Tarana.
- VI. For instrumental Music one Dhun based on any rag in Tals other than trital should be prepared.
- VII. Special attention should be given towards artistic presentation, while preparing all the ten ragas.
- VIII. Variety of tals may be kept in view for khayal and Gat.

Note: Questions will be set at the spot by board of examiners in consultation with internal examiners.

Semester III (Stage Performance Practical Paper V)

Marks 35 + 15 internal assessment = Total Marks 50

Stage performance practical :- Full-fledged performance of a raga of the candidate's choice out of the prescribed course before an invited audience lasting approximately 45-60 Minutes.

OR

For Dissertation :

Candidates who obtain at least 55% marks in the aggregate of the theory papers i.e. paper I and II at the M.A. I and II Semester examinations taken together will be allowed to offer Dissertation as an option for course in M.A. IV semester examination. The dissertation shall be type-written and shall be submitted in triplicate.

OR

Essay Writing :

Essays will be related to general and critical topics related to Music. Essays may be written in Hindi/English.

Semester III (Folk Music and Semi-Classical Music Practical Paper – VI)

Marks 35 + 15 internal assessment = Total Marks 50

This paper is introduced to incorporate regional land marks in the course of study in view of the changing perspectives, in regard to link our past with the present day need.

1. A candidate is required to present two Folk Music compositions.
2. Variety of Ragas and Talas may be kept in mind while selecting compositions.
3. Variety of moods representing various occasions should be kept in mind while selecting compositions.
4. A candidate is required to give a brief account of aesthetic aspects of the songs and accompanying instruments.

For Semi-Classical - A candidate is required to collect two semi classical compositions Thumari / Bhajan / Dhun based on different Ragas / Gat in a Tal other than Teental may be presented.

Note: The concern teacher will review the work and shall allow only the reviewed compositions for final examination.

Continuous assessment shall be done every month by the teacher Concerned. Assessment of the field study will be done along with the other practical examinations.

OR

Project Work

Marks 35 + 15 internal assessment = Total Marks 50

A candidate is required to review two classical music concerts. The student should submit a written document consisting of not less than 2000 words for each concern incorporating all the impact factor leading to the success of the concert.

Note: Student is required to obtain continuous guidance of the concerning teacher.

A student is required to submit typed three copies of the project latest by one week prior to commencement of the theory examination.

Skill Course III

Unit I : Different Alankars (For Vocal / Instrument Sitar Music)

Unit II : Thata : Kafi Thata & Bhairavi Thata

Unit III : General Knowledge of the Instrments - its tuning and playing : Sitar and Tabla

Unit IV : To play the following Tals Dhamar, Jhaptal & Rupak

Books Recommended for Skill Course :

1. Sangeet Visharad : Vasant
2. Raga Parichaya : Harish Chandra Shrivastava
3. Kramik Poostak Malika : Pt. Bhatkahnde
4. Vadya Shastra : Srivastava, Harish Chandra
5. Sitar Marg : Bandhopadhyay
6. My Music My Life : Pt. Ravishankar
7. Sitar Malika : Bhagwat Sharan Sharma.

Semester IV (Theory Paper I)
Voice Culture and Philosophy of Music

Marks : 70

Time : 3 Hours

- Unit - 1 : (a) Voice Culture Historical survey from Sangeet Ratnakar to the present day
(b) Elementary Theory of sound its production and propagation
- Unit - 2 : (a) Place of Music in Fine Arts.
(b) Music and Religion
- Unit - 3 : (a) Aesthetics ideas in music basic ideas of ragas and its ten Lakshanas (Raga-Dasha Lakshanas)
(b) Aesthetic experience through the art music
- Unit - 4 : (a) Role of Music in Hindu Philosophy.
(b) Art appreciation and music listeners

Internal Assesment : 30 Marks

Recommended Books

1. Short Studies in Nature : Herbert Anticilife.
2. What is Music : Leo Tolestory.
3. Music a Science and / or Art : John Recfield.
4. Illusion and Realigy : Christopher Grudvell.
5. Philosophy of Music William Pole.
6. Arts and the man-Irawin Edman.
7. Sound Catch and Saterly.
8. Hindustani Music : G.H. Ranade.
9. Civilisation, Science and Religion : A Rithole.
10. Science and Music : James Jeans.
11. Philosphy in a New Key : Susamme Langer.
12. Forms in Music : J.Macpherson.
13. What is Art : Tagore.
14. Effect of Music : Max-Schoen and Esther Gat Wood.
15. Sources of Music : Erick Bloom.
16. Fundamental of Indian Arts : S.N. Dasgupta.
17. Visualised Music : Pracy Brown
18. Some Conceptions of Music : Mavd Monn.
19. The cultural aspect of Indian Musioc and Dancing : C.P. Srinivasa Ilyengar.
20. The Physics of Music : Dr. Vasudeva Shaan.
21. Indian Concept of the Beautiful : K.S. Ramaswami.
22. Comparative Aesthetics : K.C. Pande.
23. A History of Aesthetics : Golbert and Kuhu.
24. Philosphies of Beauty : E.F. Carritik.
25. Modern Book of Aesthetics : Mialvi Rudar.
26. Text Book of Sound : Broton.

Semester IV (Theory Paper II)
PSYCHOLOGY OF MUSIC

Marks : 70
Time : 3 Hours

- Unit - 1 : (a) Mind and Music
 (b) Feelings, Emotion and Application of music.
- Unit - 2 : (a) Emotional Integration through Music.
 (b) Imagination and Creative activity in Music.
- Unit - 3 : (a) Sensation Hearing in Music
 (b) Attention Role of interest in Attention (Music)
- Unit - 4 : Musical Aptitude Tests.

Internal Assessment : 30 Marks

Recommended Books

1. Contemporary School of psychology : Robert S. Wood Wroth.
2. An Outline of psychology : William Dongall.
3. Music Therapy : Edited by Edward Podolsky M.D. Department of Psychiatry. Kings Court Hospital Brooklyn, New York.
4. The Psychodynamics of every day behavior : K.L. Brown and Karl A Meanninger.
5. Psychology of Musicians : Parcy C. Buck.
6. Psychology of Music : Carl E. Seashore.
7. The Psychology of Society : Maris Gingsberg.
8. Fundamentals of Industrial Psychology : Albert Walton
9. Experimental and Industrial Psychology : Milto L. Blum.
10. Psychology of Industry : Norman R.G. Majer.
11. Therapeutic Value of Music : Manly P. Hill.
12. Psycho-acoustics : B.C. Deva.
13. Effect of Music : Max-Sohen and easter Gatewood.
14. Sources of Music : Eric Bloo.
15. Psychology of Music : Pole.
16. Therapeutic Quality of Music : B. Bellamy Gardner.
17. Manoviygan Ke Mool Siddhant : R.K. Tondon.
18. The Analysis of Snsation : Eames Mach.
19. William Pole - Philosophy of Music
20. The psychology of Imagination : John Paul Sartre.
21. Studies in Artistic Creativity : Manas Tai Choudhary.
22. Kala Ke Siddhant : R.G. Kalingwood.
23. Dr. Ma. Shyamala Varanasi : Psychology of Music.
24. Seashore : Psychology of Music (2nd Editor)
25. Mwesell : Psychology of Music.

Semester IV (Main Practical Paper III)

VOCAL AND INSTRUMENTAL (Sitar)

Division of Marks:

(a) Choice Raga	12 Marks
(b) Question Raga (Slow khayal of Gat)	07 Marks
(c) Question Raga in two fast khayals of Gats	06 Marks
(d) Alap	04 Marks
(e) Singing one Dhruvpad / Dhamar / Tarana	06 Marks
Or	
Gats in other than Teental	

Total	= 35 Marks
Internal Assessment	= 15 Marks
Total	= 50 Marks

Compulsory Group

Todi, Marawa, Bahar or Chhayanat

Optional Groups :

1. Gujari-Todi, Bilaskhani-Todi, Bhupal-Todi, Asavari-Todi (Konal, Rishabh, Asavari)
2. Ahir Bhairav, Bhairagi Bhairav, Nat Bhairav, Anand Bhairav, Saurashta Bhairav, Shivamat Bhairav, Prabhat Bhairav.
3. Bhairav-Bahar, Basant-Bahar, Kedar-Bahar, Begeshri-Bahar
4. Hanskinkini, Dhanashri, Patdeep, Madhuwanti, Kirvani, Barwa, Sindhura.

- I. Candidates are required to prepare all the ragas from the compulsory group very thoroughly with extensive elaboration.
- II. Any two from the four groups may be selected and at least two ragas from each may be prepared with a vilambit and Drut Khayal or a Masitkhani and a Razakhani Gat should be prepared.
- III. Choice is given to the candidates to select and prepare any three ragas from the above groups in which only Drut Khayal/Tarana or Razakhani Gat should be prepared.
- IV. In all 10 ragas are to be prepared with 7 vilambit khayals or Masitkhani Gats and 10 Drut khayals or Tarana or Razakhani Gats.
- V. Candidates should learn one composition in any raga out of the following Dhruvpad/Dhamar/Chaturang/Tarana.
- VI. For instrumental Music one Dhun based on any rag in Tals other than trital should be prepared.
- VII. Special attention should be given towards artistic presentation, while preparing all the ten ragas.
- VIII. Variety of tals may be kept in view for khayal and Gat.

Note: Questions will be set at the spot by board of examiners in consultation with internal examiners.

Semester IV (Practical cum Viva-Voce Paper IV)

VOCAL AND INSTRUMENTAL (Sitar)

Division of Marks:

(a) Notation writing of any recorded song	=	15 Marks
(b) Viva Voce (Pertaining to general questions of Raga, Laya and Tala)		10 Marks
(c) Comparative and critical study of prescribed Ragas		10 Marks

Total	=	35 Marks
	Internal Assessment	= 15 Marks
	Total	= 50 Marks

Compulsory Group

Todi, Marawa, Bahar or Chhayana

Optional Groups :

1. Gujari-Todi, Bilaskhani-Todi, Bhupal-Todi, Asavari-Todi (Konal, Rishabh, Asavari)
2. Ahir Bhairav, Bhairagi Bhairav, Nat Bhairav, Anand Bhairav, Saurashta Bhairav, Shivamat Bhairav, Prabhat Bhairav.
3. Bhairav-Bahar, Basant-Bahar, Kedar-Bahar, Begeshri-Bahar
4. Hanskinkini, Dhanashri, Patdeep, Madhuwanti, Kirvani, Barwa, Sindhura.

- I. Candidates are required to prepare all the ragas from the compulsory group very thoroughly with extensive elaboration.
- II. Any two from the four groups may be selected and at least two ragas from each may be prepared with a vilambit and Drut Khayal or a Masitkhani and a Razakhani Gat should be prepared.
- III. Choice is given to the candidates to select and prepare any three ragas from the above groups in which only Drut Khayal/Tarana or Razakhani Gat should be prepared.
- IV. In all 10 ragas are to be prepared with 7 vilambit khayals or Masitkhani Gats and 10 Drut khayals or Tarana or Razakhani Gats.
- V. Candidates should learn one composition in any raga out of the following Dhruvpad/Dhamar/Chaturang/Tarana.
- VI. For instrumental Music one Dhun based on any rag in Tals other than trital should be prepared.
- VII. Special attention should be given towards artistic presentation, while preparing all the ten ragas.
- VIII. Variety of tals may be kept in view for khayal and Gat.

Note: Questions will be set at the spot by board of examiners in consultation with internal examiners.

Semester IV (Stage Performance Practical Paper V)

Marks 35 + 15 internal assessment = Total Marks 50

Stage performance practical :- Full-fledged performance of a raga of the candidate's choice out of the prescribed course before an invited audience lasting approximately 45-60 Minutes.

OR

For Dissertation :

Candidates who obtain at least 55% marks in the aggregate of the theory papers i.e. paper I and II at the M.A. I and II Semester examinations taken together will be allowed to offer Dissertation as an option for course in M.A. IV semester examination. The dissertation shall be type-written and shall be submitted in triplicate.

OR

Essay Writing :

Essays will be related to general and critical topics related to Music. Essays may be written in Hindi/English.

Semester IV (Folk Music and Semi-Classical Music Practical Paper – VI)

Marks 35 + 15 internal assessment = Total Marks 50

This paper is introduced to incorporate regional land marks in the course of study in view of the changing perspectives, in regard to link our past with the present day need.

1. A candidate is required to present two Folk Music compositions.
2. Variety of Ragas and Talas may be kept in mind while selecting compositions.
3. Variety of moods representing various occasions should be kept in mind while selecting compositions.
4. A candidate is required to give a brief account of aesthetic aspects of the songs and accompanying instruments.

For Semi-Classical - A candidate is required to collect two semi classical compositions Thumari / Bhajan / Dhun based on different Ragas / Gat in a Tal other than Teental may be presented.

Note: The concern teacher will review the work and shall allow only the reviewed compositions for final examination.

Continuous assessment shall be done every month by the teacher Concerned. Assessment of the field study will be done along with the other practical examinations.

OR

Project Work

Marks 35 + 15 internal assessment = Total Marks 50

A candidate is required to review two classical music concerts. The student should submit a written document consisting of not less than 2000 words for each concern incorporating all the impact factor leading to the success of the concert.

Note: Student is required to obtain continuous guidance of the concerning teacher.

A student is required to submit typed three copies of the project latest by one week prior to commencement of the theory examination.

Skill Course IV

- Unit I : Knowledge of Swara and Different Alankars
- Unit II : Thata - Main Ten Thatas
- Unit III : General Knowledge of the Art. Sitar, Tabla, Tanpura, Harmonium
- Unit IV : General Understanding of the following Tals and to play : Teental, Keherva, Roopak, Dadra, Deepchandi

Books Recommended for Skill Course :

1. Sangeet Visharad : Vasant
2. Raga Parichaya : Harish Chandra Shrivastava
3. Kramik Poostak Malika : Pt. Bhatkahnde
4. Vadya Shastra : Srivastava, Harish Chandra
5. Sitar Marg : Bandhopadhyay
6. My Music My Life : Pt. Ravishankar
7. Sitar Malika : Bhagwat Sharan Sharma.

Department of Philosophy
Jai Narain Vyas University, Jodhpur

M.A. Philosophy 2019-20 (CBCS)

Semester I

Core Course 1.

Philosophy 101

Max. Marks 70 (Theory)

30 (Internal)

Min. Marks 25 (Theory)

11 (Internal)

Indian Philosophy - I

Unit I Veda and Upanishads

- (1) The Veda: The evolution of Vedic Religion: Polytheism, Henotheism and Monotheism and Essential concept Rita, Rina, Yajna.
- (2) The Upanishads: Concept of self and Brahman. Means and Nature of Self-Realization and concept of Jivatma (Panch Kosh and Four Levels).

Unit II Charvaka and Early Buddhism

- (1) Charvaka : Metaphysics and Epistemology
- (2) Early Buddhism : Four Noble Truths. avyakrtavada, pratityasamutapada, anatmavada and kshanikavada

Unit III Samkhya and Vaisheshika

- (1) Samkhya : Satkaryavada, Dualism of the Purusha and Prakrti, their nature and proofs. Bondage and Liberation.
- (2) Vaisheshika : Asatkaryavada, Realism and Pluralism, Concept of the padartha (ontological category), classification and Explanation of the theory of Seven categories.

Unit IV Nyaya and Mimamsa

- (1) Nyaya : Sixteen Categories, Pramana, Prama and Aprama, Pratyaksha, Anumana, Upamana and Shabda. Vyapti and Hetvabhasas.

- (2) Mimamsa : Dharma and Apurva. Reality of the World. Self-Validity, Eternality and the Authorlessness of the Vedas. Upamana and Anuplabdhi.

Book Prescribed :

1. N.K. Devaraja (ed.), *Bhartiya Darshan*, Uttar Pradesh Hindi Sansthan, Lucknow.

Books Recommended :

1. Baldeva Upadhyaya, *Bhartiya Darshan*
2. M. Hiriyanna, *Outlines of Indian Philosophy (Hindi Translation available = H.T.A.)*
3. Datta and Chatterjee. *An Introduction To Indian Philosophy (H.T.A.)*
4. C.D. Sharma, *A Critical Survey of Indian Philosophy (H.T.A.)*
5. Ramakrishna Puligandla, *Fundamentals of Indian Philosophy*, D.K. Printworld, New Delhi.
6. P.T. Raju, *Structural Depths of Indian Thought*, South Asian Publishers, New Delhi, 1985.
7. Kusum Jain (ed.), *Foundations of Indian Moral Thought*, Article V, pp. 79-88, Deptt. Of Philosophy, University of Rajasthan, Jaipur.
8. S. Radhakrishnan, *Indian Philosophy*, 2 vols. (H.T.A.)
9. S.N. Dasgupta, *A History of Indian Philosophy*, 5 vols. (H.T.A.)

Core Course 2.

Philosophy 102

Max. Marks 70 (Theory)

30 (Internal)

Min. Marks 25 (Theory)

11 (Internal)

Western Philosophy - I

- Unit I** Early Greek Philosophy : From Thales to Socrates
- Unit II** Plato
- Unit III** Aristotle
- Unit IV** Plotinus, St. Augustine and St. Thomas Aquinas.

Books Prescribed :

1. Frank Thilly, *A History of Philosophy*
2. Prof. Daya Krishna (ed.), *Paschatya Darshan ka Itihasa (2 vols.) (in Hindi)*, Rajasthan Hindi Grantha Akademy, Jaipur.
3. Jagadish Sahay Srivastava, *Paschatya Darshan ki Darshanika Pravrittiyam (in Hindi)*, Allahabad, 2002.

Books Recommended :

1. Bertrand Russell, *A History of Western Philosophy*.
2. W.T. Stace, *A Critical History of Greek Philosophy*.
3. D.J.O' Connor (ed.), *A Critical History of Western Philosophy*.
4. Frederick Copleston S.J., *A History of Philosophy, Vol. I&II*.
5. Yakub Masih, *A Critical History of Western Philosophy (H.T.A.)*
6. Wilhelm Windelband, *A History of Philosophy*.

Core Course 3.

Philosophy 103

Max. Marks 70 (Theory)

30 (Internal)

Min. Marks 25 (Theory)

11 (Internal)

Ethics

Note : The paper is entirely based on the Prescribed Text Book.

Prescribed Text Book:

1. William K. Frankena, *Ethics*, Prentice Hall of India

Unit I Morality and Moral Philosophy, Egoistic and Deontological Theories (Ch. 1 & 2)

Unit II Utilitarianism, Justice and Love (Ch. 3)

Unit III Moral Value and Responsibility (Ch. 4)

Unit IV Intrinsic Value and the Good Life (Ch. 5)

Suggested Readings :

1. William Lillie, *An Introduction to Ethics*.
2. Joel Feinberg (ed.), *Moral Concepts*, OUP.
3. Ved Prakash Verma, *Niti Shastra Ke Mool Siddhanta*.
4. Richard T. Garner and Bernard Rosen, *Moral Philosophy*, The Macmillan Co., New York and Collier – Macmillan Ltd., London.
5. Prof. Nityanand Mishra, *Nitishastra : Siddhanta Aur Vyavahar*, MLBD.

Core Course 4.

Philosophy 104

Max. Marks 70 (Theory)

30 (Internal)

Min. Marks 25 (Theory)

11 (Internal)

Logic

- Unit I** Definition and Truth Tables of Five Truth - Functional Sentential Connectives. Tautologies, Contradictory and Contingent Sentences.
- Unit II** Sentential Theory of Inference-criteria for the rules of inference. Sentential Interpretation. Derivation Techniques in Sentential Logic, Consistency.
- Unit III** Set, Membership, Subset, Empty Set, Domain of Discourse, Venn Diagrams, Operation on Sets and related Theorems.
- Unit IV** Ordered Pairs, Definition of Relation, Properties of Binary Relations, Equivalence Relation, Ordering Relations, Operation on Relations.

Prescribed Text Book:

1. Patrick Suppes, *Introduction to Logic* (Ch. 1, 2, 9 & 10)

Note: The use of the nomenclature and abbreviations of the *Nineteen Rules* of the Method of Deduction for the Sentential Logic given by I.M. Copi in his *Introduction to Logic* is also permitted.

Semester I – Skill Course

Yoga Philosophy

Prescribed Text Book:

1. Patanjali, *The Yoga Sutra* or the *Patanjalayogadarshana* with Hindi Translation by Harikrishnadas Goyandaka. Geeta Press, Gorakhpur.

(Note : Many other translations are also available)

Unit I	Ch. 1	:	The Samadhipada
Unit II	Ch. 2	:	The Sadhanapada
Unit III	Ch. 3	:	The Vibhutipada
Unit IV	Ch. 4	:	The Kaivalyapada

Suggested Reading :

1. G.J. Larson and R.S. Bhattacharya (ed.) : *Encyclopedia of Indian Philosophies*, Vol. XII, Yoga philosophy MLBD, New Delhi, 2008.

M.A. Philosophy
Semester II 2019-20

Core Course 5.

Philosophy 201

Max. Marks 70 (Theory)

30 (Internal)

Min. Marks 25 (Theory)

11 (Internal)

Indian Philosophy II

Unit I Jainism :

Metaphysics, Epistemology and Soteriology. Anekantavada and Syadvada.

Unit II Mahayana Buddhism :

(i) Vijnanavada

(ii) Shunyavada

Unit III Shamkara and Ramanuja

Unit IV Nimbarka, Madhva, Vallabha and Kashmira Shaivism

Book Prescribed :

1.N.K. Devaraja (ed.), *Bhartiya Darshan*, Uttar Pradesh Hindi Sansthan, Lucknow.

Books Recommended :

1. Baldeva Upadhyaya, *Bhartiya Darshan*

2. M. Hiriyanna, *Outlines of Indian Philosophy* (Hindi Translation available = H.T.A.)

3. Datta and Chatterjee. *An Introduction To Indian Philosophy* (H.T.A.)

4. C.D. Sharma, *A Critical Survey of Indian Philosophy* (H.T.A.)

5. Ramakrishna Puligandla, *Fundamentals of Indian Philosophy*, D.K. Printworld, New Delhi.

6. P.T. Raju, *Structural Depths of Indian Thought*, South Asian Publishers, New Delhi, 1985.

7. S. Radhakrishnan, *Indian Philosophy*, 2 vols. (H.T.A.)

8. S.N. Dasgupta, *A History of Indian Philosophy*, 5 vols. (H.T.A.)

Core Course 6.

Philosophy 202

Max. Marks 70 (Theory)

30 (Internal)

Min. Marks 25 (Theory)

11 (Internal)

Western Philosophy II

Unit I Descartes, Spinoza, Leibniz

Unit II Locke, Berkeley, Hume

Unit III Kant

Unit IV Hegel

Books Prescribed :

1. Frank Thilly, *A History of Philosophy*
2. Prof. Daya Krishna (ed.), *Paschatya Darshan ka Itihasa (2 vols.) (in Hindi)*, Rajasthan Hindi Grantha Akademy, Jaipur.
3. Jagadish Sahay Srivastava, *Paschatya Darshan ki Darshanika Pravrittiyam (in Hindi)*, Allahabad, 2002.

Books Recommended :

1. Bertrand Russell, *A History of Western Philosophy*.
2. D.J.O' Connor (ed.), *A Critical History of Western Philosophy*.
3. Frederick Copleston S.J., *A History of Philosophy, Vol. IV to VII*.
4. Yakub Masih, *A Critical History of Western Philosophy (H.T.A.)*
5. Wilhelm Windelband, *A History of Philosophy*.

Core Course 7.

Philosophy 203

Max. Marks 70 (Theory)

30 (Internal)

Min. Marks 25 (Theory)

11 (Internal)

Meta-Ethics

Unit I Distinction between Normative Ethics and Meta-Ethics. Problems and classification of Meta-ethical Theories.

Unit II Cognitivist Definist Theories

Unit III Cognitivist nondefinist Theories

Unit IV Noncognitivist Theories

Books prescribed :

1. William K. Frankena, *Ethics*, Ch. 6.
2. Richard T. Garner and Bernard Rosen, *Moral Philosophy*, Part-Three, Meta-Ethics, Ch. 10-13, The Macmillan Co., New York and Collier-Macmillan Ltd., London.

Suggested Readings :

1. P.H. Nowell-Smith. *Ethics* .
2. R.M. Hare, *Language of Morals*
3. A.J. Ayer, *Language, Truth and Logic*, Ch. 6.
4. Ved Prakash Verma, *Adhi-Nitishastra Ke Mukhya Siddhanta*.
5. Prof. Nityanand Mishra, *Nitishastra : Siddhanta Aur Vyavahar*, Ch. 18, MLBD.
6. John Hospers, *An Introduction to Philosophical Analysis*, Ch. 9.

Core Course 8.

Philosophy 204

Max. Marks 70 (Theory)

30 (Internal)

Min. Marks 25 (Theory)

11 (Internal)

Epistemology

This paper is entirely based on the *Prescribed Text Book*.

Prescribed Text Book :

1. John Hospers, *An Introduction to Philosophical Analysis*, Second Edition, Prentice Hall, 1967.

(Note : The Hindi translation is available published by the Bihar Hindi Grantha Akademy, Patna)

Unit I	Ch. 1	:	Meaning and Definition
Unit II	Ch. 2	:	Knowledge
Unit III	Ch. 3	:	Necessary Truth
Unit IV	Ch. 4	:	Empirical Knowledge

Suggested Readings :

1. Roderick Chisholm, *Theory of Knowledge*.

2. A. Phillips Griffiths (ed.), *Knowledge and Belief* (O.U.P.)
3. G.H.R. Parkinson (ed.), *The Theory of Meaning* (O.U.P.)

Semester II
Skill Course II
Moral Education

Prescribed Text Book :

The Thirukkural

1. In Hindi translation published by the Bhartiya Jnanapith, New Delhi.
2. Original Tamil with English and Hindi versions published by the Prakrit Bharati Academy, Jaipur

Unit I	Concepts of God, Ascetics and the Dharma (the Path of Righteousness). Householder's Dharma (Ch. 1 to 10, 14, 17 to 21, 28 and 31)
Unit II	Wisdom, Courage, Temperance, Penance, Renunciation and Justice (Ch. 12, 13, 27, 34-36, 38, 40-43, 55-57, 60-63 and 78)
Unit III	Non-violence, Truth, Non-stealing, Celibacy and Non-Possession (Ch. 15, 18, 25, 26, 29, 30, 33-37, 92-94)
Unit IV	Other Virtues : Gratitude, Forgiveness, Charity, Friendship, Renown, Nobility, Piety, Fraternity, Honour, Greatness, Virtue and Courtesy (Ch. 11, 16, 22-24, 45, 53, 66, 79-83, 96-100)

M.A. Philosophy 2020-21
Semester III

Core Course 9.
(Internal)

Philosophy 301

Max. Marks: 70 (Theory) + 30

(Internal)

Min. Marks: 25 (Theory) & 11

Contemporary Indian Philosophy

Unit I Mahatma Gandhi and Rabindranath Tagore

Unit II Sri Aurobindo and K.C. Bhattacharya

Unit III S. Radhakrishnan and Mohammad Iqbal

Unit IV M.N. Roy and J. Krishnamurti

Prescribed Text Books :

1. N.K.Devaraja, *Bhartiya Darshan*, Chapter 19.
2. B.K. Lal, *Contemporary Indian Philosophy* (HTA), MLBD.
3. Laxmi Saxena (et.al.) (ed.), *Samakaleen Bhartiya Darshan*, Uttar Pradesh Hindi Sansthan, Lucknow.

Suggested Reading :

1. V.S. Naravane, *Modern Indian Thought* (HTA from Rajkamal Prakashan, Delhi)

Core Course 10.

Philosophy 302

Max. Marks: 70 (Theory) + 30 (Internal)

Min. Marks: 25 (Theory) & 11 (Internal)

Contemporary Western Philosophy

Unit I Moore and Russell

Unit II Logical Positivism

Unit III Wittgenstein : Early and Later

Unit IV Gilbert Ryle, J.L. Austin and W.V.O. Quine

Prescribed Text Books :

1. Jagadeesh Sahay Srivastava, *Pashchatya Darshna ki Darshnik Pravrittiyam*, Abhivyakti Prakashan and Jnana Bharti, Allahabad.
2. B.K. Lal, *Contemporary Western Philosophy* (HTA), MLBD.
3. Laxmi Saxena (et.al.) (ed.), *Samakaleen Pashchatya Darshna*, Uttar Pradesh Hindi Sansthan, Lucknow.

Suggested Readings :

1. D.J.O' Connor (ed.), *A Critical History of Western Philosophy*.
2. Frederick Copleston, *A History of Philosophy* Vol. VIII.

3. John Passmore, *A Hundred Years of Philosophy* (HTA).
4. A.J. Ayer, *Philosophy in the Twentieth Century*, Unwin Paperbacks, London, 1984.
5. Barry R. Gross, *Analytic Philosophy*, Oxford & IBH Publishing Co., New Delhi, 1981.
6. Milton K. Munitz, *Contemporary Analytic Philosophy*, Macmillan, New York, 1981.
7. Dr. Surendra Verma, *Pashchatya Darshna ki Samkaleen Pravrittiam*, Madhyapradesh Hindi Granth Academy, Bhopal.
8. Wolfgang Stegmuller, *Main Currents in Contemporary German, British and American Philosophy*, D. Reidal Publishing Company, Dordrecht-Holland, 1969.

Discipline Specific Elective I Philosophy 303

**Max. Marks: 70 (Theory) + 30
(Internal)**

**Min. Marks: 25 (Theory) & 11
(Internal)**

(Paper XI)

One Elective Paper from the List of Group I :

Continental and American Philosophy

(a) Pragmatism

Unit I C.S. Peirce

Unit II William James

Unit III John Dewey

Unit IV Pragmatism, Radical Empiricism and Humanism

Prescribed Text Books :

1. Frederick Copleston, *A History of Philosophy*, Vol. VIII, Pt. IV, Ch. XIV-XVI.
2. Guy W. Stroh, *American Philosophy from Edwards to Dewey*, Affiliated East-West Press Pvt. Ltd., New Delhi, 1970.
3. D.J O'connor (ed.), *A Critical History of Western Philosophy*, Ch. 24.

Recommended Books :

1. A.J. Ayer, *The Origins of Pragmatism*, Freeman, Cooper & Company, California, 1968.
2. Christopher Hookway, *Peirce*, Routledge & Kegan Paul, 1985.
3. Graham Bird, *William James*, Routledge & Kegan Paul, 1986.
4. Charles Hartshorne and Paul Weiss (ed.), *Collected Papers of C.S. Peirce*, Harvard University Press.
5. William James, *Pragmatism* (HTA).
6. William James, *Essays in Radical Empiricism*.
7. William James, *The Will to Believe and Other Essays*.

(Note : Books 5-7 are published from Longman Green, N.Y.)

OR

(b) Phenomenology

Prescribed Text Book :

1. Rajendra Prasad Pandey, *Phenomenology* (in Hindi), Rajasthan Hindi Granth Academy, Jaipur, 1992.

Unit I Ch. 1 and 2

Unit II Ch. 3

Unit III Ch. 4

Unit IV Ch. 5

Recommended Books :

1. Mrinal Kanti Bhadra, *A Critical Survey of Phenomenology and Existentialism*, Ch. 1 to 4, ICPR, Delhi, 2004.
2. Barry Smith and D.W. Smith (ed.), *The Cambridge Companion to Husserl*, Cambridge University Press, 1995.
3. Paul Edwards (ed.), *Encyclopedia of Philosophy*, the entry on *Phenomenology* .

OR

(c) Existentialism

Unit I Soren Kierkegaard

Unit II Friedrich Nietzsche

Unit III Ch. 6 and 7 : Problems of Religious Language and Verification.

Unit IV Ch. 9 and 10 : Human Destiny , Immortality and the Karmavada.

Suggested Readings :

1. Basil Mitchell (ed.), *The Philosophy of Religion* (O.U.P.)
2. Ved Prakash Verma, *Dharmadarshan Ki Mool Samasyai*, Delhi University.
3. Ved Prakash Verma, *Samakaleen Vishleshanatmak Dharma-Darshan*, Hindi Madhyam Karyanvaya Nideshalaya, Delhi University.

Discipline Specific Elective II Philosophy 304 **Max. Marks: 70 (Theory) + 30 (Internal)**
Min. Marks: 25 (Theory) & 11 (Internal)

(Paper XII)

One Elective Paper from the List of Group II:

Philosophy of Religion

(a) Some Major Living Religions

This paper will focus upon History of Religion and their concepts of God, Man, World and Salvation.

Prescribed Text Book :

1. John R. Hinnells (ed.), *A Handbook of Living Religions*, Viking, Penguin Books, 1984.

Unit I Hinduism and Zoroastrianism

Unit II Jainism and Buddhism

Unit III Judaism and Christianity

Unit IV Islam and Sikhism

Suggested Readings :

1. Y. Masih, *A Comparative Study of Religions*, MLBD.
2. Y. Masih, *Tulnatmak Dharma-Darshan*, MLBD

OR

(b) Study of Jain Religion

Prescribed Text Book :

1. Jinendra Varni, *The Samanasuttam*, Sarva Seva Samgha Prakashan, Rajghata Varanasi
(English Translation also available)

Unit I Part I Ch. 1 to 8.

Unit II Part I Ch. 9 to 15

Unit III Part II Ch. 16 to 24

Unit IV Part III and Part IV, Ch. 37 to 40

Suggested Reading

1. Jinendra Varni, *Shanti Patha Pradarshan*, Jinendra Varni Granthmala, Panipat.

OR

Paper (D)

Philosophy of Poornawad

Unit - I

1. Poornā Puruśā

1. All Completeness only is the *Absolute, Pure, Truth, Supreme* Lord.
2. Poorna Puruṣā is the only Absolute Truth and the Śivā-form, Viśnu-form and the Viśwa-form are his three forms. There is no 'cause-effect' relation of these forms with Poorna Puruṣā but these three forms have essential-form-relation with Poorna Puruṣā.
3. Difference between Vedik *Ultimate Truth* and Vedāntins *Ultimate Truth*.
4. Exposition on 'Form relation' and "causal relation"
5. 'Om' and Poorna Puruṣā 'Form relation'.
6. 'Form relation' of Poorna Puruṣā and Life.
7. Material, Spiritual and Divine aspects of Life.
8. Vedas equal thrust on Knowledge, Action and Devotion (Upasana). There is no discrimination.

Unit - II

1. Māyā

1. Māyā according to Vedas and Vedāntins.
2. Vedāntins Māyā: *ādhyāsa* and *vivartā*. Avaran and Vikshep.

2. Vidyā Avidyā

1. Vedas assert Vidyā Avidyā both as Vidyā.
2. According to Vedāntins Vidyā annihilates Avidyā.

Unit - III

1. Para Bramhan

1. Vedāntins māyā is ParaBramhan's potency and universe is her activity
2. Conflicting views of Mayawadi and Ajatwadins on Parabrahman.
3. Views of Vidyanaraya swami, Gaudapadacharya and other acharyas on Astiwad, Agnosticism, Nosticism, Ābhāsvadā, Bimb-pratibimbavada, Avaḥhedavādā, Druṣṭiśrustivādā, Śruṣṭidruṣṭivada, comprehension of Bramha and self realization.

2. Vaiśnav

1. *Review of philosophies proposed by Śri Rāmānujācāryā , Śri Vallabhācāryā, Śri Nimbārkācāryā, Bhaskarācāryā, Śri Jeevā Goswāmi.*
2. Discussion about differences between philosophical views of Śri Śankarācārya and *Vaiśnavācāryās*.

Unit - IV

1. Dnyān Vidnyān

1. Definition of 'Dnyān Vidnyān' by different philosophers (Acharyas).
2. Definition of 'Dnyān Vidnyān' according to Poornawad, which is based on Vedic literature.

2. Mokṣā

1. 'Bondage and Liberation treatment' – Bandha and *Moksa* (emancipation) in Mayawad.
2. Concept of *Moksa* (emancipation) in Poornawad.
3. *Kruto smara krutam smara*

3. The Purnādvaita

1. In the *Vedā*, *Poorna Puruṣā* is the only *Absolute Truth* and the *Śivā-form*, *Viṣṇu-form* and the *Viśwa-form* are his three forms. There is no 'cause-effect' relation of these forms with *Poorna Puruṣā* but these three forms have essential-form-relation with *Poorna Puruṣā* just as *Truth-Consciousness-Bliss* have form-relation with *Parabramhan*.

2. In the *Vedā* emphasizes equally all the three means: 'knowledge', 'action', and 'upāsana'.

Prescribe Book: *Poornawad (English/Hindi)*: Dr. R. P. Parnerkar

Published by:

Shree Vimal Publishers Pvt. Ltd., 5/129, Malati Complex-B wing, Paud Road, Kothrud, Pune – 411038

Skill Course III

Art of Living

Prescribed Text Book :

1. Thomas O. Buford, *Personal Philosophy : The Art of Living* , Holt Rinehart and Winston , New York, 1984.

Unit I Ch. 2 & 7 : Sexual Relations and Craftsmanship

Unit II Ch. 8 & 10 : Values and the Good Life, Community and Rights

Unit III Ch. 11 & 13 : Determinism and Free Will, the nature of Persons.

Unit IV Ch. 14 & 16 : Knowledge and Truth, Justification of Knowledge.

or

Paper M.A. (Philosophy) Semester- III ,

Skill course

YOGA IN DAILY LIFE

Unit –I The Spiritual Background of "Yoga in Daily Life"

- The Origin of "Yoga in Daily Life"
- The Four Paths of Yoga
- Prana, Mantra, Chakras, The Light of Life
- Vegetarian Food and Fasting.

Unit-II The System of Yoga in Daily Life

- Yama – Niyama

Unit-III Asanas and Pranayamas

- The Significance of the Asanas and Pranayamas
- The Full Yoga Breath
- Relaxation

Unit - IV Meditation

- Sitting Postures for Pranayama and Meditation
 - Self-Inquiry Meditation (Levels 1-8)
- Hatha - Yoga Kriyas

Prescribe Book:

Yoga in Daily Life(English/Hindi): Paramhans Swami Maheshwarananda
Published : 2nd edition @2005, By IbraVerlag/ European University Press, Vienna

M.A. Philosophy 2020-21

Semester IV

Core Course 11. Philosophy 401 Max. Marks: 70 (Theory) + 30 (Internal)
Min. Marks: 25 (Theory) & 11 (Internal)

(Paper XIII)

Problems of Indian Philosophy

Unit I Realism and Idealism

Unit II Anekantavada and Shunyavada

Unit III Knowledge , Pramana and Prama

Unit IV Pramanyavada and Khyativada

Prescribed Text Books :

1. D.D. Bandishte and Ramashankar Sharma (ed.), *Bhartiya Darshanik Nibandh*, Madhya Pradesh Hindi Granth Academy, Bhopal.
2. Dr. Mahesh Bhartiya, *Bhartiya Darshan Ki Pramukha Samasyaiem*, Indo-Vision Pvt. Ltd., Gaziabad.
3. Dr. N.K. Sharma, *Bhartiya Darshanik Samasyaiem*, Rajasthan Hindi Granth Academy, Jaipur.
4. N.V. Banerjee, *The Spirit of Indian Philosophy*.

Recommended Books :

1. J.N. Sinha, *Indian Realism.13*
2. B.K. Motilal, *Perception*, Clarendon Press, Oxford, 1986.
3. S.N. Dasputa, *Indian Idealism*, Cambridge University Press, Reprint, 1962.
4. T.R.V. Murti, *The Central Philosophy of Buddhism*, George Allen and Unwin Ltd., London.
5. Satkari Mookerjee, *The Jaina Philosophy of Non-Absolutism*, MLBD.
6. Sharda Gandhi, *Bhartiya Darshna Me Pramanyavada*, Sahitya Bhandar, Meerut.
7. Bijayananda Kar, *The Theories of Error in Indian Philosophy*, Ajanta Publication, Delhi, 1978.

Core Course 12. Philosophy 402 Max. Marks: 70 (Theory) + 30 (Internal)
Min. Marks: 25 (Theory) & 11 (Internal)

(Paper XIV)

Indian Ethics

Unit I	Dharma and Morality, Four Purusharthas and Karmavada
Unit II	Mimamsa and the Gita
Unit III	Jaina Ethics
Unit IV	Buddhist Ethics

Prescribed Text Book :

1. Dr. Rajveer Singh Shekhawat, *Bhartiya Neeti-mimamsa*, Dimple Publications, Jaipur, 2007.

Recommended Books :

2. S.E. Bhelke and P.P. Gokhale (ed.), *Studies in Indian Moral Philosophy*, Deptt. Of Philosophy, Pune, 2002.
3. Prof. Nityananda Mishra, *Neetishastra* Part III : Indian Ethics Ch. 19-25 & 27, MLBD.
4. N.V. Banerjee, *The Spirit of Indian Philosophy*, Part III and IV, Arnold-Heinemann Publishers (India) Pvt. Ltd., Delhi, 1974.
5. D.D. Bandishte and Ramashankar Sharma (ed.), *Bhartiya Darshanik Nibandh*, Ch. 4-6, 12, 19, 20, 22, 23.
6. I.C. Sharma, *Ethical Philosophies of India*
7. S. Dasgupta, *Development of Moral Philosophy in India*
8. H.M. Joshi, *Traditional and Contemporary Ethics, Western and Indian*. Bhartiya Vidya Prakashan, Delhi, 2000.
1. Prof. Sagarmal Jain, *Jaina, Bauddha aur Gita ke Achara Darshanom ka Tulnatmak Adhyayan*, 2 vols., Prakrit Bharti, Jaipur.

Discipline Specific Philosophy 403

Max. Marks: 70 (Theory) + 30 (Internal)

Min. Marks: 25 (Theory) & 11 (Internal)

**Elective Paper 3
(Paper XV)**

One Elective Paper from the List of Group III:

Indian Logic

(a) Nyaya

Unit I	The Nyaya Model of Philosophy, Sixteen Categories. Explanation and Examination of Pramana and Prameya. Realism.
Unit II	Explanation and Examination of Perception and Inference. Tarka, Vyapti and Hetvabhasas.
Unit III	Explanation and Examination of Comparison (upamana) and Testimony (shabda). Validity of the Vedas and Theory of Meaning.
Unit IV	Self and God, Bondage and Liberation.

Prescribed Text Book :

1. Gotama, *The Nyaya Sutra* with Vatsyayana's *Bhashya*
(a) Hindi tr. Dhundhiraj Shastri Chaukhambha.
(b) English tr. Mrinalkanti Gangopadhyaya. Indian Studies, Calcutta, 1982.

Suggested Readings :

- 1.S.C. Chatterjee, *The Nyaya Theory of Knowledge*
- 2.B.K. Matilal, *Perception*
- 3.B.K. Matilal, *Logic, Language and Reality*, MLBD.

OR

(b) Jaina Logic

Prescribed Text Book :

1. Laghu Anantavirya, *Prameyaratnamala*, Tr. Hiralal Jain, Chowkhamba

Unit I Definition, Classification and Justification of Pramana. Pramanyavada (Ch. 1 and 2)

Unit II Pratyaksha Pramana (Ch. 2)

Unit III Paroksha Pramana (Ch. 3)

Unit IV Object and Result of Pramana (Ch. 4 and 5)

Suggested Readings :

1. Mahendra Kumar Jain, *Jaina Darshan*.
2. Kailash Chandra Shastri, *Jaina Nyaya*.

OR

(c) Buddhist Logic

Prescribed Text Books :

1. Dharmakirti, *The Nyayabindu* with Dharmottara's Tika (ed. Tr.) Dr. Srinivas Shastri.Sahitya Bhandar, Meerut.
2. Ratnakirti, *The Apohasiddhi*, Hindi translation and explanation by G.C. Pandey, Central Institute of Higher Tibetan Studies, Sarnath, 1995.

Unit I The Nyayabindutika (=NBT) Ch. 1

Unit II NBT Ch. 2

Unit III NBT Ch. 3

Unit IV The Apohasiddhi, The doctrine of apoha.

Recommended Books :

1. F. Th. Stcherbatsky, *Buddhist Logic*, 2 Vols.
- 2.Satkari Mookerjee, *The Buddhist Philosophy of Universal Flux*, MLBD.
1. Dharmachand Jain, *Bauddha Pramana-Mimamsa ki Jaina Drishti se Samiksha*, Varanasi.

Discipline Specific **Philosophy 404** **Max. Marks: 70 (Theory) + 30 (Internal)**
Min. Marks: 25 (Theory) & 11 (Internal)

Elective 4
(Paper XVI)

One elective paper from the Group IV:

Branches of Philosophy

(a) Social and Political Philosophy

Prescribed Text Book :

1.O.P. Gauba, *Social and Political Philosophy*, Mayur Paperbacks, Noida, 2011.

- Unit I** Nature and Function of Social and Political Philosophy. Individual and the State. Human Rights, Duties and obligations, Concept of Sovereignty (Ch. 1, 3 and 4)
- Unit II** Democracy, Humanism and Secularism (Ch. 5, 10 and 11)
- Unit III** Marxism and Gandhian Perspective (Chs. 13 and 16)
- Unit IV** Liberty, Equality and Justice (Chs. 6, 7 and 8)

Recommended and Suggested Readings :

1. Daya Krishna, *Social Philosophy : Past and Future*, IAS, Shimla, 1968.
2. Yashder Shalya, *Samaj : Darshnik Parisheelan*, Rawat Publications, Jaipur.
3. Satyapal Gautam, *Samaj Darshana*, Haryana Sahitya Academy, Chandigarh, 1991.
1. Hriday Narayan Mishra, *Samajik-Rajnitik Darshan Ke Naye Aayam*, Shekhar Prakashan, Allahabad, 2004.
2. Hriday Narayan Mishra, *Samaj Darshana*, 2006.
3. Ernest Barker, *Principles of Social and Political Theory*, OUP.
4. K. Roy and C. Gupta (eds.), *Essays in Social and Political Philosophy*, ICPR.
5. K.G. Mashruwalla, *Gandhi and Marx*.

OR

(b) Philosophy of Culture

Prescribed Text Book :

1. Himmat Singh Sinha, *Sanskriti – Darshana*, Haryana Sahitya Academy, Chandigarh, 1990.

- Unit I** Concept of Culture, Man and Culture (Chs 1 and 2)
- Unit II** Culture, Symbolism and Religion (Chs 3 and 4)
- Unit III** Socio-cultural change and Social Values (Chs 5 and 6)

Unit IV Social Standard and the Indian Axiology (Chs 7 and 8)

Recommended works :

- 1.G.C. Pandey, *The Meaning and Process of Culture*, Shiv Lal Agrawala & Co., Agra, 1972.
- 2.N.K. Devaraj, *Sanskriti ka Darshanik Vivechan*, Hindi Samiti, Lucknow.

OR

(d) Axiology

Prescribed Text Book :

- 1.G.C. Pandey, *Mulya-Mimamsa*, Rajasthan Hindi Granth Academy, Jaipur, 1973.

- Unit I** Axiology and its origins. Value and Consciousness of Value. Reality, Truth and Value.
- Unit II** Approaches to the Pursuits of Values.
- Unit III** Stages and Classification of Values. Empirical, Metaphysical and Moral Values.
- Unit IV** Aesthetics, Art and the Search of Truth.

Skill Course IV

Logical Reasoning

- Unit I** Deductive Reasoning
(Chapter 5 and 6 of Copi's Text)
- Unit II** Symbolic Propositional Logic
(Chapter 8 and 9 of Copi's Text)
- Unit III** Non-Verbal Reasoning
(Section 2 of Edgar's Text)
- Unit IV** Verbal Reasoning
(Section 4 of Edgar's Text)

Prescribed Text Books:

1. I.M. Copi, *Introduction to Logic*
2. Thorpe Edgar, *Test of Reasoning*, Tata McGraw-Hill Publishing Co. Ltd., New Delhi.

Suggested Reading:

- 1.R.S. Aggrawal, *A Modern Approach to Logical Reasoning* S. Chand & Sons, New Delhi.

JAI NARAIN VYAS UNIVERSITY

JODHPUR (RAJASTHAN)

FACULTY OF ARTS, EDUCATION AND SOCIAL SCIENCES



SYLLABUS

FOR

M.A. PSYCHOLOGY (SEMESTER SCHEME)

(SEMESTER I AND SEMESTER II) EXAMINATIONS 2018-2019

&

(SEMESTER III AND SEMESTER IV) EXAMINATIONS 2019-2020

DETAIL EXAMINATION SCHEME FOR CHOICE BASED CREDIT SYSTEM

GUIDELINES

Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete **four skill courses:** two within the Department and two from other Department within JNV University or the Universities approved by JNV University
3. **Course:** Usually referred to, as 'papers' is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period of teaching (lecture or tutorial) or two periods of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.
12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/ December and even semester from December/January to May. Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May. The Department shall conduct the Practical examination of odd and even semesters as per the Panel of Examiners approved by the University. Each Board of examiners shall consist for one external Examiner from other University/Institute and another from the Department.
13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Arts, Education & Social Sciences resolves the following:

- a. All internal assessments shall on term test and seminar. Attendance shall carry the prescribed marks in all papers.
- b. In each semester two out of four theoretical components of the University examinations shall be undertaken by external examiners from outside JNV University, who may be appointed by the competent authorities.

Grievances and Redressal Mechanism

- The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head of the Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.
- The appeal will be assessed by the Chairman and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Dean, Faculty of Arts, Education & Social Sciences comprising of the HOD of the concerned Department and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S. No.	Letter Grade	Meaning	Grade Point
1	'O'	Outstanding	10
2	'A+'	Excellent	9
3	'A'	Very Good	8
4	'B+'	Good	7
5	'B'	Above Average	6
6	'C'	Average	5
7	'P'	Pass	4
8	'F'	Fail	0
9	'Ab'	Absent	0

- A student obtaining Grade F in a paper shall be considered failed and will be required to reappear in the University End Semester examination.
- For noncredit courses (Skill Courses) 'Satisfactory' or "Unsatisfactory" shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

- = and > 95 % marks Grade Point 10.0
- 90 to less than 95 % marks Grade Point 9.5
- 85 to less than 90 % marks Grade Point 9.0
- 80 to less than 85 % marks Grade Point 8.5
- 75 to less than 80 % marks Grade Point 8.0
- 70 to less than 75 % marks Grade Point 7.5
- 65 to less than 70 % marks Grade Point 7.0
- 60 to less than 65 % marks Grade Point 6.5
- 55 to less than 60 % marks Grade Point 6.0
- 50 to less than 55 % marks Grade Point 5.5
- 45 to less than 50 % marks Grade Point 5.0
- 40 to less than 45 % marks Grade Point 4.5
- 35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e. $SGPA (S_i) = \frac{\sum (C_i \times G_i)}{\sum C_i}$, where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.
- The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme, i.e. $CGPA = \frac{\sum (C_i \times S_i)}{\sum C_i}$ where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.
- The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade	Grade Point	Credit Point (Credit x Grade)
1	Course 1	6	B	6	6 x 6 =36
2	Course 2	6	B+	7	6 X 7 =42
3	Course 3	6	B	6	6X 6 = 36
4	Course 4	6	O	10	6 X 10 =60
Total		24			36+42+36+60=174

Thus, $SGPA = 174/24 = 7.25$

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	7.25	7.25	7	6.25

Type of Course	Course Code	Title of the Course	Lectur- e- Tutori- al- Practi- cal/ Week	No. of Credi- ts	Continuou- s Compre- hensive Assessment (CCA)	End- Semester Examination (ESE) [University Examination	Total
Semester – I							
Core course 1	PSY 101	Theories & Systems of Psychology – I		6			
			6-0-0		30	70	100
Core course 2	PSY 102	Advanced Abnormal Psychology – I (Behaviour Pathology – 1)		6			
			6-0-0		30	70	100
Core course 3	PSY 103	Cognitive Psychology – I		6			
			6-0-0		30	70	100
Core course 4	PSY 104	Research Methods & Statistics – I		6			
			6-0-0		30	70	100
Practical 4	PPC 105	Project Work		3			
			0-2-2		15	35	50
Practical (1) based on Core course 2	PSY106	Practical – 1 Advanced Abnormal Psychology – I		3			
			0-0-4		15	35	50
Practical (2) based on Core course 3	PSY 107	Practical 2 – Cognitive Psychology – I		3			
			0-0-4		15	35	50
Practical (3) based on Core course 4	PSY 108	Practical 3 – Research Methods & Statistics		3			
			0-0-4		15	35	50
Skill Course 1	PSY 109	Skill Course -- I (Modern Application of psychology)					
			2-0-2				
Total				36	180	420	600

Type of Course	Course Code	Title of the Course	Lectur- e- Tutori- al- Practi- cal/ Week	No. of Credi- ts	Continu- ous Compre- hensive Assessm- ent (CCA)	End-Semester Examination (ESE) [University Examination	Total
Semester – II							
Core course 5	PSY 201	Theories & Systems of Psychology—II					
			6-0-0	6	30	70	100
Core course 6	PSY 202	Advanced Abnormal Psychology -- II (Behaviour Pathology—II)					
			6-0-0	6	30	70	100
Core course 7	PSY 203	Cognitive Psychology – II					
			6-0-0	6	30	70	100
Core course 8	PSY 204	Research Methods and Statistics – II					
			6-0-0	6	30	70	100
Practical 4	PPC 205	Project Work – II		3			
			0-2-2		15	35	50

Practical (1) based on Core Course 6	PSY 206	Practical I –Adv. Abnormal Psychology– II	0-0-4	3	15	35	50
Practical (2) based on Core Course 7	PSY 207	Practical 2 – Cognitive Psychology – II	0-0-4	3	15	35	50
Practical (3) based on Core Course 8	PSY 208	Practical 3 – Research Methods and Statistics – II	0-0-4	3	15	35	50
Skill course II	PSY 209	Skill Course – II (Introduction to Psychology)	2-0-2				
Total				36	180	420	600

Type of Course	Course Code	Title of the Course	Lecture - Tutorial- Practical/ Week	No. of Credits	Continuous Comprehensive Assessment (CCA)	End-Semster Examination (ESE) [University Examination]	Total
Semester – III							
Core course 9	PSY 301	Social Psychology - I	6-0-0	6	30	70	100
Core course 10	PSY 302	Psychological Testing - I	6-0-0	6	30	70	100
Discipline Specific (Elective) 11 and 12	Elect any any Group (I,II or III)		6-0-0	6	30	70	100
			6-0-0	6	30	70	100
Group I	PSY 303	Clinical Psychology - I					
	PSY 304	Psychology of Personality					
Group II	PSY 305	Educational Psychology -I					
	PSY 306	Guidance Psychology - I					
Group III	PSY 307	Organizational Psychology – I					
	PSY 308	Personnel Psychology – I					
Practical (1) Based on core Course 9	PPC 309	Practicum – Social Psychology – I	0-0-4	3	15	35	50
Practical (2) based on core course 10	PPC 10	Practicum – Psychological Tasting – I	0-0-4	3	15	35	50
Practical (3 and 4) based on Elective course 11 and 12	Practical (3 and 4) for Elective Course 11 and 12		0-0-4	3	15	35	50
			0-0-4	3	15	35	50
Group I	PSY 311	Practicum – Clinical Psychology – I					
	PSY 312	Practicum – Psychology of Personality - I					
Group II	PSY 313	Practicum – Educational Psychology – I					
	PSY 314	Practicum – Guidance Psychology – I					
Group III	PSY 315	Practicum – Organizational Psychology – I					
	PSY 316	Practicum – Personnel Psychology – I					
Skill Course III	PSY 317	Skill Course – III (self and positive psychology)	2-0-2				
Total				36	180	420	600

Type of Course	Course Code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of Credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Semester – IV							
Core course 13	PSY 401	Social Psychology- II	6-0-0	6	30	70	100
Core course 14	PSY 402	Psychological Testing – II	6-0-0	6	30	70	100
Elective Course 15 and 16	Elect any one Group (I,II or III) (Same as Semester- III)		6-0-0	6	30	70	100
			6-0-0	6	30	70	100
Group I	PSY 403	Clinical Psychology-II					
	PSY 404	Health Psychology					
Group II	PSY 405	Educational Psychology – II					
	PSY 406	Guidance Psychology - II					
Group III	PSY 407	Organizational Psychology – II					
	PSY 408	Personnel Psychology- II					
Practical Course (1)	PSY 409	Practicum – Social Psychology II	0-0-4	3	15	35	50
Practical Course (2)	PSY 410	Practicum – Psychological Testing II	0-0-4	3	15	35	50
Practical Course (3) based on Elective course 15 and 16	Practical 3 for Elective course 15 and 16		0-0-4	3	15	35	50
Group I Practical Course (3)	PSY 411	Practicum – Clinical Psychology II					
Group II Practical Course (3)	PSY 412	Practicum – Educational Psychology II					
Group III Practical Course (3)	PSY413	Practicum – Organizational Psychology II					
Practical Course (4)	PSY 414	Internship	0-0-4	3	15	35	50
Skill Course	PSY 417	Skill Course – IV (Life Skills)	2-0-2				
Total				36	180	420	600

***The Department shall offer one skill course per semester from the list of skill courses approved for the Department.**

In view of the course content, the Department of Psychology distributed the Periods between Theory/ Tutorial/ Practical as under per paper

- 6: 0 : 0 (six lectures only (no tutorial and no practical) per week) – For Theory
- 0: 0 :12(no lecture, no tutorial and twelve practical only per week)- For practical per paper
- 2+0+2 (two lectures, no tutorial and two practical/field experimentations) - For Skill course

The Duration of the Period shall be forty five minutes. In each of these combinations, the first value stands for the same number of lecture instructions per week, whereas the last two values stand for doubles the number of tutorial/ practical instructions per week. In each practical group the number of students that can be accommodated will be fifteen.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective/ Practicals) involve an evaluation system of students that has the following two components:-

- (i) **Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
- (ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.

- (i) **Continuous Comprehensive Assessment (CCA):** This would have the following components:

Term Test: One term test shall be arranged for each paper prior to End-Semester Examination; examination duration shall be of three hours; maximum marks shall be 60 (reduced to 15).

Seminar: Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 40 (reduced to 10). The seminar shall be completed prior to term test for all the papers.

Classroom Attendance – Each student will have to attend a minimum of 75% Lectures / Tutorials / Practicals. A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE). Attendance marks will be awarded by following the system proposed below:

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

75% to 80%	=	1 mark
81% to 85%	=	2 marks
86 to 90%	=	3 marks
91% to 95%	=	4 marks
96% and above	=	5 marks

Note:

- Compensation in classroom attendance of a student will be as per prevalent University rules.
- Each student’s cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Arts, Education & Social Sciences.
- CCA is based on open evaluation system without any bias to any student.
- Any grievance received in the Department from student shall be placed before the Grievance Redressal Committee with adjudicated comments
- Each component marks will be added making it rounding as per norms.

Marking Scheme of Continuous Comprehensive Assessment (CCA)

Components	Maximum Marks	Reduced and Original Marks
Term Test	60	(reduced to 15)
Seminar	40	(reduced to 10)
Classroom Attendance	05	05
Total Marks of CCA	100	30

Note : Classroom Attendance marks will be as follows :-

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

Percentage	Marks
75% to 80%	1 mark
81% to 85%	2 marks
86 to 90%	3 marks
91% to 95%	4 marks
96% and above	5 marks

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective Department shall declare the result as “Satisfactory” or “Non-Satisfactory”; each student need to get a minimum of three “Satisfactory” declaration for the course completion

For the Term test and ESE:**Part A**

Ten questions (Definitions, illustrations, functions, short explanations, etc; 25-50 words) for one mark each. $10 \times 1 = 10$ marks; comprising questions from each Unit; no choice in this part

Part B

Four questions of long/explanatory answer (500 words) type, one drawn from each Unit; with internal choices : $4 \times 15 = 60$ marks.

$10+60 = 70$ marks

MEDIUM

Candidates are not allowed to use any medium except Hindi or English for answering question papers. For answering papers in the subjects of English/Hindi the medium will be corresponding language only.

Qualifying for Next semester

- i. **A student acquiring minimum of 40% in total of the CCA is eligible to join next semester.**
- ii. A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as 'Fail'), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.
- iii. A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time, i.e. three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted, for additional chances examination fee shall be on additive basis.

Improvement Option:

Every student shall have the opportunity to improve Credit through University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final.

Result Declaration:

The ESE (End Semester Examination/University Examination) results shall be declared within twenty days of the last examination. The Theory Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation.

POST -GRADUTE COURSE: A DESCRIPTION

The full course is of FOUR SEMESTERS spread for TWO YEARS duration. A semester-wise list of courses to be offered is given below. In each paper there will be four units.

SEMESTER I

SEMESTER II

SEMESTER III

SEMESTER IV

Elective paper group – First – Semester III

Elective paper group – Second – Semester III

Elective paper group – First – Semester IV

Elective paper group – Second – Semester IV

Skill Courses in the respective subject

Electives would be discipline centric and only students from concerned departments can register.

ADMISSION

The details of the eligibility conditions and admission procedures are given in the admission forms and on university website. The admission would be done on the basis of merit as per university rules. Reservation for SC, ST and OBC would also be done as per J.N.V. University, Jodhpur rules. Candidates are required to attend minimum 75% of the classes in theory and practicals both.

FACILITIES

The Department of Psychology possesses several sophisticated, advanced and modern equipments required for teaching and research.

FACULTY MEMBERS:

Professor:

- Pof. L.N. Bunker (Head)
- Prof. Preeti Mathur
- Prof. Vimla Verma

Assistant Professor:

- Dr. Hemlata Joshi
- Dr. Arpita Kackar

TEACHING AND EXAMINATION SCHEME
Per Semester

Course	Periods/Week	Examination Hours	CCA	ESE	Total
Theory Papers/Practicals					
Course – I	6	3	30	70	100
Course – II	6	3	30	70	100
Course – III	6	3	30	70	100
Course – IV	6	3	30	70	100
Course – V	6		30	70	100
Course VI Practical 1	2	3	10	20	30

UNIVERSITY EXAMINATION

Each course paper shall be of three hours duration.

Note: In Semester I and II all the four papers shall be compulsory. In semesters III and IV two papers will be compulsory and the student will be allowed to opt from the three area of specialization, viz., Clinical, Guidance Counseling and Industrial. Each group consists of two papers and the student will have to study both of them. The opted group shall remain the same for semesters III and IV. In the odd semester two skill courses will be those offered by the respective departments in the even semester skill courses will be from other departments.

SCHEME OF EXAMINATION FOR M.A PSYCHOLOGY (SEMESTER SYSTEM) FOR THE EXAMINATION OF 2018-19

INSTRUCTIONS FOR THE PAPER SETTERS AND THE STUDENTS

Max. Marks – 70
Duration – 3 Hours

Min. Marks – 25

Note :

- i. There shall be 9 questions in all. Five questions have to be attempted.
- ii. The first question shall be short answer type containing 10 short questions spread over the whole syllabus to be answered in about 30 words each. It shall carry 10 marks and shall be a compulsory question.
- iii. Rest of the paper shall contain 8 questions with internal choice. The entire syllabus has been divided into four units. Each unit shall have two questions and the candidates shall be given internal choice i.e. the candidate shall attempt one question from each unit.

SEMESTER – I

Type of Course	Course Code	Title of the Course	Lectur- re- Tutor- ial- Practi- cal/ Week	No. of Credits	Continuou s Compre hensive Assessment (CCA)	End- Semester Examination (ESE) [University Examination	Total
Semester – I							
Core course 1	PSY 101	Theories & System of Psychology – I	6-0-0	6	30	70	100
Core course 2	PSY 102	Advanced Abnormal Psychology – I (Behaviour Pathology – 1)	6-0-0	6	30	70	100
Core course 3	PSY 103	Cognitive Psychology – I	6-0-0	6	30	70	100
Core course 4	PSY 104	Research Methods & Statistics – I	6-0-0	6	30	70	100
Practical 4	PPC 105	Project Work	0-2-2	3	15	35	50
Practical (1) based on Core course 2	PSY106	Practical – 1 Advanced Abnormal Psychology - I	0-0-4	3	15	35	50
Practical (2) based on Core course 3	PSY 107	Practical 2 – Cognitive Psychology – I	0-0-4	3	15	35	50
Practical (3) based on Core course 4	PSY 108	Practical 3 – Research Methods & Statistics	0-0-4	3	15	35	50
Skill Course 1	PSY 109	Skill Course -- I (Modern Application of psychology)	2-0-2				
Total				36	180	420	600

Total marks of Semester – I = 600 marks and Credits 36
Skill Course – I (for Students of the Deptt.) 2-0-2

SEMESTER – II

Type of Course	Course Code	Title of the Course	Lectur e- Tutori al- Practic al/ Week	No. of Credi ts	Continu ous Compre hensi ve Assesm ent (CCA)	End-Semester Examination (ESE) [University Examination	Tot al
Semester – II							
Core course 5	PSY 201	Theories & Systems of Psychology—II	6-0-0	6	30	70	100
Core course 6	PSY 202	Advanced Abnormal Psychology -- II (Behaviour Pathology—II)	6-0-0	6	30	70	100
Core course 7	PSY 203	Cognitive Psychology – II	6-0-0	6	30	70	100
Core course 8	PSY 204	Research Methods and Statistics – II	6-0-0	6	30	70	100
Practical 4	PPC 205	Project Work – II	0-2-2	3	15	35	50
Practical (1) based on Core Course 6	PSY 206	Practical I –Adv. Abnormal Psychology– II	0-0-4	3	15	35	50
Practical (2) based on Core Course 7	PSY 207	Practical 2 – Cognitive Psychology – II	0-0-4	3	15	35	50
Practical (3) based on Core Course 8	PSY 208	Practical 3 – Research Methods and Statistics – II	0-0-4	3	15	35	50
Skill course II	PSY 209	Skill Course – II (Introduction to Psychology)	2-0-2				
Total				36	180	420	600

Total marks of Semester – II = 600 marks and Credits 34

Total marks of M.A (Semester I and II) 1200 marks and Credits 72

Skill Course – II (PSC202) (for Students of other Deptt.) 2-0-2

Educational Tour will organized before II semester and report will be submitted after the examination of II semester (For every 15 students one teacher shall accompany the group).

**SCHEME OF EXAMINATION FOR M.A PSYCHOLOGY (SEMESTER SYSTEM) FOR THE
EXAMINATION OF 2016-17
SEMESTER – III**

Type of Course	Course Code	Title of the Course	Lecture-Tutorial-Practical / Week	No. of Credits	Continuous Comprehensive Assessment (CCA)	End-Semster Examination (ESE) [University Examination]	Total
Semester – III							
Core course 9	PSY 301	Social Psychology – I	6-0-0	6	30	70	100
Core course 10	PSY 302	Psychological Testing - I	6-0-0	6	30	70	100
Discipline Specific (Elective) 11 and 12	Elect any any Group (I,II or III)		6-0-0	6	30	70	100
			6-0-0	6	30	70	100
Group I	PSY 303	Clinical Psychology - I					
	PSY 304	Psychology of Personality					
Group II	PSY 305	Educational Psychology -I					
	PSY 306	Guidance Psychology - I					
Group III	PSY 307	Origination Psychology – I					
	PSY 308	Personnel Psychology – I					
Practical (1) Based on core Course 9	PPC 309	Practicum – Social Psychology – I	0-0-4	3	15	35	50
Practical (2) based on core course 10	PPC 10	Practicum – Psychological Tasting – I	0-0-4	3	15	35	50
Practical (3 and 4) based on Elective course 11 and 12	Practical (3 and 4) for Elective Course 11 and 12		0-0-4	3	15	35	50
			0-0-4	3	15	35	50
Group I	PSY 311	Practicum – Clinical Psychology – I					
	PSY 312	Practicum – Psychology of Personality - I					
Group II	PSY 313	Practicum – Educational Psychology – I					
	PSY 314	Practicum – Guidance Psychology – I					
Group III	PSY 315	Practicum – Origination Psychology – I					
	PSY 316	Practicum – Personnel Psychology - I					
Skill Course III	PSY 317	Skill Course – III(self and positive psychology)	2-0-2				

Total		36	180	420	600
--------------	--	-----------	------------	------------	------------

Total marks of Semester – III = 600 marks and Credits 36
Skill Course – III (Psy301) (for Students of the Deptt.) 2-0-2

SEMESTER – IV

Type of Course	Course Code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of Credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total					
Semester – IV												
Core course 13	PSY 401	Social Psychology - II	6-0-0	6	30	70	100					
Core course 14	PSY 402	Psychological Testing – II	6-0-0	6	30	70	100					
Elective Course 15 and 16	Elect any one Group (I,II or III) (Same as Semester- III)		6-0-0	6	30	70	100					
			6-0-0	6	30	70	100					
Group I	PSY 403	Clinical Psychology-II										
	PSY 404	Health Psychology										
Group II	PSY 405	Educational Psychology – II										
	PSY 406	Guidance Psychology - II										
Group III	PSY 407	Orgzn. Psychology – II										
	PSY 408	Personnel Psychology- II										
Practical Course (1)	PSY 409	Practicum – Social Psychology II						0-0-4	3	15	35	50
Practical Course (2)	PSY 410	Practicum – Psychological Testing II						0-0-4	3	15	35	50
Practical Course (3) based on Elective course 15 and 16	Practical 3 for Elective course 15 and 16		0-0-4	3	15	35	50					
Group I Practical Course (3)	PSY 411	Practicum – Clinical Psychology II										
Group II Practical Course (3)	PSY 412	Practicum – Educational Psychology II										
Group III Practical Course (3)	PSY413	Practicum – Organizational Psychology II										
Practical Course (4)	PSY 414	Internship	0-0-4	3	15	35	50					
Skill Course	PSY 415	Skill Course – IV (Life Skills)	2-0-2									
Total				36	180	420	600					

Total marks of Semester – IV = 600 marks and Credits 36
Skill Course – IV (Psy404) (for Students of other Deptt.) 2-0-2

Total marks of M.A (Semester III and IV) 1200 Marks and 64 Credits

Total marks of M.A (Semester I, II, III and IV) 2400 Marks and Credits 128

M.A. SEMESTER – I

Theories and Systems of Psychology – I (PSY101)

- Unit I** Emergence and growth of Psychology the impact of physiology, Scientific Psychology- Wundt. Structuralism – Titchener.
- Unit II** The Challenge of Introspections, Functionalism – William James, John Dewey.
- Unit III** Behaviorism Basic Tenets, Watson, Lashley
Neo Behaviorism : baci tenets, Guthrie, Skinner, Tolman, Bandura
- Unit IV** Hormic Psychology: Basic tenets, McDougall Humanistic Psychology: Basic Tenets, Rogers, Maslow

Existential Psychology: Basic tenets, Rollo May

SUGGESTED READINGS:

- Wolman: Contemporary Theories and Systems in Psychology, Harper and Row, New York, 1979
- Hilgard and Bower: Theories of Learning, Prentice Hall of India, 4th Ed., New Delhi, 1977
- Shahakin, W S.: Psychology of Learning, Markhan Publishing Co., Chicago, 1970
- Marx and Hillix: Systems and Theories in Psychology, Tata McGraw Hill, New Delhi, 2nd Ed., 1979
- Chaplin and Krewice : Systems and Theories in Psychology, Rinehart and Winston, 3rd. Ed., Holt, 1974
- Woodworm and Sheehan: Contemporary Schools of Psychology, Ronald Press, 3rd Ed* New York, 1974
- Helson: Approaches in Contemporary Psychology, Affiliated East West Press, New Delhi, 1964
- Schultz, R. W.: History of Modern Psychology, Academic Press, 3rd Ed., New York, 1983
- Singh, A.K.: History and Systems in Psychology New Delhi. Motilal Banarsidas, 2010.
- Singh, A. K Manovigyan Ke Sampraday avam itihās, new Delhi. Motilal

Semester – I
Advanced Abnormal Psychology I
(PSY102)

Objectives:

To provide an in depth understanding of abnormal Psychology.

To provide background knowledge regarding psychopathology, etiology and symptomatology of various psychological disorders.

Unit I : Abnormal Behaviour: Its meaning, Historical background, evidence and Risk factors, Causes of abnormal Behaviour : Biological, psycho-social , Socio cultural and neuro – psychological factors.

Unit II : Theoretical perspective on maladaptive Behaviour: Biological perspective, Psychodynamic perspective, Behavioral Perspective, Humanist – perspective, diatheses, stress Model.

Unit III : Stress coping and maladaptive Behaviour : Stress and coping, stressful life situations and transitions, clinical reaction to stress and its management. Trauma and stress related Disorder : Post traumatic stress disorder, Acute stress disorder Adjustment disorder.

Unit IV : Depression, Anstey, Obsessive Compulsive Disorder Depression : Definition , types – Deregulation disorder Major depression, dysthymia , causes and treatment of depression.

Bipolar disorder : Types – Bipolar I and Bipolar cyclothymiacs disorder, symptoms causes and treatment.

Anxiety related disorder : separation Anxiety disorder generalized anxiety disorder, pain disorder

Cognitive Psychology – I

(PSY103)

- Unit I:** Introduction:
Emergence of Cognitive Psychology; Approaches: Information Processing Approach, Ecological, Connectionist and Evolutionary perspective.
Psychophysics: meaning, problems and the three classical methods of psychophysics; Theory of signal detection.
- Unit II:** Attention:
Nature; divided attention, automaticity, sustained attention, selective attention – theories: Filter theory, Attenuation theory and late-selection theory, neuropsychological studies of attention.
- Unit III:** Perceptual Process: Perceptual constancy : Size; Principles of organization
Meaning and nature of sensation and perception; Pattern recognition: top-down and bottom-up approaches; cognitive and motivational influences on perception.
- Unit IV:** Imagery and cognitive maps:
Imagery- dual code theory: Analogical images versus symbols; mental manipulations of images-mental rotations, image scaling, image scanning; cognitive maps -mental shortcuts, text maps and development of visuo -spatial relationships.

SUGGESTED READINGS:

- Soslo, 6th Ed. : Cognitive Psychology. Pearson Education.
- Medin, D.L. and Ross, B.H. (1992). Cognitive Psychology. Orlando CL Harcourt Brace Jovanovich.
- Posner, M.(Ed) (1989). Foundations of Cognitive Science London : MIT Press.
- Galotti, K.M. (1999). Cognitive Psychology in and Outside Laboratory. Mumbai : Thomson Asia
- Matlin, Margaret W. (1995). Cognition (IIIed.). Prism Books Pvt. Ltd., Bangalore.
- Reed, Stephen K. (1988). Cognition: Theory and application (III ed.) Pacific Grove, California: Brooks/Cole Publishing Company.
- Hewes, Mary B. (1990). The Psychology of Human Cognition. New York : Pergamon Press.
- Baddeley, A.D. (1997) Human Memory : Washington : Psychology Press.
- Crowder R.G. (1976). Principles of Learning and Memory. NY : Lawrence Erlbaum.
- Dember, & Warm, J.S. (1979). Psychology of Perception. NY : Holt.
- Gardner, H. (1985). The Mind's New Science : A History of the Cognitive Revolution. Cambridge Mass : Bert Books.
- Ittyearh, M. and Broota, K.D. (1983). Inter and Intra-model Processing of Sensory – specific Information. Perceptual and Motor Skills 56. 5.7-517
- Mark L.E. (1978). Unity of the Senses. London : Academic Press.
- Newell, A. and Simon H. (1972). Human Problem Solving. NJ : Prentice Hall.
- Rock, I. (1995). Perception. NY : Scientific American.
- Sen, A. (1983). Attention and Distribution, ND : Sterling.
- Sen, A.K. and Pande, P. (Ed.) (1998). Current Issues in Cognitive Psychology Delhi : Campus.
- Wilhite, S.C. and Payne, D.E. (1992). Learning and Memory : The Basis of Behaviors. Needham Heights, Mass : Allyn and Bacon.
- Snodgrass, Berger Hayden (1985). Human Experimental Psychology. New Delhi : Oxford University Press.
- Sternberg . J. Robert : Cognitive Psychology, Thomson Wadsworth, India Edition
- Shergill Kaur Hardeep: Experimental Psychology, PHI Learning Private Limited, New Delhi.
- Singh A.K., Sangyanatmak Manovigyan, Motilal Banarsidas. New Delhi.

Research Methods and Statistics I

(PSY104)

- Unit I:** Nature and purpose of research in Psychology; Research Problem and Hypothesis; Variables; Review of literature; Probability, Normal Curve: properties and applications.
- Unit II:** Research Techniques: Observation, Experimental Method- Lab Experiment, Field Experiment, Field Studies; Survey research; case history, interview method, schedule, and questionnaire; Research format and report writing
- Unit III:** Sampling theory and its techniques; Testing of statistical hypothesis, levels of significance and types of errors; Parametric tests: t-test, 'A' test and 'F' test and one-way analysis of variance.
- Unit IV:** Correlation: Pearson's product moment correlation, Spearman Rank Difference Correlation, special correlational methods: Bi-serial correlation, point Bi-serial correlation, Phi-Coefficient, Linear regression.

SUGGESTED READINGS:

- Guilford J.P. (1954). Psychometric Method. McGraw Hill. N.Y. Guilford J.P. Fruchter's (1981). Fundamental Statistics in Psychology Education. International McGraw Hill Publisher, New York.
- Kerlinger, F.N. (1983). Foundations of Behavioral Research. ND : Surjeet.
- Kothari, C.R. (1986) : Research Methodology, Methods and Techniques. ND : Wiley Eastern Limited.
- Singh, A.K. (1997). Tests Measurements and Research Method in Behavioral Science. Patna : Bharti Bhavan.
- Garrett, Henry and (1981). Statistics in Psychology and Education. Vakils, Feffner Simons Ltd, Bombay.
- Minium, E.W. , King B.M. and Bear G (1995) Statistical Reasoning in Psychology and Education. NY : John Wiley.
- Welkowitz, J. Ewen, R.B. and Chocen J. (1982). Introduction to Statistics for Behavioral Sciences. Academic Press New York
- Glenburg, Arthur, (1988). Learning From Data. An Introduction to Statistical Reasoning. Harecourt Brace, Hovanovich. New York.
- Bailey, K.D. (1978). Methods of Social Research. The Free Press New York.
- Cattell, R.P. (1966). Handbook of Multivariate Experimental Psychology. Rand McNancy, Chicago.
- Guy, R.F., Edgley, C.E., Arefat, J and Allen, D. E. (1987). Social Research Methods : Puzzles and Solutions. Allyn and Bacon, Boston.
- Holt, R.R. (1978). Methods in Clinical Psychology (Vols. I & II) Plenum Press, N.Y.
- Whiting J.W., M. (1969). Methods and Problem in Cross-culture research. In B.

PRACTICALS (Sem. I):

- The students will be required to do practical's for three theory papers:- paper II,III and IV.
- 3-4 Practical's to be introduced to the students based on the syllabus of the relevant theory paper.

Skill I (PSY109)
Modern Applications of Psychology

- Unit I: School Psychology:**
Academic stress and anxiety, adjustment problems and depression in students, intervention program for parents and teachers for creating student friendly environment.
- Unit II: Sports Psychology:**
Definition, nature and scope of sports psychology, motivating sports persons and building team morale, factors affecting performance of sportspersons.
- Unit III: Forensic Psychology:**
Definition, nature and fields (Correctional and Investigative). Criminal Psychology, cyber crimes, violence(meaning and types); contribution of psychology to law; Current challenges(reliability of investigative procedures- Polygraph and Eye witness testimony.)
- Unit IV: Engineering psychology:**
Origin, nature and scope; man-machine systems, problems of spatial configuration and arrangement, situational and individual factors related to accident reduction.

SUGGESTED READINGS

- Deb, Sibnath (2006). Children in Agony. New Delhi, Concept Pub.
- Deb, Sibnath (2006). Contemporary Social Problems in India. New Delhi, Anmol Pub.
- Deb Sibnath, Mitra Chirasree, Majumdar Bishakha and Sun Jiandog (2011). Effect of '12 Day Induction Training for ART/CCC Counsellors' under GFATM Project in India: an In-depth Study, *Indian Journal of Health and Wellbeing*, Vol.2 (2), pp.5-11.
- HIV Counselling Training Modules for VCT, PPTCT and ART Counsellors, developed by NACO, MHFW, GOI (2006).
- Cariappa, M. & Geeta, D. (1997). How to help your disabled child. UBSPD.
- Carter, J.W. (1986). Research contributions from community psychology in community health health. Behaviour Pub. NY.
- Dalton J.H., Elias, M.J. et al., (2007). Community psychology, linking individuals and communities. Wadsworth, Thomson Learning US.
- Desai, A.N. (1995). Helping the handicapped. Ashish Pub. House.
- Iscoe, I. Block, B.L. & Spielberger, CD (Eds.) (1997). Community psychology: Perspectives in training and research. Appleton Century Crofts. NY.
- Kapur, M. (1995). Mental health of Indian Children, Sage Pub.
- Mandelbawn, B. (1972). Society in India. Popular Prakashan. Bombay.
- Mann, P.A. (1978). Community Psychology: Concepts and Applications. The Free Press.
- Part, J.E. & Park, K. (1989). The Text Book of Social and Preventive Medicine. Baranasidas, Jubbulpur.
- Rajan, S.I. et al., (1999). Indian's elderly: Burden or challenge, Sage Pub.
- Patel, Vikram, Flisher alan, Hetrick Sarah and McGorry Patrick (March, 2007). Mental Health of Young People: A Global Public-health Challenge, *the Lancet*.

M.A. SEMESTER II

Theories and Systems of Psychology – II (PSY201)

- Unit I** Psychoanalysis: Sigmund Freud – Postulates, Theory of Instincts, Theory of Personality, Developmental Stages.
- Unit II** **Away from Freud-** Horney, Fromm, Sullivan
Individual Psychology- Alfred Adler, Analytic Psychology- Carl Gustav Jung.
- Unit III** Gestalt Psychology- perception, Learning and Thinking.
Personality Psychology- Spranger, William Stern, Gordon Allport
- Unit IV** Field Theory: Lewins Concepts and Theory of Behaviour
Indian Psychology : Psychology in Vedas, Upanishads.

BOOKS RECOMMENDED

- Wolman: Contemporary Theories and Systems in Psychology, Harper and Row, New York, 1979
- Hilgard and Bower: Theories of Learning, Prentice Hall of India, 4th Ed., New Delhi, 1977
- Shahakin, W S.: Psychology of Learning, Markhan Publishing Co., Chicago, 1970
- Marx and Hillix: Systems and Theories in Psychology, Tata McGraw Hill, New Delhi, 2nd Ed., 1979
- Chaplin and Krewice : Systems and Theories in Psychology, Rinehart and Winston, 3rd. Ed., Holt, 1974
- Woodworm and Sheehan: Contemporary Schools of Psychology, Ronald Press, 3rd Ed* New York, 1974
- Helson: Approaches in Contemporary Psychology, Affiliated East West Press, New Delhi, 1964
- Schultz, R. W.: History of Modern Psychology, Academic Press, 3rd Ed., New York, 1983
- Singh, A.K.: History and Systems in Psychology New Delhi. Motilal Banarsidas, 2010.
- Singh, A. K Manovigyan Ke Sampraday avam itihās, new Delhi. Motilal

Advanced Abnormal Psychology II (PSY202)

Objective

To acquaint the student with:

- a) Various paradigms of psychopathology
- b) The symptoms and prognosis of different Mental disorder.

- Unit – I : Neuro-developmental disorder, schizophrenia and other Psychotic disorder
Intellectual disability : Definition, types, causes and treatment.
Schizophrenia : Definition, Phases, Symptoms etiology and treatment.
Schizophrenia spectrum Psychotic Disorder : Brief Psychotic Disorder,
schizoaffective Disorder, Delusional Disorder.
- Unit – II : Dissociative and somatic disorders , Dissociative disorder: definition and types -
Dissociative Identity Disorder, Dissociative Amnesia, Dissociative Trique,
Depersonalization.
Somatic Symptom related Disorders : Types – Somatic Symptom disorder, ,
Conversion disorder.
- Unit III : Eating, Elimination and sleep wake disorders eating disorders – Piray Ruminantion,
Bulimia
Elimination Disorder – Enuresis, Encopresis sleep wake Disorder – Insomnia,
Hypersomnia Naredepsy.
- Unit IV : Disorders diagnosed in Infancy. ADHD, Autism, learning disorder, conduct
disorder – Causes, Symptoms and Treatment.

Reference Books :

- Carson, R.C. Butcher, J.N. Mineka,
S., & Hodey, J.M. (2007) : Abnormal Psychology, 13th Edn. Pearson
Education India.
- Sarason, IG & Sarason, : Abnormal Psychology : The Problem of
R.B. (2002) Maladaptive Behaviour (10th edit.) Delhi :
Pearson Education.
- Idemna, J.C. (1986) : Abnormal Psychology and modern life,
Bombay : Taraporewala Sons & Co.
- Barlow, D.H. & Durand, : Abnormal Psychology (4th Ed.) Pacific Grove :
V.M. (2005) Books / Role.
- Davison G.C., Neal, : Abnormal Psychology : Current Perspectives,
J.M. & Kring, A.M 9th Ed. Tata Mc Graw Hill : New Delhi, India
(2004)
- Oltmanns T.F., Emery : “Abnormal Psychology” Prentice Hall
R.E. (1995)

Cognitive Psychology - II (PSY203)

- Unit I:** Learning:
Meaning and nature of learning; classical conditioning- paradigm and phenomena;
Instrumental Conditioning: types and schedules of reinforcement; cognitive learning-
Latent learning, Insight learning and Observational learning.
Verbal Learning : material and prouddest.
- Unit II:** Concept learning and memory
Concept learning- Theories – Hypothesis and Cue selection and Information
Processing. Meaning, Types of memory- nature and characteristics of sensory , short-
term and long-term memory; levels of processing model of memory; theories of
forgetting; mnemonics, , Construction and Re-construction in memory
- Unit III:**
Intelligence and Creativity:
Definition and nature of Intelligence; cognitive theories of intelligence- Piaget and
Sternberg; Artificial Intelligence- concept and importance; Creativity: definition and
nature, stages of creative thinking, functional fixity.
- Unit IV:**
Thinking , Reasoning and Problem solving:
Thinking: nature and types, theories of cognitive development: Bruner and Vygotsky;
Types and errors of reasoning; Judgment and decision making; Problem-solving:
meaning and classification, problem solving approaches.

SUGGESTED READINGS:

- Soslo, 6th Ed. : Cognitive Psychology. Pearson Education.
- Medin, D.L. and Ross, B.H. (1992). Cognitive Psychology. Orlando CL Harcourt Brace Jovanovich.
- Posner, M.(Ed) (1989). Foundations of Cognitive Science London : MIT Press.
- Galotti, K.M. (1999). Cognitive Psychology in and Outside Laboratory. Mumbai : Thomson Asia
- Matlin, Margaret W. (1995). Cognition (IIIed.). Prism Books Pvt. Ltd., Bangalore.
- Reed, Stephen K. (1988). Cognition : Theory and application (III ed.) Pecific Grove, California : Brooks/Cole Publishing Company.
- Hewes, Mary B. (1990). The Psychology of Human Cognition. New York : Pergamon Press.
- Baddeley, A.D. (1997) Human Memory : Washington : Psychology Press.
- Crowder R.G. (1976). Principles of Learning and Memory. NY : Lawrence Erlbaum.
- Dember, & Warm, J.S. (1979). Psychology of Perception. NY : Holt.
- Gardner, H. (1985). The Mind's New Science : A History of the Cognitive Revolution. Cambridge Mass : Bert Books.

- Tyearh, M. and Broota, K.D. (1983). Inter and Intra-model Processing of Sensory – specific Information. *Perceptual and Motor Skills* 56. 5.7-517
- Mark L.E. (1978). *Unity of the Senses*. London : Academic Press.
- Newell, A. and Simon H. (1972). *Human Problem Solving*. NJ : Prentice Hall.
- Rock, I. (1995). *Perception*. NY : Scientific American.
- Sen, A. (1983). *Attention and Distribution*, ND : Sterling.
- Sen, A.K. and Pande, P. (Ed.) (1998). *Current Issues in Cognitive Psychology* Delhi : Campus.
- Wilhite, S.C. and Payne, D.E. (1992). *Learning and Memory : The Basis of Behaviors*. Needham Heights, Mass : Allyn and Bacon.
- Snodgrass, Berger Haydon (1985). *Human Experimental Psychology*. New Delhi : Oxford University Press.
- Sternberg . J. Robert : *Cognitive Psychology*, Thomson Wadsworth, India Edition
- Shergill Kaur Hardeep: *Experimental Psychology*, PHI Learning Private Limited, New Delhi.
- Singh A.K., *Sangyanatmak Manovigyan*, Motilal Banarsidas. New Delhi.

Research Methods and Statistics-II

(PSY204)

- Unit I:** Nature, functions and uses of tests, Scaling methods, test norms, ethical issues in psychological research and testing.
- Unit II:** Research Designs: Meaning, purpose and principles; pre-experimental, quasi-experimental and experimental designs, randomized groups design, matched groups design, randomized block designs and factorial designs.
- Unit III:** Non-Parametric Techniques: Wilcoxon Sign rank test, median test, Mann-Whitney U test; Kruskal-Wallis H test, Chi-Square, Kendall's rank difference correlation, Kendall's coefficient of concordance W
- Unit IV:** Test construction- Item writing and analysis; reliability and validity; application of SPSS in psychological statistics.

SUGGESTED READINGS:

- Garrett, Henry and (1981). Statistics in Psychology and Education. Vakils, Fefferman Simons Ltd, Bombay.
- Guilford J.P. (1954). Psychometric Method. McGraw Hill. N.Y. Guilford J.P. Fruchter's (1981). Fundamental Statistics in Psychology Education. International McGraw Hill Publisher, New York.
- Minium, E.W., King B.M. and Bear G (1995) Statistical Reasoning in Psychology and Education. NY: John Wiley.
- Seigel S. (1956). Nonparametric Statistics. McGraw Hill, New York.
- Welkowitz, J. Ewen, R.B. and Chocen J. (1982). Introduction to Statistics for Behavioral Sciences. Academic Press New York.
- Winer, B.J. (1971). Statistical Principles in Experimental Designs. McGraw Hill, New York.
- Singh, A.K. (1997). Tests Measurements and Research Method in Behavioral Science. Patna: Bharti Bhavan.
- Kerlinger, Fred, N. (1980). Foundations of behavioral Research (Revised Edition)Holt, Rinehart and Winston, N.Y.
- Kothari, C.R. (1987). Research Methodology, Wiley Eastern, New Delhi.
- Bailey, K.D. (1978). Methods of Social Research. The Free Press New York.
- Cattell, R.P. (1966). Handbook of Multivariate Experimental Psychology. Rand McNancy, Chicago.
- Gear, W (1975). Introduction to Computer Science, SRA.
- Guy, R.F., Edgley, C.E., Arefat, J and Allen, D. E. (1987). Social Research Methods : Puzzles and Solutions. Allyn and Bacon, Boston.
- Holt, R.R. (1978). Methods in Clinical Psychology (Vols. I & II) Plenum Press, N.Y.
- Whiting J.W., M. (1969). Methods and Problem in Cross-culture research. In B. Lindzey and E. Aronson (Eds). The Handbook of Social Psychology, Addison Wesley N.Y.
- Broota; K.D. (1989). Experimental Design in Behavioral Research. Wiley Eastern. New Delhi.
- Edward A.L. (1976). Experimental Design in Psychological Research. Holt Rinehart Winston, New York.
- Glenburg, Arthur, (1988). Learning From Data. An Introduction to Statistical Reasoning. Harecourt Brace, Hovanovich. New York.

- Maxwell, A.E. (1968). Experimental Design for behavioral and Medical Sciences, Holt, Rinehart Winston, New York.
- McNemar (1989). Experimental Design. McGraw Hill, New York.
- Welkowitz, J. Ewen, R.B. and Chocen J. (1982). Introduction to Statistics for Behavioral Sciences. Academic Press New York.
- Winer, B.J. (1971). Statistical Principles in Experimental Designs. McGraw Hill, New York.

PRACTICALS:

- The students will be required to undertake Project work as paper V of their curriculum.
- The students will be required to do practicals for three theory papers paper II, III and IV.
- 3-4 Practical to be introduced to the students based on the syllabus of the relevant theory paper.

Skill II (PSY209)
Introduction to Psychology

Unit I What is Psychology? Importance and Scope of Psychology in Life.

Unit II Motivation, Emotion and Adjustment: Basic processes

Unit III Attitude, Prejudice and discrimination

Unit IV What is a Psychological test?

SUGGESTED READINGS:

- Morgan and King: Introduction to Psychology.
- Baron.A.Robert: Psychology; Pearson Education.

M.A.SEMESTER III

SOCIAL PSYCHOLOGY (PSY301)

Unit-I Introduction

Social Perception and Social Cognition: Nature and Focus of Social Psychology, Causes of Social Behaviour, New Perspectives in Social Psychology, Role of Theory in Modern Social Psychology; Social Cognition: Self Perception, Self concept and self esteem; Impression Formation and Management; Schemas in Person Perception

Unit- II Social Relations

Interpersonal Attraction: Nature and Determinants of Interpersonal Attraction, Theories of Interpersonal Attraction, Bases of Friendship and Family Relationships; Aggression: Nature and Types of Aggressive Behaviour, Determinants of Aggression, Prevention and Control of Aggressive Behaviour

Unit- III Attitudes and Prejudice

Attitudes: Nature and Characteristics of Attitudes, Attitude Formation, Attitude Change, Theories of Attitude Change; Prejudice: Nature and origins of Prejudice and Discrimination, Prevention and Control of Prejudice and Discrimination

Unit- IV

Social Influence and Pro-social Behaviour: Conformity, Groups Influence and Groups Norms, Determinants of Conformity; Compliance: Nature and Tactics of Compliance, Obedience, Imitation and Modeling

SUGGESTED READINGS:

- Brown, R. (2000), Group processes: Dynamics within and between groups. 2nd edition, Blackwell Publishers.
- Hastie, R. and Stasser, G. (2000). In Reis H.T. and Gudd C.H. (eds). Handbook of Research Methods in Social and Personality Psychology. Cambridge University.
- Higgins, E.T. and Kruglansk A.W. (1996) Social Psychology Handbook of Basic Principles. Guilford Press, New York. London.
- Mamson and Harvey (2002). Attribution in Close Relationships. Cambridge University Press.
- Myers, D. G (1996) Social Psychology, International Edition Fifth Edition.
- Aronson, E. Ellsworth, P., Calsmith, J.M. & Gonzales, M.H. (1990). Methods of Research in Social Psychology. NY: McGraw Hill.
- Farr, R.M. (1996). The Roots of Modern Social Psychology. Oxford: Blackwell.
- Ruscher, J.B. (2001) Prejudiced Communication: A Social Psychological Perspective. New York: The Guilford Press.
- Semin, G.R. and Fiedler, K. (1996). Applied Social Psychology Sage Publications, Delhi.
- Vago, S. (1990) Social Change, New Jersey: Prentice Hall.

PSYCHOLOGICAL TESTING I (PSY302)

- Unit 1 Introduction : Nature and uses of Tests, Basic Principles of Testing, Measurement, Statistics and Mathematics, Measurement Scales.
- Unit 2 Reliability : Basic concepts, Types and Measurement
Validity : Basic concepts, Types, Measurement and Interpretation.
- Unit 3 Test Construction : Item Analysis-Constructing items. Testing Items : Classical Test theory and Item Response theory.
- Unit 4 Ability Testing and Theories of Intelligence: Intelligence Testing : Individual Tests SBIS, Wechsler Scales WAIS, WISC; Group Tests : Multiple Aptitude Tests- DAT, GATB, MAB

Books Recommended

- Anastasi & Urbina : Psychology Testing, New Delhi : Prentice Hall of India. New Delhi : Pearson Education, 7th Ed., 2004.
- Gregory Psychology Testing : History, Principle and Application. New Delhi: person Education, 4th Ed., 2005
- Freema : Theory and practices of Psychological Testing. New Delhi: Oxford & IBH 3rd, Ed. 2001.
- Singh, A.k. : Tests Measurement and Research methods in Behaviour Sciences. New Delhi : Bharti Bhawan 2nd, ED., 2002.
- Bhargava, M.: Modern psychological Tests and Measurements (Hindi). Agra: H.P. Bhargava Book House, 15th Ed., 2006.
- Guilford : Psychometric Methods, New Delhi : Tata McGraw Hill, 1984.

Clinical Psychology – I (PSY303)

Unit-I. Introduction and Mental health

Introduction and Mental health: Perspective of clinical psychology: brief history and conceptual framework, Nature of Mental health concept of normality and pathology, Models of Mental health intervention.

Unit-II. Clinical Assessment

Clinical Assessment: Nature and purpose of Assessment,. Formal and Informal assessment, Classification of Psychiatric disorders with special reference to international classification and DSM V

Unit- III. Psychological Testing

Psychological Testing: Description of TAT, Rorschach and WAIS, General Principles, Diagnostic test in clinical use: Intelligence and Personality test.

Unit-IV. Neurological Assessment

Neurological Assessment: Role and Purpose: diagnosis of brain damage localization of brain injury, Neurological test in neurological assessment, single and multiple test procedures.

SUGGESTED READINGS:

- Korchin, S. I. : Modern Clinical Psychology, Tokyo, Harper International Edition, 1976
- Kendall and Norton Ford : Clinical Psychology. Tokyo, Wiley International Edition, 1982
- Wolman : Handbook of Clinical Psychology, New York, Me Graw Hill, 1965
- Anderson and Anderson : Introduction to Projective, Techniques, New York, Prentice Hall, 1951
- Klopfer and Davidson : Rorchach Techniques, New York, Harcourt, Brace and World, 1962
- Stein : Thematic Apperception Test, Massachusetts, Addison-Wesley, 1955
- Worberg : Techniques of Psychotherapy, New York, Gum and Stration, 1967
- Lezak, M. D : Neuropsychological Assessment, London, Oxford University Press, 1976
- Golden, C. J. : Diagnosis and Rehabilitation in Clinical Neuropsychology, Springfield, Charles Thomas, 1978

Psychology of Personality (PSY304)

- Unit 1: Introduction and Approaches:**
Introduction: Nature of Personality, Constructs of Personality Types, Traits, Temperament, Cognitive Styles, Social Learning.
- Unit 2: Determinants of Personality:**
Determinants: Biological and Constitutional factors. Psycho-social factors. Socio-cultural factors, Environmental factors, Gender Differences in Personality
- Unit 3: Assessment of Personality:**
Assessment: Nature and purpose of Assessment, Idiographic and Nomothetic Approaches. Interviewing, Self-Report Inventories, Objective-Behavioral Tests; Values and Self concept; Projective Techniques
- Unit 4 : Theories of Personality :**
Theories : Allport's Theory, Eysenck's Biological Trait Theory. Cattell's Facto-Analytic Trait Theory, Kelly's Personal Construct Theory, Social Learning Theories of Rotter and Bandura

SUGGESTED READINGS

- Friedman and Schustak Personality: Classic Theories and Modern Research, New Delhi : Pearson Education, 2nd Ed., 2004
- Pervin-Personality : Theory and Research. New York : John Wiley 5th Ed., 2000.
- Hall, Lindzey and Campbell: Theories of Personality, Singapore : Wiley Student Edition (WSE) 4th Ed. 2004
- Five Theories of Personality, Tokyo: HRW International Edition, 2000|
- Singh, A.K. : Psychology of Personality (Hindi), Delhi : Motilal Banarasisdas,2004
- Srivastava, D. N. : Psychology of Personality (Hindi). Agra: Vinod Pustak Mandir, 2001.

EDUCATIONAL PSYCHOLOGY I

(PSY 305)

- Unit 1 Nature and Scope of Educational Psychology; Methods of Educational Psychology: Roles and Functions of teachers, characteristics of effective and successful teachers.
- Unit 2 Educational Objectives & Models: taxonomy of educational Objectives, cognitive, affective and psychomotor domain; Basic Teaching Model : psychological teaching models.
- Unit 3 Motivations, Learning and Verbal Knowledge:
Motivation : Definition of Motivation, Motivation of the students
Learning : Basic concept, Basic conditions, S. R. views and Gestalt views on learning; learning conditions and procedure.
- Unit 4 Teaching and learning of Verbal Knowledge; Nature and development of Verbal Learning conditions, Instructions in Verbal knowledge.

Books Recommended

DeCecco and Crawford : Psychology of Learning and Instruction, New Delhi, Prentice Hall of

India, 2nd Ed., 1974

Kolesnik : Educational Psychology, New York, McGraw Hill, 2nd Ed., 1970.

Thorndike and Hag: Measurement and Evaluation in Psychology and Education, New Delhi,

Wiley Eastern 4th Ed., 1976

Stanley and Hopkin : Education and Psychological Measurement and Evaluation, New Delhi,

Prentice hall, 1972.

Krik : Educating Exceptional Children, New Delhi, Oxford and IBH, 1970.

Bhargava M.: Exceptional Children ; HP Ishorn Book House, Agra, 2002

Guidance Psychology I (PSY 306)

- Unit I : **Introduction, Evaluation and Research :**
Nature of Problems : Basic movement and need of guidance.
A brief history of. Guidance movement with special reference to India
- Unit II : **Evaluation and Research :**
Need and Purpose of research and evaluation, Guidance research in India.
- Unit III : **Understanding the Individual :**
Understanding the individual : Testing and Non-Testing techniques. Testing-Intelligence tests, Personality tests, Achievement tests, Aptitude tests and Interest inventories; Non-testing-anecdotal records, biographies, observation rating inventories, interviews, cumulative records, card nature, preparation and use.
- Unit IV : **Knowing the Environment and Counselling :**
Knowing the environment: Securing and organizing information, various methods and sources, Classification I and evaluation of Information.

Books Recommended

- Miller, Carrrol, H. : Guidance Services : An introduction, Harper and Row, 1971
- Downing, Laster, N. : Guidance and counselling services : An Introduction, New York, McGraw Hill, 1968
- Traxier, A.E. and Humphreys : Guidance Services, Chiago, Science Research AssociateInc.1986
- Crites : Vocational Psychology, McGraw Hill,1967
- Kochar : Guidance and counseling in school and colleges subject plus, New Delhi,1988

Organizational Psychology - I (PSY307)

- Unit I** Organizations, management and Organizational Behaviour:
Definition, characteristics of organization, Management of Organization.
Organisational components, approaches, Perspective of management,
- Unit II** Defining organization Behaviour:
Cognitive, Behaviouristic and Social learning from work, Total quality
management, Organizational Behaviour model: Classical Bareaustic
model, Administrative management of Fayol and Urwick, Human
Resource.
- Unit III:** Organizational Influence and Control Processes:
Organizational Influence and Control: Power & Politics, Authority,
legitimacy, Compliance and obedience, Occupation stress,
Organizational conflict.
- Unit IV:** Communication and Decision Making:
Communication: Function and Process, Technology, Downward and
upward communication. Interactive communication in organizations.
Decision Making: The Nature of decision making, Decision Rationality,
Techniques, Factors affective decision making.

SUGGESTED READINGS

- Luthans: Organizational Behaviour, McGraw, Hill 2010
- Robbins,S."Organizational Behaviour, Prentice-Hall of India Pvt.Ltd., 2012.
- Katz, D. and Khan, R.L.: The Social Psychology of Organizations, Tokyo, Wiley International, Edition 2, 1976
- Nenstom & Davis: Organizational Behaviour, New Delhi: Tata McGraw

Personnel Psychology – I
(PSY308)

Unit I: Overview and Main Functions:

Psychology applied to Personnel Management :

Conceptualisation and issues; the Concept of Human Resource Development; Training and Development : Development of Human Resources; Employee and Supervisor development; Executive/Managerial development.

Unit II: Manpower Planning and Management

Definitions and Concepts; Systematic Manpower planning; Staffing requirements, policies, constraints; Personnel Appraisals: Practices, Limitations and Deficiencies, ways of Improvement; Recruitment and its sources: Guidelines, Internal and External Recruitments.

Unit III: The Job:

Job Analysis, information and Evaluation: Uses and Value of job Analysis methods of Job Analysis; Job Evaluation and Evaluation of Job evaluation; Occupational Information

Job Analysis for Supervisory and Managerial Jobs: Terms and Definitions; Job Specification; Job Analysis Information's; Comparison and Utility of Methods; The process of Job analysis.

Unit IV: The Selection Process:

Recruitment, Selection and Managerial Selection: Recruitment and Screening; Role of Policy Employee Selection : Programmes, use of testing in selection, review and evaluation;

Managerial/Executive Selection: Personnel Selection: Decision Making and Models; Criteria of Managerial Success; Effectiveness of Prediction Strategies.

SUGGESTED READINGS:

- Cascio, W.F. : Applied Psychology in Personnel Management, Prentice Hall, New Jersey (IV Edition), 1979 (Ref. : Units 1a, 1b, 2a ,2b0, 3a, 3b, 4a, 4b, 5a, 5b)
- Yodr, D.: Personnel Management and Industrial Relations, Prentici Hill of India, New Delhi (VI Edition), 1979 (Ref. : Units : 1a, 1b, 3a, 5a, 5b).
- Blum, M.L. and Naylor, J.C.: Industrial Psychology of Its Theoretical and Social Foundation, CBS Publishers, Delhi; Its India Edition, 1984 (Ref. : 2a, 2b, 3b, 4a, 5a)
- Anastasi, A. : Field of Applied Psychology, McGraw-Hill, Kogakusl Ltd., Tokyo (ii Edition), 1979, (Ref. : Unit : 5b)
- D. S. Bech; Personnel, N.Y., McGraw Hill, 1985
- M. M. Meidel: The Selection Process, Bombay, Tarapore, 1970 Dunnette, M : Handbook of Industrial and organization! Psychology, Chicago, Rand McNully, 1976
- D.B. Gilmer : Industrial Psychology. New Delhi, TMH, 1971

PRACTICALS (Semester – III):

- The students will be required to do four practical papers in all. Two practical papers will be compulsory for all, based on theory papers I and II of the semester. The other two
- practical papers will be based on the papers of the optional group that the student opts for.
- Atleast 3-4 practicals based on the content of the relevant theory papers are to be done by the students.

Skill III (PSY317) Self and Positive Psychology

- UNIT I:** Introduction
Concept of self and personal growth.
Sources of self knowledge, positive psychology.
- UNIT II:** Subjective well being
The science of Happiness and life satisfaction.
- UNIT III:** Resilience in Development
History, conceptual models of resilience,
Fostering resilience, future directions for resilience research.
- UNIT IV:** The Social Construction of Self esteem.
Experience of self esteem; Self Efficacy: Introduction, source of self efficacy, Importance of self efficacy.

SUGGESTED READINGS:

- Bayer, B.M. and Shotton, J.S. (1997). *Reconstructing the Psychological Subject*. London : Sage.
- *Hand book of Positive Psychology*; Snyder C.R., Lopez Shane J. 2005, Oxford University Press.
- Andrews, F.M., & Robinson, J.P. (1992) Measures of subjective well-being. In J.P. Robinson, P.R. Shaver, & L.S. Wrightsman (Eds.) *Measures of Personality and social psychological attitudes* (pp. 61-114). San Diego, CA : Academic Press.
- Andrews : F.M., & Withey, S.B. (1976). *Social indicators of well-being*. New York : Plenum Press.
- Argyle, M. (1987). *The Psychology of happiness* London : Methuen.
- Campbell A, Converse, P.E. & Rodgers, W.L. (1976). *The Quality of American Life*. New York. Russell Sage Foundation.
- Costa., P.T., & McCare, R.R. (1988). Personality in adulthood : A Six year longitudinal study of self-reports and spouse rating on the NEO personality Inventory. *Journal of Personality and Social Psychology*, 54, 853-863.
- Diener, E. (1984). Subjective well-being. *Psychological Bulletin*, 93, 542-575.
- Diener, E. (2000a) Subjective well-being : The Science of happiness and a proposal for a national index. *American Psychologist*, 55, 34-43.

- Diener, E. & Diener C (1996), C. (1996) Most people are happy. *Psychological Science* 7, 181-185.
- Diener, E. & Diener, M. (1995). Cross cultural correlates of life satisfaction and self-esteem. *Journal of Personality and Social Psychology*, 68, 653-663.
- Diener, E. Emmons, R.A., Larsen, R.J. & Griffen S. (19885). The Satisfaction with Life Scale *Journal of Personality Assessment*, 49, 71-75.
- Emmons, R.A. (1986). *Personal Strivings : An approach to personality and subjective well-being*

M.A.SEMESTER IV

Social Psychology II (PSY401)

- Unit I: Group and Individuals:**
Nature and Function, social facilitation, group values and group world, group dynamics; Decision making and commitment, group cohesiveness: nature, factors and effects.
- Unit II: Leadership and Performance:**
Leadership characteristics, types and functions of , power, theories of leadership.
- Unit III: Social Problems and Social Change:**
Social problems: meaning and types - poverty, problems of deprivation, population explosion. Solution of social problems, social change – sanskritization, westernization and modernization.
- Unit IV: Environment and Social Behaviour:**
Environment and Human Behavior : Crowding and urbanization, environmental stresses, health related behavior, coping with stress and promoting health and wellness.

SUGGESTED READINGS

- Brown, R. (2000), Group Processes : Dynamics within and between groups. 2nd edition, Blackwell Publishers.
- Hastie, R. and Stasser, G. (2000). In Reis H.T. and Gudd C.H. (Eds). Handbook of Research Methods in Social and Personality Psychology. Cambridge University.
- Higgins, E.T. and Kruglansk A.W. (1996) Social Psychology Handbook of Basic Principles. Guilford Press, New York. London.
- Mamson and Harvey (2002). Attribution in Close Relationships. Cambridge University Press.
- Myers, D. G (1996) Social Psychology, International Edition Fifth Edition.
- Aronson, E. Ellsworth, P. , Calsmith, J.M. & Gonzales, M.H. (1990). Methods of Research in Social Psychology. NY : McGraw Hill.
- Farr, R.M. (1996). The Roots of Modern Social Psychology. Oxford : Blackwell.
- Ruscher, J.B. (2001) Prejudiced Communication : A Social Psychological Perspective. New York : The Guilford Press.
- Semin, G.R. and Fiedler, K. (1996). Applied Social Psychology Sage Publications, Delhi.
- Vago, S. (1990) Social Change, New Jersey : Prentice Hall.

**PSYCHOLOGICAL TESTING II
(PSY402)**

- Unit 1 Theories of Trait organization : Spearman :Thrustone, Cattell, Guilford,Gardner and Strenberg, Emotional Intelligence-Concept and Measurement.
Personality Testing : Self-Report, Personality Inventories : MMPI, CPI, EPPS, MBTI, 16 PF, NEO-PiR.
- Unit 2 Projective Techniques : Association, Completion Construction and Expression Techiques, TAT, Rorsharch, Measuring interests and values.
- Unit 3 Applications of Testing and Issues
Educational Testing : Educational Achievement Test, General Achievement Batteries, Teacher's made Achievement Tests.
- Unit 4 Occupational Testing: Industrial and Organizational
Assessment : Personnel Assessment and Selection Occupational use of Tests, Job analysis and Job Performance.

Books Recommended

- Anastasi & Urbina : Psychology Testing, New Delhi : Prentice Hall of India. New Delhi :
Pearson Education, 7th Ed., 2004.
- Gregory Psychology Testing : History, Principle and Application. New Delhi: person
Education,4th Ed.,2005
- Freema : Theory and practices of Psychological Testing. New Delhi: Oxford & IBH 3rd,
Ed.
2001.
- Singh, A.k. : Tests Measurement and Research methods in Behaviour Sciences. New
Delhi :
Bharti Bhawan 2nd, ED., 2002.
- Bhargava, M.: Modern psychological Tests and Measurements (Hindi). Agra: H.P.
Bhargava
Book House, 15th Ed., 2006.
- Guilford : Psychometric Methods, New Delhi : Tata McGraw Hill, 1984

Clinical Psychology II (PSY403)

- Unit I : Psychotherapy : Definition , Objectives, Types of Psychotherapy .
Freudian Psychoanalytic
Therapy – Objectives , Steps, Merits, Limitations Behaviour therapy –
Methods and applications.
- Unit II : Existential – Humanistic Therapy : Carl Rogers person Centered therapy,
Gestalt therapy, BeR's Cognitive Therapy, Ellis Rational Emotive
Therapy.
- Unit III : Positive Psychology : Definition, Origin , Methods and applications of
Positive Psychology. Three pillars of Positive Psychology.
Forgiveness, Gratitude Empathy.
- Unit IV : Health Psychology
Introduction : Definition , Origin and development . Objective and
applications of health psychology. Stress: The Modern Concept ,
stressors : Environmental, social Psychological.

सिंह, ए के (2008) : आधुनिक नेदानिक मनोविज्ञान,

मोतीलाल बनारसी दास, : आधुनिक नेदानिक मणोवी मनोविज्ञान, जनरल बुक
एजेसी , पटना

दिल्ली सुलेमान, मुहम्मद

एव कुमार, दिनेश (2006)

List of Practical's

1. Mental Health Scale
2. Ravens standard Matrices
3. Rorschach INR Blot Test
4. TAT
5. Preparation of case histories
6. Psychological well being scale
7. Mindful Attention Awareness scale
8. Quality of life Inventory (QOLI)

Books Recommended

Korchin , S.I. : Modern Clinical Psychology, Toryo , Harper International Edition 1976.

Wolman : Handbook of Clinical Psychology, New York , Mc Graw Hill 1965

Carr, A (2008) : Positive Psychology : The science of happiness and human strength.
New Delhi : Rout ledge.

Peterson, C (2006), A Primer in Positive Psychology. New York : oxford university
Press.

Dimatteo , M.R. & Martin, L.R. (2007).

Health Psychology. New Delhi, Pearson Education Tnc. , & Doling Kindersley
Publishing, Inc.

Health Psychology (PSY 404)

- Unit 1 Health and well being: Concept and indicators, medical and bio-psycho social models of Health cross cultural perspectives on health, goals of health psychology, approaches to health.
- Unit 2 Health Behaviour : Role of behavioral factors in disease and disorder : Changing health habits; Models and approaches to health behavioural change – Cognitive, behavioral and social engineering approaches and transtheoretical model.
- Unit 3 Health problems and their cognitive representation: General and chronic health problems: Causal factors and explanations. Stress born health problems; coping strategies
- Unit 4 Management of health problems: Preventive, Promotive and curative aspects of health; choice of medicinal systems ; patient doctor relationship, treatment adherence, alternative medicines.

Books Recommended

1. Baum, A. Gatchel , R.J. ,& Krantz , D.S. (1997). An introduction to health psychology. New York : MC Graw Hill.
2. DiMatteo , M.R & Martin L.R. (2002). Health psychology. Boston : Ailyn & Bacon.
3. Radley , M (1994). Health psychology: Bio Psycho – Social integration. New York: John Wiley
4. S.S. Mathur, Dr Anju Mathur Swasthya Manourigyan

EDUCATIONAL PSYCHOLOGY II
(PSY405)

- Unit 1 Concepts, principle, Problem solving and Creativity Learning of Concepts and Principles; Nature of concept formation, Teaching of concepts and principles.
- Unit 2 Problem solving and Creativity: Nature of problem solving and creative thinking, Instructions for creativity and problem solving.
- Unit 3 Teaching of Individual Difference: Individual Differences in Intelligence and Personality.
Individual difference and educating exceptional children, problem of behavior deviants, special education
- Unit 4 Educational Innovations and Research Evaluation: Educational Innovation : Programmed Instructions, Instructional media.

Books Recommended

DeCecco and Crawford : Psychology of Learning and Instruction, New Delhi, Prentice Hall of India, 2nd Ed., 1974

Kolesnik : Educational Psychology, New York, McGraw Hill, 2nd Ed., 1970.

Thorndike and Hag: Measurement and Evaluation in Psychology and Education, New Delhi,

Wiley Eastern 4th Ed., 1976

Stanley and Hopkin : Education and Psychological Measurement and Evaluation, New Delhi,

Prentice hall, 1972.

Krik : Educating Exceptional Children, New Delhi, Oxford and IBH, 1970.

Bhargava M.: Exceptional Children ; HP Ishorgn Book House, Agra, 2002

Guidance Psychology II (PSY406)

- Unit I : Counseling : Nature and theories of Counselling, directive, non-directive and elective approach ; use and limitation of test in counselling; counselling process; diagnosis in counselling, counselling interviews and professional competence of counselor.
- Unit II : Placement and Follow-up :
Placement: Importance of placement service, placement at various levels, educational and vocational placement Follow-up : Need of follow-up, procedures, instruments and techniques.
- Unit III : Areas of Guidance : Educational, Vocational and Social-personal
Educational guidance: Importance and nature of guidance at various levels; Various guidance personnel in school, career masters, their qualifications.
- Unit IV : Vocational guidance : Theories of Vocational choice, procedures in vocational guidance, vocational counseling, informational collection and dissemination Social and personal guidance : Adjustment, nature of adjustment, motivation, conflict and frustration, Special problems of guidance. Handicapped and gifted children and their adjustment problems.

Books Recommended

- Miller, Carrol, H. : Guidance Services : An introduction, Harper and Row, 1971
- Downing, Laster, N. : Guidance and counselling services : An Introduction, New York, McGraw Hill, 1968
- Traxier, A.E. and Humphreys : Guidance Services, Chiago, Science Research Associate Inc. 1986
- Crites : Vocational Psychology, McGraw Hill, 1967
- Kochar : Guidance and counseling in school and colleges subject plus, New Delhi, 1988

Organizational Psychology – II (PSY407)

Unit I: Leadership

Decision Making: The Nature of decision making, Decision Rationality, Techniques, Factors affective decision making.

Leadership: The nature, function and theories of leadership, contemporary issues in leadership.

Unit II Organizational effectiveness:

The definition of the efficiency, efficiency and effectiveness, criteria of organizational effectiveness- Behavioural and motivational requirements.

Unit III : Organizational culture:

Meaning, nature, functions, creating and maintaining a culture.

Unit IV: Organizational Change:

The changes facing organizations, forces of change, resistance of change and approaches to managing organizational changes. Contemporary changes issues for today.

SUGGESTED READINGS:

Luthans: Organizational Behaviour, McGraw, Hill 2010

Robbins,S.”Organizational Behaviour, Prentice-Hall of India Pvt.Ltd., 2012.

Katz, D. and Khan, R.L.: The Social Psychology of Organizations, Tokyo, Wiley International, Edition 2, 1976

Nenstom & Davis: Organizational Behaviour, New Delhi: Tata McGraw

Personnel Psychology II (PSY408)

- Unit – I Training and Placement :**
Concept and Training Design: Training and Learning; Training;
Evaluation of Effectiveness/ Outcomes; Classification and Placement
Testing in Organisations : Introduction; Types of tests; Views, Attitudes
and practices; Overview and Evaluation of testing in selection, device.
- Unit – II Personnel Testing for Measuring Difference:**
Nature of Measurements; Scales Psychological Measurements and their
criteria for evaluation; Nature of measuring procedures; Interpreting
Results of Measurement Procedures; Reliability and Validity of
Measures.
- Unit III: Maintenance and Progress:**
Effect of Attitudes and Behaviour on outcomes; Commitment & Morale;
Employment communications; Reward/Punishment and Benefit systems.
- Unit IV. Counselling, career Planning and Development;**
Work and Role of Counsellor; Using tests in counselling; Using
occupational information; Evaluating counselling, effectiveness;
Developing Employee and Managers
Career and its management: Definitions, Career ladders, Career Systems,
Career Paths, and Career Planning. Career Development : Occupations :
Decisions; Development.

SUGGESTED READINGS

- Cascio, W.F. : Applied Psychology in Personnel Management, Prentice Hall, New Jersey (IV Edition), 1979 (Ref. : Units 1a, 1b, 2a, 2b, 3a, 3b, 4a, 4b, 5a, 5b)
- Yodanis, D. : Personnel Management and Industrial Relations, Prentice Hall of India, New Delhi (VI Edition), 1979 (Ref. : Units : 1a, 1b, 3a, 5a, 5b).
- Blum, M.L. and Naylor, J.C.: Industrial Psychology of Its Theoretical and Social Foundation, CBS Publishers, Delhi; Its India Edition, 1984 (Ref. : 2a, 2b, 3b, 4a, 5a)
- Anastasi, A. : Field of Applied Psychology, McGraw-Hill, Kogakusha Ltd., Tokyo (ii Edition), 1979, (Ref. : Unit : 5b)
- D. S. Bech; Personnel, N.Y., McGraw Hill, 1985
- M. M. Meidel: The Selection Process, Bombay, Tarapore, 1970 Dunnette, M : Handbook of Industrial and organization! Psychology, Chicago, Rand McNally, 1976
- D.B. Gilmer : Industrial Psychology. New Delhi, TMH, 1971

Internship (Semester - IV):

The students will be required to undertake training/render services in institutions/organisations relevant to their opted group of specialization as paper V of their fourth semester. At the end of training/services they will have to present a report of the work done by them. Viva shall be conducted for internship done.

Skills IV (PSY 415)

Life Skills

- Unit I** Intelligence – Nature and Types; Concept and Measurement of IQ, emotional intelligence.
- Unit II** Communication – Meaning and basic process, barriers to effective communication.
- Unit III** Empathy and healthy relationships
- Unit IV** Stress and relaxation

SUGGESTED READINGS:

- Katz, D. and Khan, R.L.: The Social Psychology of Organizations, Tokyo, Wiley International, Edition 2, 1976
- Ruscher, J.B. (2001) Prejudiced Communication: A Social Psychological Perspective. New York : The Guilford Press.
- Semin, G.R. and Fiedler, K. (1996). Applied Social Psychology Sage Publications, Delhi
- Morgan and King: Introduction to Psychology.
- Baron.A.Robert: Psychology; Pearson Education.

SYLLABUS

MASTER OF ARTS

PUBLIC ADMINISTRATION

M.A.

(Under the Choice Based Credit System) 2017-18



JAI NARAIN VYAS UNIVERSITY

JODHPUR

IMPORTANT

With a view to bring about greater reliability, validity and objectivity in the examination system and also for closer integration of teaching, learning and evaluation.

- (i) The syllabus has been divided into units. Questions will be set from each unit with provision for internal choice.
- (ii) In order to ensure that the students do not leave out the important portion of the syllabus, examiners shall be free to repeat the questions set in the previous examinations.

(Ref. Resolution No. 21 (c) of Academic Council dated 9.2.84)

The examinees be permitted to use their personal transistorized pocket battery operated calculators in the examinations. The calculator to be used by the candidates in the examinations should not have more than 12 digits, 6 functions and 2 memories and should be noiseless and cordless. A Calculator belonging to one candidate shall not be allowed to be used by another candidate. The Superintendent of the centre will have complete discretion to disallow the use of a calculator which does not conform to the above specification.

(Ref. Resolution No. 6/90 of Academic Council dated 20th July, 1990)

In Engineering and any other examinations where the use of calculators is already permitted, it shall remain undisturbed.

NOTIFICATION

In compliance of decision of the Hon'ble High Court all students are required to fulfill 75% attendance rule in each subject and there must be 75 % attendance of the student before he/she could be permitted to appear in the examination.

**REGISTRAR
(Academic)**

SYLLABUS

MASTER OF ARTS

PUBLIC ADMINISTRATION

M.A. (Semester System), 2017-18



JAI NARAIN VYAS UNIVERSITY

JODHPUR

GUIDELINES FOR CHOICE BASED CREDIT SYSTEM

Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete **four skill courses:** two within the Department and two from other Department within JNV University or the Universities approved by J.N.V. University
3. **Course:** Usually referred to, as 'papers' is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period of teaching (lecture or tutorial) or two periods of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.
12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/ December and even semester from December/January to May.
Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May.
13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Arts, Education & Social Sciences resolves the following:

- a. All internal assessments shall on term test and seminar. Attendance shall carry the prescribed marks in all papers.
- b. In each semester two out of four theoretical components of the University examinations shall be undertaken by external examiners from outside J.N.V. University, who may be appointed by the competent authorities.

Grievances and Redressal Mechanism

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head of the Department as the case may be clearly stating in writing the reason(s) for the complaint / appeal.
- b) The appeal will be assessed by the Chairman and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Dean, Faculty of Arts, Education & Social Sciences comprising of the HOD of the concerned Department and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	'O'	Outstanding	10
2	'A+'	Excellent	9
3	'A'	Very Good	8
4	'B+'	Good	7
5	'B'	Above Average	6
6	'C'	Average	5
7	'P'	Pass	4
8	'F'	Fail	0
9	'Ab'	Absent	0

- i. A student obtaining Grade F in a paper shall be considered failed and will be required to reappear in the University End Semester examination.

- ii. For noncredit courses (Skill Courses) ‘Satisfactory’ or ‘Unsatisfactory’ shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

- = and > 95 % marks Grade Point 10.0
- 90 to less than 95 % marks Grade Point 9.5
- 85 to less than 90 % marks Grade Point 9.0
- 80 to less than 85 % marks Grade Point 8.5
- 75 to less than 80 % marks Grade Point 8.0
- 70 to less than 75 % marks Grade Point 7.5
- 65 to less than 70 % marks Grade Point 7.0
- 60 to less than 65 % marks Grade Point 6.5
- 55 to less than 60 % marks Grade Point 6.0
- 50 to less than 55 % marks Grade Point 5.5
- 45 to less than 50 % marks Grade Point 5.0
- 40 to less than 45 % marks Grade Point 4.5
- 35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,
i.e.

$$\text{SGPA (Si)} = \frac{\sum (C_i \times G_i)}{\sum C_i}$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,
i.e.

$$\text{CGPA} = \frac{\sum (C_i \times S_i)}{\sum C_i}$$

where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.

- iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	6	B	6	6 x 6 =36
2	Course 2	6	B+	7	6 X 7 =42
3	Course 3	6	B	6	6X 6 = 36
4	Course 4	6	O	10	6 X 10 =60
	Total	24			36+42+36+60=174

Thus, $SGPA = 174/24 = 7.25$

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	7.25	7.25	7	6.25

$CGPA = (24X 7.25 + 24X7.25 + 24 X 7+ 24 X 6.25)/ 96$

$$666/96 = 6.94$$

Semester-wise Theory Papers/Practical / Skill component

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Semester I							
Core course 1	PUB 101		6-0-0	6	30	70	100
Core course 2	PUB 102		6-0-0	6	30	70	100
Core course 3	PUB 103		6-0-0	6	30	70	100
Core course 4	PUB 104		6-0-0	6	30	70	100
*Skill Course I	As per the list		2-0-0				
Total				24	120	280	400
Semester II							
Core course 5	PUB 201		6-0-0	6	30	70	100
Core course 6	PUB 202		6-0-0	6	30	70	100
Core course 7	PUB 203		6-0-0	6	30	70	100
Core course 8	PUB 204		6-0-0	6	30	70	100
*Skill course II	As per the list		2-0-0				
Total				24	120	280	400
Semester III							
Core course 9	PUB 301		6-0-0	6	30	70	100
Core course 10	PUB 302		6-0-0	6	30	70	100
Discipline Specific Elective/s 1	Elective papers		6-0-0	6	30	70	100
Discipline Specific Elective/s 2	Elective papers		6-0-0	6	30	70	100
*Skill course III	As per the list		2-0-0				
Total				24	120	280	400
Semester IV							
Core course 11	PUB 401		6-0-0	6	30	70	100
Core course 12	PUB 402		6-0-0	6	30	70	100
Discipline Specific Elective/s 3	Elective paper		6-0-0	6	30	70	100
Discipline Specific Elective/s 4	Elective paper		6-0-0	6	30	70	100
*Skill course IV	As per the list		2-0-0				
Total				24	120	280	400

***The Department shall offer one skill course per semester from the list of skill courses approved for the Department.**

In view of the course content, the Department of Public Administration distributed the Periods between Theory/Tutorial/~~Practical~~ as under per paper

- 6: 0 : 0 (six lectures only (no tutorial and no practical) per week) – For Theory
- 2+0+0 (two lectures) - For Skill course

The Duration of the Period shall be forty five minutes. In each of these combinations, the first value stands for the same number of lecture instructions per week.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective) involve an evaluation system of students that has the following two components:-

- (i) **Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
 - (ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.
- (i) **Continuous Comprehensive Assessment (CCA):** This would have the following components:
 - a. **Term Test:** One term test shall be arranged for each paper prior to End-Semester Examination; examination duration shall be of three hours; maximum marks shall be 60 (reduced to 15).
 - b. **Seminar:** Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 40 (reduced to 10). The seminar shall be completed prior to term test for all the papers.
 - c. **Classroom Attendance** – Each student will have to attend a minimum of 75% Lectures / Tutorials / Practicals. A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE). Attendance marks will be awarded by following the system proposed below:

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

75% to 80%	=	1 mark
81% to 85%	=	2 marks
86 to 90%	=	3 marks
91% to 95%	=	4 marks
96% and above	=	5 marks

Note : Compensation in classroom attendance of a student will be as per prevalent University rules.

Each student's cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Arts, Education & Social Sciences.

- d. CCA is based on open evaluation system without any bias to any student.
- e. Any grievance received in the Department from student shall be placed before the **Grievance Redressal Committee** with adjudicated comments

Each component marks will be added making it rounding as per norms.

Marking Scheme of Continuous Comprehensive Assessment (CCA)

Components	Maximum Marks	Reduced and Original Marks
Term Test	60	(reduced to 15)
Seminar	40	(reduced to 10)
Classroom Attendance	05	05
Total Marks of CCA	100	30

Note : Classroom Attendance marks will be as follows :-

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

Percentage	Marks
75% to 80%	1 mark
81% to 85%	2 marks
86 to 90%	3 marks
91% to 95%	4 marks
96% and above	5 marks

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective Department shall declare the result as “Satisfactory” or “Non-Satisfactory”; each student need to get a minimum of three “Satisfactory” declaration for the course completion

For the Term test and ESE:

Part A

Ten questions (Definitions, illustrations, functions, short explanations, etc; 25-50 words) for one mark each. $10 \times 1 = 10$ marks; comprising questions from each Unit; no choice in this part

Part B

Four questions of long/explanatory answer (500 words) type, one drawn from each Unit; with internal choices : $4 \times 15 = 60$ marks.

10+60 = 70 marks

Qualifying for Next semester

- 1. A student acquiring minimum of 40% in total of the CCA is eligible to join next semester.**
- 2. A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as ‘Fail’), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.**
- 3. A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time, i.e. three additional chances for each paper; the student is ineligible for the Postgraduate**

degree in the Subject in which he/she is admitted, for additional chances examination fee shall be on additive basis.

Improvement Option:

Every student shall have the opportunity to improve Credit through University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final.

Result Declaration:

The ESE (End Semester Examination/University Examination) results shall be declared within twenty days of the last examination. The Theory Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation.

POST -GRADUATE COURSE: A DESCRIPTION

The full course is of FOUR SEMESTERS spread for TWO YEARS duration. A semester-wise list of courses to be offered is given below. In each paper there will be four unit.

SEMESTER I

SEMESTER II

SEMESTER III

Elective paper group – First – Semester III
Elective paper group – Second – Semester III

SEMESTER IV

Elective paper group – First – Semester IV
Elective paper group – Second – Semester IV

Skill Courses in the respective subject

Electives would be discipline centric and only students from concerned departments can register.

ADMISSION

The minimum qualification for admission to M.A. Course is Graduate Degree. The details of eligibility conditions and admission procedure will be as per University rules. The candidates are required to attend minimum of a 75% of classes.

TEACHING AND EXAMINATION SCHEME

Per Semester

Course	Periods/Week	Examination hours	CCA	ESE	Total
Theory Papers					
Course I	6	3	30	70	100
Course II	6	3	30	70	100
Course III	6	3	30	70	100
Course IV	6	3	30	70	100

UNIVERSITY EXAMINATION

Each course paper shall be of three hours duration.

Note: The number of elective to be taught from each group in a particular year shall be decided by the Department. Electives offered will be announced at the beginning of the academic session. Each student shall be assigned one Elective Paper from Group ONE and the second from Group TWO. Elective papers will be allotted on merit-cum-choice basis as far as possible. In the odd semester two skill courses will be those offered by the respective departments in the even semester skill courses will be from other departments.

SCHEME OF EXAMINATION FOR M.A. PUBLIC ADMINISTRATION (SEMESTER SYSTEM) FOR THE EXAMINATION

INSTRUCTIONS FOR THE PAPER SETTERS AND THE STUDENTS

Max. Marks - 70
Min. Marks – 25

Duration – 3 hours

Note :

- (i) There shall be 9 questions in all. Five questions have to be attempted.
- (ii) The first question shall be short answer type containing 10 short questions spread over the whole syllabus to be answered in about 30 words each. It shall carry 10 marks and shall be a compulsory question.
- (iii) Rest of the paper shall contain 8 questions with internal choice. The entire syllabus has been divided into four units. Each unit shall have two questions and the candidates shall be given internal choice i.e. the candidate shall attempt one question from each unit.

SEMESTER I

THEORY PAPERS (Four Core Papers)	ESE	CCA	Total	Lecture- Tutorial- Practical/ Week	Credits
Paper I : PUB 101	70	30	100	6-0-0	6
Paper II : PUB 102	70	30	100	6-0-0	6
Paper III : PUB 103	70	30	100	6-0-0	6
Paper IV : PUB 104	70	30	100	6-0-0	6

Skill Course Basics in Public Administration

Grand Total 400 marks

24 credits

SEMESTER – FIRST

COURSE NO. PUB ADM – 101

Principles of Public Administration

- Unit I Meaning, nature, scope and importance of Public Administration, Politics and Administration. New Public Administration.
- Unit II New Public Management Perspective Public and Private Administration Organisation: Meaning, Formal and Informal Organisation.
- Unit III Bases of Departmental Organisation, Hierarchy, span of control, Unity of Command, Authority and Responsibility.
- Unit IV Coordination, Supervision, Centralisation and Decentralisation, Chief Executive, Line and Staff Agencies.

Prescribed Readings:

Sharma M.P: Public Administration: Theory and Practice

Bhambari C.P. Public Administration

Awasthi & Maheshwari: Public Administration (Hindi and English)

Sharma R.D. : Advanced Public Administration

COURSE NO. PUB. ADM. – 102

Administrative theories of Public Administration

- Unit I Scientific Management theory of organization, The Bureaucratic theory of organization, Classical theory.
- Unit II The Human Relations Theory, Behavioral Approach, Systems Approach, Communication Approach.
- Unit III Decision making theory, Theories of leadership, Motivation theories.
- Unit IV Public Policy Process, Policy Making model, Role of Civil Society, Right to Information and Citizen's Charter.

Prescribed Readings:

White, : Introduction to Public Administration

Sharma M.P. : Public Administration: Theory and Practice

Rumki Basu: Public Administration: Concept and theories

Awasthi and Maheshwari: Public Administration (Hindi and English)

COURSE NO. PUB. ADM. – 103

Comparative Public Administration

- Unit I Concept of Comparative Public Administration. Nature, Scope and Importance of Comparative Public Administration Evolution of Comparative Public Administration.
- Unit II Features of Developed and Developing Societies Administration. Approaches to the study of comparative Public Administration.
- Unit III Weber's Typology of Authority and Administrative system with particular reference to the Ideal Type Bureaucratic Model.
- Unit IV F.W. Rigg's Contribution with particular reference to prismatic society and sala model, F.W. Rigg's views on Development.

Prescribe Readings:

Arora, Ramesh K: Comparative Public Administration (Hindi and English)

Chaturvedi T.N. : Tulnatmak Lok Prashasan

Verma, S.P. and Khanna: Comparative Public Administration.

COURSE NO. PUB. ADM. – 104

Comparative Administration System

- Unit I Salient features of Administrative System of U.K., Characteristic of Administrative system of U.S.A and France.
- Unit II Comparative study of Political Executive, British Prime Minister: Power and Position. American President Power and Position. French President: Power and Position.
- Unit III Organisation and functions of Treasury of U.K., State Department of U.S.A., Ombudsman of Sweden.
- Unit IV Organisation and functions of Council of State in France, Independent Regulatory Commission of U.S.A. Concept of Administration Development.

Prescribed Readings:

Ferril Heady: Public Administration : A Comparative Perspective

Verma S.P. and Khanna: Comparative Public Administration

Arora, Ramesh K.: Comparative Public Administration (Hindi and English)

Chaturvedi, T.N.: Tulnatmak Lok Prashasan

THEORY PAPERS (Four Core Papers)	SEMESTER II			Lecture- Tutorial- Practical/ Week	Credits
	ESE	CCA	Total		
Paper V : PUB 201	70	30	100	6-0-0	6
Paper VI : PUB 202	70	30	100	6-0-0	6
Paper VII : PUB 203	70	30	100	6-0-0	6
Paper VIII : PUB 204	70	30	100	6-0-0	6
Grand Total 400 marks					24 credits

Skill Course – Basics in Administration and State

SEMESTER – II

COURSE NO. PUB. ADM. 201

Public Personnel Administration

- Unit I Meaning, Nature and Scope of Public Personnel Administration
Development and Significance of Public Personnel Administration.
- Unit II Administration and Policy making, Professionalization of Civil
Service. Integrity in Administration. Concept of Ethic in Public
Services.
- Unit III Administrative Culture, Bureaucracy and Environment Political,
Social and Economic Aspects of Environment.
- Unit IV General Characteristic of Public Personnel Administration of U.S.A.,
U.K. and France.

Prescribed Readings:

Goel, S.J. Public Personnel Administration

Sinha, V.M. Public Personnel Administration (English and Hindi)

Jain, R.B. (ed): Aspects of personnel Administration

Jain. C.M. : Sevavargiya Prashasan

COURSE NO. PUB. ADM. 202

Contemporary Issues in Public Personnel Administration

- Unit I Organisation and working of Central Personnel Agencies in U.S.A., U.K. and France Recruitment and Training of Public Personnel Administration.
- Unit II Development of merit system. Importance of Recruitment and Need for Central personnel Agencies. Methods of recruitment in U.S.A., U.K. and France.
- Unit III Importance and types of Training Institutions in U.S.A., U.K. and France Training techniques, Promotion: Seniority versus merit.
- Unit IV Salary, Service Conditions and Service Rules in Personnel Administration. Disciplinary Procedures, Political Rights of Civil Servants in U.S., U.K., and France Management of Staff Relations.

Prescribed Readings:

Stal, O. Glenn: Public Personnel Administration

Goel, S.L. : Public Personnel Administration

Sinha, V.M. Public Personnel Administration (Hindi and English)

Jain, C.M. : Sevavargiya Prashasan.

COURSE NO. PUB. ADM. 203

Public Administration in India

- Unit I Evolution of Indian Administration Kautilya, Mugal Period and British Legacy.
- Unit II Constitutional Framework: Value Premises of the Constitution. Parliamentary Democracy, Federalism, Planning, National Human Rights Commission.
- Unit III Union Government and Administration President, Prime Minister and Council of Ministers, Cabinet Committee.
- Unit IV Cabinet Secretariat Prime Minister's office, Central Secretariat, Major Ministries and Departments.

Prescribed Readings:

Maheshwari, S.R. : Indian Administration

Ashok Chandra : Indian Administration

Parmatma Sharan : Public Administration in India

Hoshiar Singh & Mohendra Singh : Public Administration in India

COURSE NO. PUB. ADM. 204

Major Issues and Personnel Administration in India

- Unit I Problems of Central State Relations, Relationship between Political and Permanent Executive. Generalist and Specialist in Administration. Law and order Administration
- Unit II Public Services All India Services Central Services, Union Public Service Commission Training in the Changing Context of Governance.
- Unit III Changing nature of Indian Administration in the Context of Economic Reforms Administrative reform Since independence Reports of the Administration Reforms Commission.
- Unit IV Impact of Information Technology on Public Administration. Indian Administration and Globalisation Role of District Collector in the Law and order and Development Management.

Prescribed Readings:

Maheshwari, S.R. : Indian Administration

Hoshier Singh and Mohendra Singh : Public Administration in India

Ashok Chandra : Indian Administration

Arora and others : Indian Administrative System

SEMESTER III

THEORY PAPERS (Core/Elective Papers)	ESE	CCA	Total	Lecture- Tutorial- Practical/ Week	Credits
Paper IX : PUB 301	70	30	100	6-0-0	6
Paper X : PUB 302	70	30	100	6-0-0	6
Paper XI : PUB 303 Any one of the following	70	30	100	6-0-0	6
303(a)				International Organisation and Administration	
303(b)				Urban Local Administration	
Paper XI : PUB 304 Any one of the following	70	30	100	6-0-0	6
304(a)				State Administration in India With Special reference to Rajasthan	
304(b)				Rural Local Administration	

Skill Course Introduction to field work in Local Self Government

Grand Total 400 marks

24 credits

SEMESTER - III

COURSE NO. PUB. ADM. 301

Administrative Thought

- Unit I Administrative Thought of Kautilya, Confucius and Woodrow Wilson.
- Unit II Bureaucratic theory of Max Weber, Scientific Management Theories of Fayol, Luther Gulick and Urwick.
- Unit III Administrative Thought of Chester I Barnard; Formal and Informal Organisation, Satisfaction, Equilibrium, Authority and Communication.
- Unit IV Human Relations Theory : Fritz j. Roethlisberger and Elton Mayo Hawthorne Study.

Prescribed Readings:

R. Prasad and others : Administrative Thinkers

S.S. Ali : Eminent Administrative Thinkers

Ziuddin Khan and Verma : Prashasnik Vicharadharen Vol. I, II

Jarnes C. Charlesworth : Theory and Practice of Public Administration

COURSE NO. PUB. ADM. 302

Financial Administration in India

- Unit I Introduction of Financial Administration Importance of Finances in Administration Constitutional Provisions relating to Finance Administration.
- Unit II Central State Finance relations, Finance Commission, Organisation, Functions and Role, Ministry of Finance in India: Organisation, Functions and role.
- Unit III Budget : Meaning, Characteristic and Importance of Budget. Budget Techniques Line Item Budget, Performance Budget, PPBS and Zero Based Budget.
- Unit IV Budgeting formulation in India Budgetary Procedure in Parliament. Execution of Budget, Deficit finance and Public Debt.

Prescribed Readings:

M.J.K. Thavaraj : Financial Administration in India

P.K. Ghosh : Public Enterprises in India

darsky: The Politics of Budgetary Process

ELECTIVE PAPER

COURSE NO. PUB. ADM. 303

International Organisation and Administration

- Unit I Evolution of Internationalism. Development of International Institutions characteristic of present Community of state pacific methods for settlement of International disputes.
- Unit II League of Nations : Origin, Structure, Functions of various organs, appraisal, causes of decline and contribution.
- Unit III U.N. : Formation of Charter, Purposes, Principles, membership, various organs of U.N.: General Assembly, Security Council, Economic and Social Council, International Court of Justice, U.N. secretariat, Role of Secretary General.
- Unit IV A Critical appraisal of U.N., U.N. Special Agencies : Organisation and working of I.L.O., UNESCO, F.A.O. and W.H.O.

Prescribed Reading :

Claude, Eagleton : International Government

Ohodrich : The United Nations

Roy, M.P. : Antarrashtriya Sangthan

Leonard : International Organisation

OR

COURSE NO. PUB. ADM. 303

Urban Local Administration

- Unit I Urban Administration: Scope and Importance General features of Urban Local Administration of U.S.A., U.K., France and India.
- Unit II Structure of Urban Local administration: U.S.A.; Major Council plan, Commission plan and City manager plan U.K.: Metropolitan Counties, Non Metropolitan Counties.
- Unit III France : The Municipal Council Local Bodies in India: Municipal cooperation's, municipal council and municipalities. Functions of Local Bodies.
- Unit IV City Government of London, Paris and Newyork, Municipal Corporation of Calcutta, Bombay and Delhi. Town planning and UIT.

Prescribed Reading:

R Agarwal : Municipal Govlernment in India

Munro : The Government of Amrican cities

Hermon Fonar : English Local Government

Nigam, S.R. : Local Self Government

COURSE NO. PUB. ADM. 304

State Administration in India with Special reference to Rajasthan

- Unit I General Background of state Administration History of state Administration in Rajasthan Constitutional Structure of state Government.
- Unit II The office of Governor : Power and role of state Administration. The Office of Chief Minister : Powers, Functions and Position, Council of Minister at state level.
- Unit III Organisation and working of state secretariat, Role of Chief Secretary Department of Home and Finance of Rajasthan: Organisation and functions organisation and working of Revenue Board.
- Unit IV Recruitment of Civil Services in Rajasthan, Organisation and working of Rajasthan Public Service Commission. Training of R.A.S., R.P.S. and other services.

Prescribed Reading:

Ziquddin khan and others: State Administration in Rajasthan

Siongh C.M. and others : Rajasthan Rajya Prashan

Sharma, Harish Chandra : Rajasthan Rajya Prashan

OR

COURSE NO. PUB. ADM. 304

Rural Local Administration

- Unit I Concept and importance of Local Self Government . The Concept of Panchayati Raj in India. Features of Rural Local Administration of U.S.A. and U.K.
- Unit II Evolution of Panchayati Raj in India. Structure and Working of Panchayati Raj Institution in Rajasthan. Characteristic of 73rd Constitutional Amendment Act.
- Unit III Panchyati Raj and Bureaucracy: The Chief Executive officer, Vikas Adhikari, Panchayat Sachiv and other official of panchayat Raj Institutions.
- Unit IV State Control over Panchayati Raj Institutions. Revenue sources of panchayati Raj Institutions. Organisation and working of Directorate of Panchayati Raj.

Prescribed Readings:

Jain, R.B. (ed) Panchayati Raj

Nigam, S.R. : Local Self Government

S.R. Maheshri : Local Government in India

Ravindra Verma : Bharat Mae Sthania Sansthya

SEMESTER IV

THEORY PAPERS (Core/Elective Papers)	ESE	CCA	Total	Lecture- Tutorial- Practical/ Week	Credits
Paper XIII : PUB 401	70	30	100	6-0-0	6
Paper XIV : PUB 402	70	30	100	6-0-0	6
Paper XV : PUB 403	70	30	100	6-0-0	6
Any one of the following					
403(a)	Development Administration				
403(b)	Economic Systems and Administration				
Paper XI : POI 304	70	30	100	6-0-0	6
Any one of the following					
404(a)	Social Administration				
404(b)	Public Policy				

Grand Total 400 marks

24 credits

..

Grand Total

400 marks

24 credits

..

Total Marks of M.A. (Semester I, II, III & IV) 1600 marks and credit 96

Skill Course – Right to Information

SEMESTER -IV

COURSE NO. PUB. ADM. 401

Administrative Thinkers

Unit I Herbert A Sumon: Decision Making and Administrative Behaviour;
Honri Fayol: Managerial Activities and Principles of Organisation.

Unit II Motivation Theory of A.H. Maslow, Frederick Herzberg F.W. Rigg's;
Agraria Transitia and Fused Prismatic Model.

Unit III Theory of Organisational Development: Chris Argyris, Rensis Likert,
MC Gregor Theory of 'X' and Theory 'y'.

Unit IV Policy Sciences: Yehezkel Dror Administrative views of Confucius
J.L. Nehru: Concept of Planning.

Prescribed Readings:

S.S. Ali : Eminent Administrative Thinkers

S.R. Maheshwari: Administrative Thinkers

Prasad and Prasad: Administrative Thinkers (Hindi and English)

G.S. Sudha: Prabadhan Chitan Ka Itihas

COURSE NO. PUB. ADM. 402

Indian Constitution

- Unit I Sources of Indian Constitution Salient features of Indian Constitution, Fundamental Rights and Duties.
- Unit II Indian Federal System, Indian Secularism Indian President: Election Process, Powers and Position prime Minister Power and Position.
- Unit III Council of Ministers: Functions and role. The Parliament: Lok Sabha and Rajya Sabha: Composition and Powers. The Supreme Court: Jurisdiction, Powers and functions.
- Unit IV Union State Relations Administrative, Legislative and financial Election Commission: Organisation, Powers and functions. Union Public Service Commission: Organisation, functions and role.

Prescribed Readings:

M.J.K. Thavaraj: Financial Administration in India

P.K. Ghosh : Public Enterprises in India

Aaron Wildavsky: The Politics of Budgetary Process

ELECTIVE PAPER

COURSE NO. PUB. ADM. 403

Development Administration

- Unit I Concept of Development Administration: Nature and Scope of Development Administration, Concept of Development Administration.
- Unit II Development and Non-Development Concept. Ecology of Development Administration: Interaction of the Political, Cultural and Economic system.
- Unit III Public Administration in Developing Countries with special reference to Nepal in Particular.
- Unit IV Administrative features in their Ecological Context Machinery of the Government at the National Level. The structure of Bureaucracy, Role of Bureaucracy in the Socio-Economic Development.

Prescribed Readings:

Faisal Al – Salem: The Ecology of Development Administration

Fred W. Riggs (ed): Frontiers of Development Administration

A.R. Tyagi: The Civil services in Developing Society

V.A. Pai Panadikar : Personnel System for Development Administration

OR

COURSE NO. PUB. ADM. 403

Economic Systems and Administration

- Unit I Defination and Nature of Economic System Relationship between Economic system and Administration. Role of Fiscal, Monetary and Price policies under various Economic system.
- Unit II Economic system in U.S.A. : Organisation of capitalist Economy, Maintenance of Competition in Capitalist Economy Planning Machinery and welfare measures.
- Unit III Economic System in U.K. and India: Problems of Nationalised Industries in UK., Indian Mixed Economy the study of Public Enterprises and their Management Planning Machinery in India.
- Unit IV Economic System in Asian Countries with special reference to china and Japan Factor effecting Economic system and Recent trends in Economic Policy.

Prescribed Readings:

K.L. Handa: Financial Administration

M.L. Seth : Theory and Practice of Economic Planning

Hazek : Economic Planning

Loucks : Comparative Economic System

ELECTIVE PAPER

COURSE NO. PUB. ADM. 404

Social Administration

- Unit I Social Administration: Meaning, Nature and scope Social Administration institutions at the central Level Composition and functions of Department of Social Welfare, Central Social welfare Board.
- Unit II Social Administration institutions at state Level Organisation and working of state Department of Social welfare, State social welfare Board. Directorate of Social Welfare.
- Unit III Methods of Social Administration: Social Case work, group work and Community work Role of Voluntary Agencies in developing societies and their relations with state.
- Unit IV Five years plans and social welfare Programmes, child Development and Nutrition, women Development and Development of Backward classes.

Prescribed Readings:

G.B. Sharma: Social Administration in India

C.R. While : Public welfare Administration

D.K. Mishra: Samajik Prashasan

David C. Marsh : An Introduction to Social Administration.

OR

COURSE NO. PUB. ADM. 404

Public Policy

- Unit I Public Policy: Meaning, Nature, Scope and Importance Contribution of yehezkel Dror's in Policy Science.
- Unit II Model of Public Policy Making: Process model, system Model, Institutional Rationalist Model and Mixed Scanning Model.
- Unit III Policy Formulation Problems, Preparation of Policy agenda, Formulation of Policy Proposal, Policy Decision Making policy Adoption.
- Unit IV The Administrative Process of policy implementation, Financial arrangement, Problems of Policy implementation. Policy evaluation process and its problems.

Prescribed Readings:

Kabra, K.N. : Public Policy

Yehezkel Dror : Public Policy Making Reexamining

Wade, Lavy L. : The Elements of public Policy

Jonesl Charlle's O. : An Introduction to the study of Public Policy

OR

COURSE NO. PUB. ADM. 405

Dissertation

- (i) Dissertation may be offered by the candidates who have secured at least 60% marks at the semester I, II and III examination.
- (ii) Dissertation be submitted within three weeks before the last Semester IV examination.

SKILL COURSE-I BASICS IN PUBLIC ADMINISTRATION

Total : 100 Marks

ESE: 70 Marks

CCA: 30 Marks

Time Allowed: 3 hours

Objectives: to develop and understanding of Basic Skills in Administration

Unit I Meaning, nature and scope of Public Administration. Public and Private Administration

Unit II Chief Executive : Functions, chief executive as general manager.

Unit III Recruitment: Importance and Methods of recruitment, morale and motivation.

Unit IV Budget meaning and significance, principles of a sound budget, preparation and execution of budget.

Books Recommended

Sharma, M.P. : Public Administration-Theory and Practice

White: Introduction to the Study of Public Administration

Willoughby: Principles of Public Administration.

SKILL COURSE-II BASICS IN ADMINISTRATION AND STATE

Total : 100 Marks

ESE: 70 Marks

CCA: 30 Marks

Time Allowed: 3 hours

Objectives: to develop and understanding of Basics in Administration and State Issues

Unit I The concept of laissez faire state, Welfare State and Administrative State.

Unit II Political parties and Pressure Groups and their interaction.

Unit III Organisaton of Government : Legislature, Executive, Judiciary.

Unit IV Central Social Welfare Board, Railway Board and Reserve Bank of India.

Books Recommended

Waldo : Administrative State

Field : Government in Modern Society

Gupta, M.G. : Modern Government

**SKILL COURSE-III INTRODUCTION TO FIELD WORK IN LOCAL
SELF GOVERNMENT**

Total : 100 Marks

ESE: 70 Marks

CCA: 30 Marks

Time Allowed: 3 hours

Objectives: to develop and understanding of Basics of Field work in Local Self Work.

Unit I Definition and Concept of field work in Local Self Government.

Unit II Methods and Techniques of field work in Local Self Government.

Unit III Major Problems and limitation in field work in Local Self Government.

Unit IV Preparation of Project Report on Local Self Government.

Books Recommended

Nigam, S.R.: Local Self Government

M.Bhattacharya: Muncipal Government Problems and Prospects

Jain, R.B. (ed): Panchyati Raj

Ravindra Sharma: Bharat me Sthaniya Shashan

SKILL COURSE-IV : RIGHT TO INFORMATION

Total : 100 Marks

ESE: 70 Marks

CCA: 30 Marks

Time Allowed: 3 hours

Objectives: to develop and understanding of Basics of Right to Information

Unit I Right to Information: Meaning and concept

Unit II Right to Information Act. 2005: Main Provision

Unit III Right to Information Act. 2005: Implementation, Problems and Suggestions

Unit IV Preparation of Project Report on Right to Information

Books Recommended

Naib Sudhir – The Right to Information in India

Vyas A.K. – Implementation of R.T.I. Act. 2005 in Armed Forces and its Implications

Madabhushi Sridhar Acharyulu: R.T.I Use and Abuse

SYLLABUS

MASTER OF ARTS

PUBLIC ADMINISTRATION

M.A.

(Under the Choice Based Credit System) 2022-23



JAINARAIN VYAS UNIVERSITY

JODHPUR

IMPORTANT

With a view to bring about greater reliability, validity and objectivity in the examination system and also for closer integration of teaching, learning and evaluation.

- (i) The syllabus has been divided into units. Questions will be set from each unit with provision for internal choice.
- (ii) In order to ensure that the students do not leave out the important portion of the syllabus, examiners shall be free to repeat the questions set in the previous examinations.

(Ref. Resolution No. 21 (c) of Academic Council dated 9.2.84)

The examinees be permitted to use their personal transistorized pocket battery operated calculators in the examinations. The calculator to be used by the candidates in the examinations should not have more than 12 digits, 6 functions and 2 memories and should be noiseless and cordless. A Calculator belonging to one candidate shall not be allowed to be used by another candidate. The Superintendent of the centre will have complete discretion to disallow the use of a calculator which does not conform to the above specification.

(Ref. Resolution No. 6/90 of Academic Council dated 20th July, 1990)

In Engineering and any other examinations where the use of calculators is already permitted, it shall remain undisturbed.

NOTIFICATION

In compliance of decision of the Hon'ble High Court all students are required to fulfill 75% attendance rule in each subject and there must be 75 % attendance of the student before he/she could be permitted to appear in the examination.

REGISTRAR

(Academic)

SYLLABUS

MASTER OF ARTS

PUBLIC ADMINISTRATION

M.A. II (Semester System), 2022-23



JAIN NARAIN VYAS UNIVERSITY

JODHPUR

GUIDELINES FOR CHOICE BASED CREDIT SYSTEM

Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete **four skill courses:** two within the Department and two from other Department within JNV University or the Universities approved by J.N.V. University
3. **Course:** Usually referred to, as „papers“ is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period of teaching (lecture or tutorial) or two periods of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.

12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/December and even semester from December/January to May.

Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May.

13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester.

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Arts, Education & Social Sciences resolves the following:

- a. All internal assessments shall on term test and seminar. Attendance shall carry the prescribed marks in all papers.
- b. In each semester two out of four theoretical components of the University examinations shall be undertaken by external examiners from outside J.N.V. University, who may be appointed by the competent authorities.

Grievances and Redressal Mechanism

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head of the Department as the case may be clearly stating in writing the reason(s) for the complaint / appeal.
- b) The appeal will be assessed by the Chairman and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Dean, Faculty of Arts, Education & Social Sciences comprising of the HOD of the concerned Department and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	'O'	Outstanding	10
2	'A+'	Excellent	9
3	'A'	Very Good	8
4	'B+'	Good	7
5	'B'	Above Average	6
6	'C'	Average	5
7	'P'	Pass	4
8	'F'	Fail	0
9	'Ab'	Absent	0

- i. A student obtaining Grade F in a paper shall be considered failed and will be required to reappear in the University End Semester examination.
- ii. For noncredit courses (Skill Courses) „Satisfactory“ or “Unsatisfactory“ shall be indicated instead of the letter grade and this will not be counted for the computation of

SGPA/CGPA

Grade Point assignment

= and > 95 % marks Grade Point 10.0

90 to less than 95 % marks Grade Point 9.5

85 to less than 90 % marks Grade Point 9.0

80 to less than 85 % marks Grade Point 8.5

75 to less than 80 % marks Grade Point 8.0

70 to less than 75 % marks Grade Point 7.5

65 to less than 70 % marks Grade Point 7.0

60 to less than 65 % marks Grade Point 6.5

55 to less than 60 % marks Grade Point 6.0

50 to less than 55 % marks Grade Point 5.5

45 to less than 50 % marks Grade Point 5.0

40 to less than 45 % marks Grade Point 4.5

35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,
i.e.

$$\text{SGPA (Si)} = \frac{\sum (C_i \times G_i)}{\sum C_i}$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,
i.e.

$$\text{CGPA} = \frac{\sum (C_i \times S_i)}{\sum C_i}$$

where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.

- iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	6	B	6	6 x 6 = 36
2	Course 2	6	B+	7	6 X 7 = 42
3	Course 3	6	B	6	6X 6 = 36
4	Course 4	6	O	10	6 X 10 = 60
	Total	24			36+42+36+60=174

Thus, $\text{SGPA} = 174/24 = 7.25$

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	7.25	7.25	7	6.25

$\text{CGPA} = \frac{(24 \times 7.25 + 24 \times 7.25 + 24 \times 7 + 24 \times 6.25)}{96}$

$$666/96 = 6.94$$

Semester-wise Theory Papers/Practical / Skill component

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Semester I							
Core course 1	PUB 101		6-0-0	6	30	70	100
Core course 2	PUB 102		6-0-0	6	30	70	100
Core course 3	PUB 103		6-0-0	6	30	70	100
Core course 4	PUB 104		6-0-0	6	30	70	100
*Skill Course I	As per the list		2-0-0				
Total				24	120	280	400
Semester II							
Core course 5	PUB 201		6-0-0	6	30	70	100
Core course 6	PUB 202		6-0-0	6	30	70	100
Core course 7	PUB 203		6-0-0	6	30	70	100
Core course 8	PUB 204		6-0-0	6	30	70	100
*Skill course II	As per the list		2-0-0				
Total				24	120	280	400
Semester III							
Core course 9	PUB 301		6-0-0	6	30	70	100
Core course 10	PUB 302		6-0-0	6	30	70	100
Discipline Specific Elective/s 1	Elective papers		6-0-0	6	30	70	100
Discipline Specific Elective/s 2	Elective papers		6-0-0	6	30	70	100
*Skill course III	As per the list		2-0-0				
Total				24	120	280	400
Semester IV							
Core course 11	PUB 401		6-0-0	6	30	70	100
Core course 12	PUB 402		6-0-0	6	30	70	100
Discipline Specific Elective/s 3	Elective paper		6-0-0	6	30	70	100
Discipline Specific Elective/s 4	Elective paper		6-0-0	6	30	70	100
*Skill course IV	As per the list		2-0-0				
Total				24	120	280	400

***The Department shall offer one skill course per semester from the list of skill courses approved for the Department.**

In view of the course content, the Department of Public Administration distributed the Periods between Theory/Tutorial/~~Practical~~ as under per paper

- 6: 0 : 0 (six lectures only (no tutorial and no practical) per week) – For Theory
- 2+0+0 (two lectures) - For Skill course

The Duration of the Period shall be forty five minutes. In each of these combinations, the first value stands for the same number of lecture instructions per week.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective) involve an evaluation system of students that has the following two components:-

- (i) **Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
 - (ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.
- (i) **Continuous Comprehensive Assessment (CCA):** This would have the following components:
- a. **Term Test:** One term test shall be arranged for each paper prior to End-Semester Examination; examination duration shall be of three hours; maximum marks shall be 60 (reduced to 15).
 - b. **Seminar:** Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 40 (reduced to 10). The seminar shall be completed prior to term test for all the papers.
 - c. **Classroom Attendance** – Each student will have to attend a minimum of 75% Lectures / Tutorials / Practicals. A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE). Attendance marks will be awarded by following the system proposed below:

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

75% to 80%	=	1 mark
81% to 85%	=	2 marks
86 to 90%	=	3 marks
91% to 95%	=	4 marks
96% and above	=	5 marks

Note : Compensation in classroom attendance of a student will be as per prevalent University rules.

Each student's cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Arts, Education & Social Sciences.

- d. CCA is based on open evaluation system without any bias to any student.
- e. Any grievance received in the Department from student shall be placed before the **Grievance Redressal Committee** with adjudicated comments

Each component marks will be added making it rounding as per norms.

Marking Scheme of Continuous Comprehensive Assessment (CCA)

Components	Maximum Marks	Reduced and Original Marks
Term Test	60	(reduced to 15)
Seminar	40	(reduced to 10)
Classroom Attendance	05	05
Total Marks of CCA	100	30

Note : Classroom Attendance marks will be as follows :-

Those having 75% attendance and greater than that will be awarded CCA marks as follows: -

Percentage	Marks
75% to 80%	1 mark
81% to 85%	2 marks
86 to 90%	3 marks
91% to 95%	4 marks
96% and above	5 marks

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective Department shall declare the result as “Satisfactory” or “Non-Satisfactory”; each student need to get a minimum of three “Satisfactory” declaration for the course completion

For the Term test and ESE:

Part A

Ten questions (Definitions, illustrations, functions, short explanations, etc; 25-50 words) for one mark each. $10 \times 1 = 10$ marks; comprising questions from each Unit; no choice in this part

Part B

Four questions of long/explanatory answer (500 words) type, one drawn from each Unit; with internal choices : $4 \times 15 = 60$ marks.

10+60 = 70 marks

Qualifying for Next semester

- 1. A student acquiring minimum of 40% in total of the CCA is eligible to join next semester.**
2. A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as „Fail“), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.
3. A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time, i.e. three additional chances for each paper; the student is ineligible for the Postgraduate

degree in the Subject in which he/she is admitted, for additional chances examination fee shall be on additive basis.

Improvement Option:

Every student shall have the opportunity to improve Credit thorough University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final.

Result Declaration:

The ESE (End Semester Examination/University Examination) results shall be declared within twenty days of the last examination. The Theory Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation.

POST -GRADUATE COURSE: A DESCRIPTION

The full course is of FOUR SEMESTERS spread for TWO YEARS duration. A semester-wise list of courses to be offered is given below. In each paper there will be four unit.

SEMESTER I

SEMESTER II

SEMESTER III

Elective paper group – First – Semester III
Elective paper group – Second – Semester III

SEMESTER IV

Elective paper group – First – Semester IV
Elective paper group – Second – Semester IV

Skill Courses in the respective subject

Electives would be discipline centric and only students from concerned departments can register.

ADMISSION

The minimum qualification for admission to M.A. Course is Graduate Degree. The details of eligibility conditions and admission procedure will be as per University rules. The candidates are required to attend minimum of a 75% of classes.

TEACHING AND EXAMINATION SCHEME

Per Semester

Course	Periods/Week	Examination hours	CCA	ESE	Total
Theory Papers					
Course I	6	3	30	70	100
Course II	6	3	30	70	100
Course III	6	3	30	70	100
Course IV	6	3	30	70	100

UNIVERSITY EXAMINATION

Each course paper shall be of three hours duration.

Note: The number of elective to be taught from each group in a particular year shall be decided by the Department. Electives offered will be announced at the beginning of the academic session. Each student shall be assigned one Elective Paper from Group ONE and the second from Group TWO. Elective papers will be allotted on merit-cum-choice basis as far as possible. In the odd semester two skill courses will be those offered by the respective departments in the even semester skill courses will be from other departments.

SCHEME OF EXAMINATION FOR M.A. PUBLIC ADMINISTRATION (SEMESTER SYSTEM) FOR THE EXAMINATION

INSTRUCTIONS FOR THE PAPER SETTERS AND THE STUDENTS

Max. Marks - 70

Min. Marks – 25

Duration – 3 hours

Note :

- (i) There shall be 9 questions in all. Five questions have to be attempted.
- (ii) The first question shall be short answer type containing 10 short questions spread over the whole syllabus to be answered in about 30 words each. It shall carry 10 marks and shall be a compulsory question.
- (iii) Rest of the paper shall contain 8 questions with internal choice. The entire syllabus has been divided into four units. Each unit shall have two questions and the candidates shall be given internal choice i.e. the candidate shall attempt one question from each unit.

SEMESTER II

THEORY PAPERS (Four Core Papers)	ESE	CCA	Total	Lecture- Tutorial- Practical/ Week	Credits
Paper V : PUB 201	70	30	100	6-0-0	6
Paper VI : PUB 202	70	30	100	6-0-0	6
Paper VII : PUB 203	70	30	100	6-0-0	6
Paper VIII : PUB 204	70	30	100	6-0-0	6
Grand Total 400 marks					24 credits

Skill Course – Basics in Administration and State

M.A. Public Administration

II Semester

Administrative Thought (201)

Unit- I	Administrative thought of Kautilya, Confucius and Woodrow Wilson.
Unit-II	Bureaucratic Theory of Max Weber, Scientific Management & Taylor Administrative Management Theories of Fayol, Luther Gullick and Urwick
Unit-III	Administrative Thoughts of Chester Bernard, Herbert Simon-Decision Making, Administrative Behaviour, Human Relations Theory – Frits J. Roethlisberger, Elton Mayo, A.H. Maslow and Frederick Herzberg
Unit-IV	Theory of Organisation Development : Chris Argyris, Rensis Likert, McGregor Policy Sciences – Yehezkel Dror

एम.ए लोक प्रशासन

II सेमेस्टर

प्रशासनिक विचारधारा (201)

इकाई प्रथम	कौटिल्य, कन्फुशियस एवं वुडरो के प्रशासनिक विचार
इकाई द्वितीय	मैक्स वेबर की नौकरशाही विचारधारा, टेलर एवं वैज्ञानिक प्रबन्ध, प्रशासनिक प्रबन्ध विचार एवं फेयोल, लुथर गुलिक तथा उर्विक की प्रशासनिक प्रबन्ध विचारधारा
इकाई तृतीय	चेस्टर बर्नार्ड के प्रशासनिक विचार, हर्बर्ट साइमन—निर्णयन, प्रशासनिक व्यवहार, मानव सम्बन्ध विचारधारा, फ्रिट्ज जे. रोथलिस बर्गर, एल्टन मेयो, ए.एच. मास्लो एवं फ्रेडरिक हर्जबर्ग
इकाई चतुर्थ	संगठन विकास की विचारधारा : क्रिस अग्रियस, रेसिस लिक्ट, मैकग्रेगर, नीतिविज्ञान : येहेजक्ल ड्रोर

Prescribed Readings:

R. Prasad and others : Administrative Thinkers

S.S. Ali : Eminent Administrative Thinkers

Jarnes C. Charlesworth : Theory and Practice of Public Administration

जियाउदीनखान एवं वर्मा : प्रशासनिक विचारधाराएं खंड I, II

M.A. Public Administration
II Semester

State Administration in India With Special reference to Rajasthan (202)

- Unit- I State Administration in India, its growing importance ; Position of States in India ; Central – State Relations, Integration of Rajasthan
- Unit-II The Office of the Governor, Chief Minister and Council of Ministers ; Department of Home and Finance
- Unit-III State Secretariat and its working, Role of Chief Secretary, Organisation and Working of Revenue Board, Rajasthan Board of Secondary Education, State Information Commission, State Human Rights Commission, State Women’s Commission
- Unit-IV Recruitment of Civil Servants, Role of Rajasthan Public Service Commission, Training of Civil Servants, HCMRIPA, Rajasthan Administrative Tribunal.

एम.ए लोक प्रशासन

II सेमेस्टर

भारत में राज्य प्रशासन, राजस्थान के विशेष संदर्भ में (202)

- इकाई प्रथम भारत में राज्य प्रशासन, इसका बढ़ता हुआ महत्व, भारत में राज्यों की स्थिति, केन्द्र-राज्य सम्बन्ध, राजस्थान का एकीकरण
- इकाई द्वितीय राज्यपाल का पद, मुख्यमंत्री एवं मंत्रिपरिषद; ग्रह तथा वित्त विभाग
- इकाई तृतीय राज्य सचिवालय एवं इसका कार्यकरण, मुख्य सचिव की भूमिका, राजस्व मंडल का संगठन एवं कार्यकरण, राजस्थान माध्यमिक शिक्षा बोर्ड, राज्य सूचना आयोग, राज्य मानवाधिकार आयोग, राज्य महिला आयोग
- इकाई चतुर्थ लोक सेवकों की भर्ती, राजस्थान लोक सेवा आयोग की भूमिका, लोक सेवकों का प्रशिक्षण, एच. सी.एम.रीपा, राजस्थान प्रशासनिक न्यायाधिकरण

Prescribed Reading:

Ziquddin Khan and others: State Administration in Rajasthan

शर्मा हरिश्चन्द्र : राजस्थान में राज्य प्रशासन

कटारिया, सुरेन्द्र : राज्य प्रशासन

M.A. Public Administration

II Semester

Comparative Administrative Systems (203)

- Unit- I Salient features of the Constitution of U.S.A, U.K and France
Features of the Administration of U.S.A., U.K. and France
- Unit-II Administration of U.S.A – Organisation and Working of Central Personnel Agency, Development of Merit System, Recruitment and Training Institution, Disciplinary Procedure and Political Rights of Civil Servants, Independent Regulatory Commission
- Unit-III Administration of U.K. – Organisation and Working of Central Personnel Agency, Recruitment and Training, Parliamentary Commissioner, Whitleyism, Political Rights of Civil Servants
- Unit-IV Administration of France – Organisation and working of Central Personnel Agency, Recruitment and Training, Administrative Court, Council D Etat, E cole Nationale d' Administration (National School of Administration)

एम.ए लोक प्रशासन

II सेमेस्टर

तुलनात्मक प्रशासनिक व्यवस्थाएं (203)

- इकाई प्रथम संयुक्त राज्य अमरीका, यूनाइटेड किंगडम और फ्रांस के संविधान की मुख्य विशेषतायें, संयुक्त राज्य अमरीका, यूनाइटेड किंगडम और फ्रांस के प्रशासन की विशेषतायें
- इकाई द्वितीय संयुक्त राज्य अमरीका का प्रशासन— केन्द्रीय कार्मिक अभिकरण का संगठन एवं कार्यकरण, योग्यता प्रणाली का विकास, भर्ती एवं प्रशिक्षण संस्थान, अनुशासनात्मक कार्यवाही एवं लोक सेवकों के राजनीतिक अधिकार, स्वतंत्र नियामकीय आयोग
- इकाई तृतीय यूनाइटेड किंगडम का प्रशासन –केन्द्रीय कार्मिक अभिकरण का संगठन एवं कार्यकरण, भर्ती एवं प्रशिक्षण, संसदीय आयुक्त, व्हिटलेवाद, लोक सेवकों के राजनीतिक अधिकार
- इकाई चतुर्थ फ्रांस का प्रशासन – केन्द्रीय कार्मिक अभिकरण का संगठन एवं कार्यप्रणाली, भर्ती एवं प्रशिक्षण, प्रशासनिक न्यायलय, कौंसिल डी इटेट, इकोल नेशनल डी एडमिनिस्ट्रेशन (नेशनल स्कूल ऑफ एडमिनिस्ट्रेशन)

Prescribed Readings:

Ferril Heady: Public Administration : A Comparative Perspective

Verma S.P. and Khanna: Comparative Public Administration

Arora, Ramesh K.: Comparative Public Administration (Hindi and English)

चतुर्वेदी टी. एन. : तुलनात्मक लोक प्रशासन

M.A. Public Administration

II Semester

Personnel Administration in India (204)

- Unit-I Salient features of the Indian Personnel Administration, Civil Services in India, Importance of the All India Services, Differences between All India Services and Central Services
- Unit-II Recruitment - Various methods, Role of Union Public Service Commission; Training – Types, Organisation and working of LBSNAA, Promotion, Disciplinary Action, Central Administrative Tribunal
- Unit-III Problems of Indian Administration – Relationship between Political-Administrative Executive, Generalist and Specialist in Administration, Corruption in Administration
- Unit-IV Administrative Reforms : Reports of First and Second Administrative Reforms Commission, Lokpal, Central Vigilance Commission, Role of Department of Personnel and Training.

एम.ए लोक प्रशासन

II सेमेस्टर

भारत में कार्मिक प्रशासन (204)

- इकाई प्रथम भारतीय कार्मिक प्रशासन की मुख्य विशेषताएँ, भारत में लोक सेवाएं, अखिल भारतीय सेवाओं का महत्व, केन्द्रीय सेवाओं तथा अखिल भारतीय संवाओं में अंतर
- इकाई द्वितीय भर्ती— विभिन्न तरीके, संघ लोक सेवा आयोग की भूमिका ; प्रशिक्षण – प्रकार, लाल बहादुर शास्त्री राष्ट्रीय प्रशासन अकादमी का संगठन व कार्य, पदोन्नति, अनुशासनात्मक कार्यवाही, केन्द्रीय प्रशासनिक न्यायाधिकरण
- इकाई तृतीय भारतीय प्रशासन की समस्याएं – राजनीतिक तथा प्रशासनिक कार्यपालिका में संबंध, सामान्यज्ञ तथा विशेषज्ञ, प्रशासन में भ्रष्टाचार
- इकाई चतुर्थ प्रशासनिक सुधार : प्रथम एवं द्वितीय प्रशासनिक सुधार आयोग की रिपोर्ट, लोकपाल, केन्द्रीय सतर्कता आयोग, कार्मिक तथा प्रशिक्षण विभाग की भूमिका

Prescribed Readings:

Goel, S.L. Public Personnel Administration

Sinha, V.M. Public Personnel Administration (English and Hindi)

Jain, R.B. (ed): Aspects of personnel Administration

जैन, सी.एम. : सेवीवर्गीय प्रशासन

SYLLABUS

MASTER OF ARTS

PUBLIC ADMINISTRATION

M.A.

(Under the Choice Based Credit System) 2022-23



JAI NARAIN VYAS UNIVERSITY

JODHPUR

IMPORTANT

With a view to bring about greater reliability, validity and objectivity in the examination system and also for closer integration of teaching, learning and evaluation.

- (i) The syllabus has been divided into units. Questions will be set from each unit with provision for internal choice.
- (ii) In order to ensure that the students do not leave out the important portion of the syllabus, examiners shall be free to repeat the questions set in the previous examinations.

(Ref. Resolution No. 21 (c) of Academic Council dated 9.2.84)

The examinees be permitted to use their personal transistorized pocket battery operated calculators in the examinations. The calculator to be used by the candidates in the examinations should not have more than 12 digits, 6 functions and 2 memories and should be noiseless and cordless. A Calculator belonging to one candidate shall not be allowed to be used by another candidate. The Superintendent of the centre will have complete discretion to disallow the use of a calculator which does not conform to the above specification.

(Ref. Resolution No. 6/90 of Academic Council dated 20th July, 1990)

In Engineering and any other examinations where the use of calculators is already permitted, it shall remain undisturbed.

NOTIFICATION

In compliance of decision of the Hon'ble High Court all students are required to fulfill 75% attendance rule in each subject and there must be 75 % attendance of the student before he/she could be permitted to appear in the examination.

**REGISTRAR
(Academic)**

SYLLABUS

MASTER OF ARTS

PUBLIC ADMINISTRATION

M.A. (Semester System), 2022-23



JAIN NARAIN VYAS UNIVERSITY

JODHPUR

GUIDELINES FOR CHOICE BASED CREDIT SYSTEM

Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete **four skill courses:** two within the Department and two from other Department within JNV University or the Universities approved by J.N.V. University
3. **Course:** Usually referred to, as „papers“ is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period of teaching (lecture or tutorial) or two periods of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.
12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/December and even semester from December/January to May.
Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May.
13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Arts, Education & Social Sciences resolves the following:

- a. All internal assessments shall on term test and seminar. Attendance shall carry the prescribed marks in all papers.
- b. In each semester two out of four theoretical components of the University examinations shall be undertaken by external examiners from outside J.N.V. University, who may be appointed by the competent authorities.

Grievances and Redressal Mechanism

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head of the Department as the case may be clearly stating in writing the reason(s) for the complaint / appeal.
- b) The appeal will be assessed by the Chairman and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Dean, Faculty of Arts, Education & Social Sciences comprising of the HOD of the concerned Department and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	'O'	Outstanding	10
2	'A+'	Excellent	9
3	'A'	Very Good	8
4	'B+'	Good	7
5	'B'	Above Average	6
6	'C'	Average	5
7	'P'	Pass	4
8	'F'	Fail	0
9	'Ab'	Absent	0

- i. A student obtaining Grade F in a paper shall be considered failed and will be required to reappear in the University End Semester examination.

- ii. For noncredit courses (Skill Courses) „Satisfactory“ or “Unsatisfactory“ shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

- = and > 95 % marks Grade Point 10.0
- 90 to less than 95 % marks Grade Point 9.5
- 85 to less than 90 % marks Grade Point 9.0
- 80 to less than 85 % marks Grade Point 8.5
- 75 to less than 80 % marks Grade Point 8.0
- 70 to less than 75 % marks Grade Point 7.5
- 65 to less than 70 % marks Grade Point 7.0
- 60 to less than 65 % marks Grade Point 6.5
- 55 to less than 60 % marks Grade Point 6.0
- 50 to less than 55 % marks Grade Point 5.5
- 45 to less than 50 % marks Grade Point 5.0
- 40 to less than 45 % marks Grade Point 4.5
- 35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,
i.e.

$$\text{SGPA (Si)} = \frac{\sum (C_i \times G_i)}{\sum C_i}$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,
i.e.

$$\text{CGPA} = \frac{\sum (C_i \times S_i)}{\sum C_i}$$

where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.

- iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	6	B	6	6 x 6 =36
2	Course 2	6	B+	7	6 X 7 =42
3	Course 3	6	B	6	6X 6 = 36
4	Course 4	6	O	10	6 X 10 =60
	Total	24			36+42+36+60=174

Thus, $SGPA = 174/24 = 7.25$

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	7.25	7.25	7	6.25

$CGPA = (24 \times 7.25 + 24 \times 7.25 + 24 \times 7 + 24 \times 6.25) / 96$

$$666/96 = 6.94$$

Semester-wise Theory Papers/Practical / Skill component

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Semester I							
Core course 1	PUB 101		6-0-0	6	30	70	100
Core course 2	PUB 102		6-0-0	6	30	70	100
Core course 3	PUB 103		6-0-0	6	30	70	100
Core course 4	PUB 104		6-0-0	6	30	70	100
*Skill Course I	As per the list		2-0-0				
Total				24	120	280	400
Semester II							
Core course 5	PUB 201		6-0-0	6	30	70	100
Core course 6	PUB 202		6-0-0	6	30	70	100
Core course 7	PUB 203		6-0-0	6	30	70	100
Core course 8	PUB 204		6-0-0	6	30	70	100
*Skill course II	As per the list		2-0-0				
Total				24	120	280	400
Semester III							
Core course 9	PUB 301		6-0-0	6	30	70	100
Core course 10	PUB 302		6-0-0	6	30	70	100
Discipline Specific Elective/s 1	Elective papers		6-0-0	6	30	70	100
Discipline Specific Elective/s 2	Elective papers		6-0-0	6	30	70	100
*Skill course III	As per the list		2-0-0				
Total				24	120	280	400
Semester IV							
Core course 11	PUB 401		6-0-0	6	30	70	100
Core course 12	PUB 402		6-0-0	6	30	70	100
Discipline Specific Elective/s 3	Elective paper		6-0-0	6	30	70	100
Discipline Specific Elective/s 4	Elective paper		6-0-0	6	30	70	100
*Skill course IV	As per the list		2-0-0				
Total				24	120	280	400

***The Department shall offer one skill course per semester from the list of skill courses approved for the Department.**

In view of the course content, the Department of Public Administration distributed the Periods between Theory/Tutorial/~~Practical~~ as under per paper

- 6: 0 : 0 (six lectures only (no tutorial and no practical) per week) – For Theory
- 2+0+0 (two lectures) - For Skill course

The Duration of the Period shall be forty five minutes. In each of these combinations, the first value stands for the same number of lecture instructions per week.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective) involve an evaluation system of students that has the following two components:-

- (i) **Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
 - (ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.
- (i) **Continuous Comprehensive Assessment (CCA):** This would have the following components:
 - a. **Term Test:** One term test shall be arranged for each paper prior to End-Semester Examination; examination duration shall be of three hours; maximum marks shall be 60 (reduced to 15).
 - b. **Seminar:** Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 40 (reduced to 10). The seminar shall be completed prior to term test for all the papers.
 - c. **Classroom Attendance** – Each student will have to attend a minimum of 75% Lectures / Tutorials / Practicals. A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE). Attendance marks will be awarded by following the system proposed below:

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

75% to 80%	=	1 mark
81% to 85%	=	2 marks
86 to 90%	=	3 marks
91% to 95%	=	4 marks
96% and above	=	5 marks

Note : Compensation in classroom attendance of a student will be as per prevalent University rules.

Each student's cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Arts, Education & Social Sciences.

- d. CCA is based on open evaluation system without any bias to any student.
- e. Any grievance received in the Department from student shall be placed before the **Grievance Redressal Committee** with adjudicated comments

Each component marks will be added making it rounding as per norms.

Marking Scheme of Continuous Comprehensive Assessment (CCA)

Components	Maximum Marks	Reduced and Original Marks
Term Test	60	(reduced to 15)
Seminar	40	(reduced to 10)
Classroom Attendance	05	05
Total Marks of CCA	100	30

Note : Classroom Attendance marks will be as follows :-

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

Percentage	Marks
75% to 80%	1 mark
81% to 85%	2 marks
86 to 90%	3 marks
91% to 95%	4 marks
96% and above	5 marks

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective Department shall declare the result as “Satisfactory” or “Non-Satisfactory”; each student need to get a minimum of three “Satisfactory” declaration for the course completion

For the Term test and ESE:

Part A

Ten questions (Definitions, illustrations, functions, short explanations, etc; 25-50 words) for one mark each. $10 \times 1 = 10$ marks; comprising questions from each Unit; no choice in this part

Part B

Four questions of long/explanatory answer (500 words) type, one drawn from each Unit; with internal choices : $4 \times 15 = 60$ marks.

10+60 = 70 marks

Qualifying for Next semester

- 1. A student acquiring minimum of 40% in total of the CCA is eligible to join next semester.**
- 2. A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as „Fail“), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.**
- 3. A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time, i.e. three additional chances for each paper; the student is ineligible for the Postgraduate**

degree in the Subject in which he/she is admitted, for additional chances examination fee shall be on additive basis.

Improvement Option:

Every student shall have the opportunity to improve Credit thorough University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final.

Result Declaration:

The ESE (End Semester Examination/University Examination) results shall be declared within twenty days of the last examination. The Theory Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation.

POST -GRADUATE COURSE: A DESCRIPTION

The full course is of FOUR SEMESTERS spread for TWO YEARS duration. A semester-wise list of courses to be offered is given below. In each paper there will be four unit.

SEMESTER I

SEMESTER II

SEMESTER III

Elective paper group – First – Semester III
Elective paper group – Second – Semester III

SEMESTER IV

Elective paper group – First – Semester IV
Elective paper group – Second – Semester IV

Skill Courses in the respective subject

Electives would be discipline centric and only students from concerned departments can register.

ADMISSION

The minimum qualification for admission to M.A. Course is Graduate Degree. The details of eligibility conditions and admission procedure will be as per University rules. The candidates are required to attend minimum of a 75% of classes.

TEACHING AND EXAMINATION SCHEME

Per Semester

Course	Periods/Week	Examination hours	CCA	ESE	Total
Theory Papers					
Course I	6	3	30	70	100
Course II	6	3	30	70	100
Course III	6	3	30	70	100
Course IV	6	3	30	70	100

UNIVERSITY EXAMINATION

Each course paper shall be of three hours duration.

Note: The number of elective to be taught from each group in a particular year shall be decided by the Department. Electives offered will be announced at the beginning of the academic session. Each student shall be assigned one Elective Paper from Group ONE and the second from Group TWO. Elective papers will be allotted on merit-cum-choice basis as far as possible. In the odd semester two skill courses will be those offered by the respective departments in the even semester skill courses will be from other departments.

SCHEME OF EXAMINATION FOR M.A. PUBLIC ADMINISTRATION (SEMESTER SYSTEM) FOR THE EXAMINATION

INSTRUCTIONS FOR THE PAPER SETTERS AND THE STUDENTS

Max. Marks - 70

Min. Marks – 25

Duration – 3 hours

Note :

- (i) There shall be 9 questions in all. Five questions have to be attempted.
- (ii) The first question shall be short answer type containing 10 short questions spread over the whole syllabus to be answered in about 30 words each. It shall carry 10 marks and shall be a compulsory question.
- (iii) Rest of the paper shall contain 8 questions with internal choice. The entire syllabus has been divided into four units. Each unit shall have two questions and the candidates shall be given internal choice i.e. the candidate shall attempt one question from each unit.

SEMESTER III

THEORY PAPERS (Core/Elective Papers)	ESE	CCA	Total	Lecture- Tutorial- Practical/ Week	Credits
Paper IX : PUB 301	70	30	100	6-0-0	6
Paper X : PUB 302	70	30	100	6-0-0	6
Paper XI : PUB 303 Any one of the following	70	30	100	6-0-0	6
303(a)				International Organisation and Administration	
303(b)				Urban Local Administration	
Paper XI : PUB 304 Any one of the following	70	30	100	6-0-0	6
304(a)				State Administration in India With Special reference to Rajasthan	
304(b)				Rural Local Administration	

Skill Course Introduction to field work in Local Self Government

Grand Total 400 marks

24 credits

SEMESTER - III

COURSE NO. PUB. ADM. 301

Administrative Thought

- Unit I Administrative Thought of Kautilya, Confucius and Woodrow Wilson.
- Unit II Bureaucratic theory of Max Weber, Scientific Management Theories of Fayol, Luther Gulick and Urwick.
- Unit III Administrative Thought of Chester I Barnard; Formal and Informal Organisation, Satisfaction, Equilibrium, Authority and Communication.
- Unit IV Human Relations Theory : Fritz j. Roethlisberger and Elton Mayo Hawthorne Study.

Prescribed Readings:

R. Prasad and others : Administrative Thinkers

S.S. Ali : Eminent Administrative Thinkers

Ziuddin Khan and Verma : Prashasnik Vicharadharen Vol. I, II

James C. Charlesworth : Theory and Practice of Public Administration

COURSE NO. PUB. ADM. 302

Financial Administration in India

- Unit I Introduction of Financial Administration Importance of Finances in Administration Constitutional Provisions relating to Finance Administration.
- Unit II Central State Finance relations, Finance Commission, Organisation, Functions and Role, Ministry of Finance in India: Organisation, Functions and role.
- Unit III Budget : Meaning, Characteristic and Importance of Budget. Budget Techniques Line Item Budget, Performance Budget, PPBS and Zero Based Budget.
- Unit IV Budgeting formulation in India Budgetary Procedure in Parliament. Execution of Budget, Deficit finance and Public Debt.

Prescribed Readings:

M.J.K. Thavaraj : Financial Administration in India

P.K. Ghosh : Public Enterprises in India

darsky: The Politics of Budgetary Process

ELECTIVE PAPER

COURSE NO. PUB. ADM. 303

International Organisation and Administration

- Unit I Evolution of Internationalism. Development of International Institutions characteristic of present Community of state pacific methods for settlement of International disputes.
- Unit II League of Nations : Origin, Structure, Functions of various organs, appraisal, causes of decline and contribution.
- Unit III U.N. : Formation of Charter, Purposes, Principles, membership, various organs of U.N.: General Assembly, Security Council, Economic and Social Council, International Court of Justice, U.N. secretariat, Role of Secretary General.
- Unit IV A Critical appraisal of U.N., U.N. Special Agencies : Organisation and working of I.L.O., UNESCO, F.A.O. and W.H.O.

Prescribed Reading :

Claude, Eagleton : International Government

Ohodrich : The United Nations

Roy, M.P. : Antarrashtriya Sangthan

Leonard : International Organisation

OR

COURSE NO. PUB. ADM. 303

Urban Local Administration

- Unit I Urban Administration: Scope and Importance General features of Urban Local Administration of U.S.A., U.K., France and India.
- Unit II Structure of Urban Local administration: U.S.A.; Major Council plan, Commission plan and City manager plan U.K.: Metropolitan Counties, Non Metropolitan Counties.
- Unit III France : The Municipal Council Local Bodies in India: Municipal cooperation"s, municipal council and municipalities. Functions of Local Bodies.
- Unit IV City Government of London, Paris and Newyork, Municipal Corporation of Calcutta, Bombay and Delhi. Town planning and UIT.

Prescribed Reading:

R Agarwal : Municipal Govlernment in India

Munro : The Government of Amrican cities

Hermon Fonar : English Local Government

Nigam, S.R. : Local Self Government

COURSE NO. PUB. ADM. 304

State Administration in India with Special reference to Rajasthan

- Unit I General Background of state Administration History of state Administration in Rajasthan Constitutional Structure of state Government.
- Unit II The office of Governor : Power and role of state Administration. The Office of Chief Minister : Powers, Functions and Position, Council of Minister at state level.
- Unit III Organisation and working of state secretariat, Role of Chief Secretary Department of Home and Finance of Rajasthan: Organisation and functions organisation and working of Revenue Board.
- Unit IV Recruitment of Civil Services in Rajasthan, Organisation and working of Rajasthan Public Service Commission. Training of R.A.S., R.P.S. and other services.

Prescribed Reading:

Ziquddin khan and others: State Administration in Rajasthan

Siongh C.M. and others : Rajasthan Rajya Prashan

Sharma, Harish Chandra : Rajasthan Rajya Prashan

OR

COURSE NO. PUB. ADM. 304

Rural Local Administration

- Unit I Concept and importance of Local Self Government . The Concept of Panchayati Raj in India. Features of Rural Local Administration of U.S.A. and U.K.
- Unit II Evolution of Panchayati Raj in India. Structure and Working of Panchayati Raj Institution in Rajasthan. Characteristic of 73rd Constitutional Amendment Act.
- Unit III Panchyati Raj and Bureaucracy: The Chief Executive officer, Vikas Adhikari, Panchayat Sachiv and other official of panchayat Raj Institutions.
- Unit IV State Control over Panchayati Raj Institutions. Revenue sources of panchayati Raj Institutions. Organisation and working of Directorate of Panchayati Raj.

Prescribed Readings:

Jain, R.B. (ed) Panchayati Raj

Nigam, S.R. : Local Self Government

S.R. Maheshri : Local Government in India

Ravindra Verma : Bharat Mae Sthania Sansthya

OR

COURSE NO. PUB. ADM.

Dissertation

- (i) Dissertation may be offered by the candidates who have secured at least 60% marks at the semester I, II and III examination.
- (ii) Dissertation be submitted within three weeks before the last Semester IV examination.

SKILL COURSE-I BASICS IN PUBLIC ADMINISTRATION

Total : 100 Marks

ESE: 70 Marks

CCA: 30 Marks

Time Allowed: 3 hours

Objectives: to develop and understanding of Basic Skills in Administration

Unit I Meaning, nature and scope of Public Administration. Public and Private Administration

Unit II Chief Executive : Functions, chief executive as general manager.

Unit III Recruitment: Importance and Methods of recruitment, morale and motivation.

Unit IV Budget meaning and significance, principles of a sound budget, preparation and execution of budget.

Books Recommended

Sharma, M.P. : Public Administration-Theory and Practice

White: Introduction to the Study of Public Administration

Willoughby: Principles of Public Administration.

SKILL COURSE-II BASICS IN ADMINISTRATION AND STATE

Total : 100 Marks

ESE: 70 Marks

CCA: 30 Marks

Time Allowed: 3 hours

Objectives: to develop and understanding of Basics in Administration and State Issues

Unit I The concept of laissez faire state, Welfare State and Administrative State.

Unit II Political parties and Pressure Groups and their interaction.

Unit III Organisation of Government : Legislature, Executive, Judiciary.

Unit IV Central Social Welfare Board, Railway Board and Reserve Bank of India.

Books Recommended

Waldo : Administrative State

Field : Government in Modern Society

Gupta, M.G. : Modern Government

**SKILL COURSE-III INTRODUCTION TO FIELD WORK IN LOCAL
SELF GOVERNMENT**

Total : 100 Marks

ESE: 70 Marks

CCA: 30 Marks

Time Allowed: 3 hours

Objectives: to develop and understanding of Basics of Field work in Local Self Work.

Unit I Definition and Concept of field work in Local Self Government.

Unit II Methods and Techniques of field work in Local Self Government.

Unit III Major Problems and limitation in field work in Local Self Government.

Unit IV Preparation of Project Report on Local Self Government.

Books Recommended

Nigam, S.R.: Local Self Government

M.Bhattacharya: Muncipal Government Problems and Prospects

Jain, R.B. (ed): Panchyati Raj

Ravindra Sharma: Bharat me Sthaniya Shashan

SKILL COURSE-IV : RIGHT TO INFORMATION

Total : 100 Marks

ESE: 70 Marks

CCA: 30 Marks

Time Allowed: 3 hours

Objectives: to develop and understanding of Basics of Right to Information

Unit I Right to Information: Meaning and concept

Unit II Right to Information Act. 2005: Main Provision

Unit III Right to Information Act. 2005: Implementation, Problems and Suggestions

Unit IV Preparation of Project Report on Right to Information

Books Recommended

Naib Sudhir – The Right to Information in India

Vyas A.K. – Implementation of R.T.I. Act. 2005 in Armed Forces and its Implications

Madabhushi Sridhar Acharyulu: R.T.I Use and Abuse

SYLLABUS

MASTER OF ARTS

PUBLIC ADMINISTRATION

M.A.

(Under the Choice Based Credit System) 2021-22



JAI NARAIN VYAS UNIVERSITY

JODHPUR

IMPORTANT

With a view to bring about greater reliability, validity and objectivity in the examination system and also for closer integration of teaching, learning and evaluation.

- (i) The syllabus has been divided into units. Questions will be set from each unit with provision for internal choice.
- (ii) In order to ensure that the students do not leave out the important portion of the syllabus, examiners shall be free to repeat the questions set in the previous examinations.

(Ref. Resolution No. 21 (c) of Academic Council dated 9.2.84)

The examinees be permitted to use their personal transistorized pocket battery operated calculators in the examinations. The calculator to be used by the candidates in the examinations should not have more than 12 digits, 6 functions and 2 memories and should be noiseless and cordless. A Calculator belonging to one candidate shall not be allowed to be used by another candidate. The Superintendent of the centre will have complete discretion to disallow the use of a calculator which does not conform to the above specification.

(Ref. Resolution No. 6/90 of Academic Council dated 20th July, 1990)

In Engineering and any other examinations where the use of calculators is already permitted, it shall remain undisturbed.

NOTIFICATION

In compliance of decision of the Hon'ble High Court all students are required to fulfill 75% attendance rule in each subject and there must be 75 % attendance of the student before he/she could be permitted to appear in the examination.

**REGISTRAR
(Academic)**

SYLLABUS

MASTER OF ARTS

PUBLIC ADMINISTRATION

M.A. (Semester System), 2021-22



JAI NARAIN VYAS UNIVERSITY

JODHPUR

GUIDELINES FOR CHOICE BASED CREDIT SYSTEM

Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete **four skill courses:** two within the Department and two from other Department within JNV University or the Universities approved by J.N.V. University
3. **Course:** Usually referred to, as „papers“ is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period of teaching (lecture or tutorial) or two periods of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.
12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/ December and even semester from December/January to May.
Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May.
13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Arts, Education & Social Sciences resolves the following:

- a. All internal assessments shall on term test and seminar. Attendance shall carry the prescribed marks in all papers.
- b. In each semester two out of four theoretical components of the University examinations shall be undertaken by external examiners from outside J.N.V. University, who may be appointed by the competent authorities.

Grievances and Redressal Mechanism

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head of the Department as the case may be clearly stating in writing the reason(s) for the complaint / appeal.
- b) The appeal will be assessed by the Chairman and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Dean, Faculty of Arts, Education & Social Sciences comprising of the HOD of the concerned Department and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	'O'	Outstanding	10
2	'A+'	Excellent	9
3	'A'	Very Good	8
4	'B+'	Good	7
5	'B'	Above Average	6
6	'C'	Average	5
7	'P'	Pass	4
8	'F'	Fail	0
9	'Ab'	Absent	0

- i. A student obtaining Grade F in a paper shall be considered failed and will be required to reappear in the University End Semester examination.

- ii. For noncredit courses (Skill Courses) „Satisfactory“ or “Unsatisfactory“ shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

- = and > 95 % marks Grade Point 10.0
- 90 to less than 95 % marks Grade Point 9.5
- 85 to less than 90 % marks Grade Point 9.0
- 80 to less than 85 % marks Grade Point 8.5
- 75 to less than 80 % marks Grade Point 8.0
- 70 to less than 75 % marks Grade Point 7.5
- 65 to less than 70 % marks Grade Point 7.0
- 60 to less than 65 % marks Grade Point 6.5
- 55 to less than 60 % marks Grade Point 6.0
- 50 to less than 55 % marks Grade Point 5.5
- 45 to less than 50 % marks Grade Point 5.0
- 40 to less than 45 % marks Grade Point 4.5
- 35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,
i.e.

$$\text{SGPA (Si)} = \Sigma (Ci \times Gi) / \Sigma Ci$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,
i.e.

$$\text{CGPA} = \Sigma (Ci \times Si) / \Sigma Ci$$

where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.

- iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	6	B	6	6 x 6 =36
2	Course 2	6	B+	7	6 X 7 =42
3	Course 3	6	B	6	6X 6 = 36
4	Course 4	6	O	10	6 X 10 =60
	Total	24			36+42+36+60=174

Thus, $SGPA = 174/24 = 7.25$

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	7.25	7.25	7	6.25

$CGPA = (24 \times 7.25 + 24 \times 7.25 + 24 \times 7 + 24 \times 6.25) / 96$

$$666/96 = 6.94$$

Semester-wise Theory Papers/Practical / Skill component

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Semester I							
Core course 1	PUB 101		6-0-0	6	30	70	100
Core course 2	PUB 102		6-0-0	6	30	70	100
Core course 3	PUB 103		6-0-0	6	30	70	100
Core course 4	PUB 104		6-0-0	6	30	70	100
*Skill Course I	As per the list		2-0-0				
Total				24	120	280	400
Semester II							
Core course 5	PUB 201		6-0-0	6	30	70	100
Core course 6	PUB 202		6-0-0	6	30	70	100
Core course 7	PUB 203		6-0-0	6	30	70	100
Core course 8	PUB 204		6-0-0	6	30	70	100
*Skill course II	As per the list		2-0-0				
Total				24	120	280	400
Semester III							
Core course 9	PUB 301		6-0-0	6	30	70	100
Core course 10	PUB 302		6-0-0	6	30	70	100
Discipline Specific Elective/s 1	Elective papers		6-0-0	6	30	70	100
Discipline Specific Elective/s 2	Elective papers		6-0-0	6	30	70	100
*Skill course III	As per the list		2-0-0				
Total				24	120	280	400
Semester IV							
Core course 11	PUB 401		6-0-0	6	30	70	100
Core course 12	PUB 402		6-0-0	6	30	70	100
Discipline Specific Elective/s 3	Elective paper		6-0-0	6	30	70	100
Discipline Specific Elective/s 4	Elective paper		6-0-0	6	30	70	100
*Skill course IV	As per the list		2-0-0				
Total				24	120	280	400

***The Department shall offer one skill course per semester from the list of skill courses approved for the Department.**

In view of the course content, the Department of Public Administration distributed the Periods between Theory/Tutorial/~~Practical~~ as under per paper

- 6: 0 : 0 (six lectures only (no tutorial and no practical) per week) – For Theory
- 2+0+0 (two lectures) - For Skill course

The Duration of the Period shall be forty five minutes. In each of these combinations, the first value stands for the same number of lecture instructions per week.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective) involve an evaluation system of students that has the following two components:-

- (i) **Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
 - (ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.
- (i) **Continuous Comprehensive Assessment (CCA):** This would have the following components:
 - a. **Term Test:** One term test shall be arranged for each paper prior to End-Semester Examination; examination duration shall be of three hours; maximum marks shall be 60 (reduced to 15).
 - b. **Seminar:** Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 40 (reduced to 10). The seminar shall be completed prior to term test for all the papers.
 - c. **Classroom Attendance** – Each student will have to attend a minimum of 75% Lectures / Tutorials / Practicals. A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE). Attendance marks will be awarded by following the system proposed below:

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

75% to 80%	=	1 mark
81% to 85%	=	2 marks
86 to 90%	=	3 marks
91% to 95%	=	4 marks
96% and above	=	5 marks

Note : Compensation in classroom attendance of a student will be as per prevalent University rules.

Each student's cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Arts, Education & Social Sciences.

- d. CCA is based on open evaluation system without any bias to any student.
- e. Any grievance received in the Department from student shall be placed before the **Grievance Redressal Committee** with adjudicated comments

Each component marks will be added making it rounding as per norms.

Marking Scheme of Continuous Comprehensive Assessment (CCA)

Components	Maximum Marks	Reduced and Original Marks
Term Test	60	(reduced to 15)
Seminar	40	(reduced to 10)
Classroom Attendance	05	05
Total Marks of CCA	100	30

Note : Classroom Attendance marks will be as follows :-

Those having 75% attendance and greater than that will be awarded CCA marks as follows:-

Percentage	Marks
75% to 80%	1 mark
81% to 85%	2 marks
86 to 90%	3 marks
91% to 95%	4 marks
96% and above	5 marks

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective Department shall declare the result as “Satisfactory” or “Non-Satisfactory”; each student need to get a minimum of three “Satisfactory” declaration for the course completion

For the Term test and ESE:

Part A

Ten questions (Definitions, illustrations, functions, short explanations, etc; 25-50 words) for one mark each. $10 \times 1 = 10$ marks; comprising questions from each Unit; no choice in this part

Part B

Four questions of long/explanatory answer (500 words) type, one drawn from each Unit; with internal choices : $4 \times 15 = 60$ marks.

10+60 = 70 marks

Qualifying for Next semester

- 1. A student acquiring minimum of 40% in total of the CCA is eligible to join next semester.**
- 2. A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as „Fail“), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.**
- 3. A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time, i.e. three additional chances for each paper; the student is ineligible for the Postgraduate**

degree in the Subject in which he/she is admitted, for additional chances examination fee shall be on additive basis.

Improvement Option:

Every student shall have the opportunity to improve Credit through University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final.

Result Declaration:

The ESE (End Semester Examination/University Examination) results shall be declared within twenty days of the last examination. The Theory Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation.

POST -GRADUATE COURSE: A DESCRIPTION

The full course is of FOUR SEMESTERS spread for TWO YEARS duration. A semester-wise list of courses to be offered is given below. In each paper there will be four unit.

SEMESTER I

SEMESTER II

SEMESTER III

Elective paper group – First – Semester III
Elective paper group – Second – Semester III

SEMESTER IV

Elective paper group – First – Semester IV
Elective paper group – Second – Semester IV

Skill Courses in the respective subject

Electives would be discipline centric and only students from concerned departments can register.

ADMISSION

The minimum qualification for admission to M.A. Course is Graduate Degree. The details of eligibility conditions and admission procedure will be as per University rules. The candidates are required to attend minimum of a 75% of classes.

TEACHING AND EXAMINATION SCHEME

Per Semester

Course	Periods/Week	Examination hours	CCA	ESE	Total
Theory Papers					
Course I	6	3	30	70	100
Course II	6	3	30	70	100
Course III	6	3	30	70	100
Course IV	6	3	30	70	100

UNIVERSITY EXAMINATION

Each course paper shall be of three hours duration.

Note: The number of elective to be taught from each group in a particular year shall be decided by the Department. Electives offered will be announced at the beginning of the academic session. Each student shall be assigned one Elective Paper from Group ONE and the second from Group TWO. Elective papers will be allotted on merit-cum-choice basis as far as possible. In the odd semester two skill courses will be those offered by the respective departments in the even semester skill courses will be from other departments.

SCHEME OF EXAMINATION FOR M.A. PUBLIC ADMINISTRATION (SEMESTER SYSTEM) FOR THE EXAMINATION

INSTRUCTIONS FOR THE PAPER SETTERS AND THE STUDENTS

Max. Marks - 70

Min. Marks – 25

Duration – 3 hours

Note :

- (i) There shall be 9 questions in all. Five questions have to be attempted.
- (ii) The first question shall be short answer type containing 10 short questions spread over the whole syllabus to be answered in about 30 words each. It shall carry 10 marks and shall be a compulsory question.
- (iii) Rest of the paper shall contain 8 questions with internal choice. The entire syllabus has been divided into four units. Each unit shall have two questions and the candidates shall be given internal choice i.e. the candidate shall attempt one question from each unit.

SEMESTER III

THEORY PAPERS (Core/Elective Papers)	ESE	CCA	Total	Lecture- Tutorial- Practical/ Week	Credits
Paper IX : PUB 301	70	30	100	6-0-0	6
Paper X : PUB 302	70	30	100	6-0-0	6
Paper XI : PUB 303 Any one of the following	70	30	100	6-0-0	6
303(a)				International Organisation and Administration	
303(b)				Urban Local Administration	
Paper XI : PUB 304 Any one of the following	70	30	100	6-0-0	6
304(a)				State Administration in India With Special reference to Rajasthan	
304(b)				Rural Local Administration	

Skill Course Introduction to field work in Local Self Government

Grand Total 400 marks

24 credits

SEMESTER - III

COURSE NO. PUB. ADM. 301

Administrative Thought

- Unit I Administrative Thought of Kautilya, Confucius and Woodrow Wilson.
- Unit II Bureaucratic theory of Max Weber, Scientific Management Theories of Fayol, Luther Gulick and Urwick.
- Unit III Administrative Thought of Chester I. Barnard; Formal and Informal Organisation, Satisfaction, Equilibrium, Authority and Communication.
- Unit IV Human Relations Theory : Fritz J. Roethlisberger and Elton Mayo Hawthorne Study.

Prescribed Readings:

R. Prasad and others : Administrative Thinkers

S.S. Ali : Eminent Administrative Thinkers

Ziuddin Khan and Verma : Prashasnik Vicharadharen Vol. I, II

Jarvis C. Charlesworth : Theory and Practice of Public Administration

COURSE NO. PUB. ADM. 302

Financial Administration in India

- Unit I Introduction of Financial Administration Importance of Finances in Administration Constitutional Provisions relating to Finance Administration.
- Unit II Central State Finance relations, Finance Commission, Organisation, Functions and Role, Ministry of Finance in India: Organisation, Functions and role.
- Unit III Budget : Meaning, Characteristic and Importance of Budget. Budget Techniques Line Item Budget, Performance Budget, PPBS and Zero Based Budget.
- Unit IV Budgeting formulation in India Budgetary Procedure in Parliament. Execution of Budget, Deficit finance and Public Debt.

Prescribed Readings:

M.J.K. Thavaraj : Financial Administration in India

P.K. Ghosh : Public Enterprises in India

darsky: The Politics of Budgetary Process

ELECTIVE PAPER

COURSE NO. PUB. ADM. 303

International Organisation and Administration

- Unit I Evolution of Internationalism. Development of International Institutions characteristic of present Community of state pacific methods for settlement of International disputes.
- Unit II League of Nations : Origin, Structure, Functions of various organs, appraisal, causes of decline and contribution.
- Unit III U.N. : Formation of Charter, Purposes, Principles, membership, various organs of U.N.: General Assembly, Security Council, Economic and Social Council, International Court of Justice, U.N. secretariat, Role of Secretary General.
- Unit IV A Critical appraisal of U.N., U.N. Special Agencies : Organisation and working of I.L.O., UNESCO, F.A.O. and W.H.O.

Prescribed Reading :

Claude, Eagleton : International Government

Ohodrich : The United Nations

Roy, M.P. : Antarrashtriya Sangthan

Leonard : International Organisation

OR

COURSE NO. PUB. ADM. 303

Urban Local Administration

- Unit I Urban Administration: Scope and Importance General features of Urban Local Administration of U.S.A., U.K., France and India.
- Unit II Structure of Urban Local administration: U.S.A.; Major Council plan, Commission plan and City manager plan U.K.: Metropolitan Counties, Non Metropolitan Counties.
- Unit III France : The Municipal Council Local Bodies in India: Municipal cooperation's, municipal council and municipalities. Functions of Local Bodies.
- Unit IV City Government of London, Paris and Newyork, Municipal Corporation of Calcutta, Bombay and Delhi. Town planning and UIT.

Prescribed Reading:

R Agarwal : Municipal Government in India

Munro : The Government of American cities

Hermon Fonar : English Local Government

Nigam, S.R. : Local Self Government

COURSE NO. PUB. ADM. 304

State Administration in India with Special reference to Rajasthan

- Unit I General Background of state Administration History of state Administration in Rajasthan Constitutional Structure of state Government.
- Unit II The office of Governor : Power and role of state Administration. The Office of Chief Minister : Powers, Functions and Position, Council of Minister at state level.
- Unit III Organisation and working of state secretariat, Role of Chief Secretary Department of Home and Finance of Rajasthan: Organisation and functions organisation and working of Revenue Board.
- Unit IV Recruitment of Civil Services in Rajasthan, Organisation and working of Rajasthan Public Service Commission. Training of R.A.S., R.P.S. and other services.

Prescribed Reading:

Ziuddin khan and others: State Administration in Rajasthan

Siongh C.M. and others : Rajasthan Rajya Prashan

Sharma, Harish Chandra : Rajasthan Rajya Prashan

OR

COURSE NO. PUB. ADM. 304

Rural Local Administration

- Unit I Concept and importance of Local Self Government . The Concept of Panchayati Raj in India. Features of Rural Local Administration of U.S.A. and U.K.
- Unit II Evolution of Panchayati Raj in India. Structure and Working of Panchayati Raj Institution in Rajasthan. Characteristic of 73rd Constitutional Amendment Act.
- Unit III Panchyati Raj and Bureaucracy: The Chief Executive officer, Vikas Adhikari, Panchayat Sachiv and other official of panchayat Raj Institutions.
- Unit IV State Control over Panchayati Raj Institutions. Revenue sources of panchayati Raj Institutions. Organisation and working of Directorate of Panchayati Raj.

Prescribed Readings:

Jain, R.B. (ed) Panchayati Raj

Nigam, S.R. : Local Self Government

S.R. Maheshri : Local Government in India

Ravindra Verma : Bharat Mae Sthania Sansthya

OR

COURSE NO. PUB. ADM.

Dissertation

- (i) Dissertation may be offered by the candidates who have secured at least 60% marks at the semester I, II and III examination.
- (ii) Dissertation be submitted within three weeks before the last Semester IV examination.

SKILL COURSE-I BASICS IN PUBLIC ADMINISTRATION

Total : 100 Marks

ESE: 70 Marks

CCA: 30 Marks

Time Allowed: 3 hours

Objectives: to develop and understanding of Basic Skills in Administration

Unit I Meaning, nature and scope of Public Administration. Public and Private Administration

Unit II Chief Executive : Functions, chief executive as general manager.

Unit III Recruitment: Importance and Methods of recruitment, morale and motivation.

Unit IV Budget meaning and significance, principles of a sound budget, preparation and execution of budget.

Books Recommended

Sharma, M.P. : Public Administration-Theory and Practice

White: Introduction to the Study of Public Administration

Willoughby: Principles of Public Administration.

SKILL COURSE-II BASICS IN ADMINISTRATION AND STATE

Total : 100 Marks

ESE: 70 Marks

CCA: 30 Marks

Time Allowed: 3 hours

Objectives: to develop and understanding of Basics in Administration and State Issues

Unit I The concept of laissez faire state, Welfare State and Administrative State.

Unit II Political parties and Pressure Groups and their interaction.

Unit III Organisation of Government : Legislature, Executive, Judiciary.

Unit IV Central Social Welfare Board, Railway Board and Reserve Bank of India.

Books Recommended

Waldo : Administrative State

Field : Government in Modern Society

Gupta, M.G. : Modern Government

**SKILL COURSE-III INTRODUCTION TO FIELD WORK IN LOCAL
SELF GOVERNMENT**

Total : 100 Marks

ESE: 70 Marks

CCA: 30 Marks

Time Allowed: 3 hours

Objectives: to develop and understanding of Basics of Field work in Local Self Work.

Unit I Definition and Concept of field work in Local Self Government.

Unit II Methods and Techniques of field work in Local Self Government.

Unit III Major Problems and limitation in field work in Local Self Government.

Unit IV Preparation of Project Report on Local Self Government.

Books Recommended

Nigam, S.R.: Local Self Government

M.Bhattacharya: Muncipal Government Problems and Prospects

Jain, R.B. (ed): Panchyati Raj

Ravindra Sharma: Bharat me Sthaniya Shashan

SKILL COURSE-IV : RIGHT TO INFORMATION

Total : 100 Marks

ESE: 70 Marks

CCA: 30 Marks

Time Allowed: 3 hours

Objectives: to develop and understanding of Basics of Right to Information

Unit I Right to Information: Meaning and concept

Unit II Right to Information Act. 2005: Main Provision

Unit III Right to Information Act. 2005: Implementation, Problems and Suggestions

Unit IV Preparation of Project Report on Right to Information

Books Recommended

Naib Sudhir – The Right to Information in India

Vyas A.K. – Implementation of R.T.I. Act. 2005 in Armed Forces and its Implications

Madabhushi Sridhar Acharyulu: R.T.I Use and Abuse



JAI NARAIYAN VYAS UNIVERSITY, JODHPUR

DEPARTMENT OF RAJASTHANI

(Faculty of Arts, Education And Social Science)

SYLLABUS

FOR

M.A. RAJASTHANI

(SEMESTER SCHEME)

(SEMESTER I AND SEMESTER II) EXAMINATIONS **2022-2023**

&

(SEMESTER III AND SEMESTER IV) EXAMINATION **2022-2023**

NOTIFICATION

In compliance of decision of the Hon'ble High Court all students are required to fulfill 75% attendance rule in each subject and there must be 75% attendance of the student before he/she could be permitted to appear in the examination.

REGISTER

(Academic)

FACULTY OF ARTS, EDUCATION & SOCIAL SCIENCES

MASTER OF ARTS

GENERAL INFORMATION FOR STUDENTS

The examination for the degree of Master of Arts, Education and Social Sciences shall consist of two parts with semester system: (i) The M.A (Semester I and Semester II), 2021-22 and (ii) M.A (Semester III and Semester IV), 2022-23.

The examination will be through theory papers/practical/viva. Pass marks for the semester I, semester II, semester III and semester IV examination will be as per GPA & GGP. A candidate is required to pass in the written and the practical/viva examination separately.

Successful candidates will be placed in the following divisions on the basis of the total marks obtained in in all four semesters of M.A (Semester I and Semester II) and (ii) M.A (Semester III and Semester IV) examinations taken together:

First division 60% , second division 48% and third division 36% no students will be permitted to register himself simultaneously for more than one post-graduate course.

ATTENDANCE

1. For all regular candidates in the faculties of arts, education and social sciences, science, law, commerce and engineering, the minimum attendance requirement shall be that a candidate should have attended at least 75% of the lecturers delivered and tutorials held taken together as well as 75% of practical and sectionals from the date of his/her admission.
2. Condonation of shortage of attendance:
The shortage of attendance up to the limits specified below may be condoned on valid reasons:
 - i) Up to 6% each subject plus 5 attendances in all the aggregate subject/papers may be condoned by the Vice-Chancellor on the recommendation of the

Dean/Director/principal for undergraduate students and on the recommendation of the Head of the Department for the post-graduate classes.

- ii) The N.C.C./N.S.S. cadets sent out to parades and camps and such students who are deputed by the University to take part in games, athletic or cultural activities may, for purpose of attendance, be treated, as present for the days of their absence in connection with the aforesaid activities and that period shall be added to their subject wise attendance.

Note:

The attendance requirement will apply to each semester.

However, in case of practical where examination is not held at the end of the first semester but the end of the second semester, attendance will be counted at the end of the second semester taking into account attendance put in both the semesters (i.e., first and second) taken together.

Candidates will be required to pass separately in theory and practical examinations.

Candidate's choice among the optional papers and groups would be restricted only to those paper or groups for which regular teaching is provided in the department.

Use of map stencils (political outline only). Log tables and calculators are allowed in the examination.

MEDIUM

Candidates are allowed to Rajasthani Language for answering question papers.

For answering papers in the subjects of English/Hindi the medium will be corresponding language only.

ADMISSION

The details of the eligibility conditions and admission procedures are given in the admission forms and on university website. The admission would be done on the basis of merit as per university rules. Reservation for SC, ST and OBC would also be done as per J.N.V. University, Jodhpur rules. Candidates are required to attend minimum 75% of the classes in theory and practicals both.

FACILITIES

The Department of Rajasthani Faculty Members -

Dr. Meenakshi Borana

Head of Department & Asstt. Professor

Dr. Dhananjaya Amarawat

Asstt. Professor

Dr. GajeSingh Rajpurohit

Asstt. Professor

GUIDELINES FOR CHOICE BASED CREDIT SYSTEM:

Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete **four skill courses:** two within the Department and two from other Department within JNV University or the Universities approved by JNV University.
3. **Course:** Usually referred to, as 'papers' is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one hour of teaching (lecture or tutorial) or two hours of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Post-graduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses

registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.

12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/December and even semester from December/January to May.

Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May. Each Department shall conduct the Practical examinations of Odd semester with internal examiners only; however during even semester one Examiner shall be from other University/Institute.

13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Arts, Edu. and Social Science resolves the following:

- a. All internal assessments shall be open assessment system only and that are based on Quizzes, term test, seminar
- b. Attendance shall carry the prescribed marks in all papers and Practical examination internal assessment
- c. In each semester three out of four theoretical component University examination shall be undertaken by external examiners from outside the university conducting examination, who may be appointed by the competent authority

Grievances and Redressal Mechanism

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head/Principal of the College or the Chairperson of the

University Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.

- b) The appeal will be assessed by the Chairman and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Dean, Faculty of Arts, Edu. and Social Science comprising all HODs of the Faculty and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	'O'	Outstanding	10
2	'A+'	Excellent	9
3	'A'	Very Good	8
4	'B+'	Good	7
5	'B'	Above Average	6
6	'C'	Average	5
7	'P'	Pass	4
8	'F'	Fail	0
9	'Ab'	Absent	0

- i. A student obtaining Grade F shall be considered failed and will be required to reappear in the examination.
- ii. For non credit courses (Skill Courses) 'Satisfactory' or "Unsatisfactory' shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

= and > 95 % marks Grade Point 10.0
 90 to less than 95 % marks Grade Point 9.5
 85 to less than 90 % marks Grade Point 9.0

80 to less than 85 % marks Grade Point 8.5
75 to less than 80 % marks Grade Point 8.0
70 to less than 75 % marks Grade Point 7.5
65 to less than 70 % marks Grade Point 7.0

60 to less than 65 % marks Grade Point 6.5

55 to less than 60 % marks Grade Point 6.0

50 to less than 55 % marks Grade Point 5.5

45 to less than 50 % marks Grade Point 5.0

40 to less than 45 % marks Grade Point 4.5

35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,
i.e

$$\text{SGPA (Si)} = \frac{\sum(C_i \times G_i)}{\sum C_i}$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,
i.e.

$$\text{CGPA} = \frac{\sum(C_i \times S_i)}{\sum C_i}$$

Where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.

- iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA-III

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	6	B	8	6*8= 48
2	Course 2	6	B+	7	6*7= 42
3	Course 3	6	B	6	6*6=36
4	Course 4	6	O	10	6*10=60
5	Practical II	12	B	6	12*6=48
	Total	36			234

Thus, **SGPA = 234/36 = 6.5**

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	36	36	36	36
SGPA	6.5	7.25	7	6.25

$$\text{CGPA} = \frac{(36 \times 6.5 + 36 \times 7.25 + 36 \times 7 + 36 \times 6.25)}{128}$$

$$\frac{(234 + 261 + 252 + 225)}{144}$$

$$972/144 = 6.75$$

Semester III							
Core course 9			6-0-0	6	30	70	100
Core course 10			6-0-0	6	30	70	100
Core course 11			6-0-0	6	30	70	100
Core course 12			6-0-0	6	30	70	100
Total				24	120	280	400
Semester IV							
Core course 13			6-0-0	6	30	70	100
Core course 14			6-0-0	6	30	70	100
Core course 15			6-0-0	6	30	70	100
Core course 16			6-0-0	6	30	70	100
Viva- Vace	-	-	-	-	-	-	100
Total				24	120	280	500

The Duration of the Period shall be 45 minutes/One hour. In each of these combinations, the first value stands for the same number of lecture instructions per week, whereas the last two values stand for double the number of tutorial / practical instructions per week.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective) involve an evaluation system of students that has the following two components:-

- (i) **Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
- (ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.

- (i) **Continuous Comprehensive Assessment (CCA):** This would have the following components:

Continuous assessment may include written assignment, participation in discussions in the class, attendance Etc.

- a. Written Test : 60 marks (reduced to 15 marks)
- b. Participation In Class Discussion : 40 marks (Reduced To 10)
- c. Attendance : 10 (Reduced To 5)

Total 110 reduced to 30 marks

- d. **Classroom Attendance** – Each student will have to attend a minimum of 75% Lectures / Tutorials / Practical. A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE). Attendance shall have 5 marks and will be awarded by following the system proposed below:

Those having greater than 75% attendance will be awarded CCA marks as follows:-

75% to 80%	=	1 marks
80% to 85%	=	2 marks
85 to 90%	=	3 marks
90% to 95%	=	4 marks
> 95%	=	5 marks

- e. Continuous Internal Assessment Awards From Affiliated College /Departments Must Be Sent To The Controller Of Examinations By Name, Two Week Before The Commencement Of The Particular Examination On The Performa Obtained From The Examination Branch.

All students' cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Arts.

Qualifying for Next semester

1. **A student acquiring minimum of 35% in total of the CCA is eligible to join next semester.**
2. A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as 'Fail'), shall be permitted to appear in such failed course(s)' in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.
3. A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time i.e three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted. Additional chances examination fee shall be on additive basis.

Improvement Option:

Every student shall have the opportunity to improve Credit thorough University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final. There shall be no improvement opportunity in Practical examinations.

परीक्षा योजना एवं अंक विभाजन

एम. ए. राजस्थानी

परीक्षा वर्ष 2022 - 2023

सेमेस्टर - I

नोट- परीक्षक एवं विद्यार्थियों के लिए निर्देश-

1. प्रत्येक प्रश्न पत्र के अंतर्गत कुल 9 प्रश्न होंगे। जिसमें से पाँच प्रश्न करने अनिवार्य हैं।
2. प्रथम प्रश्न अतिलघूत्तरी का होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे जिसके सभी प्रश्न करने अनिवार्य हैं। प्रत्येक प्रश्न 1 अंक का होगा।

10 x 1 = 10 अंक

3. प्रथम प्रश्न अतिलघूत्तरी के अलावा कुल 8 प्रश्न होंगे। सम्पूर्ण पाठ्यक्रम 4 इकाइयों में विभक्त हैं। प्रत्येक इकाई से दो - दो प्रश्न विकल्प सहित पूछे जायेंगे। जिसमें से प्रत्येक इकाई में से 1 प्रश्न करना अनिवार्य है। प्रत्येक प्रश्न 15 अंक का होगा।

15 x 04 = 60 अंक

4. प्रत्येक सेमेस्टर में 30 अंक का आंतरिक मूल्यांकन होगा। जिसमें विद्यार्थी की उपस्थिति, शोध पत्र, विभागीय साहित्यिक गतिविधि, प्रश्नोत्तरी प्रतियोगिता आदि सम्मिलित है।

= 30 अंक

5. प्रत्येक प्रश्न पत्र की अवधि 3 घण्टे की होगी।
6. प्रत्येक सेमेस्टर में 4 प्रश्न पत्र होंगे। सेमेस्टर चतुर्थ में 100 अंको की मौखिक परीक्षा (Viva-voce) होगी।

SEMESTER – I

1. THEORY PAPER (For Core Papers)	ESE	CCA	TOTAL	Lecture- Tutorial- Practical/Week	Credits
Paper-I आधुनिक राजस्थानी गद्य-भाग प्रथम	70	30	100	6-0-0	6
Paper-II आधुनिक राजस्थानी पद्य-भाग प्रथम	70	30	100	6-0-0	6
Paper –III राजस्थानी भाषा एवं साहित्य का इतिहास- भाग प्रथम	70	30	100	6-0-0	6
Paper- IV लोक साहित्य- भाग प्रथम	70	30	100	6-0-0	6
Grand Total		400 marks		24 credits	

Total Marks of Semester I 400 Marks and Credits 24

पाठ्यक्रम सेमेस्टर – I

प्रथम प्रश्न पत्र

आधुनिक राजस्थानी गद्य-भाग प्रथम

समय: 3 घण्टे

पूर्णांक : 70

- | | |
|---|----------|
| इकाई 1. सप्रसंग व्याख्या
(पाठ्यक्रम पुस्तक- मेवें रा रूख से एक व्याख्या) | अंक – 15 |
| इकाई 2. सप्रसंग व्याख्या
(पाठ्यक्रम पुस्तक- माटी री महक से एक व्याख्या) | अंक – 15 |
| इकाई 3. आलोचनात्मक प्रश्न
(पाठ्यक्रम पुस्तक- मेवें रा रूख से एक प्रश्न) | अंक – 15 |
| इकाई 4. आलोचनात्मक प्रश्न
(पाठ्यक्रम पुस्तक- माटी री महक से एक प्रश्न) | अंक – 15 |

नोट : अतिलघूत्तरी दस प्रश्न अंक – 10
(पाठ्यक्रम पुस्तक- मेवें रा रूख एवं माटी री महक)

पाठ्य पुस्तकें-

1. अन्नाराम सुदामा : मेवें रा रूख (उपन्यास) – धरती प्रकाशन बीकानेर
2. करणी दान बारहठ: माटी री महक (कहानी) – बारहठ प्रकाशन फेफाना, हनुमानगढ़

संदर्भ ग्रन्थ

डॉ. किरण नाहटा : आधुनिक राजस्थानी साहित्य, चिन्मय प्रकाशन, जयपुर
अगरचन्द नाहटा : राजस्थानी काव्य की गौरवपूर्ण परम्परा, राधकृष्ण प्रकाशन, दिल्ली
राजस्थानी साहित्य की समीक्षा- 'जागती जोत' पत्रिका, राजस्थानी भाषा साहित्य एवं संस्कृति अकादमी, बीकानेर

द्वितीय प्रश्न पत्र
आधुनिक राजस्थानी पद्य-भाग प्रथम

समय: 3 घण्टे

पूर्णांक : 70

- | | |
|---|----------|
| इकाई 1. सप्रसंग व्याख्या
(पाठ्यक्रम पुस्तक- वीर सतसई से एक व्याख्या) | अंक - 15 |
| इकाई 2. सप्रसंग व्याख्या
(पाठ्यक्रम पुस्तक- लू से एक व्याख्या) | अंक - 15 |
| इकाई 3. आलोचनात्मक प्रश्न
(पाठ्यक्रम पुस्तक- वीर सतसई से एक प्रश्न) | अंक - 15 |
| इकाई 4. आलोचनात्मक प्रश्न
(पाठ्यक्रम पुस्तक- लू से एक प्रश्न) | अंक - 15 |

नोट : अतिलघूत्तरी दस प्रश्न अंक - 10
(पाठ्यक्रम पुस्तक- वीर सतसई एवं लू)

पाठ्य पुस्तकें-

1. पतराम गौड़, ईश्वरदान आशिया व डॉ. कन्हैयालाल सहज (सम्पादक) : वीर सतसई (सूर्यमल्ल मिश्रण), बंगाल हिन्दी मण्डल, कलकत्ता
2. चन्द्रसिंह : लू चौद जलेरी प्रकाशन, जयपुर

संदर्भ ग्रन्थ

महाकवि सूर्यमल्ल मिश्रण स्मृति अंक, सूर्यमल्ल स्मारक समिति, बूंदी परम्परा (त्रै-मासिक पत्रिका), सूर्यमल्ल मिश्रण विशेषांक तथा 'हेमाणी' अंक, राजस्थानी शोध संस्थान, चौपासनी, जोधपुर , डॉ.शम्भुसिंह मनोहर : वीर सतसई (सम्पादक), स्टुडेन्ट्स बुक कम्पनी, चौडा रास्ता, जयपुर

तृतीय प्रश्न पत्र

राजस्थानी भाषा एवं साहित्य का इतिहास –भाग प्रथम

समय: 3 घण्टे

पूर्णांक : 70

- इकाई 1. . आलोचनात्मक प्रश्न अंक – 15
(भाषा : परिभाषा, अंग,विकास, मानक भाषा)
- इकाई 2. आलोचनात्मक प्रश्न अंक – 15
(लिपि: परिभाषा, मुडिया और देवनागरीलिपि का सामान्य परिचय)
- इकाई 3. आलोचनात्मक प्रश्न अंक – 15
(राजस्थानी भाषा– उदभव, विकास)
- इकाई 4. आलोचनात्मक प्रश्न अंक – 15
(व्याकरण, बोलिया एवं क्षेत्र)

नोट : अतिलघूत्तरी दस प्रश्न अंक – 10
(उपरोक्त चारो इकाईयो से सम्बधित प्रश्न)

पाठ्यक्रम विषय सामग्री –

भाषा : भाषा विज्ञान की परिभाषा, भाषा के अंग, भाषा विकास के कारण, मानक भाषा, बोली, उपबोली

लिपि : लिपि और भाषा का सम्बन्ध, नागरी अंक और लिपि का विकास,मुडिया लिपि: सामान्य परिचय

राजस्थानी भाषा : वैदिक संस्कृत, प्राकृत,अपभ्रंश– सामान्य परिचय राजस्थानी भाषा की उत्पत्ति एवं विकास, क्षेत्र– विस्तार, बोलियां, उपबोलियां

डिंगल–पिंगल की सामान्य विशेषताएं, राजस्थानी की व्याकरणिक विशेषताएं

संदर्भ ग्रन्थ –

प्रो. रामाश्रय मिश्र एवं डॉ. नरेश मिश्र: भाषा और भाषा विज्ञान, उन्मेश प्रकाशन,12,

सुभाष कॉलोनी ,करनाल, हरियाणा

भोलानाथ तिवारी: भाषा विज्ञान, किताब महल,दिल्ली

डॉ.सुनिति कुमार चाटुर्ज्या : राजस्थानी भाषा,साहित्य संस्थान, उदयपुर
एल.पी.टैक्सीटोरी (अनु.)डॉ० नामवरसिंह : पुरानी राजस्थानी
जार्ज ए.ग्रियसैन (अनु.) आत्माराम जाजोदिया: राजस्थान का भाषा सर्वेक्षण, राजस्थानी
भाषा प्रचार, जयपुर
जगदीश प्रसाद कौशिक : भारतीय आर्य भाषाओं का इतिहास
डॉ.मोतीलाल मेनारिया: राजस्थानी भाषा और साहित्य
नरोतमदास स्वामी : राजस्थानी भाषा – एक परिचय
डॉ.मोतीलाल मेनारिया: राजस्थान का पिंगल साहित्य
सीताराम लालस(सम्पा.) : राजस्थानी शब्दकोस (प्रथम खण्ड),राजस्थानी
शोध संस्थान,चौपासनी, जोधपुर
डॉ.उदयनारायण तिवारी : वीर साहित्य
डॉ. गोवर्द्धन शर्मा : डिंगल साहित्य
डॉ. हजारीप्रसाद द्विवेदी : हिन्दी साहित्य का आदिकाल
रामचन्द्र शुक्ल : हिन्दी साहित्य का इतिहास
डॉ.कन्हैयालाल शर्मा : हाडौती बोली और साहित्य
श्याम परमार : मालवी और उसका इतिहास
डॉ. महावीरप्रसाद शर्मा : मेवाती का उद्भव एवं विकास
डॉ. ओमप्रकाश भारद्वाज : मानक भाषा विज्ञान
डॉ. कैलाशचन्द्र अग्रवाल : शेखावटी बोली का विवरणात्मक अध्ययन
डॉ. रतनचन्द्र शर्मा : मानक हिन्दी और भाषा विज्ञान
डॉ.एल.बी.जोशी : बागड़ी बोली का स्वरूप और तुलनात्मक अध्ययन
गोरीशंकर हीराचन्द ओझा : प्राचीन भारतीय लिपिमाला
नरोतमदास स्वामी : राजस्थानी व्याकरण
रामकरण आसोपा : मारवाडी व्याकरण
सीताराम लालस : राजस्थानी व्याकरण
सांस्कृतिक राजस्थान : अखिल भारतीय मारवाड़ी सम्मेलन, कलकत्ता
डॉ. देवेन्द्रनाथ शर्मा : भाषा विज्ञान की भूमिका,राधाकृष्ण प्रकाशन,दिल्ली
परम्परा : त्रैमासिक पत्रिका के आदिकाल तथा मध्यकाल संबंधी विशेषांक

चतुर्थ प्रश्न पत्र
लोक साहित्य –भाग प्रथम

समय: 3 घण्टे

पूर्णांक : 70

- इकाई 1. . आलोचनात्मक प्रश्न अंक – 15
(लोक, लोक वार्ता – लोक मानस, लोक साहित्य और लोक वार्ता,)
- इकाई 2. आलोचनात्मक प्रश्न अंक – 15
(लोक तत्व, लोक संस्कृति, लोक साहित्य और आभिजात्य साहित्य)
- इकाई 3. आलोचनात्मक प्रश्न अंक – 15
(लोक साहित्य तथा अन्य समाज विज्ञान— इतिहास, दर्शन, भाषा—विज्ञान, मनोविज्ञान, पुरातत्व और नृविज्ञान)
- इकाई 4. आलोचनात्मक प्रश्न अंक – 15
(राजस्थानी लोक साहित्य प्रवृत्तियां एवं प्रमुख लोक विधाएँ, लोक साहित्य के संकलन एवं संरक्षण की आवश्यकता , समस्या एवं समाधान)
- नोट** : अतिलघूत्तरी दस प्रश्न अंक – 10
(उपरोक्त चारो इकाईयों से सम्बंधित प्रश्न)

पाठ्यक्रम विषय सामग्री

लोक साहित्य : लोक, लोक वार्ता – लोक मानस, लोक साहित्य और लोक वार्ता आलोचनात्मक प्रश्न , लोक तत्व, लोक संस्कृति, लोक साहित्य और आभिजात्य साहित्य) आलोचनात्मक प्रश्न , लोक साहित्य तथा अन्य समाज विज्ञान— इतिहास, दर्शन, भाषा—विज्ञान, मनोविज्ञान, पुरातत्व और नृविज्ञान आलोचनात्मक प्रश्न, राजस्थानी लोक साहित्य प्रवृत्तियां एवं प्रमुख लोक विधाएँ, लोक साहित्य के संकलन एवं संरक्षण की आवश्यकता , समस्या एवं समाधान आलोचनात्मक प्रश्न

संदर्भ ग्रन्थ

डॉ.सोहनदान चारण : राजस्थानी लोक साहित्य का आलोचनात्मक अध्ययन

डॉ.महेन्द्र भानावत : लोक रंग

डॉ. महेन्द्र भानावत : राजस्थानी लोक नाट्य परम्परा एवं प्रवृत्तियाँ
डॉ. सत्येन्द्र : लोक साहित्य विज्ञान
डॉ. कृष्णदेव उपाध्याय : लोक साहित्य की भूमिका
श्याम परमार : भारतीय लोक वांगमय
डॉ. कल्याण सिंह शेखावत : राजस्थानी भाषा साहित्य एवं संस्कृति
श्याम परमार : लोकधर्मी नाट्य परम्परा
वसुदेवशरण अग्रवाल : लोक धर्म
मन्मथनाथ गुप्त : लोकोत्सव
श्रीकृष्णदास : लोकगीतों का समाजशास्त्रीय अध्ययन
झवेरचन्द मेघानी : लोक साहित्य (व्याख्यान)
सूर्यकरण पारीक : राजस्थानी लोक गीत
नानूराम संस्कर्ता : राजस्थान का लोक-साहित्य
डॉ. कृष्णकुमार शर्मा : राजस्थानी लोक गाथा
डॉ. कन्हैयालाल सहल : राजस्थानी लोकभाषाओं के कुछ रूढ़ तत्व
लक्ष्मीलाल जोशी : मेवाड़ की कहावतें
डॉ. कन्हैयालाल सहल : राजस्थानी कहावतें – एक अध्ययन
डॉ. कन्हैयालाल शर्मा : तेजाजी
डॉ. महेन्द्र भानावत : तेजाजी
चन्द्रदान चारण : गोगाजी चौहान की राजस्थानी गाथा
डॉ. मनोहर शर्मा : राजस्थानी साहित्य और संस्कृति
गौरीशंकर हीराचन्द ओझा : मध्यकालीन भारतीय संस्कृति
लक्ष्मीकुमारी चूंडावत(सम्पा.) : बगड़ावत देवनारायण गाथा
भागीरथ कानोडिया तथा गोविन्द अग्रवाल : राजस्थानी कहावत – कोश

पाठ्यक्रम संख्या (Raj. 105)
कौशल पाठ्यक्रम (Skill Course : I)
“राजस्थानी बात साहित्य”

इकाई 1. राजस्थानी बात साहित्य: अर्थ, परम्परा, विविध रूप एवं शैली

इकाई 2. मध्यकालीन राजस्थानी बात साहित्य: सामाजिक एवं सांस्कृतिक चित्रण।

इकाई 3. राजस्थानी बात साहित्य: लोक विश्वास, लोक मान्यतावां।

इकाई 4. आधुनिक राजस्थानी बात साहित्य (बातां री फुलवाड़ी भाग 1 से 14 के विशेष सन्दर्भ में)

सहायक पुस्तकें—

1. राजस्थानी बात संग्रह: मनोहर शर्मा/ श्रीलाल नथमल जोशी
2. राजस्थानी बात साहित्य: पूनम चंद दहिया
3. राजस्थानी प्राचीन गद्य साहित्य : शिव कुमार अंचल
4. राजस्थानी बात साहित्य: परम्परा विशेषांक :- सम्पादक डॉ. नारायणसिंह भाटी
5. बातां री फुलवाड़ी : विजयदान देथा



JAIN NARAIYAN VYAS UNIVERSITY, JODHPUR

DEPARTMENT OF RAJASTHANI

(Faculty of Arts, Education And Social Science)

SYLLABUS

FOR

M.A. RAJASTHANI

(SEMESTER SCHEME)

(SEMESTER I AND SEMESTER II) EXAMINATIONS **2022-2023**

&

(SEMESTER III AND SEMESTER IV) EXAMINATION **2022-2023**

FACULTY MEMBERS

Dr. Meenakshi Borana

Head of Department & Asstt. Professor

Dr. Dhananjaya Amarawat Asstt. Professor

Dr. GajeSingh Rajpurohit Asstt. Professor

परीक्षा योजना एवं अंक विभाजन

एम. ए. राजस्थानी

परीक्षा वर्ष 2022 - 2023

सेमेस्टर - II

नोट— परीक्षक एवं विद्यार्थियों के लिए निर्देश—

1. प्रत्येक प्रश्न पत्र के अंतर्गत कुल 9 प्रश्न होंगे। जिसमें से पाँच प्रश्न करने अनिवार्य हैं।
2. प्रथम प्रश्न अतिलघूत्तरी का होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे जिसके सभी प्रश्न करने अनिवार्य हैं। प्रत्येक प्रश्न 1 अंक का होगा।

10 x 1 = 10 अंक

3. प्रथम प्रश्न अतिलघूत्तरी के अलावा कुल 8 प्रश्न होंगे। सम्पूर्ण पाठ्यक्रम 4 इकाइयों में विभक्त हैं। प्रत्येक इकाई से दो – दो प्रश्न विकल्प सहित पूछे जायेंगे। जिसमें से प्रत्येक इकाई में से 1 प्रश्न करना अनिवार्य हैं। प्रत्येक प्रश्न 15 अंक का होगा।

15 x 04 = 60 अंक

4. प्रत्येक सेमेस्टर में 30 अंक का आंतरिक मुल्यांकन होगा। जिसमें विद्यार्थी की उपस्थिति, शोध पत्र, विभागीय साहित्यिक गतिविधि, प्रश्नोत्तरी प्रतियोगिता आदि सम्मिलित हैं।

= 30 अंक

5. प्रत्येक प्रश्न पत्र की अवधि 3 घण्टे की होगी।
6. प्रत्येक सेमेस्टर में 4 प्रश्न पत्र होंगे। सेमेस्टर चतुर्थ में 100 अंको की मौखिक परीक्षा(Viva-voce) होगी।

SEMESTER – II

1. THEORY PAPER (For Core Papers)	ESE	CCA	TOTAL	Leacture- Tutorial- Practical/Week	Credits
Paper-I आधुनिक राजस्थानी गद्य-भाग द्वितीय	70	30	100	6-0-0	6
Paper-II आधुनिक राजस्थानी पद्य-भाग द्वितीय	70	30	100	6-0-0	6
Paper –III राजस्थानी भाषा एवं साहित्य का इतिहास- भाग द्वितीय	70	30	100	6-0-0	6
Paper- IV लोक साहित्य- भाग द्वितीय	70	30	100	6-0-0	6
Grand Total		400 marks		24 credits	

Total Marks of Semester I 400 Marks and Credits 24

पाठ्यक्रम सेमेस्टर – II

प्रथम प्रश्न पत्र

आधुनिक राजस्थानी गद्य-भाग द्वितीय

समय: 3 घण्टे

पूर्णांक : 70

- | | |
|--|----------|
| इकाई 1. सप्रसंग व्याख्या
(पाठ्यक्रम पुस्तक- राजस्थानी निबन्ध संग्रह से एक व्याख्या) | अंक – 15 |
| इकाई 2. सप्रसंग व्याख्या
(पाठ्यक्रम पुस्तक- तास रो घर से एक व्याख्या) | अंक – 15 |
| इकाई 3. आलोचनात्मक प्रश्न
(पाठ्यक्रम पुस्तक- राजस्थानी निबन्ध संग्रह से एक प्रश्न) | अंक – 15 |
| इकाई 4. आलोचनात्मक प्रश्न
(पाठ्यक्रम पुस्तक- तास रो घर से एक प्रश्न) | अंक – 15 |

नोट : अतिलघूत्तरी दस प्रश्न अंक – 10
(पाठ्यक्रम पुस्तक- राजस्थानी निबन्ध संग्रह एवं तास रो घर)

पाठ्य पुस्तकें-

1. चन्द्रसिंह: राजस्थानी निबन्ध संग्रह निबन्ध, राजस्थानी साहित्य अकादमी, उदयपुर
2. यादवेन्द्र शर्मा 'चन्द्र' : तास रो घर, प्रकाशक राजस्थानी भाषा प्रचार सभा, जयपुर

संदर्भ ग्रन्थ

डॉ. किरण नाहटा : आधुनिक राजस्थानी साहित्य, चिन्मय प्रकाशन, जयपुर
अगरचन्द नाहटा : राजस्थानी काव्य की गौरवपूर्ण परम्परा, राधकृष्ण प्रकाशन, दिल्ली
राजस्थानी साहित्य की समीक्षा- 'जागती जोत' पत्रिका, राजस्थानी भाषा साहित्य एवं संस्कृति अकादमी, बीकानेर

द्वितीय प्रश्न पत्र
आधुनिक राजस्थानी पद्य-भाग द्वितीय

समय: 3 घण्टे

पूर्णांक : 70

- | | |
|--|----------|
| इकाई 1. सप्रसंग व्याख्या
(पाठ्यक्रम पुस्तक- राधा से एक व्याख्या) | अंक - 15 |
| इकाई 2. सप्रसंग व्याख्या
(पाठ्यक्रम पुस्तक- लीलटांस से एक व्याख्या) | अंक - 15 |
| इकाई 3. आलोचनात्मक प्रश्न
(पाठ्यक्रम पुस्तक- राधा से एक प्रश्न) | अंक - 15 |
| इकाई 4. आलोचनात्मक प्रश्न
(पाठ्यक्रम पुस्तक- लीलटांस से एक प्रश्न) | अंक - 15 |

नोट : अतिलघूत्तरी दस प्रश्न
(पाठ्यक्रम पुस्तक- राधा एवं लीलटांस)

अंक - 10

पाठ्य पुस्तकें-

1. सत्यप्रकाश जोशी: राधा, राजस्थानी ग्रंथागार, जोधपुर
2. कन्हैयालाल सेठिया- लीलटांस, स्व. मुरलीधर सराफ स्मृति ग्रंथ माला, कलकत्ता मे से निर्धारित कविताएं - 1. मादा 2. पिछांग 3. ओपरो 4. सांच'र झूठ 5. साच'र सपनूं 6. मिणधर सरप 7. दीठ'र अदीठ 8. निजर 9. निराकार 10. ईश्वर 11. थितप्रग्य 12. सापेख 13. डर 14. नरग - सरग 15. जिनगानी रो आंच 16. करणी जाणीजै 17. इजगर री लीक 18. पिच्छम'र पूरब 19. रतनागर 20. ओळख 21. एक दीठ : दो साच 22. कविता 23. जलम भौम 24. सै'र (1) 25. सै'र (2) 26. जय जात्रा 27. सिरजन धरमी 28. बसन्त 29. सबद अमरित 30. उन्याळो 31. सियाळो 32. चौमासो 33. जलमदिन 34. रमत 35. सिंझ्या (कुल - 35 कविताएं)

संदर्भ ग्रन्थ

महाकवि सूर्यमल्ल मिश्रण स्मृति अंक, सूर्यमल्ल स्मारक समिति, बूंदी परम्परा (त्रै-मासिक पत्रिका), सूर्यमल्ल मिश्रण विशेषांक तथा 'हेमाणी' अंक, राजस्थानी शोध

संस्थान, चौपासनी, जोधपुर , डॉ.शम्भुसिंह मनोहर : वीर सतसई (सम्पादक), स्टुडेन्ट्स
बुक कम्पनी, चौडा रास्ता,जयपुर

तृतीय प्रश्न पत्र

राजस्थानी भाषा एवं साहित्य का इतिहास – भाग द्वितीय

समय: 3 घण्टे

पूर्णांक : 70

- इकाई 1. . आलोचनात्मक प्रश्न (राजस्थानी साहित्य का काल विभाजन विवेचन) अंक – 15
- इकाई 2. आलोचनात्मक प्रश्न (राजस्थानी साहित्य का आदिकाल) अंक – 15
- इकाई 3. आलोचनात्मक प्रश्न (राजस्थानी साहित्य का मध्यकाल) अंक – 15
- इकाई 4. आलोचनात्मक प्रश्न (राजस्थानी साहित्य का आधुनिककाल) अंक – 15

नोट : अतिलघूत्तरी दस प्रश्न (उपरोक्त चारो इकाईयो से सम्बन्धित प्रश्न) अंक – 10

पाठ्यक्रम विषय सामग्री –

राजस्थानी साहित्य का इतिहास : राजस्थानी साहित्य का काल विभाजन, कालगत-प्रवृत्तियाँ, काव्य-धाराएँ, विधाएँ, प्रमुख रचनाएँ तथा रचनाकार। आदिकाल, मध्यकाल, आधुनिककाल।

संदर्भ ग्रन्थ –

प्रो. रामाश्रय मिश्र एवं डॉ. नरेश मिश्र: भाषा और भाषा विज्ञान, उन्मेश प्रकाशन, 12, सुभाष कॉलोनी, करनाल, हरियाणा
भोलानाथ तिवारी: भाषा विज्ञान, किताब महल, दिल्ली
डॉ. सुनिति कुमार चाटुर्ज्या : राजस्थानी भाषा, साहित्य संस्थान, उदयपुर
एल.पी.टैक्सीटोरी (अनु.) डॉ० नामवरसिंह : पुरानी राजस्थानी
जार्ज ए. ग्रेयसैन (अनु.) आत्माराम जाजोदिया: राजस्थान का भाषा सर्वेक्षण, राजस्थानी भाषा प्रचार, जयपुर
जगदीश प्रसाद कौशिक : भारतीय आर्य भाषाओं का इतिहास

डॉ.मोतीलाल मेनारिया: राजस्थानी भाषा और साहित्य
नरोतमदास स्वामी : राजस्थानी भाषा – एक परिचय
डॉ.मोतीलाल मेनारिया: राजस्थान का पिंगल साहित्य
सीताराम लालस(सम्पा.) : राजस्थानी शब्दकोस (प्रथम खण्ड),राजस्थानी
शोध संस्थान,चौपासनी, जोधपुर
डॉ.उदयनारायण तिवारी : वीर साहित्य
डॉ. गोवर्द्धन शर्मा : डिंगल साहित्य
डॉ. हजारीप्रसाद द्विवेदी : हिन्दी साहित्य का आदिकाल
रामचन्द्र शुक्ल : हिन्दी साहित्य का इतिहास
डॉ.कन्हैयालाल शर्मा : हाडौती बोली और साहित्य
श्याम परमार : मालवी और उसका इतिहास
डॉ. महावीरप्रसाद शर्मा : मेवाती का उद्भव एवं विकास
डॉ. ओमप्रकाश भारद्वाज : मानक भाषा विज्ञान
डॉ. कैलाशचन्द्र अग्रवाल : शेखावटी बोली का विवरणात्मक अध्ययन
डॉ. रतनचन्द्र शर्मा : मानक हिन्दी और भाषा विज्ञान
डॉ.एल.बी.जोशी : बागड़ी बोली का स्वरूप और तुलनात्मक अध्ययन
गोरीशंकर हीराचन्द ओझा : प्राचीन भारतीय लिपिमाला
नरोतमदास स्वामी : राजस्थानी व्याकरण
रामकरण आसोपा : मारवाडी व्याकरण
सीताराम लालस : राजस्थानी व्याकरण
सांस्कृतिक राजस्थान : अखिल भारतीय मारवाडी सम्मेलन, कलकत्ता
डॉ. देवेन्द्रनाथ शर्मा : भाषा विज्ञान की भूमिका,राधाकृष्ण प्रकाशन,दिल्ली
परम्परा : त्रैमासिक पत्रिका के आदिकाल तथा मध्यकाल संबंधी विशेषांक

चतुर्थ प्रश्न पत्र
लोक साहित्य –भाग द्वितीय

समय: 3 घण्टे

पूर्णांक : 70

- इकाई 1. . आलोचनात्मक प्रश्न अंक – 15
(राजस्थानी लोक साहित्य : लोक कथाएं)
- इकाई 2. आलोचनात्मक प्रश्न अंक – 15
(राजस्थानी लोक साहित्य : लोक गाथाएं)
- इकाई 3. आलोचनात्मक प्रश्न अंक – 15
(राजस्थानी लोक साहित्य : लोक नाट्य एवं लोक गीत)
- इकाई 4. आलोचनात्मक प्रश्न अंक – 15
(राजस्थानी लोक साहित्य : लोक विश्वास पहेलियां, कहावतें, लोकोत्सव तथा राजस्थानी लोक संस्कृति)

नोट : अतिलघूत्तरी दस प्रश्न अंक – 10
(उपरोक्त चारो इकाईयो से सम्बन्धित प्रश्न)

पाठ्यक्रम विषय सामग्री

राजस्थानी लोक साहित्य : प्रमुख लोक कथाएं आलोचनात्मक प्रश्न , राजस्थानी लोक साहित्य , प्रमुख लोक गाथाएँ आलोचनात्मक प्रश्न, प्रमुख लोक नाट्य ,लोक गीत आलोचनात्मक प्रश्न , राजस्थानी लोक साहित्य : लोक विश्वास, लोक पहेलियां, लोक कहावतें लोकोत्सव तथा राजस्थानी लोक संस्कृति आलोचनात्मक प्रश्न ।

संदर्भ ग्रन्थ

डॉ.सोहनदान चारण : राजस्थानी लोक साहित्य का आलोचनात्मक अध्ययन

डॉ.महेन्द्र भानावत : लोक रंग

डॉ. महेन्द्र भानावत : राजस्थानी लोक नाट्य परम्परा एवं प्रवृत्तियाँ

डॉ. सत्येन्द्र : लोक साहित्य विज्ञान
डॉ. कृष्णदेव उपाध्याय : लोक साहित्य की भूमिका
श्याम परमार : भारतीय लोक वांगमय
डॉ. कल्याण सिंह शेखावत : राजस्थानी भाषा साहित्य एवं संस्कृति
श्याम परमार : लोकधर्मी नाट्य परम्परा
वसुदेवशरण अग्रवाल : लोक धर्म
मन्मथनाथ गुप्त : लोकोत्सव
श्रीकृष्णदास : लोकगीतों का समाजशास्त्रीय अध्ययन
झवेरचन्द मेघानी : लोक साहित्य (व्याख्यान)
सूर्यकरण पारीक : राजस्थानी लोक गीत
नानूराम संस्कर्ता : राजस्थान का लोक-साहित्य
डॉ.कृष्णकुमार शर्मा : राजस्थानी लोक गाथा
डॉ. कन्हैयालाल सहल : राजस्थानी लोकभाषाओं के कुछ रूढ़ तत्व
लक्ष्मीलाल जोशी : मेवाड़ की कहावतें
डॉ. कन्हैयालाल सहल : राजस्थानी कहावतें – एक अध्ययन
डॉ. कन्हैयालाल शर्मा : तेजाजी
डॉ. महेन्द्र भनावत : तेजाजी
चन्द्रदान चारण : गोगाजी चौहान की राजस्थानी गाथा
डॉ. मनोहर शर्मा : राजस्थानी साहित्य और संस्कृति
गौरीशंकर हीराचन्द ओझा : मध्यकालीन भारतीय संस्कृति
लक्ष्मीकुमारी चूंडावत(सम्पा.) : बगडावत देवनारायण गाथा
भागीरथ कानोडिया तथा गोविन्द अग्रवाल : राजस्थानी कहावत – कोश।

पाठ्यक्रम संख्या (Raj. 205)
कौशल पाठ्यक्रम (Skill Course : II)
“राजस्थानी – काव्य”

- इकाई 1. राजस्थानी काव्य: अर्थ परिभाषा, काव्य तत्व, काव्य दोष।
- इकाई 2. आदिकालीन राजस्थानी शैलियां एवं प्रमुख कवि – शिवदास गाडण, सांयाजी झूला।
- इकाई 3. मध्यकालीन राजस्थानी काव्य धारा, प्रमुख कवि – ईसरदास बारहठ, मीरां बाई, पृथ्वीराज राठौड, कृपाराम खिड़िया।
- इकाई 4. आधुनिक राजस्थानी काव्य, स्वतंत्रता आंदोलन में राजस्थानी कवियों का योगदान

सहायक पुस्तकें—

1. राजस्थानी भाषा और साहित्य— डॉ. मोतीलाल मेनारिया
2. राजस्थानी भाषा साहित्य का इतिहास – नरोत्तम दास स्वामी
3. राजस्थानी भाषा साहित्य एवं संस्कृति – डॉ. कल्याणसिंह शेखावत
4. स्वतंत्रता आंदोलन में राजस्थानी कवियों का योगदान – नृसिंह राजपुरोहित
5. राजस्थानी प्राचीन काव्य रूप – अजरचंद नाहटा



JAIN NARAYAN VYAS UNIVERSITY, JODHPUR

DEPARTMENT OF RAJASTHANI

(Faculty of Arts, Education And Social Science)

SYLLABUS

FOR

M.A. RAJASTHANI

(SEMESTER SCHEME)

(SEMESTER I AND SEMESTER II) EXAMINATIONS **2022-2023**

&

(SEMESTER III AND SEMESTER IV) EXAMINATION **2022-2023**

FACULTY MEMBERS

Dr. Meenakshi Borana

Head of Department & Asstt. Professor

Dr. Dhananjaya Amarawat Asstt. Professor

Dr. GajeSingh Rajpurohit Asstt. Professor

परीक्षा योजना एवं अंक विभाजन

एम. ए. राजस्थानी

परीक्षा वर्ष 2022 - 2023

सेमेस्टर - III

नोट— परीक्षक एवं विद्यार्थियों के लिए निर्देश—

1. प्रत्येक प्रश्न पत्र के अंतर्गत कुल 9 प्रश्न होंगे। जिसमें से पाँच प्रश्न करने अनिवार्य हैं।
2. प्रथम प्रश्न अतिलघूत्तरी का होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे जिसके सभी प्रश्न करने अनिवार्य हैं। प्रत्येक प्रश्न 1 अंक का होगा।

10 x 1 = 10 अंक

3. प्रथम प्रश्न अतिलघूत्तरी के अलावा कुल 8 प्रश्न होंगे। सम्पूर्ण पाठ्यक्रम 4 इकाइयों में विभक्त हैं। प्रत्येक इकाई से दो – दो प्रश्न विकल्प सहित पूछे जायेंगे। जिसमें से प्रत्येक इकाई में से 1 प्रश्न करना अनिवार्य है। प्रत्येक प्रश्न 15 अंक का होगा।

15 x 04 = 60 अंक

4. प्रत्येक सेमेस्टर में 30 अंक का आंतरिक मुल्यांकन होगा। जिसमें विद्यार्थी की उपस्थिति, शोध पत्र, विभागीय साहित्यिक गतिविधि, प्रश्नोत्तरी प्रतियोगिता आदि सम्मिलित है।

= 30 अंक

5. प्रत्येक प्रश्न पत्र की अवधि 3 घण्टे की होगी।
6. प्रत्येक सेमेस्टर में 4 प्रश्न पत्र होंगे। सेमेस्टर चतुर्थ में 100 अंको की मौखिक परीक्षा(Viva-voce) होगी।

SEMESTER – III

1. THEORY PAPER (For Core Papers)	ESE	CCA	TOTAL	Leacture- Tutorial- Practical/Week	Credits
Paper-I प्राचीन और मध्यकालीन राजस्थानी पद्य : भाग प्रथम	70	30	100	6-0-0	6
Paper-II प्राचीन और मध्यकालीन राजस्थानी गद्य : भाग प्रथम	70	30	100	6-0-0	6
Paper –III साहित्यशास्त्र एवं पाठालोचन : भाग प्रथम	70	30	100	6-0-0	6
Paper- IV राजस्थानी निबन्ध (भाषा साहित्य एवं संस्कृति से संबंधित)	70	30	100	6-0-0	6
Grand Total		400 marks			24 credits

Total Marks of Semester I 400 Marks and Credits 24

पाठ्यक्रम सेमेस्टर – III

प्रथम प्रश्न पत्र (Raj. 301)

प्राचीन और मध्यकालीन राजस्थानी पद्य : भाग प्रथम

समय: 3 घण्टे

पूर्णांक : 70

- इकाई 1. सप्रसंग व्याख्या अंक – 15
(पाठ्यक्रम पुस्तक— ढोला मारु रा दूहा से एक व्याख्या)
- इकाई 2. सप्रसंग व्याख्या अंक – 15
(पाठ्यक्रम पुस्तक— वेलि क्रिसन रूकमणी री से एक व्याख्या)
- इकाई 3. आलोचनात्मक प्रश्न अंक – 15
(पाठ्यक्रम पुस्तक— ढोला मारु रा दूहा से एक प्रश्न)
- इकाई 4. आलोचनात्मक प्रश्न अंक – 15
(पाठ्यक्रम पुस्तक— वेलि क्रिसन रूकमणी री से एक प्रश्न)

नोट : अतिलघूत्तरी दस प्रश्न अंक – 10
(पाठ्यक्रम पुस्तक—ढोला मारु रा दूहा एवं वेलि क्रिसन रूकमणी री)

पाठ्य पुस्तकें—

- 1 रामसिंह, सूर्यकरण पारीक और नरोतमदास स्वामी (समप.) : ढोला मारु रा दूहा (केवल प्रथम 210 दोहे), नापगरी प्रचारिणी सभा, काशी
- 2 नरोतमदास स्वामी (संपा.) : वेलि क्रिसन रूकमणी री (केवल प्रथम 239 छन्द), श्री राम मेहरा एण्ड कम्पनी, आगरा

संदर्भ ग्रन्थ

डॉ. शान्ता भानावत : ढोला मारु रा दूहा का अर्थ और वैज्ञानिक अध्ययन, अनुपम प्रकाशन, जयपुर। डॉ. भगवतीलाल शर्मा : ढोला मारु रा दूहा में काव्य, संस्कृति और इतिहास। अगरचन्द नाहटा : प्राचीन काव्यों की रूप – परम्परा, भारतीय विद्या मंदिर शोध प्रतिष्ठान, बीकानेर। डॉ.आनन्द प्रकाश दीक्षित : वेलि क्रिसन रूकमणी री।

द्वितीय प्रश्न पत्र (Raj. 302)

प्राचीन और मध्यकालीन राजस्थानी गद्य : भाग प्रथम

समय: 3 घण्टे

पूर्णांक : 70

- इकाई 1. सप्रसंग व्याख्या अंक - 15
(पाठ्यक्रम पुस्तक- कुंवरसी सांखलो, से एक व्याख्या)
- इकाई 2. सप्रसंग व्याख्या अंक - 15
(पाठ्यक्रम पुस्तक- राजस्थानी साहित्य संग्रह भाग-II से एक व्याख्या)
- इकाई 3. आलोचनात्मक प्रश्न अंक - 15
(पाठ्यक्रम पुस्तक- कुंवरसी सांखलो से एक प्रश्न)
- इकाई 4. आलोचनात्मक प्रश्न अंक - 15
(पाठ्यक्रम पुस्तक- राजस्थानी साहित्य संग्रह भाग-II से एक प्रश्न)

नोट : अतिलघूत्तरी दस प्रश्न अंक - 10
(पाठ्यक्रम पुस्तक- कुंवरसी सांखलो एवं राजस्थानी साहित्य संग्रह भाग-I)

पाठ्य पुस्तकें-

1. डॉ. मनोहर शर्मा (सम्पा.) : कुंवरसी सांखलो, पंचशील प्रकाशन, जयपुर
2. पुरुषोत्तम लाल मेनारिया (सम्पा.) : राजस्थानी साहित्य संग्रह (भाग द्वितीय), राजस्थान प्राच्य विद्या प्रतिष्ठान, जोधपुर मे से 1. देवजी बगडावतां री बात तथा 2 वीरमदे सोनीगरा री बात (कुल - 2) अध्याय

संदर्भ ग्रन्थ

- डॉ. पूनम दइया : राजस्थानी बात साहित्य , राजस्थान साहित्य अकादमी, उदयपुर
डॉ. शिव स्वरूप शर्मा 'अचल' : राजस्थानी गद्य साहित्य : अद्भव और विकास
डॉ. मनोहर शर्मा : राजस्थानी बात साहित्य : एक अध्ययन

तृतीय प्रश्न पत्र (Raj. 303)

साहित्यशास्त्र एवं पाठालोचन : भाग प्रथम

समय: 3 घण्टे

पूर्णांक : 70

- इकाई 1. . आलोचनात्मक प्रश्न अंक – 15
(साहित्यशास्त्र : साहित्य का स्वरूप तथा विवेचन)
- इकाई 2. आलोचनात्मक प्रश्न अंक – 15
(काव्य की प्रेरणा और प्रयोजन)
- इकाई 3. आलोचनात्मक प्रश्न अंक – 15
(रस सिद्धान्त: रस निष्पत्ति, साधारणीकरण, अलंकार-सम्प्रदाय)
- इकाई 4. आलोचनात्मक प्रश्न अंक – 15
(वक्रोक्ति सिद्धान्त, ध्वनि सिद्धान्त)

नोट : अतिलघूत्तरी दस प्रश्न अंक – 10
(उपरोक्त चारो इकाईयो से सम्बन्धित प्रश्न)

पाठ्यक्रम विषय सामग्री –

साहित्य का स्वरूप तथा विवेचन, भारतीय एवं पाश्चात्य दृष्टि से, साहित्य के तत्त्व, काव्य की मूल प्रेरणा और प्रयोजन।

रस सिद्धान्त : रस-निष्पत्ति, साधारणीकरण, अलंकार – सम्प्रदाय

वक्रोक्तिसिद्धान्त (स्वरूप और भेद), ध्वनि-सिद्धान्त (ध्वनी का अर्थ और भेद)

संदर्भ ग्रन्थ –

रामचन्द्र शुक्ल : रस मीमांसा

बलदेव उपाध्याय : भारतीय साहित्यशास्त्र

डॉ. रामप्रकाश : समीक्षा- सिद्धान्त , आर्य बुक डिपो, नई दिल्ली

डॉ. ओमानन्द सारस्वत : दोहा – शब्द और व्याप्ति, चिन्ता प्रकाशन, पिलानी

डॉ. गुलाबराय : काव्य के रूप

डॉ.गुलाबराय : काव्य सिद्धान्त और अध्ययन

डॉ. राममूर्ति त्रिपाठी : साहित्य के प्रमुख सिद्धान्त

डॉ. नरेन्द्र : रस सिद्धान्त

डॉ. भोलाशंकर व्यास : ध्वनी सम्प्रदाय और उसके सिद्धान्त, चौखम्भा प्रकाशन, वाराणसी

डॉ. तारकनाथ बाली : पाश्चात्य काव्यशास्त्र का इतिहास, मैकमिलन कम्पनी ऑल इण्डिया लिमिटेड, दिल्ली

डॉ. केसरी नारायण शुक्ल : पाश्चात्य समीक्षा सिद्धान्त , नन्दकिशोर एण्ड ब्रदर्स, वाराणसी

किसना आढा : रघुवर जस प्रकाश, राजस्थान प्राच्य विद्या प्रतिष्ठान, जोधपुर

चतुर्थ प्रश्न पत्र (Raj. 304)

राजस्थानी निबन्ध

(भाषा साहित्य एवं संस्कृति से संबंधित)

समय: 3 घण्टे

पूर्णांक : 70

अंक विभाजन – 35 x 2 = 70

इस प्रश्न पत्र के अर्न्तगत राजस्थानी भाषा , साहित्य, संस्कृति एवं लोक साहित्य से संबंधित 10 (दस) विषय (टॉपिक) दिये जायेगे। जिनमें से किन्ही दो विषयों पर राजस्थानी भाषा में निबन्ध लिखना होगा।

पाठ्यक्रम संख्या (Raj. 305)

कौशल पाठ्यक्रम (Skill Course : III)

“पाठालोचन एवं संपादन”

इकाई 1. पाठालोचन— अर्थ, परिभाषा एवं स्वरूप ।

इकाई 2. पाठालोचन के प्रमुख सिद्धांत ।

इकाई 3. पाठालोचन की प्रक्रियाएं ।

इकाई 4. पाठ संपादन की प्रमुख सावधानियां ।

सहायक पुस्तकें—

1. पाठालोचन सिद्धांत और प्रक्रिया – डॉ. मिथलेश कांति / डॉ. विमलेश कांति

2. पाठालोचन की भूमिका – डॉ. उदयनारायण तिवारी

3. पाठालोचन के सिद्धांत – डॉ. सत्येन्द्र

4. संपादन कला –



JAIN NARAIYAN VYAS UNIVERSITY, JODHPUR

DEPARTMENT OF RAJASTHANI

(Faculty of Arts, Education And Social Science)

SYLLABUS

FOR

M.A. RAJASTHANI

(SEMESTER SCHEME)

(SEMESTER I AND SEMESTER II) EXAMINATIONS 2022-2023

&

(SEMESTER III AND SEMESTER IV) EXAMINATION 2022-2023

FACULTY MEMBERS

Dr. Meenakshi Borana

Head of Department & Asstt. Professor

Dr. Dhananjaya Amarawat Asstt. Professor

Dr. GajeSingh Rajpurohit Asstt. Professor

परीक्षा योजना एवं अंक विभाजन

एम. ए. राजस्थानी

परीक्षा वर्ष 2022 - 2023

सेमेस्टर - IV

नोट— परीक्षक एवं विद्यार्थियों के लिए निर्देश—

1. प्रत्येक प्रश्न पत्र के अंतर्गत कुल 9 प्रश्न होंगे। जिसमें से पाँच प्रश्न करने अनिवार्य हैं।
2. प्रथम प्रश्न अतिलघूत्तरी का होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे जिसके सभी प्रश्न करने अनिवार्य हैं। प्रत्येक प्रश्न 1 अंक का होगा।

10 x 1 = 10 अंक

3. प्रथम प्रश्न अतिलघूत्तरी के अलावा कुल 8 प्रश्न होंगे। सम्पूर्ण पाठ्यक्रम 4 इकाइयों में विभक्त हैं। प्रत्येक इकाई से दो – दो प्रश्न विकल्प सहित पूछे जायेंगे। जिसमें से प्रत्येक इकाई में से 1 प्रश्न करना अनिवार्य हैं। प्रत्येक प्रश्न 15 अंक का होगा।

15 x 04 = 60 अंक

4. प्रत्येक सेमेस्टर में 30 अंक का आंतरिक मुल्यांकन होगा। जिसमें विद्यार्थी की उपस्थिति, शोध पत्र, विभागीय साहित्यिक गतिविधि, प्रश्नोत्तरी प्रतियोगिता आदि सम्मिलित है।

= 30 अंक

5. प्रत्येक प्रश्न पत्र की अवधि 3 घण्टे की होगी।
6. प्रत्येक सेमेस्टर में 4 प्रश्न पत्र होंगे। सेमेस्टर चतुर्थ में 100 अंको की मौखिक परीक्षा(Viva-voce) होगी।

SEMESTER – IV

1. THORY PAPER (For Core Papers)	ESE	CCA	TOTAL	Leacture- Tutorial- Practical/Week	Credits
Paper-I प्राचीन और मध्यकालीन राजस्थानी पद्य : भाग द्वितीय	70	30	100	6-0-0	6
Paper-II प्राचीन और मध्यकालीन राजस्थानी गद्य : भाग द्वितीय	70	30	100	6-0-0	6
Paper –III साहित्यशास्त्र एवं पाठालोचन : भाग द्वितीय	70	30	100	6-0-0	6
Paper- IV राजस्थानी संत साहित्य	70	30	100	6-0-0	6

Grand Total

400 marks

24 credits

Total Marks of Semester I 400 Marks and Credits 24

पाठ्यक्रम सेमेस्टर – IV

प्रथम प्रश्न पत्र

प्राचीन और मध्यकालीन राजस्थानी पद्य : भाग द्वितीय

समय: 3 घण्टे

पूर्णांक : 70

- इकाई 1. सप्रसंग व्याख्या अंक – 15
(पाठ्यक्रम पुस्तक— रणमल्ल छंद से एक व्याख्या)
- इकाई 2. सप्रसंग व्याख्या अंक – 15
(पाठ्यक्रम पुस्तक— हालां झालां रा कुण्डलियां से एक व्याख्या)
- इकाई 3. आलोचनात्मक प्रश्न अंक – 15
(पाठ्यक्रम पुस्तक— रणमल्ल छंद से एक प्रश्न)
- इकाई 4. आलोचनात्मक प्रश्न अंक – 15
(पाठ्यक्रम पुस्तक— हालां झालां रा कुण्डलियां से एक प्रश्न)

नोट : अतिलघूत्तरी दस प्रश्न अंक – 10
(पाठ्यक्रम पुस्तक— रणमल्ल छंद एवं हालां झालां रा कुण्डलियां)

पाठ्य पुस्तकें—

- 1 मूलचन्द्र प्राणेश (सम्पा.) : रणमल्ल छन्द, भारतीय विद्या मन्दिर शोध प्रतिष्ठान, बीकानेर
- 2 डॉ. मोतीलाल मेनारिया (सम्पा.) : हालां झालां रा कुण्डलियां, हितेषी पुस्तक भण्डार, उदयपुर

संदर्भ ग्रन्थ

अगरचन्द नाहटा : प्राचीन काव्यों की रूप – परम्परा, भारतीय विद्या मंदिर शोध प्रतिष्ठान, बीकानेर

द्वितीय प्रश्न पत्र

प्राचीन और मध्यकालीन राजस्थानी गद्य : भाग द्वितीय

समय: 3 घण्टे

पूर्णांक : 70

- इकाई 1. सप्रसंग व्याख्या अंक – 15
(पाठ्यक्रम पुस्तक— अचलदास खींची री वचनिका से एक व्याख्या)
- इकाई 2. सप्रसंग व्याख्या अंक – 15
(पाठ्यक्रम पुस्तक— चौबोली से एक व्याख्या)
- इकाई 3. आलोचनात्मक प्रश्न अंक – 15
(पाठ्यक्रम पुस्तक— अचलदास खींची री वचनिका से एक प्रश्न)
- इकाई 4. आलोचनात्मक प्रश्न अंक – 15
(पाठ्यक्रम पुस्तक— चौबोली से एक प्रश्न)

नोट : अतिलघूत्तरी दस प्रश्न अंक – 10
(पाठ्यक्रम पुस्तक— अचलदास खींची री वचनिका एवं चौबोली)

पाठ्य पुस्तकें—

- 1 भूपतिराम साकरिया (सम्पा.) : अचलदास खींची री वचनिका, पंचशील प्रकाशक, जयपुर
- 2 डॉ. कन्हैयालाल सहल (सम्पा.) : चौबोली, प्रकाशक: द स्टुडेन्ट्स बुक कम्पनी, जयपुर (राज.)

संदर्भ ग्रन्थ

डॉ. शिव स्वरूप शर्मा 'अचल' : राजस्थानी गद्य साहित्य : अद्भव और विकास
मुकुन्दनारायण पुरोहित : वचनिका अचलदास खींची री (अन्वेषण एवं मूल्यांकन),
राजस्थान एज्युकेशनल स्टोर, बीकानेर

तृतीय प्रश्न पत्र
साहित्यशास्त्र एवं पाठालोचन : भाग द्वितीय

समय: 3 घण्टे

पूर्णांक : 70

- इकाई 1. . आलोचनात्मक प्रश्न अंक – 15
(अरस्तु के काव्य सिद्धान्त , क्रोंचे का अभिव्यंजनावाद)
- इकाई 2. आलोचनात्मक प्रश्न अंक – 15
(आई. ए रिचर्डस के काव्य सिद्धान्त , कॉलरिज का स्वच्छन्दतावाद)
- इकाई 3. आलोचनात्मक प्रश्न अंक – 15
(राजस्थानी छंद – अंलकार)
- इकाई 4. आलोचनात्मक प्रश्न अंक – 15
(पाठालोचन : स्वरूप और सिद्धान्त)

नोट : अतिलघूत्तरी दस प्रश्न अंक – 10
(उपरोक्त चारो इकाईयो से सम्बधित प्रश्न)

पाठ्यक्रम विषय साम्रगी –

अरस्तु के काव्य सिद्धान्त (अनुकृति-सिद्धान्त, विरेचन सिद्धान्त एवं काव्य रूपों का विवेचन), क्रोंचे का अभिव्यंजनावाद ।

आई.ए.रिचर्डस के काव्य सिद्धान्त (मूल्य का सिद्धान्त), कॉलरिज,परम्परावाद और स्वच्छन्दतावाद ।

राजस्थानी छन्दशास्त्र का परिचय, अलंकार,काव्य-दोष ।

पाठालोचन की परिभाषा, स्वरूप और सिद्धान्त ।

संदर्भ ग्रन्थ –

बलदेव उपाध्याय : भारतीय साहित्यशास्त्र

डॉ.रामपत यादव : पाठालोचन और बिहारी सतसई, चिन्ता प्रकाशन, पिलानी

डॉ.मिथलेश कांति तथा डॉ. विमलेश कांति : पाठालोचन – सिद्धान्त और प्रक्रिया

डॉ. रामप्रकाश : समीक्षा- सिद्धान्त , आर्य बुक डिपो, नई दिल्ली

डॉ. ओमानन्द सारस्वत : दोहा – शब्द और व्याप्ति, चिन्ता प्रकाशन, पिलानी

डॉ. गुलाबराय : काव्य के रूप

डॉ.गुलाबराय : काव्य सिद्धान्त और अध्ययन

डॉ. राममूर्ति त्रिपाठी : साहित्य के प्रमुख सिद्धान्त

डॉ. एम.एम.कत्रे : भारतीय – पाठालोचन की भूमिका(अनु.) डॉ. उदयकरण तिवारी

डॉ. तारकनाथ बाली : पाश्चात्य काव्यशास्त्र का इतिहास, मैकमिलन कम्पनी ऑल इण्डिया लिमिटेड, दिल्ली

डॉ. केसरी नारायण शुक्ल : पाश्चात्य समीक्षा सिद्धान्त , नन्दकिशोर एण्ड ब्रदर्स, वाराणसी

डॉ.सत्येन्द्र : पाठालोचन के सिद्धान्त, राजस्थान हिन्दी ग्रन्थ अकादमी, जयपुर

चतुर्थ प्रश्न पत्र
राजस्थानी संत साहित्य

समय: 3 घण्टे

पूर्णांक : 70

- इकाई 1. . आलोचनात्मक प्रश्न अंक – 15
(संत काव्य परम्परा, प्रेरणा तथा स्त्रोत)
- इकाई 2. आलोचनात्मक प्रश्न अंक – 15
(राजस्थानी संत साहित्य, विशेषताएं)
- इकाई 3. आलोचनात्मक प्रश्न अंक – 15
(राजस्थान के प्रमुख संत एवं सम्प्रदाय)
- इकाई 4. आलोचनात्मक प्रश्न अंक – 15
(राजस्थानी संत साहित्य की देन समन्वय की उत्कृष्ट साधना)
- नोट** : अतिलघूत्तरी दस प्रश्न अंक – 10
(उपरोक्त चारो इकाईयो से सम्बन्धित प्रश्न)

पाठ्यक्रम विषय सामग्री –

संत शब्द की व्याख्या : संत काव्य परम्परा एवं मूल प्रेरणा तथा स्त्रोत ।

राजस्थानी संत साहित्य की विशेषताएं एवं राजस्थानी संत साहित्य को रामानन्द,

कबीर , रैदास, पीपा, धन्ना आदि संतों का योगदान । राजस्थान के प्रमुख संत–

संप्रदाय : पश्चिमी राजस्थान के प्रमुख संत–संप्रदाय और उनकी परम्पराएं– विश्‍नोई

संप्रदाय जसनाथी संप्रदाय, रामस्नेही संप्रदाय, नाथ सम्प्रदाय, आई पंथ, संक्षिप्त

इतिहास, प्रमुख संतों की सैद्धान्तिक मान्यताएं ।

राजस्थानी संत साहित्य की देन समन्वय की उत्कृष्ट साधना – समाज संस्कृति,

धर्म–साधना, दर्शन में सामंजस्य भावना, पर्यावरण संरक्षण, लोक जीवन की अभिव्यक्ति,

साहित्यिक तत्त्व, राजस्थानी भाषा को संतों का योगदान

संदर्भ ग्रन्थ

- परशुराम चतुर्वेदी : उत्तर भारत की संत परम्परा, भारती भंडार, प्रयाग
पुरशुराम चतुर्वेदी : संत काव्य, किताबमहल, इलाहाबाद
परशुराम चतुर्वेदी : संत साहित्य के प्रेरणा के स्रोत, राजपाल एण्ड संस, दिल्ली
डॉ.पीताम्बर दत्त बड़थवाल : हिन्दी काव्य में निर्गुण पंथ संप्रदाय, अवध पब्लिशिंग हाउस, लखनऊ
डॉ.विष्णुदत्त राकेश : उत्तर भारत के निर्गुण पंथ साहित्य का इतिहास, साहित्य भवन प्रा.लि. इलाहाबाद
डॉ.वेदप्रकाश जुनेजा : नाथ सम्प्रदाय और साहित्य, गोरखनाथ मंदिर, गोरखपुर
छया बाई री वाणी : बेलवेडियर प्रेस, प्रयाग
स्वामी केवलराम : रामस्नेही संप्रदाय, बीकानेर
स्वामी मंगलदास : दादू संप्रदाय का इतिहास, जयपुर
सुरजनदास : श्री जांभेजी महाराज का जीवन चरित्र, कोलायत
डॉ.राधिका प्रसाद त्रिपाठी : रामस्नेही संप्रदाय, फैजाबाद
डॉ. राजदेवसिंह : संत साहित्य का पुनर्मूल्यांकन
डॉ.रामखेलवान पाण्डेय : मध्यकालीन संत साहित्य
डॉ.मदन कुमार जानी : राजस्थान एवं गुजरात के मध्यकालीन संत एवं भक्त कवि
डॉ.हजारीप्रसाद द्विवेदी : नाथ संप्रदाय
डॉ.मोतीलाल मेनारिया : राजस्थानी भाषा और साहित्य, प्रयाग
डॉ.ब्रजलाल वर्मा : संत कवि रज्जब, जोधपुर
डॉ.पेमाराम : मध्यकालीन राजस्थान में धार्मिक आन्दोलन, अर्चना प्रकाशन, अजमेर
डॉ. रामप्रसाद दाधीच : महाराज मानसिंह : व्यक्तित्व और कृतित्व, जोधपुर
डॉ. हरिश्चन्द्र वर्मा : हिन्दी साहित्य का इतिहास, रोहतक

पाठ्यक्रम संख्या (Raj. 405)

कौशल पाठ्यक्रम (Skill Course : 4)

“राजस्थानी लोक संस्कृति”

- इकाई 1. राजस्थानी लोक संस्कृति— अर्थ, परिभाषा एवं स्वरूप ।
इकाई 2. राजस्थानी संस्कृति की प्रमुख विशेषताएं एवं स्वरूप ।
इकाई 3. राजस्थानी वेशभूषा एवं आभूषण ।
इकाई 4. राजस्थानी लोक विश्वास ।

सहायक पुस्तकें—

1. राजस्थानी लोक साहित्य —नानूराम संस्कृता
2. राजस्थानी साहित्य एवं संस्कृति — डॉ. मनोहर शर्मा
3. भारतीय संस्कृति — डॉ. गौरीशंकर हीराचंद ओझा
4. लोक साहित्य विज्ञान — डॉ. सत्येन्द्र
5. मारवाड़ की सांस्कृतिक धरोहर — डॉ. गोविन्द सिंह राठौड़



JAI NARAIYAN VYAS UNIVERSITY, JODHPUR

DEPARTMENT OF RAJASTHANI

(Faculty of Arts, Education And Social Science)

SYLLABUS

FOR

M.A. RAJASTHANI

(SEMESTER SCHEME)

(SEMESTER I AND SEMESTER II) EXAMINATIONS **2019-2020**

&

(SEMESTER III AND SEMESTER IV) EXAMINATION **2019-2020**

NOTIFICATION

In compliance of decision of the Hon'ble High Court all students are required to fulfill 75% attendance rule in each subject and there must be 75% attendance of the student before he/she could be permitted to appear in the examination.

REGISTER

(Academic)

FACULTY OF ARTS, EDUCATION & SOCIAL SCIENCES

MASTER OF ARTS

GENERAL INFORMATION FOR STUDENTS

The examination for the degree of Master of Arts, Education and Social Sciences shall consist of two parts with semester system: (i) The M.A (Semester I and Semester II), 2016-17 and (ii) M.A (Semester III and Semester IV), 2017-18.

The examination will be through theory papers/practical/viva. Pass marks for the semester I, semester II, semester III and semester IV examination will be as per GPA & GGP. A candidate is required to pass in the written and the practical/viva examination separately.

Successful candidates will be placed in the following divisions on the basis of the total marks obtained in in all four semesters of M.A (Semester I and Semester II) and (ii) M.A (Semester III and Semester IV) examinations taken together:

First division 60% , second division 48% and third division 36% no students will be permitted to register himself simultaneously for more than one post-graduate course.

ATTENDANCE

1. For all regular candidates in the faculties of arts, education and social sciences, science, law, commerce and engineering, the minimum attendance requirement shall be that a candidate should have attended at least 75% of the lecturers delivered and tutorials held taken together as well as 75% of practical and sectionals from the date of his/her admission.
2. Condonation of shortage of attendance:
The shortage of attendance up to the limits specified below may be condoned on valid reasons:
 - i) Up to 6% each subject plus 5 attendances in all the aggregate subject/papers may be condoned by the Vice-Chancellor on the recommendation of the

Dean/Director/principal for undergraduate students and on the recommendation of the Head of the Department for the post-graduate classes.

- ii) The N.C.C./N.S.S. cadets sent out to parades and camps and such students who are deputed by the University to take part in games, athletic or cultural activities may, for purpose of attendance, be treated, as present for the days of their absence in connection with the aforesaid activities and that period shall be added to their subject wise attendance.

Note:

The attendance requirement will apply to each semester.

However, in case of practical where examination is not held at the end of the first semester but the end of the second semester, attendance will be counted at the end of the second semester taking into account attendance put in both the semesters (i.e., first and second) taken together.

Candidates will be required to pass separately in theory and practical examinations.

Candidate's choice among the optional papers and groups would be restricted only to those paper or groups for which regular teaching is provided in the department.

Use of map stencils (political outline only). Log tables and calculators are allowed in the examination.

MEDIUM

Candidates are allowed to Rajasthani Language for answering question papers.

For answering papers in the subjects of English/Hindi the medium will be corresponding language only.

ADMISSION

The details of the eligibility conditions and admission procedures are given in the admission forms and on university website. The admission would be done on the basis of merit as per university rules. Reservation for SC, ST and OBC would also be done as per J.N.V. University, Jodhpur rules. Candidates are required to attend minimum 75% of the classes in theory and practicals both.

FACILITIES

The Department of Rajasthani Faculty Members -

Dr. Dhananjaya Amarawat

Head of Department & Asstt. Professor

Dr. Minakshi Borana

Asstt. Professor

Dr. GajeSingh Rajpurohit

Asstt. Professor

GUIDELINES FOR CHOICE BASED CREDIT SYSTEM:

Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete **four skill courses:** two within the Department and two from other Department within JNV University or the Universities approved by JNV University.
3. **Course:** Usually referred to, as 'papers' is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one hour of teaching (lecture or tutorial) or two hours of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Post-graduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses

registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.

12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/December and even semester from December/January to May.

Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May. Each Department shall conduct the Practical examinations of Odd semester with internal examiners only; however during even semester one Examiner shall be from other University/Institute.

13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Arts, Edu. and Social Science resolves the following:

- a. All internal assessments shall be open assessment system only and that are based on Quizzes, term test, seminar
- b. Attendance shall carry the prescribed marks in all papers and Practical examination internal assessment
- c. In each semester three out of four theoretical component University examination shall be undertaken by external examiners from outside the university conducting examination, who may be appointed by the competent authority

Grievances and Redressal Mechanism

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head/Principal of the College or the Chairperson of the

University Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.

- b) The appeal will be assessed by the Chairman and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Dean, Faculty of Arts, Edu. and Social Science comprising all HODs of the Faculty and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	'O'	Outstanding	10
2	'A+'	Excellent	9
3	'A'	Very Good	8
4	'B+'	Good	7
5	'B'	Above Average	6
6	'C'	Average	5
7	'P'	Pass	4
8	'F'	Fail	0
9	'Ab'	Absent	0

- i. A student obtaining Grade F shall be considered failed and will be required to reappear in the examination.
- ii. For non credit courses (Skill Courses) 'Satisfactory' or "Unsatisfactory' shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

= and > 95 % marks Grade Point 10.0
 90 to less than 95 % marks Grade Point 9.5
 85 to less than 90 % marks Grade Point 9.0

80 to less than 85 % marks Grade Point 8.5
75 to less than 80 % marks Grade Point 8.0
70 to less than 75 % marks Grade Point 7.5
65 to less than 70 % marks Grade Point 7.0

60 to less than 65 % marks Grade Point 6.5

55 to less than 60 % marks Grade Point 6.0

50 to less than 55 % marks Grade Point 5.5

45 to less than 50 % marks Grade Point 5.0

40 to less than 45 % marks Grade Point 4.5

35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,
i.e

$$\text{SGPA (Si)} = \frac{\sum(C_i \times G_i)}{\sum C_i}$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,
i.e.

$$\text{CGPA} = \frac{\sum(C_i \times S_i)}{\sum C_i}$$

Where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.

- iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA-III

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	6	B	8	6*8= 48
2	Course 2	6	B+	7	6*7= 42
3	Course 3	6	B	6	6*6=36
4	Course 4	6	O	10	6*10=60
5	Practical II	12	B	6	12*6=48
	Total	36			234

Thus, **SGPA = 234/36 = 6.5**

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	36	36	36	36
SGPA	6.5	7.25	7	6.25

$$\text{CGPA} = \frac{(36 \times 6.5 + 36 \times 7.25 + 36 \times 7 + 36 \times 6.25)}{144}$$
$$\frac{(234 + 261 + 252 + 225)}{144}$$
$$972/144 = 6.75$$

Semester III							
Core course 9			6-0-0	6	30	70	100
Core course 10			6-0-0	6	30	70	100
Core course 11			6-0-0	6	30	70	100
Core course 12			6-0-0	6	30	70	100
Total				24	120	280	400
Semester IV							
Core course 13			6-0-0	6	30	70	100
Core course 14			6-0-0	6	30	70	100
Core course 15			6-0-0	6	30	70	100
Core course 16			6-0-0	6	30	70	100
Viva- Vace	-	-	-	-	-	-	100
Total				24	120	280	500

The Duration of the Period shall be 45 minutes/One hour. In each of these combinations, the first value stands for the same number of lecture instructions per week, whereas the last two values stand for double the number of tutorial / practical instructions per week.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective) involve an evaluation system of students that has the following two components:-

- (i) **Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
- (ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.

- (i) **Continuous Comprehensive Assessment (CCA):** This would have the following components:

Continuous assessment may include written assignment, participation in discussions in the class, attendance Etc.

- a. Written Test : 60 marks (reduced to 15 marks)
- b. Participation In Class Discussion : 40 marks (Reduced To 10)
- c. Attendance : 10 (Reduced To 5)

Total 110 reduced to 30 marks

- d. **Classroom Attendance** – Each student will have to attend a minimum of 75% Lectures / Tutorials / Practical. A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE). Attendance shall have 5 marks and will be awarded by following the system proposed below:

Those having greater than 75% attendance will be awarded CCA marks as follows:-

75% to 80%	=	1 marks
80% to 85%	=	2 marks
85 to 90%	=	3 marks
90% to 95%	=	4 marks
> 95%	=	5 marks

- e. Continuous Internal Assessment Awards From Affiliated College /Departments Must Be Sent To The Controller Of Examinations By Name, Two Week Before The Commencement Of The Particular Examination On The Performa Obtained From The Examination Branch.

All students' cumulative attendance shall be displayed in the Department Notice Board every month with a copy to the Dean, Faculty of Arts.

Qualifying for Next semester

1. **A student acquiring minimum of 35% in total of the CCA is eligible to join next semester.**
2. A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as 'Fail'), shall be permitted to appear in such failed course(s)' in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be.
3. A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time i.e three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted. Additional chances examination fee shall be on additive basis.

Improvement Option:

Every student shall have the opportunity to improve Credit thorough University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final. There shall be no improvement opportunity in Practical examinations.

परीक्षा योजना एवं अंक विभाजन

एम. ए. राजस्थानी

परीक्षा वर्ष 2019 - 2020

सेमेस्टर - I

नोट- परीक्षक एवं विद्यार्थियों के लिए निर्देश-

1. प्रत्येक प्रश्न पत्र के अंतर्गत कुल 9 प्रश्न होंगे। जिसमें से पाँच प्रश्न करने अनिवार्य हैं।
2. प्रथम प्रश्न अतिलघूत्तरी का होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे जिसके सभी प्रश्न करने अनिवार्य हैं। प्रत्येक प्रश्न 1 अंक का होगा।

10 x 1 = 10 अंक

3. प्रथम प्रश्न अतिलघूत्तरी के अलावा कुल 8 प्रश्न होंगे। सम्पूर्ण पाठ्यक्रम 4 इकाइयों में विभक्त हैं। प्रत्येक इकाई से दो - दो प्रश्न विकल्प सहित पूछे जायेंगे। जिसमें से प्रत्येक इकाई में से 1 प्रश्न करना अनिवार्य है। प्रत्येक प्रश्न 15 अंक का होगा।

15 x 04 = 60 अंक

4. प्रत्येक सेमेस्टर में 30 अंक का आंतरिक मूल्यांकन होगा। जिसमें विद्यार्थी की उपस्थिति, शोध पत्र, विभागीय साहित्यिक गतिविधि, प्रश्नोत्तरी प्रतियोगिता आदि सम्मिलित है।

= 30 अंक

5. प्रत्येक प्रश्न पत्र की अवधि 3 घण्टे की होगी।
6. प्रत्येक सेमेस्टर में 4 प्रश्न पत्र होंगे। सेमेस्टर चतुर्थ में 100 अंको की मौखिक परीक्षा (Viva-voce) होगी।

SEMESTER – I

1. THEORY PAPER (For Core Papers)	ESE	CCA	TOTAL	Leacture- Tutorial- Practical/Week	Credits
Paper-I आधुनिक राजस्थानी गद्य-भाग प्रथम	70	30	100	6-0-0	6
Paper-II आधुनिक राजस्थानी पद्य-भाग प्रथम	70	30	100	6-0-0	6
Paper –III राजस्थानी भाषा एवं साहित्य का इतिहास- भाग प्रथम	70	30	100	6-0-0	6
Paper- IV लोक साहित्य- भाग प्रथम	70	30	100	6-0-0	6
Grand Total		400 marks		24 credits	

Total Marks of Semester I 400 Marks and Credits 24

पाठ्यक्रम सेमेस्टर – I

प्रथम प्रश्न पत्र

आधुनिक राजस्थानी गद्य-भाग प्रथम

समय: 3 घण्टे

पूर्णांक : 70

- | | |
|---|----------|
| इकाई 1. सप्रसंग व्याख्या
(पाठ्यक्रम पुस्तक- मेवें रा रूख से एक व्याख्या) | अंक – 15 |
| इकाई 2. सप्रसंग व्याख्या
(पाठ्यक्रम पुस्तक- माटी री महक से एक व्याख्या) | अंक – 15 |
| इकाई 3. आलोचनात्मक प्रश्न
(पाठ्यक्रम पुस्तक- मेवें रा रूख से एक प्रश्न) | अंक – 15 |
| इकाई 4. आलोचनात्मक प्रश्न
(पाठ्यक्रम पुस्तक- माटी री महक से एक प्रश्न) | अंक – 15 |

नोट : अतिलघूत्तरी दस प्रश्न अंक – 10
(पाठ्यक्रम पुस्तक- मेवें रा रूख एवं माटी री महक)

पाठ्य पुस्तकें-

1. अन्नाराम सुदामा : मेवें रा रूख (उपन्यास) – धरती प्रकाशन बीकानेर
2. करणी दान बारहठ: माटी री महक (कहानी) – बारहठ प्रकाशन फेफाना, हनुमानगढ़

संदर्भ ग्रन्थ

डॉ. किरण नाहटा : आधुनिक राजस्थानी साहित्य, चिन्मय प्रकाशन, जयपुर
अगरचन्द नाहटा : राजस्थानी काव्य की गौरवपूर्ण परम्परा, राधकृष्ण प्रकाशन, दिल्ली
राजस्थानी साहित्य की समीक्षा- 'जागती जोत' पत्रिका, राजस्थानी भाषा साहित्य एवं संस्कृति अकादमी, बीकानेर

द्वितीय प्रश्न पत्र
आधुनिक राजस्थानी पद्य-भाग प्रथम

समय: 3 घण्टे

पूर्णांक : 70

- | | |
|---|----------|
| इकाई 1. सप्रसंग व्याख्या
(पाठ्यक्रम पुस्तक- वीर सतसई से एक व्याख्या) | अंक - 15 |
| इकाई 2. सप्रसंग व्याख्या
(पाठ्यक्रम पुस्तक- लू से एक व्याख्या) | अंक - 15 |
| इकाई 3. आलोचनात्मक प्रश्न
(पाठ्यक्रम पुस्तक- वीर सतसई से एक प्रश्न) | अंक - 15 |
| इकाई 4. आलोचनात्मक प्रश्न
(पाठ्यक्रम पुस्तक- लू से एक प्रश्न) | अंक - 15 |

नोट : अतिलघूत्तरी दस प्रश्न अंक - 10
(पाठ्यक्रम पुस्तक- वीर सतसई एवं लू)

पाठ्य पुस्तकें-

1. पतराम गौड़, ईश्वरदान आशिया व डॉ. कन्हैयालाल सहज (सम्पादक) : वीर सतसई (सूर्यमल्ल मिश्रण), बंगाल हिन्दी मण्डल, कलकत्ता
2. चन्द्रसिंह : लू चौद जलेरी प्रकाशन, जयपुर

संदर्भ ग्रन्थ

महाकवि सूर्यमल्ल मिश्रण स्मृति अंक, सूर्यमल्ल स्मारक समिति, बूंदी परम्परा (त्रै-मासिक पत्रिका), सूर्यमल्ल मिश्रण विशेषांक तथा 'हेमाणी' अंक, राजस्थानी शोध संस्थान, चौपासनी, जोधपुर , डॉ.शम्भुसिंह मनोहर : वीर सतसई (सम्पादक), स्टुडेन्ट्स बुक कम्पनी, चौडा रास्ता, जयपुर

तृतीय प्रश्न पत्र

राजस्थानी भाषा एवं साहित्य का इतिहास –भाग प्रथम

समय: 3 घण्टे

पूर्णांक : 70

- इकाई 1. . आलोचनात्मक प्रश्न अंक – 15
(भाषा : परिभाषा, अंग,विकास, मानक भाषा)
- इकाई 2. आलोचनात्मक प्रश्न अंक – 15
(लिपि: परिभाषा, मुडिया और देवनागरीलिपि का सामान्य परिचय)
- इकाई 3. आलोचनात्मक प्रश्न अंक – 15
(राजस्थानी भाषा– उदभव, विकास)
- इकाई 4. आलोचनात्मक प्रश्न अंक – 15
(व्याकरण, बोलिया एवं क्षेत्र)

नोट : अतिलघूत्तरी दस प्रश्न अंक – 10
(उपरोक्त चारो इकाईयो से सम्बधित प्रश्न)

पाठ्यक्रम विषय सामग्री –

भाषा : भाषा विज्ञान की परिभाषा, भाषा के अंग, भाषा विकास के कारण, मानक भाषा, बोली, उपबोली

लिपि : लिपि और भाषा का सम्बन्ध, नागरी अंक और लिपि का विकास,मुडिया लिपि: सामान्य परिचय

राजस्थानी भाषा : वैदिक संस्कृत, प्राकृत,अपभ्रंश– सामान्य परिचय राजस्थानी भाषा की उत्पत्ति एवं विकास, क्षेत्र– विस्तार, बोलियां, उपबोलियां

डिंगल–पिंगल की सामान्य विशेषताएं, राजस्थानी की व्याकरणिक विशेषताएं

संदर्भ ग्रन्थ –

प्रो. रामाश्रय मिश्र एवं डॉ. नरेश मिश्र: भाषा और भाषा विज्ञान, उन्मेश प्रकाशन,12,

सुभाष कॉलोनी ,करनाल, हरियाणा

भोलानाथ तिवारी: भाषा विज्ञान, किताब महल,दिल्ली

डॉ.सुनिति कुमार चाटुर्ज्या : राजस्थानी भाषा,साहित्य संस्थान, उदयपुर
एल.पी.टैक्सीटोरी (अनु.)डॉ० नामवरसिंह : पुरानी राजस्थानी
जार्ज ए.ग्रियसैन (अनु.) आत्माराम जाजोदिया: राजस्थान का भाषा सर्वेक्षण, राजस्थानी
भाषा प्रचार, जयपुर
जगदीश प्रसाद कौशिक : भारतीय आर्य भाषाओं का इतिहास
डॉ.मोतीलाल मेनारिया: राजस्थानी भाषा और साहित्य
नरोतमदास स्वामी : राजस्थानी भाषा – एक परिचय
डॉ.मोतीलाल मेनारिया: राजस्थान का पिंगल साहित्य
सीताराम लालस(सम्पा.) : राजस्थानी शब्दकोस (प्रथम खण्ड),राजस्थानी
शोध संस्थान,चौपासनी, जोधपुर
डॉ.उदयनारायण तिवारी : वीर साहित्य
डॉ. गोवर्द्धन शर्मा : डिंगल साहित्य
डॉ. हजारीप्रसाद द्विवेदी : हिन्दी साहित्य का आदिकाल
रामचन्द्र शुक्ल : हिन्दी साहित्य का इतिहास
डॉ.कन्हैयालाल शर्मा : हाडौती बोली और साहित्य
श्याम परमार : मालवी और उसका इतिहास
डॉ. महावीरप्रसाद शर्मा : मेवाती का उद्भव एवं विकास
डॉ. ओमप्रकाश भारद्वाज : मानक भाषा विज्ञान
डॉ. कैलाशचन्द्र अग्रवाल : शेखावटी बोली का विवरणात्मक अध्ययन
डॉ. रतनचन्द्र शर्मा : मानक हिन्दी और भाषा विज्ञान
डॉ.एल.बी.जोशी : बागड़ी बोली का स्वरूप और तुलनात्मक अध्ययन
गोरीशंकर हीराचन्द ओझा : प्राचीन भारतीय लिपिमाला
नरोतमदास स्वामी : राजस्थानी व्याकरण
रामकरण आसोपा : मारवाडी व्याकरण
सीताराम लालस : राजस्थानी व्याकरण
सांस्कृतिक राजस्थान : अखिल भारतीय मारवाड़ी सम्मेलन, कलकत्ता
डॉ. देवेन्द्रनाथ शर्मा : भाषा विज्ञान की भूमिका,राधाकृष्ण प्रकाशन,दिल्ली
परम्परा : त्रैमासिक पत्रिका के आदिकाल तथा मध्यकाल संबंधी विशेषांक

चतुर्थ प्रश्न पत्र
लोक साहित्य –भाग प्रथम

समय: 3 घण्टे

पूर्णांक : 70

- इकाई 1. . आलोचनात्मक प्रश्न अंक – 15
(लोक, लोक वार्ता – लोक मानस, लोक साहित्य और लोक वार्ता,)
- इकाई 2. आलोचनात्मक प्रश्न अंक – 15
(लोक तत्व, लोक संस्कृति, लोक साहित्य और आभिजात्य साहित्य)
- इकाई 3. आलोचनात्मक प्रश्न अंक – 15
(लोक साहित्य तथा अन्य समाज विज्ञान— इतिहास, दर्शन, भाषा—विज्ञान, मनोविज्ञान, पुरातत्व और नृविज्ञान)
- इकाई 4. आलोचनात्मक प्रश्न अंक – 15
(राजस्थानी लोक साहित्य प्रवृत्तियां एवं प्रमुख लोक विधाएँ, लोक साहित्य के संकलन एवं संरक्षण की आवश्यकता , समस्या एवं समाधान)
- नोट** : अतिलघूत्तरी दस प्रश्न अंक – 10
(उपरोक्त चारो इकाईयों से सम्बंधित प्रश्न)

पाठ्यक्रम विषय सामग्री

लोक साहित्य : लोक, लोक वार्ता – लोक मानस, लोक साहित्य और लोक वार्ता आलोचनात्मक प्रश्न , लोक तत्व, लोक संस्कृति, लोक साहित्य और आभिजात्य साहित्य) आलोचनात्मक प्रश्न , लोक साहित्य तथा अन्य समाज विज्ञान— इतिहास, दर्शन, भाषा—विज्ञान, मनोविज्ञान, पुरातत्व और नृविज्ञान आलोचनात्मक प्रश्न, राजस्थानी लोक साहित्य प्रवृत्तियां एवं प्रमुख लोक विधाएँ, लोक साहित्य के संकलन एवं संरक्षण की आवश्यकता , समस्या एवं समाधान आलोचनात्मक प्रश्न

संदर्भ ग्रन्थ

डॉ.सोहनदान चारण : राजस्थानी लोक साहित्य का आलोचनात्मक अध्ययन

डॉ.महेन्द्र भानावत : लोक रंग

डॉ. महेन्द्र भानावत : राजस्थानी लोक नाट्य परम्परा एवं प्रवृत्तियाँ
डॉ. सत्येन्द्र : लोक साहित्य विज्ञान
डॉ. कृष्णदेव उपाध्याय : लोक साहित्य की भूमिका
श्याम परमार : भारतीय लोक वांगमय
डॉ. कल्याण सिंह शेखावत : राजस्थानी भाषा साहित्य एवं संस्कृति
श्याम परमार : लोकधर्मी नाट्य परम्परा
वसुदेवशरण अग्रवाल : लोक धर्म
मन्मथनाथ गुप्त : लोकोत्सव
श्रीकृष्णदास : लोकगीतों का समाजशास्त्रीय अध्ययन
झवेरचन्द मेघानी : लोक साहित्य (व्याख्यान)
सूर्यकरण पारीक : राजस्थानी लोक गीत
नानूराम संस्कर्ता : राजस्थान का लोक-साहित्य
डॉ. कृष्णकुमार शर्मा : राजस्थानी लोक गाथा
डॉ. कन्हैयालाल सहल : राजस्थानी लोकभाषाओं के कुछ रूढ़ तत्व
लक्ष्मीलाल जोशी : मेवाड़ की कहावतें
डॉ. कन्हैयालाल सहल : राजस्थानी कहावतें – एक अध्ययन
डॉ. कन्हैयालाल शर्मा : तेजाजी
डॉ. महेन्द्र भानावत : तेजाजी
चन्द्रदान चारण : गोगाजी चौहान की राजस्थानी गाथा
डॉ. मनोहर शर्मा : राजस्थानी साहित्य और संस्कृति
गौरीशंकर हीराचन्द ओझा : मध्यकालीन भारतीय संस्कृति
लक्ष्मीकुमारी चूंडावत(सम्पा.) : बगड़ावत देवनारायण गाथा
भागीरथ कानोडिया तथा गोविन्द अग्रवाल : राजस्थानी कहावत – कोश

पाठ्यक्रम संख्या (Raj. 105)
कौशल पाठ्यक्रम (Skill Course : I)
“राजस्थानी बात साहित्य”

इकाई 1. राजस्थानी बात साहित्य: अर्थ, परम्परा, विविध रूप एवं शैली

इकाई 2. मध्यकालीन राजस्थानी बात साहित्य: सामाजिक एवं सांस्कृतिक चित्रण।

इकाई 3. राजस्थानी बात साहित्य: लोक विश्वास, लोक मान्यतावां।

इकाई 4. आधुनिक राजस्थानी बात साहित्य (बातां री फुलवाड़ी भाग 1 से 14 के विशेष सन्दर्भ में)

सहायक पुस्तकें—

1. राजस्थानी बात संग्रह: मनोहर शर्मा/ श्रीलाल नथमल जोशी
2. राजस्थानी बात साहित्य: पूनम चंद दहिया
3. राजस्थानी प्राचीन गद्य साहित्य : शिव कुमार अंचल
4. राजस्थानी बात साहित्य: परम्परा विशेषांक :- सम्पादक डॉ. नारायणसिंह भाटी
5. बातां री फुलवाड़ी : विजयदान देथा



JAI NARAIYAN VYAS UNIVERSITY, JODHPUR

DEPARTMENT OF RAJASTHANI

(Faculty of Arts, Education And Social Science)

SYLLABUS

FOR

M.A. RAJASTHANI

(SEMESTER SCHEME)

(SEMESTER I AND SEMESTER II) EXAMINATIONS **2020-2021**

&

(SEMESTER III AND SEMESTER IV) EXAMINATION **2020-2021**

FACULTY MEMBERS

Dr. Meenakshi Borana

Head of Department & Asstt. Professor

Dr. Dhananjaya Amarawat Asstt. Professor

Dr. GajeSingh Rajpurohit Asstt. Professor

परीक्षा योजना एवं अंक विभाजन

एम. ए. राजस्थानी

परीक्षा वर्ष 2020 - 2021

सेमेस्टर - II

नोट— परीक्षक एवं विद्यार्थियों के लिए निर्देश—

1. प्रत्येक प्रश्न पत्र के अंतर्गत कुल 9 प्रश्न होंगे। जिसमें से पाँच प्रश्न करने अनिवार्य हैं।
2. प्रथम प्रश्न अतिलघूत्तरी का होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे जिसके सभी प्रश्न करने अनिवार्य हैं। प्रत्येक प्रश्न 1 अंक का होगा।

10 x 1 = 10 अंक

3. प्रथम प्रश्न अतिलघूत्तरी के अलावा कुल 8 प्रश्न होंगे। सम्पूर्ण पाठ्यक्रम 4 इकाइयों में विभक्त हैं। प्रत्येक इकाई से दो – दो प्रश्न विकल्प सहित पूछे जायेंगे। जिसमें से प्रत्येक इकाई में से 1 प्रश्न करना अनिवार्य है। प्रत्येक प्रश्न 15 अंक का होगा।

15 x 04 = 60 अंक

4. प्रत्येक सेमेस्टर में 30 अंक का आंतरिक मूल्यांकन होगा। जिसमें विद्यार्थी की उपस्थिति, शोध पत्र, विभागीय साहित्यिक गतिविधि, प्रश्नोत्तरी प्रतियोगिता आदि सम्मिलित है।

= 30 अंक

5. प्रत्येक प्रश्न पत्र की अवधि 3 घण्टे की होगी।
6. प्रत्येक सेमेस्टर में 4 प्रश्न पत्र होंगे। सेमेस्टर चतुर्थ में 100 अंको की मौखिक परीक्षा (Viva-voce) होगी।

SEMESTER – II

1. THEORY PAPER (For Core Papers)	ESE	CCA	TOTAL	Leacture- Tutorial- Practical/Week	Credits
Paper-I आधुनिक राजस्थानी गद्य-भाग द्वितीय	70	30	100	6-0-0	6
Paper-II आधुनिक राजस्थानी पद्य-भाग द्वितीय	70	30	100	6-0-0	6
Paper –III राजस्थानी भाषा एवं साहित्य का इतिहास- भाग द्वितीय	70	30	100	6-0-0	6
Paper- IV लोक साहित्य- भाग द्वितीय	70	30	100	6-0-0	6
Grand Total		400 marks		24 credits	

Total Marks of Semester I 400 Marks and Credits 24

पाठ्यक्रम सेमेस्टर – II

प्रथम प्रश्न पत्र

आधुनिक राजस्थानी गद्य-भाग द्वितीय

समय: 3 घण्टे

पूर्णांक : 70

- | | |
|--|----------|
| इकाई 1. सप्रसंग व्याख्या
(पाठ्यक्रम पुस्तक- राजस्थानी निबन्ध संग्रह से एक व्याख्या) | अंक – 15 |
| इकाई 2. सप्रसंग व्याख्या
(पाठ्यक्रम पुस्तक- तास रो घर से एक व्याख्या) | अंक – 15 |
| इकाई 3. आलोचनात्मक प्रश्न
(पाठ्यक्रम पुस्तक- राजस्थानी निबन्ध संग्रह से एक प्रश्न) | अंक – 15 |
| इकाई 4. आलोचनात्मक प्रश्न
(पाठ्यक्रम पुस्तक- तास रो घर से एक प्रश्न) | अंक – 15 |

नोट : अतिलघूत्तरी दस प्रश्न अंक – 10
(पाठ्यक्रम पुस्तक- राजस्थानी निबन्ध संग्रह एवं तास रो घर)

पाठ्य पुस्तकें-

1. चन्द्रसिंह: राजस्थानी निबन्ध संग्रह निबन्ध, राजस्थानी साहित्य अकादमी, उदयपुर
2. यादवेन्द्र शर्मा 'चन्द्र' : तास रो घर, प्रकाशक राजस्थानी भाषा प्रचार सभा, जयपुर

संदर्भ ग्रन्थ

डॉ. किरण नाहटा : आधुनिक राजस्थानी साहित्य, चिन्मय प्रकाशन, जयपुर
अगरचन्द नाहटा : राजस्थानी काव्य की गौरवपूर्ण परम्परा, राधकृष्ण प्रकाशन, दिल्ली
राजस्थानी साहित्य की समीक्षा- 'जागती जोत' पत्रिका, राजस्थानी भाषा साहित्य एवं संस्कृति अकादमी, बीकानेर

द्वितीय प्रश्न पत्र
आधुनिक राजस्थानी पद्य-भाग द्वितीय

समय: 3 घण्टे

पूर्णांक : 70

- इकाई 1. सप्रसंग व्याख्या अंक - 15
(पाठ्यक्रम पुस्तक- राधा से एक व्याख्या)
- इकाई 2. सप्रसंग व्याख्या अंक - 15
(पाठ्यक्रम पुस्तक- लीलटांस से एक व्याख्या)
- इकाई 3. आलोचनात्मक प्रश्न अंक - 15
(पाठ्यक्रम पुस्तक- राधा से एक प्रश्न)
- इकाई 4. आलोचनात्मक प्रश्न अंक - 15
(पाठ्यक्रम पुस्तक- लीलटांस से एक प्रश्न)

नोट : अतिलघूत्तरी दस प्रश्न अंक - 10
(पाठ्यक्रम पुस्तक- राधा एवं लीलटांस)

पाठ्य पुस्तकें-

1. सत्यप्रकाश जोशी: राधा, राजस्थानी ग्रंथागार, जोधपुर
2. कन्हैयालाल सेठिया- लीलटांस, स्व. मुरलीधर सराफ स्मृति ग्रंथ माला, कलकत्ता मे से निर्धारित कविताएं - 1. मादा 2. पिछांग 3. ओपरो 4. सांच'र झूठ 5. साच'र सपनूं 6. मिणधर सरप 7. दीठ'र अदीठ 8. निजर 9. निराकार 10. ईश्वर 11. थितप्रग्य 12. सापेख 13. डर 14. नरग - सरग 15. जिनगानी रो आंच 16. करणी जाणीजै 17. इजगर री लीक 18. पिच्छम'र पूरब 19. रतनागर 20. ओळख 21. एक दीठ : दो साच 22. कविता 23. जलम भौम 24. सै'र (1) 25. सै'र (2) 26. जय जात्रा 27. सिरजन धरमी 28. बसन्त 29. सबद अमरित 30. उन्याळो 31. सियाळो 32. चौमासो 33. जलमदिन 34. रमत 35. सिंझ्या (कुल - 35 कविताएं)

संदर्भ ग्रन्थ

महाकवि सूर्यमल्ल मिश्रण स्मृति अंक, सूर्यमल्ल स्मारक समिति, बूंदी परम्परा (त्रै-मासिक पत्रिका), सूर्यमल्ल मिश्रण विशेषांक तथा 'हेमाणी' अंक, राजस्थानी शोध

संस्थान, चौपासनी, जोधपुर , डॉ.शम्भुसिंह मनोहर : वीर सतसई (सम्पादक), स्टुडेन्ट्स
बुक कम्पनी, चौडा रास्ता,जयपुर

तृतीय प्रश्न पत्र

राजस्थानी भाषा एवं साहित्य का इतिहास – भाग द्वितीय

समय: 3 घण्टे

पूर्णांक : 70

- इकाई 1. . आलोचनात्मक प्रश्न (राजस्थानी साहित्य का काल विभाजन विवेचन) अंक – 15
- इकाई 2. आलोचनात्मक प्रश्न (राजस्थानी साहित्य का आदिकाल) अंक – 15
- इकाई 3. आलोचनात्मक प्रश्न (राजस्थानी साहित्य का मध्यकाल) अंक – 15
- इकाई 4. आलोचनात्मक प्रश्न (राजस्थानी साहित्य का आधुनिककाल) अंक – 15

नोट : अतिलघूत्तरी दस प्रश्न (उपरोक्त चारो इकाईयो से सम्बन्धित प्रश्न) अंक – 10

पाठ्यक्रम विषय सामग्री –

राजस्थानी साहित्य का इतिहास : राजस्थानी साहित्य का काल विभाजन, कालगत-प्रवृत्तियाँ, काव्य-धाराएँ, विधाएँ, प्रमुख रचनाएँ तथा रचनाकार। आदिकाल, मध्यकाल, आधुनिककाल।

संदर्भ ग्रन्थ –

प्रो. रामाश्रय मिश्र एवं डॉ. नरेश मिश्र: भाषा और भाषा विज्ञान, उन्मेश प्रकाशन, 12, सुभाष कॉलोनी, करनाल, हरियाणा
भोलानाथ तिवारी: भाषा विज्ञान, किताब महल, दिल्ली
डॉ. सुनिति कुमार चाटुर्ज्या : राजस्थानी भाषा, साहित्य संस्थान, उदयपुर
एल.पी.टैक्सीटोरी (अनु.) डॉ० नामवरसिंह : पुरानी राजस्थानी
जार्ज ए. ग्रियसैन (अनु.) आत्माराम जाजोदिया: राजस्थान का भाषा सर्वेक्षण, राजस्थानी भाषा प्रचार, जयपुर
जगदीश प्रसाद कौशिक : भारतीय आर्य भाषाओं का इतिहास

डॉ.मोतीलाल मेनारिया: राजस्थानी भाषा और साहित्य
नरोतमदास स्वामी : राजस्थानी भाषा – एक परिचय
डॉ.मोतीलाल मेनारिया: राजस्थान का पिंगल साहित्य
सीताराम लालस(सम्पा.) : राजस्थानी शब्दकोस (प्रथम खण्ड),राजस्थानी
शोध संस्थान,चौपासनी, जोधपुर
डॉ.उदयनारायण तिवारी : वीर साहित्य
डॉ. गोवर्द्धन शर्मा : डिंगल साहित्य
डॉ. हजारीप्रसाद द्विवेदी : हिन्दी साहित्य का आदिकाल
रामचन्द्र शुक्ल : हिन्दी साहित्य का इतिहास
डॉ.कन्हैयालाल शर्मा : हाडौती बोली और साहित्य
श्याम परमार : मालवी और उसका इतिहास
डॉ. महावीरप्रसाद शर्मा : मेवाती का उद्भव एवं विकास
डॉ. ओमप्रकाश भारद्वाज : मानक भाषा विज्ञान
डॉ. कैलाशचन्द्र अग्रवाल : शेखावटी बोली का विवरणात्मक अध्ययन
डॉ. रतनचन्द्र शर्मा : मानक हिन्दी और भाषा विज्ञान
डॉ.एल.बी.जोशी : बागड़ी बोली का स्वरूप और तुलनात्मक अध्ययन
गोरीशंकर हीराचन्द ओझा : प्राचीन भारतीय लिपिमाला
नरोतमदास स्वामी : राजस्थानी व्याकरण
रामकरण आसोपा : मारवाडी व्याकरण
सीताराम लालस : राजस्थानी व्याकरण
सांस्कृतिक राजस्थान : अखिल भारतीय मारवाड़ी सम्मेलन, कलकत्ता
डॉ. देवेन्द्रनाथ शर्मा : भाषा विज्ञान की भूमिका,राधाकृष्ण प्रकाशन,दिल्ली
परम्परा : त्रैमासिक पत्रिका के आदिकाल तथा मध्यकाल संबंधी विशेषांक

चतुर्थ प्रश्न पत्र
लोक साहित्य –भाग द्वितीय

समय: 3 घण्टे

पूर्णांक : 70

- इकाई 1. . आलोचनात्मक प्रश्न अंक – 15
(राजस्थानी लोक साहित्य : लोक कथाएं)
- इकाई 2. आलोचनात्मक प्रश्न अंक – 15
(राजस्थानी लोक साहित्य : लोक गाथाएं)
- इकाई 3. आलोचनात्मक प्रश्न अंक – 15
(राजस्थानी लोक साहित्य : लोक नाट्य एवं लोक गीत)
- इकाई 4. आलोचनात्मक प्रश्न अंक – 15
(राजस्थानी लोक साहित्य : लोक विश्वास पहेलियां, कहावतें, लोकोत्सव तथा राजस्थानी लोक संस्कृति)

नोट : अतिलघूत्तरी दस प्रश्न अंक – 10
(उपरोक्त चारो इकाईयो से सम्बन्धित प्रश्न)

पाठ्यक्रम विषय सामग्री

राजस्थानी लोक साहित्य : प्रमुख लोक कथाएं आलोचनात्मक प्रश्न , राजस्थानी लोक साहित्य , प्रमुख लोक गाथाएँ आलोचनात्मक प्रश्न, प्रमुख लोक नाट्य ,लोक गीत आलोचनात्मक प्रश्न , राजस्थानी लोक साहित्य : लोक विश्वास, लोक पहेलियां, लोक कहावतें लोकोत्सव तथा राजस्थानी लोक संस्कृति आलोचनात्मक प्रश्न ।

संदर्भ ग्रन्थ

डॉ.सोहनदान चारण : राजस्थानी लोक साहित्य का आलोचनात्मक अध्ययन

डॉ.महेन्द्र भानावत : लोक रंग

डॉ. महेन्द्र भानावत : राजस्थानी लोक नाट्य परम्परा एवं प्रवृत्तियाँ

डॉ. सत्येन्द्र : लोक साहित्य विज्ञान
डॉ. कृष्णदेव उपाध्याय : लोक साहित्य की भूमिका
श्याम परमार : भारतीय लोक वांगमय
डॉ. कल्याण सिंह शेखावत : राजस्थानी भाषा साहित्य एवं संस्कृति
श्याम परमार : लोकधर्मी नाट्य परम्परा
वसुदेवशरण अग्रवाल : लोक धर्म
मन्मथनाथ गुप्त : लोकोत्सव
श्रीकृष्णदास : लोकगीतों का समाजशास्त्रीय अध्ययन
झवेरचन्द मेघानी : लोक साहित्य (व्याख्यान)
सूर्यकरण पारीक : राजस्थानी लोक गीत
नानूराम संस्कर्ता : राजस्थान का लोक-साहित्य
डॉ.कृष्णकुमार शर्मा : राजस्थानी लोक गाथा
डॉ. कन्हैयालाल सहल : राजस्थानी लोकभाषाओं के कुछ रूढ़ तत्व
लक्ष्मीलाल जोशी : मेवाड़ की कहावतें
डॉ. कन्हैयालाल सहल : राजस्थानी कहावतें – एक अध्ययन
डॉ. कन्हैयालाल शर्मा : तेजाजी
डॉ. महेन्द्र भनावत : तेजाजी
चन्द्रदान चारण : गोगाजी चौहान की राजस्थानी गाथा
डॉ. मनोहर शर्मा : राजस्थानी साहित्य और संस्कृति
गौरीशंकर हीराचन्द ओझा : मध्यकालीन भारतीय संस्कृति
लक्ष्मीकुमारी चूंडावत(सम्पा.) : बगडावत देवनारायण गाथा
भागीरथ कानोडिया तथा गोविन्द अग्रवाल : राजस्थानी कहावत – कोश।

पाठ्यक्रम संख्या (Raj. 205)
कौशल पाठ्यक्रम (Skill Course : II)
“राजस्थानी – काव्य”

- इकाई 1. राजस्थानी काव्य: अर्थ परिभाषा, काव्य तत्व, काव्य दोष।
- इकाई 2. आदिकालीन राजस्थानी शैलियां एवं प्रमुख कवि – शिवदास गाडण, सांयाजी झूला।
- इकाई 3. मध्यकालीन राजस्थानी काव्य धारा, प्रमुख कवि – ईसरदास बारहठ, मीरां बाई, पृथ्वीराज राठौड, कृपाराम खिड़िया।
- इकाई 4. आधुनिक राजस्थानी काव्य, स्वतंत्रता आंदोलन में राजस्थानी कवियों का योगदान

सहायक पुस्तकें—

1. राजस्थानी भाषा और साहित्य— डॉ. मोतीलाल मेनारिया
2. राजस्थानी भाषा साहित्य का इतिहास – नरोत्तम दास स्वामी
3. राजस्थानी भाषा साहित्य एवं संस्कृति – डॉ. कल्याणसिंह शेखावत
4. स्वतंत्रता आंदोलन में राजस्थानी कवियों का योगदान – नृसिंह राजपुरोहित
5. राजस्थानी प्राचीन काव्य रूप – अजरचंद नाहटा



JAIN NARAIYAN VYAS UNIVERSITY, JODHPUR

DEPARTMENT OF RAJASTHANI

(Faculty of Arts, Education And Social Science)

SYLLABUS

FOR

M.A. RAJASTHANI

(SEMESTER SCHEME)

(SEMESTER I AND SEMESTER II) EXAMINATIONS **2019-2020**

&

(SEMESTER III AND SEMESTER IV) EXAMINATION **2019-2020**

FACULTY MEMBERS

Dr. Dhananjaya Amarawat

Head of Department & Asstt. Professor

Dr. Minakshi Borana Asstt. Professor

Dr. GajeSingh Rajpurohit Asstt. Professor

परीक्षा योजना एवं अंक विभाजन

एम. ए. राजस्थानी

परीक्षा वर्ष 2019 - 2020

सेमेस्टर - III

नोट— परीक्षक एवं विद्यार्थियों के लिए निर्देश—

1. प्रत्येक प्रश्न पत्र के अंतर्गत कुल 9 प्रश्न होंगे। जिसमें से पाँच प्रश्न करने अनिवार्य हैं।
2. प्रथम प्रश्न अतिलघूत्तरी का होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे जिसके सभी प्रश्न करने अनिवार्य हैं। प्रत्येक प्रश्न 1 अंक का होगा।

10 x 1 = 10 अंक

3. प्रथम प्रश्न अतिलघूत्तरी के अलावा कुल 8 प्रश्न होंगे। सम्पूर्ण पाठ्यक्रम 4 इकाइयों में विभक्त हैं। प्रत्येक इकाई से दो – दो प्रश्न विकल्प सहित पूछे जायेंगे। जिसमें से प्रत्येक इकाई में से 1 प्रश्न करना अनिवार्य है। प्रत्येक प्रश्न 15 अंक का होगा।

15 x 04 = 60 अंक

4. प्रत्येक सेमेस्टर में 30 अंक का आंतरिक मूल्यांकन होगा। जिसमें विद्यार्थी की उपस्थिति, शोध पत्र, विभागीय साहित्यिक गतिविधि, प्रश्नोत्तरी प्रतियोगिता आदि सम्मिलित है।

= 30 अंक

5. प्रत्येक प्रश्न पत्र की अवधि 3 घण्टे की होगी।
6. प्रत्येक सेमेस्टर में 4 प्रश्न पत्र होंगे। सेमेस्टर चतुर्थ में 100 अंको की मौखिक परीक्षा(Viva-voce) होगी।

SEMESTER – III

1. THEORY PAPER (For Core Papers)	ESE	CCA	TOTAL	Leacture- Tutorial- Practical/Week	Credits
Paper-I प्राचीन और मध्यकालीन राजस्थानी पद्य : भाग प्रथम	70	30	100	6-0-0	6
Paper-II प्राचीन और मध्यकालीन राजस्थानी गद्य : भाग प्रथम	70	30	100	6-0-0	6
Paper –III साहित्यशास्त्र एवं पाठालोचन : भाग प्रथम	70	30	100	6-0-0	6
Paper- IV राजस्थानी निबन्ध (भाषा साहित्य एवं संस्कृति से संबंधित)	70	30	100	6-0-0	6
Grand Total			400 marks		24 credits

Total Marks of Semester I 400 Marks and Credits 24

पाठ्यक्रम सेमेस्टर – III

प्रथम प्रश्न पत्र (Raj. 301)

प्राचीन और मध्यकालीन राजस्थानी पद्य : भाग प्रथम

समय: 3 घण्टे

पूर्णांक : 70

- इकाई 1. सप्रसंग व्याख्या अंक – 15
(पाठ्यक्रम पुस्तक— ढोला मारु रा दूहा से एक व्याख्या)
- इकाई 2. सप्रसंग व्याख्या अंक – 15
(पाठ्यक्रम पुस्तक— वेलि क्रिसन रूकमणी री से एक व्याख्या)
- इकाई 3. आलोचनात्मक प्रश्न अंक – 15
(पाठ्यक्रम पुस्तक— ढोला मारु रा दूहा से एक प्रश्न)
- इकाई 4. आलोचनात्मक प्रश्न अंक – 15
(पाठ्यक्रम पुस्तक— वेलि क्रिसन रूकमणी री से एक प्रश्न)

नोट : अतिलघूत्तरी दस प्रश्न अंक – 10
(पाठ्यक्रम पुस्तक—ढोला मारु रा दूहा एवं वेलि क्रिसन रूकमणी री)

पाठ्य पुस्तकें—

- 1 रामसिंह, सूर्यकरण पारीक और नरोतमदास स्वामी (समप.) : ढोला मारु रा दूहा (केवल प्रथम 210 दोहे), नापगरी प्रचारिणी सभा, काशी
- 2 नरोतमदास स्वामी (संपा.) : वेलि क्रिसन रूकमणी री (केवल प्रथम 239 छन्द), श्री राम मेहरा एण्ड कम्पनी, आगरा

संदर्भ ग्रन्थ

डॉ. शान्ता भानावत : ढोला मारु रा दूहा का अर्थ और वैज्ञानिक अध्ययन, अनुपम प्रकाशन, जयपुर। डॉ. भगवतीलाल शर्मा : ढोला मारु रा दूहा में काव्य, संस्कृति और इतिहास। अगरचन्द नाहटा : प्राचीन काव्यों की रूप – परम्परा, भारतीय विद्या मंदिर शोध प्रतिष्ठान, बीकानेर। डॉ.आनन्द प्रकाश दीक्षित : वेलि क्रिसन रूकमणी री।

द्वितीय प्रश्न पत्र (Raj. 302)

प्राचीन और मध्यकालीन राजस्थानी गद्य : भाग प्रथम

समय: 3 घण्टे

पूर्णांक : 70

- इकाई 1. सप्रसंग व्याख्या अंक – 15
(पाठ्यक्रम पुस्तक— कुंवरसी सांखलो, से एक व्याख्या)
- इकाई 2. सप्रसंग व्याख्या अंक – 15
(पाठ्यक्रम पुस्तक— राजस्थानी साहित्य संग्रह भाग—II से एक व्याख्या)
- इकाई 3. आलोचनात्मक प्रश्न अंक – 15
(पाठ्यक्रम पुस्तक— कुंवरसी सांखलो से एक प्रश्न)
- इकाई 4. आलोचनात्मक प्रश्न अंक – 15
(पाठ्यक्रम पुस्तक— राजस्थानी साहित्य संग्रह भाग—II से एक प्रश्न)

नोट : अतिलघूत्तरी दस प्रश्न अंक – 10
(पाठ्यक्रम पुस्तक— कुंवरसी सांखलो एवं राजस्थानी साहित्य संग्रह भाग—I)

पाठ्य पुस्तकें—

1. डॉ. मनोहर शर्मा (सम्पा.) : कुंवरसी सांखलो, पंचशील प्रकाशन, जयपुर
2. पुरुषोत्तम लाल मेनारिया (सम्पा.) : राजस्थानी साहित्य संग्रह (भाग द्वितीय), राजस्थान प्राच्य विद्या प्रतिष्ठान, जोधपुर मे से 1. देवजी बगडावतां री बात तथा 2 वीरमदे सोनीगरा री बात (कुल – 2) अध्याय

संदर्भ ग्रन्थ

- डॉ. पूनम दइया : राजस्थानी बात साहित्य , राजस्थान साहित्य अकादमी, उदयपुर
डॉ. शिव स्वरूप शर्मा 'अचल' : राजस्थानी गद्य साहित्य : अद्भव और विकास
डॉ. मनोहर शर्मा : राजस्थानी बात साहित्य : एक अध्ययन

तृतीय प्रश्न पत्र (Raj. 303)

साहित्यशास्त्र एवं पाठालोचन : भाग प्रथम

समय: 3 घण्टे

पूर्णांक : 70

- इकाई 1. . आलोचनात्मक प्रश्न अंक – 15
(साहित्यशास्त्र : साहित्य का स्वरूप तथा विवेचन)
- इकाई 2. आलोचनात्मक प्रश्न अंक – 15
(काव्य की प्रेरणा और प्रयोजन)
- इकाई 3. आलोचनात्मक प्रश्न अंक – 15
(रस सिद्धान्त: रस निष्पत्ति, साधारणीकरण, अलंकार-सम्प्रदाय)
- इकाई 4. आलोचनात्मक प्रश्न अंक – 15
(वक्रोक्ति सिद्धान्त, ध्वनि सिद्धान्त)

नोट : अतिलघूत्तरी दस प्रश्न अंक – 10
(उपरोक्त चारो इकाईयो से सम्बन्धित प्रश्न)

पाठ्यक्रम विषय सामग्री –

साहित्य का स्वरूप तथा विवेचन, भारतीय एवं पाश्चात्य दृष्टि से, साहित्य के तत्त्व, काव्य की मूल प्रेरणा और प्रयोजन।

रस सिद्धान्त : रस-निष्पत्ति, साधारणीकरण, अलंकार – सम्प्रदाय

वक्रोक्तिसिद्धान्त (स्वरूप और भेद), ध्वनि-सिद्धान्त (ध्वनी का अर्थ और भेद)

संदर्भ ग्रन्थ –

रामचन्द्र शुक्ल : रस मीमांसा

बलदेव उपाध्याय : भारतीय साहित्यशास्त्र

डॉ. रामप्रकाश : समीक्षा- सिद्धान्त , आर्य बुक डिपो, नई दिल्ली

डॉ. ओमानन्द सारस्वत : दोहा – शब्द और व्याप्ति, चिन्ता प्रकाशन, पिलानी

डॉ. गुलाबराय : काव्य के रूप

डॉ.गुलाबराय : काव्य सिद्धान्त और अध्ययन

डॉ. राममूर्ति त्रिपाठी : साहित्य के प्रमुख सिद्धान्त

डॉ. नरेन्द्र : रस सिद्धान्त

डॉ. भोलाशंकर व्यास : ध्वनी सम्प्रदाय और उसके सिद्धान्त, चौखम्भा प्रकाशन, वाराणसी

डॉ. तारकनाथ बाली : पाश्चात्य काव्यशास्त्र का इतिहास, मैकमिलन कम्पनी ऑल इण्डिया लिमिटेड, दिल्ली

डॉ. केसरी नारायण शुक्ल : पाश्चात्य समीक्षा सिद्धान्त , नन्दकिशोर एण्ड ब्रदर्स, वाराणसी

किसना आढा : रघुवर जस प्रकाश, राजस्थान प्राच्य विद्या प्रतिष्ठान, जोधपुर

चतुर्थ प्रश्न पत्र (Raj. 304)

राजस्थानी निबन्ध

(भाषा साहित्य एवं संस्कृति से संबंधित)

समय: 3 घण्टे

पूर्णांक : 70

अंक विभाजन – 35 x 2 = 70

इस प्रश्न पत्र के अर्न्तगत राजस्थानी भाषा , साहित्य, संस्कृति एवं लोक साहित्य से संबंधित 10 (दस) विषय (टॉपिक) दिये जायेगे। जिनमें से किन्ही दो विषयों पर राजस्थानी भाषा में निबन्ध लिखना होगा।

पाठ्यक्रम संख्या (Raj. 305)

कौशल पाठ्यक्रम (Skill Course : III)

“पाठालोचन एवं संपादन”

इकाई 1. पाठालोचन— अर्थ, परिभाषा एवं स्वरूप ।

इकाई 2. पाठालोचन के प्रमुख सिद्धांत ।

इकाई 3. पाठालोचन की प्रक्रियाएं ।

इकाई 4. पाठ संपादन की प्रमुख सावधानियां ।

सहायक पुस्तकें—

1. पाठालोचन सिद्धांत और प्रक्रिया – डॉ. मिथलेश कांति / डॉ. विमलेश कांति

2. पाठालोचन की भूमिका – डॉ. उदयनारायण तिवारी

3. पाठालोचन के सिद्धांत – डॉ. सत्येन्द्र

4. संपादन कला –



JAIN NARAYAN VYAS UNIVERSITY, JODHPUR

DEPARTMENT OF RAJASTHANI

(Faculty of Arts, Education And Social Science)

SYLLABUS

FOR

M.A. RAJASTHANI

(SEMESTER SCHEME)

(SEMESTER I AND SEMESTER II) EXAMINATIONS 2017-2018

&

(SEMESTER III AND SEMESTER IV) EXAMINATION 2017-2018

FACULTY MEMBERS

Dr. Dhannjaya Amarawat

Head of Department & Asstt. Professor

Dr. GajeSingh Rajpurohit, Asstt. Professor

Dr. Minakshi Borana Asstt. Professor

परीक्षा योजना एवं अंक विभाजन

एम. ए. राजस्थानी

परीक्षा वर्ष 2016 - 2017

सेमेस्टर - IV

नोट— परीक्षक एवं विद्यार्थियों के लिए निर्देश—

1. प्रत्येक प्रश्न पत्र के अंतर्गत कुल 9 प्रश्न होंगे। जिसमें से पाँच प्रश्न करने अनिवार्य हैं।
2. प्रथम प्रश्न अतिलघूत्तरी का होगा। इस प्रश्न के अंतर्गत सम्पूर्ण पाठ्यक्रम से 10 प्रश्न होंगे जिसके सभी प्रश्न करने अनिवार्य हैं। प्रत्येक प्रश्न 1 अंक का होगा।

10 x 1 = 10 अंक

3. प्रथम प्रश्न अतिलघूत्तरी के अलावा कुल 8 प्रश्न होंगे। सम्पूर्ण पाठ्यक्रम 4 इकाइयों में विभक्त हैं। प्रत्येक इकाई से दो – दो प्रश्न विकल्प सहित पूछे जायेंगे। जिसमें से प्रत्येक इकाई में से 1 प्रश्न करना अनिवार्य है। प्रत्येक प्रश्न 15 अंक का होगा।

15 x 04 = 60 अंक

4. प्रत्येक सेमेस्टर में 30 अंक का आंतरिक मूल्यांकन होगा। जिसमें विद्यार्थी की उपस्थिति, शोध पत्र, विभागीय साहित्यिक गतिविधि, प्रश्नोत्तरी प्रतियोगिता आदि सम्मिलित है।

= 30 अंक

5. प्रत्येक प्रश्न पत्र की अवधि 3 घण्टे की होगी।
6. प्रत्येक सेमेस्टर में 4 प्रश्न पत्र होंगे। सेमेस्टर चतुर्थ में 100 अंको की मौखिक परीक्षा (Viva-voce) होगी।

SEMESTER – IV

1. THEORY PAPER (For Core Papers)	ESE	CCA	TOTAL	Leacture- Tutorial- Practical/Week	Credits
Paper-I प्राचीन और मध्यकालीन राजस्थानी पद्य : भाग द्वितीय	70	30	100	6-0-0	6
Paper-II प्राचीन और मध्यकालीन राजस्थानी गद्य : भाग द्वितीय	70	30	100	6-0-0	6
Paper –III साहित्यशास्त्र एवं पाठालोचन : भाग द्वितीय	70	30	100	6-0-0	6
Paper- IV राजस्थानी संत साहित्य	70	30	100	6-0-0	6
Grand Total		400 marks			24 credits

Total Marks of Semester I 400 Marks and Credits 24

पाठ्यक्रम सेमेस्टर – IV

प्रथम प्रश्न पत्र

प्राचीन और मध्यकालीन राजस्थानी पद्य : भाग द्वितीय

समय: 3 घण्टे

पूर्णांक : 70

- इकाई 1. सप्रसंग व्याख्या अंक – 15
(पाठ्यक्रम पुस्तक— रणमल्ल छंद से एक व्याख्या)
- इकाई 2. सप्रसंग व्याख्या अंक – 15
(पाठ्यक्रम पुस्तक— हालां झालां रा कुण्डलियां से एक व्याख्या)
- इकाई 3. आलोचनात्मक प्रश्न अंक – 15
(पाठ्यक्रम पुस्तक— रणमल्ल छंद से एक प्रश्न)
- इकाई 4. आलोचनात्मक प्रश्न अंक – 15
(पाठ्यक्रम पुस्तक— हालां झालां रा कुण्डलियां से एक प्रश्न)

नोट : अतिलघूत्तरी दस प्रश्न अंक – 10
(पाठ्यक्रम पुस्तक— रणमल्ल छंद एवं हालां झालां रा कुण्डलियां)

पाठ्य पुस्तक—

मूलचन्द्र प्राणेश (सम्पा.) : रणमल्ल छन्द, भारतीय विद्या मन्दिर शोध प्रतिष्ठान, बीकानेर
डॉ. मोतीलाल मेनारिया (सम्पा.) : हालां झालां रा कुण्डलियां, हितेषी पुस्तक भण्डार,
उदयपुर

संदर्भ ग्रन्थ

अगरचन्द नाहटा : प्राचीन काव्यों की रूप – परम्परा, भारतीय विद्या मंदिर शोध
प्रतिष्ठान, बीकानेर

द्वितीय प्रश्न पत्र

प्राचीन और मध्यकालीन राजस्थानी गद्य : भाग द्वितीय

समय: 3 घण्टे

पूर्णांक : 70

- इकाई 1. सप्रसंग व्याख्या अंक – 15
(पाठ्यक्रम पुस्तक— अचलदास खींची री वचनिका से एक व्याख्या)
- इकाई 2. सप्रसंग व्याख्या अंक – 15
(पाठ्यक्रम पुस्तक— चौबोली से एक व्याख्या)
- इकाई 3. आलोचनात्मक प्रश्न अंक – 15
(पाठ्यक्रम पुस्तक— अचलदास खींची री वचनिका से एक प्रश्न)
- इकाई 4. आलोचनात्मक प्रश्न अंक – 15
(पाठ्यक्रम पुस्तक— चौबोली से एक प्रश्न)

नोट : अतिलघूत्तरी दस प्रश्न अंक – 10
(पाठ्यक्रम पुस्तक— अचलदास खींची री वचनिका एवं चौबोली)

पाठ्य पुस्तक—

भूपतिराम साकरिया (सम्पा.) : अचलदास खींची री वचनिका, पंचशील प्रकाशक, जयपुर
डॉ. कन्हैयालाल सहल (सम्पा.) : चौबोली, प्रकाशक: द स्टुडेन्ट्स बुक कम्पनी, जयपुर
(राज.)

संदर्भ ग्रन्थ

डॉ. शिव स्वरूप शर्मा 'अचल' : राजस्थानी गद्य साहित्य : अद्भव और विकास
मुकुन्दनारायण पुरोहित : वचनिका अचलदास खींची री (अन्वेषण एवं मूल्यांकन),
राजस्थान एज्युकेशनल स्टोर, बीकानेर

तृतीय प्रश्न पत्र
साहित्यशास्त्र एवं पाठालोचन : भाग द्वितीय

समय: 3 घण्टे

पूर्णांक : 70

- इकाई 1. . आलोचनात्मक प्रश्न अंक – 15
(अरस्तु के काव्य सिद्धान्त , क्रोंचे का अभिव्यंजनावाद)
- इकाई 2. आलोचनात्मक प्रश्न अंक – 15
(आई. ए रिचर्डस के काव्य सिद्धान्त , कॉलरिज का स्वच्छन्दतावाद)
- इकाई 3. आलोचनात्मक प्रश्न अंक – 15
(राजस्थानी छंद – अंलकार)
- इकाई 4. आलोचनात्मक प्रश्न अंक – 15
(पाठालोचन : स्वरूप और सिद्धान्त)

नोट : अतिलघूत्तरी दस प्रश्न अंक – 10
(उपरोक्त चारो इकाईयो से सम्बधित प्रश्न)

पाठ्यक्रम विषय साम्रगी –

अरस्तु के काव्य सिद्धान्त (अनुकृति-सिद्धान्त, विरेचन सिद्धान्त एवं काव्य रूपों का विवेचन), क्रोंचे का अभिव्यंजनावाद ।

आई.ए.रिचर्डस के काव्य सिद्धान्त (मूल्य का सिद्धान्त), कॉलरिज,परम्परावाद और स्वच्छन्दतावाद ।

राजस्थानी दन्दशास्त्र का परिचय, अलंकार,काव्य-दोष ।

पाठालोचन की परिभाषा, स्वरूप और सिद्धान्त ।

संदर्भ ग्रन्थ –

बलदेव उपाध्याय : भारतीय साहित्यशास्त्र

डॉ.रामपत यादव : पाठालोचन और बिहारी सतसई, चिन्ता प्रकाशन, पिलानी

डॉ.मिथलेश कांति तथा डॉ. विमलेश कांति : पाठालोचन – सिद्धान्त और प्रक्रिया

डॉ. रामप्रकाश : समीक्षा- सिद्धान्त , आर्य बुक डिपो, नई दिल्ली

डॉ. ओमानन्द सारस्वत : दोहा – शब्द और व्याप्ति, चिन्ता प्रकाशन, पिलानी

डॉ. गुलाबराय : काव्य के रूप

डॉ.गुलाबराय : काव्य सिद्धान्त और अध्ययन

डॉ. राममूर्ति त्रिपाठी : साहित्य के प्रमुख सिद्धान्त

डॉ. एम.एम.कत्रे : भारतीय – पाठालोचन की भूमिका(अनु.) डॉ. उदयकरण तिवारी

डॉ. तारकनाथ बाली : पाश्चात्य काव्यशास्त्र का इतिहास, मैकमिलन कम्पनी ऑल इण्डिया लिमिटेड, दिल्ली

डॉ. केसरी नारायण शुक्ल : पाश्चात्य समीक्षा सिद्धान्त , नन्दकिशोर एण्ड ब्रदर्स, वाराणसी

डॉ.सत्येन्द्र : पाठालोचन के सिद्धान्त, राजस्थान हिन्दी ग्रन्थ अकादमी, जयपुर

चतुर्थ प्रश्न पत्र
राजस्थानी संत साहित्य

समय: 3 घण्टे

पूर्णांक : 70

- इकाई 1. . आलोचनात्मक प्रश्न अंक – 15
(संत काव्य परम्परा, प्रेरणा तथा स्रोत)
- इकाई 2. आलोचनात्मक प्रश्न अंक – 15
(राजस्थानी संत साहित्य, विशेषताएं)
- इकाई 3. आलोचनात्मक प्रश्न अंक – 15
(राजस्थान के प्रमुख संत एवं सम्प्रदाय)
- इकाई 4. आलोचनात्मक प्रश्न अंक – 15
(राजस्थानी संत साहित्य की देन समन्वय की उत्कृष्ट साधना)
- नोट** : अतिलघूत्तरी दस प्रश्न अंक – 10
(उपरोक्त चारो इकाईयो से सम्बन्धित प्रश्न)

पाठ्यक्रम विषय सामग्री –

संत शब्द की व्याख्या : संत काव्य परम्परा एवं मूल प्रेरणा तथा स्रोत।
राजस्थानी संत साहित्य की विशेषताएं एवं राजस्थानी संत साहित्य को रामानन्द,
मीरां बाई , रैदास, पीपा, धन्ना आदि संतों का योगदान । राजस्थान के प्रमुख संत–
संप्रदाय : पश्चिमी राजस्थान के प्रमुख संत–संप्रदाय और उनकी परम्पराएं– विश्‍नोई

संप्रदाय जसनाथी संप्रदाय, रामस्नेही संप्रदाय, नाथ सम्प्रदाय, आई पंथ, संक्षिप्त इतिहास, प्रमुख संतों की वाणियां और दार्शनिक सिद्धान्त ।
राजस्थानी संत साहित्य की देन समन्वय की उत्कृष्ट साधना – समाज संस्कृति, धर्म-साधना, दर्शन में सामंजस्य भावना, पर्यावरण संरक्षण, लोक जीवन की अभिव्यक्ति, साहित्यिक तत्त्व, राजस्थानी भाषा को संतों का योगदान

संदर्भ ग्रन्थ

परशुराम चतुर्वेदी : उत्तर भारत की संत परम्परा, भारती भंडार, प्रयाग
पुरशुराम चतुर्वेदी : संत काव्य, किताबमहल, इलाहाबाद
परशुराम चतुर्वेदी : संत साहित्य के प्रेरणा के स्रोत, राजपाल एण्ड संस, दिल्ली
डॉ.पीताम्बर दत्त बड़थवाल : हिन्दी काव्य में निर्गुण पंथ संप्रदाय, अवध पब्लिशिंग हाउस, लखनऊ
डॉ.विष्णुदत्त राकेश : उत्तर भारत के निर्गुण पंथ साहित्य का इतिहास, साहित्य भवन प्रा.लि. इलाहाबाद
डॉ.वेदप्रकाश जुनेजा : नाथ सम्प्रदाय और साहित्य, गोरखनाथ मंदिर, गोरखपुर
छया बाई री वाणी : बेलवेडियर प्रेस, प्रयाग
स्वामी केवलराम : रामस्नेही संप्रदाय, बीकानेर
स्वामी मंगलदास : दादू संप्रदाय का इतिहास, जयपुर
सुरजनदास : श्री जांभेजी महाराज का जीवन चरित्र, कोलायत
डॉ.राधिका प्रसाद त्रिपाठी : रामस्नेही संप्रदाय, फैजाबाद
डॉ. राजदेवसिंह : संत साहित्य का पुनर्मूल्यांकन
डॉ.रामखेलवान पाण्डेय : मध्यकालीन संत साहित्य
डॉ.मदन कुमार जानी : राजस्थान एवं गुजरात के मध्यकालीन संत एवं भक्त कवि
डॉ.हजारीप्रसाद द्विवेदी : नाथ संप्रदाय
डॉ.मोतीलाल मेनारिया : राजस्थानी भाषा और साहित्य, प्रयाग
डॉ.ब्रजलाल वर्मा : संत कवि रज्जब, जोधपुर
डॉ.पेमाराम : मध्यकालीन राजस्थान में धार्मिक आन्दोलन, अर्चना प्रकाशन, अजमेर
डॉ. रामप्रसाद दाधीच : महाराज मानसिंह : व्यक्तित्व और कृतित्व, जोधपुर
डॉ. हरिश्चन्द्र वर्मा : हिन्दी साहित्य का इतिहास, रोहतक

पाठ्यक्रम संख्या (Raj. 405)

कौशल पाठ्यक्रम (Skill Course : 4)

“राजस्थानी लोक संस्कृति”

- इकाई 1. राजस्थानी लोक संस्कृति— अर्थ, परिभाषा एवं स्वरूप ।
इकाई 2. राजस्थानी संस्कृति की प्रमुख विशेषताएं एवं स्वरूप ।
इकाई 3. राजस्थानी वेशभूषा एवं आभूषण ।
इकाई 4. राजस्थानी लोक विश्वास ।

सहायक पुस्तकें—

1. राजस्थानी लोक साहित्य —नानूराम संस्कृता
2. राजस्थानी साहित्य एवं संस्कृति — डॉ. मनोहर शर्मा
3. भारतीय संस्कृति — डॉ. गौरीशंकर हीराचंद ओझा
4. लोक साहित्य विज्ञान — डॉ. सत्येन्द्र
5. मारवाड़ की सांस्कृतिक धरोहर — डॉ. गोविन्द सिंह राठौड़

ढौखलक डरीकुषल

वलशुष : कतुर्थ सेडुडुडर डें 100 अंकु डी डुंखलक डरीकुषल (Viva- voce) हुुगुी । डह डुंखलक डरीकुषल वलडुडुग डें वलडुडुगलधुडकुष अवं रलकुसुथलनी डुषल- सलहुलतुडु कें कुसुी वलषडु वलशुषङुग दुवलरल लुी कुलडुगुी ।

डुंखलक डरीकुषल (Viva- voce) डें अडु. अ. डलडुडुकुरडु (सडुी सेडुडुडर) से डुरशुन डुूके कुलडुगुे ।

जयनारायण व्यास विश्वविद्यालय, जोधपुर
संस्कृत – विभाग

एम. ए. संस्कृत (नियमित)

सामान्य निर्देश – एम. ए. संस्कृत परीक्षा चार सेमेस्टर में आयोजित होगी। प्रथम वर्ष में दो सेमेस्टर (प्रथम, द्वितीय) एवं द्वितीय वर्ष में दो सेमेस्टर (तृतीय एवं चतुर्थ) होंगे। सेमेस्टर तृतीय एवं चतुर्थ ग्रुप चयन के आधार पर होंगे। विद्यार्थी को ग्रुप ए, बी, सी, डी, ई में से एक ग्रुप का चयन करना होगा। प्रत्येक सेमेस्टर में चार प्रश्न-पत्र होंगे। प्रत्येक प्रश्न-पत्र 100 अंकों का होगा। जिनमें से 30 अंक टर्म टेस्ट, सेमिनार एवं उपस्थिति के लिए सुरक्षित होंगे तथा 70 अंक की सेमेस्टर के अन्त में मुख्य परीक्षा होगी। प्रत्येक विद्यार्थी को चार कुशल पाठ्यक्रमों पर ससमक ब्यनतेमद्ध करना अनिवार्य होगा, जिनमें से 2 कोर्स सम्बन्धित विभाग एवं 2 कोर्स किसी भी अन्य विभाग अथवा संकाय से किये जा सकते हैं। चार सेमेस्टर के प्रत्येक सेमेस्टर में 1 कुशल पाठ्यक्रमों पर ससमक ब्यनतेमद्ध करना अनिवार्य होगा, जो इस प्रकार हैं:-

कुशल पाठ्यक्रम (Skilled Courses)

प्रथम सेमेस्टर	–	(1) संस्कृत लेखन
द्वितीय सेमेस्टर	–	(2) संस्कृत उच्चारण एवं सम्भाषण
तृतीय सेमेस्टर	–	(3) पाण्डुलिपि विज्ञान
चतुर्थ सेमेस्टर	–	(4) संस्कृत शिक्षण :- (क) हितोपदेश (ख) नीतिशतक (ग) पचतन्त्र

एम. ए. संस्कृत प्रथम वर्ष – 2021-22

सेमेस्टर – 1

PAPER CODE- SANS .101 (वैदिक साहित्य)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई – 1	ऋग्वेद के निम्नांकित सूक्त वरुण 1.24, इन्द्र 1.32, सूर्य 1.115, बृहस्पति 2.23,
इकाई – 2	यजुर्वेद – शिवसंकल्पसूक्त अध्याय 34, सामवेद – सोम सूक्त 6.1.4
इकाई – 3	इकाई 1 और 2 में निर्धारित सूक्तों के मन्त्रों का पदपाठ, देवतास्वरूप
इकाई – 4	निरुक्त (प्रथम, द्वितीय अध्याय)

प्रश्न-पत्र का निर्माण निम्नानुसार होगा –

खण्ड 'अ' – 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' – 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

अथर्ववेद: सातवलेकर

निरुक्तम् : व्या. छज्जूराम शास्त्री, निरुक्तम् : व्या. उमाशंकर शर्मा 'ऋषि'

बलदेव उपाध्याय : वैदिक साहित्य और संस्कृति, शारदा मन्दिर, वाराणसी

सूर्यकान्त शास्त्री : वैदिक देवशास्त्र, युधिष्ठिर मीमांसक : वैदिक स्वर मीमांसा

ओमप्रकाश पाण्डेय : वैदिक स्वर मीमांसा

ओमप्रकाश पाण्डेय : वैदिक साहित्य और संस्कृति का स्वरूप, विश्व प्रकाशन, दरियागंज, नई दिल्ली

आर. वी. जोशी तथा जे.पी. खण्डेलवाल : वैदिक साहित्य की रूपरेखा

रामगोपाल : वैदिक व्याकरण, बी.बी. चौबे : वैदिक स्वर बोध

उमेश पाण्डेय : वैदिक व्याकरण, दयानन्द भार्गव : वैदिक विज्ञान, राजस्थानी ग्रन्थागार, जोधपुर

देवराज चानना : ऋग्भाष्य संग्रह, दिल्ली

बसकमद ठमतहरू त्मसपहपवद वटिमकं

ळीजमरू ळीजमेश समबजनतमे वद जीम त्पहअमकं

जीम छमू टमकपबैमसमबजपवद च्तज ः - ः . ज्मसंदह - बीवनइमए टींतजपलं टपकलं च्तीोंदए टंतंदेंप

जीम छपतनाजं ज्मगज दक जतंदेसंजपवद . स्पैतनच

लेंशे छपतनाजं. टण्ण त्रंअंकम

अवस्थी, नरेन्द्र : नूपुर ध्वनि (वेद, उपनिषद् एवं गीता का दार्शनिक विवेचन), राजस्थानी ग्रन्थागार, जोधपुर

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 में 2 मन्त्रों (7) अंक) की विकल्पसहित ससन्दर्भ व्याख्या सम्बन्धित प्रश्न होंगे

इकाई - 2 में 2 मन्त्रों (7) अंक)की विकल्पसहित ससन्दर्भ व्याख्या सम्बन्धित प्रश्न होंगे

इकाई - 3 में एक पदपाठसम्बन्धी (7) अंक) तथा देवतास्वरूप सम्बन्धी (7) अंक) विकल्पसहित एक - एक प्रश्न

इकाई - 4 में निरुक्त के पठितांश में से

(अ) निर्वचन - 5 अंक (दो निर्वचन विकल्पसहित) (ब) व्याख्या - 5 अंक (विकल्पसहित)

(स) संक्षिप्त टिप्पणी - 5 अंक (विकल्पसहित) पूछे जायें।

PAPER CODE- SANS . 102 (भारतीय दर्शन)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	तर्कभाषा (प्रत्यक्ष, उपमान)
इकाई - 2	वेदान्तसार 1 से 34 (सन्तनारायण श्रीवास्तव की पुस्तक) - एतेषां स्थूलसूक्ष्मकारणप्रपञ्चानामपिप्रतिविम्बाकाशवच्चैकमेव पर्यन्त
इकाई - 3	सांख्यकारिका 34 कारिका तक
इकाई - 4	तत्त्वार्थसूत्र प्रथम अध्याय - 1-16 सूत्र तक , अर्थ संग्रह - उत्पत्ति विधि पर्यन्त

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

विश्वेश्वर सिद्धान्तशिरोमणि: तर्कभाषा (व्या.)

बद्रीनाथ शुक्ल: तर्कभाषा (व्या.), मोतीलाल बनारसी दास, दिल्ली

सन्तनारायण श्रीवास्तव: वेदान्तसार (व्या.), राममूर्ति शर्मा : वेदान्तसार (व्या.)

ब्रह्ममोहन चतुर्वेदी : सांख्यकारिका (व्या.), सूर्य नारायण शास्त्री (संपा.) : सांख्यकारिका

अमलधारीसिंह: सांख्यतत्त्व प्रदीप, भारतीय विद्या प्रकाशन, वाराणसी

पं. सुखलाल संघवी: तत्त्वार्थ सूत्र (व्या.), पार्श्वनाथ विद्यापीठ, वाराणसी

दयाशंकर शास्त्री : अर्थ संग्रह (व्या.), साहित्य भण्डार, मेरठ

कामेश्वरनाथ मिश्र : अर्थ संग्रह (व्या.)

बलदेव उपाध्याय: भारतीय दर्शन, शारदा मन्दिर, वाराणसी

महेन्द्रकुमार: जैन- दर्शन , सुखलाल संघवी: दर्शन और चिन्तन

मुनि नथमल : जैन दर्शन के मौलिक तत्त्व

डण्भ्यतपलंददंरु ळजसपदम वऱ्दिकपंद चैपसवेवचीलए टवसण ए ष ;तमसमअंदज चवतजपवदे वदसलद्ध

एण्कीतपीदंदरु भ्जेजवतल वऱ्दिकपंद चैपसवेवचीलए टवसण ष

उप छपीपसंदंदकरु टमकंदजेतं ;मदहसपीद्ध ;ज्तणद्धए ळसबनजजं

दीलं तंतां ;ज्तण मदहसपीद्धए षसेवदए कमसीप

ळरमदकतंहंकांत - जंतदंतामतरु ।तर्जीदहतीए डण्णटण्णए कमसीप

एण्ण वें ळनचजंरु भ्जेजवतल वऱ्दिकपंद चैपसवेवचील

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : प्रत्येक इकाई में से विकल्पपूर्वक दो व्याख्या (7) (7) अंक) अथवा एक व्याख्या तथा एक प्रश्न पूछा जाये।

PAPER CODE- SANS - 103 (व्याकरण तथा भाषा विज्ञान)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	कारक प्रकरण- प्रथम से चतुर्थी विभक्ति
इकाई - 2	अजन्त - पुल्लिङ्ग
इकाई - 3	हलन्त - पुल्लिङ्ग
इकाई - 4	भाषाविज्ञान - भाषा का वाक्, बोली व उपबोली से भेद, अर्थ विज्ञान (अर्थ परिवर्तन के कारण, अर्थ विकास की अवस्थाएँ) वाक्य संरचना सिद्धान्त (वाक्य का लक्षण तथा भेद), ध्वनिविज्ञान - (स्वर तथा व्यंजन ध्वनियों का वर्गीकरण, उच्चारण स्थान व यंत्र, ध्वनियों के गुण, ध्वनि परिवर्तन ध्वनि-नियम)

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -
खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

श्रीनिवास शास्त्री: संस्कृत व्याकरण
भीमसेन शास्त्री (व्या.): लघुसिद्धान्तकौमुदी
वासुदेव विष्णु मिराशी (व्या.): लघुसिद्धान्तकौमुदी
गोपालदत्त पाण्डेय (व्या.): सिद्धान्तकौमुदी
बालकृष्ण पंचोली: (हिन्दी व्या.) सिद्धान्तकौमुदी (तद्धित प्रकरण)
रामसुरेश त्रिपाठी: संस्कृत-व्याकरण-दर्शन, राजकमल प्रकाशन, दिल्ली
भोलानाथ तिवारी : भाषा विज्ञान
कर्णसिंह: भाषा विज्ञान
पी.डी. गुणे: तुलनात्मक भाषा विज्ञान (हिन्दी), मोतीलाल बनारसीदास
मंगलदेव शास्त्री: भाषा विज्ञान, इण्डियन प्रेस, प्रयाग
बाबूराम सक्सेना : सामान्य भाषा विज्ञान
देवेन्द्रनाथ शर्मा : भाषा विज्ञान की भूमिका
शिवनारायण शास्त्री : वैदिक वाङ्मय में भाषा चिन्तन
कपिलदेव : भाषा विज्ञान
देवीदत्त शर्मा: संस्कृत का ऐतिहासिक एवं संरचनात्मक परिचय
ज्जं च्वतमूसरू म्ममउमदजे वाँबपमदबम वसिंदहनंहम
त्पठण ळीवेमरू सपदहनपेजपब प्दजतवकनबजपवद वाँदेतपज
डण्ठसववउपिमसकरू संदहनंहम
पसेवदरू चैपसवसवहपबंस स्मबजनतमे
ज्ण्ठनततवूरू देतपज संदहनंहम
पककीमैतू तमतउरू चैवदमजपबे पद ।दबपमदज प्दकपं

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 में 3 सूत्रों की विकल्पसहित सोदाहरण व्याख्या (555)

इकाई - 2 व 3 : विकल्पसहित तीन सूत्रों की व्याख्या अथवा सूत्रनिर्देशपूर्वक रूपसिद्धि का प्रश्न, सोदाहरण (555)

इकाई - 4: विकल्पसहित दो प्रश्नों का समाधान (7) अंक)

PAPER CODE- SANS - 104 (काव्य तथा काव्यशास्त्र)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	शिशुपालवधम् (प्रथम सर्ग) ५ माघ श्लोक संख्या- 1 से 40 तक
इकाई - 2	मेघदूतम् (पूर्व मेघ)
इकाई - 3	मृच्छकटिकम् - शूद्रक (1 से 5 अंक)
इकाई - 4	साहित्यदर्पण (प्रथम परिच्छेद, द्वितीय परिच्छेद- लक्षणा पर्यन्त)

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

डॉ. केशवराव मुसलगांवकर (सम्पादक) : शिशुपालवध (प्रथम सर्ग) (संस्कृत हिन्दी व्याख्योपेत)

मृच्छकटिकम् : शूद्रक विरचित

शालिग्राम शास्त्री (व्या.): साहित्य दर्पण, चौखम्बा विद्याभवन, वाराणसी

पी.वी. काणे (व्या.): साहित्य दर्पण

देवदत्त कौशिक (व्या.): साहित्य दर्पण, लोचन टीका सहित, भारतीय विद्या प्रकाशन, दिल्ली

केदारनाथ शर्मा (व्या.): मेघदूत, चौखम्बा पब्लिकेशन्स, दिल्ली

चरणतीर्थ मधराज (व्या.): मेघदूत, चौखम्बा पब्लिकेशन्स, दिल्ली

भोलाशंकर व्यास: संस्कृत कवि दर्शन, चौखम्बा विद्याभवन, वाराणसी

बलदेव उपाध्याय: संस्कृत आलोचना

एम. एन. व्यास तथा चन्द्रशेखर पाण्डेय: संस्कृत साहित्य की रूपरेखा, साहित्य निकेतन, कानपुर

रामजी उपाध्याय: संस्कृत साहित्य का आलोचनात्मक इतिहास, रामनारायण बेनीमाधव, इलाहाबाद

मनमोहन लाल शर्मा: महाकवि माघ

वी.वी. मिराशी: कालिदास

ठाकुरदत्त जोशी: संस्कृत साहित्य में लक्षणा का उद्भव तथा विकास

पण्डित कमलदेव वैद्य: संस्कृत साहित्य का आलोचनात्मक इतिहास, रामनारायण बेनीमाधव, इलाहाबाद

पण्डित देवीप्रसाद शर्मा: संस्कृत साहित्य का आलोचनात्मक इतिहास, रामनारायण बेनीमाधव, इलाहाबाद

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई 1, 2 व 3 में विकल्पपूर्वक दो श्लोकों की सप्रसं व्याख्या (7) (7) अंक) सम्बन्धित प्रश्न

इकाई 4 : दो कारिकाओं की विकल्पसहित व्याख्या अथवा एक व्याख्या तथा एक प्रश्न (7) (7) अंक) सम्बन्धित प्रश्न पूछे जाये।

जयनारायण व्यास विश्वविद्यालय, जोधपुर
संस्कृत – विभाग

एम. ए. संस्कृत द्वितीय वर्ष
सत्र – 2022-23

सेमेस्टर – 3

सामान्य निर्देश— द्वितीय वर्ष में दो सेमेस्टर (तृतीय एवं चतुर्थ) होंगे। सेमेस्टर तृतीय एवं चतुर्थ ग्रुप चयन के आधार पर होंगे। विद्यार्थी को ग्रुप ए,बी,सी,डी,ई में से एक ग्रुप का चयन करना होगा। प्रत्येक सेमेस्टर में चार प्रश्न-पत्र होंगे। प्रत्येक प्रश्न-पत्र 100 अंकों का होगा। जिनमें से 30 अंक टर्म टेस्ट, सेमिनार एवं उपस्थिति के लिए सुरक्षित होंगे तथा 70 अंक की सेमेस्टर के अन्त में मुख्य परीक्षा होगी।

ग्रुप 'अ' : साहित्य
PAPER CODE- SANS-A-SH- 301 (गद्य तथा काव्य)

नोट:— प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई – 1	कादम्बरी (चाण्डाल कन्या प्रवेश पर्यन्त)
इकाई – 2	कादम्बरी (चाण्डाल कन्या वर्णन के पश्चात् से अगस्त्याश्रम पर्यन्त)
इकाई – 3	नैषधीयचरितम् (प्रथम सर्ग- 1-75) : श्रीहर्ष
इकाई – 4	विक्रमांकदेवचरितम् (प्रथम सर्ग) : बिल्हण

प्रश्न-पत्र का निर्माण निम्नानुसार होगा –

खण्ड 'अ' – 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' – 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

- बाणभट्ट : कादम्बरी (कथामुख), साहित्य भण्डार, मेरठ
मोहन देव पन्त (व्या.): नैषधीयचरितम् (प्रथम सर्ग), मोतीलाल बनारसीदास, दिल्ली
श्रीहर्ष : नैषधीयचरितम्, निर्णय सागर, मुम्बई
श्रीहर्ष : नैषधीयचरितम् (मल्लिनाथ कृत 'जीवातु' व्याख्या युक्त), चौखम्बा संस्कृत सीरीज, वाराणसी, 1976
विश्वनाथ शास्त्री भारद्वाज : विक्रमांकदेवचरित (हिन्दी व्याख्या), बनारस हिन्दू विश्वविद्यालय, 1964
डॉ. हरिदत्त शास्त्री (व्या.) विक्रमांकदेवचरितम्, साहित्य भण्डार, सुभाष बाजार, मेरठ
पुष्पदन्ताचार्य : शिवमहिम्नस्तोत्र
बलदेव उपाध्याय : संस्कृतसुकविसमीक्षा, चौखम्बा संस्कृत सीरीज, वाराणसी
सुधीर कुमार गुप्त : बाण तथा दण्डी
अमरनाथ पाण्डेय : बाणभट्ट का साहित्यिक अनुशीलन, भारतीय विद्या प्रकाशन, वाराणसी
भोलाशंकर व्यास : संस्कृत कवि दर्शन, चौखम्बा संस्कृत सीरीज, वाराणसी
Buehler George (Ed.) : विक्रमांकदेवचरितम्, Bombay Sanskrit Series, XIV, 1875
R.D. Karmarker : Bana

S.P. Dixit: Banabhatta-Life and Literature
A.N. Jani: A Critical Study of Naishadhiyacharitam

प्रश्न पत्र निर्माण के लिए निर्देश –

भाग – अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग – ब : इकाई – 1 व 2 में : विकल्पसहित दो उद्धरणों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न
(7 ½ + 7 ½ अंक) पूछे जाये।

इकाई – 3 व 4 में विकल्पसहित दो श्लोकों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न
(7 ½ + 7 ½ अंक) पूछे जाये।

PAPER CODE- SANS-A-SH- 302 (नाटक तथा नाट्य शास्त्र)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	उत्तररामचरितम् - 1 से 3 अंक : भवभूति
इकाई - 2	रत्नावली (1,2 अंक) - हर्ष
इकाई - 3	रत्नावली (3,4 अंक) - हर्ष
इकाई - 4	दशरूपकम् (प्रथम प्रकाश) : धनंजय

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

तारिणीश झा : उत्तररामचरित (हिन्दी व्याख्या), रामनारायण वेणी माधव प्रकाशन
रमाकान्त त्रिपाठी (व्या.) : उत्तररामचरितम्, चौखम्बा संस्कृत प्रकाशन, वाराणसी
मोतीलाल बनारसीदास : रत्नावली (हिन्दी-संस्कृत व्याख्योपेत), दिल्ली
रमाशंकर त्रिपाठी : दशरूपक (हिन्दी व्याख्या), विश्वविद्यालय प्रकाशन, वाराणसी
बहुरूप मिश्र, (टीकाकार) : दशरूपक (दशरूपक दीपिका सहित) भारतीय विद्या प्रकाशन, जवाहर नगर, नई दिल्ली
रामजी उपाध्याय (व्या.) : दशरूपक
ए.बी. कीथ और उदयभानुसिंह (अनु.) : संस्कृत ड्रामा, मोतीलाल बनारसीदास
भोलाशंकर व्यास : संस्कृत कवि दर्शन, चौखम्बा संस्कृत सीरीज, वाराणसी
अयोध्याप्रसादसिंह : भवभूति की नाट्यकला

Indu Shekhar : Sanskrit Drama

Mankad : Types of Sanskrit Drama

N.P. Unni : Natya Shastra, Delhi, 1998

प्रश्न पत्र निर्माण के लिए निर्देश -

- भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।
- भाग - ब : इकाई - 1, 2 व 3 : विकल्पसहित दो श्लोको की व्याख्या एवं एक प्रश्न (5 + 5 + 5 अंक)
इकाई - 4 में विकल्पसहित दो कारिकाओं की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक) पूछे जाये।

PAPER CODE- SANS-A-SH- 303 (साहित्य शास्त्र)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	काव्यप्रकाश (1 व 2 उल्लास) : मम्मट
इकाई -2	काव्यप्रकाश (3 व 4 उल्लास) : मम्मट
इकाई - 3	ध्वन्यालोक (प्रथम उद्घोत- आठवीं कारिका पर्यन्त): आनन्दवर्धन
इकाई - 4	रसगंगाधर (काव्य लक्षण पर्यन्त) : पण्डितराज जगन्नाथ

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

आचार्य विश्वेश्वर : काव्यप्रकाश (हिन्दी व्याख्या), गजेन्द्र गडकर : काव्य प्रकाश
आर. एस. त्रिपाठी : ध्वन्यालोक, प्रथम उद्घोत (हिन्दी व्याख्या), दिल्ली
बद्रीनाथ शर्मा एवं शोभित मिश्र : ध्वन्यालोक (हिन्दी-संस्कृत व्याख्या), चौखम्बा संस्कृत सीरीज, वाराणसी
आचार्य विश्वेश्वर : ध्वन्यालोक (हिन्दी व्याख्या)
बद्रीनाथ झा एवं मदन मोहन झा : रसगंगाधर (हिन्दी-संस्कृत व्याख्या) वाराणसी, 1978
पी.वी. काणे: अलंकार शास्त्र का इतिहास, बलदेव उपाध्याय : भारतीय साहित्य शास्त्र
बी.टी. देशपाण्डे : भारतीय साहित्य शास्त्र
सुरजनदास स्वामी : रससिद्धान्त की शास्त्रीय समीक्षा, प्र. नीरज शर्मा, सी-82, रामदास मार्ग, तिलक नगर, जयपुर
डॉ. नगेन्द्र : रस सिद्धान्त, ठाकुरदत्त जोशी : संस्कृत साहित्य में लक्षणा का उद्भव तथा विकास

S.K.De : Sanskrit Poetics

S.K. De : Some Problems of Sanskrit Poetics

V.Raghavn : Some Concepts of Alankarashastra

V.Raghavan : Number of Rasas

V.S. Sukthandar : Kavya Prakasha

K.Krishnamoorthy : Anandavardhan's Dhavanyaloka, Delhi 1982

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 व 2 : विकल्पसहित दो कारिकाओं की एक व्याख्या एवं एक प्रश्न (5 + 5 + 5 अंक)

इकाई - 3 में विकल्पसहित एक कारिका की व्याख्या तथा एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 4 में विकल्पसहित दो व्याख्या (7 ½ + 7 ½ अंक) पूछे जाये।

PAPER CODE- SANS-A-SH- 304 (प्रकरणग्रन्थ तथा अलंकारशास्त्र)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	इकाई 1 : वक्रोक्तिजीवितम् : कुन्तक - प्रथम उन्मेष - कारिका 1-24
इकाई -2	काव्यमीमांसा (1 से 3 अध्याय) : राजशेखर
इकाई - 3	अलंकार शास्त्र : से सम्बन्धित निम्नलिखित विषय काव्य लक्षण, काव्य हेतु, काव्य-प्रयोजन, रसनिष्पत्तिसूत्र की चार व्याख्यायें
इकाई - 4	काव्यसत्यालोक (प्रथम एवं पंचम उद्योत) - डॉ. ब्रह्मानन्द शर्मा

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ'

- 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब'

- 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएंगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

के. कृष्णमूर्ति (सम्पा) : वक्रोक्ति जीवित (प्रथम उन्मेष), धारवाड़, 1977

साधना पाराशर : काव्य मीमांसा (हिन्दी व्याख्या), दिल्ली, 2000

पं. विजयमित्र शास्त्री : काव्यमीमांसारहस्यम् (1.5 अध्याय), भारतीय विद्या प्रकाशन, जवाहर नगर, नई दिल्ली

पी. वी. काणे : अलंकार शास्त्र का इतिहास

बलदेव उपाध्याय : भारतीय साहित्य शास्त्र

जी.टी. देशपाण्डे : भारतीय साहित्य शास्त्र

डॉ. ब्रह्मानन्द शर्मा - काव्यसत्यालोक : (अनुवाद - डॉ. प्रवीण पण्ड्या) राजस्थान संस्कृत अकादमी - 2013- संस्करण

V.Raghavan: Some Concepts of Alankarshastra

S.K. De: Sanskrit Poetics

S.K. De : Some Problems of Sanskrit Poetics

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 में विकल्पसहित दो कारिकाओं की व्याख्या (7 ½ + 7 ½ अंक)

इकाई - 2 में विकल्पसहित दो व्याख्या अथवा एक व्याख्या व एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 3 में विकल्पसहित दो प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 4 में विकल्पसहित दो कारिकाओं की व्याख्या (7 ½ + 7 ½ अंक)पूछे जाये।

सेमेस्टर – 3

ग्रुप 'बी' : वैदिक वाङ्मय

PAPER CODE- SANS-B-VV- 301 (संहिता-साहित्य)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई – 1	ऋग्वेद शाकल-संहिताऋ (1) 16, 25, 38 ,143; (2) 39, 40 42, 43,
इकाई –2	ऋग्वेद शाकल-संहिताऋ-(3) 57, 59;(4) 9, 10, (5) 83, 84;
इकाई – 3	शुक्ल यजुर्वेद – सा. शु. य-31-1-22; 31-1-16; 34-1-6
इकाई – 4	शुक्ल यजुर्वेद के निर्धारित भाग से पदपाठ

प्रश्न-पत्र का निर्माण निम्नानुसार होगा –

खण्ड 'अ' – 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' – 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

- न्यू वैदिक सेलेक्शन (भाग दो)
ऋग्वेद : (सायण भाष्य) (दयानन्द भाष्य)
यजुर्वेद तथा अथर्ववेद (सा. भा.)
सूर्यकान्त, मैकडॉनल: वैदिक देवशास्त्र
उपध्याय बलदेव : वैदिक साहित्य और संस्कृति
अरविन्द : वेदरहस्य
सातवलेकर : अथर्व का सुबोधभाष्य

प्रश्न पत्र निर्माण के लिए निर्देश –

भाग – अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग – ब : इकाई – 1 व 2 : विकल्पसहित दो मंत्रों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई – 3 विकल्पसहित दो मंत्रों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई – 4 विकल्पसहित दो मंत्रों के पदपाठ (7 ½ + 7 ½ अंक) पूछे जायें।

PAPER CODE- SANS-B-VV- 302 (ब्राह्मण, आरण्यक एवम् उपनिषद्)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	ब्राह्मणसाहित्य शतपथब्राह्मण का 1, अ. 2, ब्रा. 5
इकाई -2	आरण्यक साहित्य :ऐतरेयारण्यक : द्वितीय प्रपाठक (प्राणविद्या)
इकाई - 3	बृहदारण्यकोपनिषद् 2,4,1-44
इकाई - 4	माण्डूक्योपनिषद्

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएंगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

शास्त्र, मोतीलाल : शतपथ ब्राह्मण
कीथ, ए.बी. (सम्पादित) : ऐतरेय ब्राह्मण
सत्यव्रत सामश्रमी (सम्पा.) : ऐतरेय ब्राह्मण, उपनिषद् संग्रह, गीता प्रेस, गोरखपुर
शर्मा शिवशंकर : बृहदारण्यकोपनिषद् भाष्यम् साहित्य संस्थान, रोहतक, हरियाणा
सातवलेकर दामोदरश्रीपाद : केनोपनिषद् माण्डूक्योपनिषद्, स्वाध्यायमण्डल, पारडी
Singh, S.P. : Symbolism of Upanisads

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1, 2, 3 व 4 (सभी इकाईयों में) : विकल्पसहित दो उद्धरणों / मंत्रों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक) पूछे जायें।

PAPER CODE- SANS-B-VV- 303 (निरुक्त, व्याकरण एवं वैदिक देवशास्त्र)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	निरुक्त (अष्टम से दशम अध्याय पर्यन्त)
इकाई -2	बृहद्देवता (प्रथम अध्याय)
इकाई - 3	ऋक्प्रातिशाख्य (प्रथम पटल)
इकाई - 4	वैदिक स्वरांकन

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएंगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

राजवाडे : निरुक्त

सामश्रमी सत्यव्रत : निरुक्तालोचनम्

मैक्डॉनल : बृहद्देवता

कीथ, ए.बी. : रिलीजन एण्ड फिलासफी ऑफ वेद एण्ड उपनिषद् (हिन्दी अनुवाद)

शास्त्री, मंगलदेव : ऋक्प्रातिशाख्य

रामगोपाल : वैदिक व्याकरण

मैक्डॉनल : द वैदिक ग्रामर

गोविन्दलाल, बन्शीलाल एवं शास्त्री सद्राम : वैदिक व्याकरण भास्कर

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 विकल्पसहित दो निर्वचन (5+5 अंक) एवं विकल्पसहित एक व्याख्या (5 अंक)

इकाई- 2 व 3 : विकल्पसहित दो उद्धरणो/मंत्रों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 4 विकल्पसहित दो प्रश्न (7 ½ + 7 ½ अंक) पूछे जायें।

PAPER CODE- SANS-B-VV- 304 (प्रकरण ग्रन्थ, वेद व्याख्या पद्धति एवं वैदिक भाष्यकार)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	प्रकरण ग्रन्थ - महर्षिकुलवैभवम् भाग प्रथम (पं. प्रद्युम्न शर्मा सम्पादित)
इकाई -2	प्राचीन भाष्यकार : वेंकटमाधव, सायण
इकाई - 3	आधुनिक व्याख्याकार - म. दयानन्द सरस्वती,
इकाई - 4	आधुनिक व्याख्याकार - पं. मधुसूदन ओझा

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ'

- 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर **संस्कृत** में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब'

- 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएंगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

सायण : ऋग्वेद भाष्य

सरस्वती, दयानन्द : ऋग्वेदादिभाष्यभूमिका

शास्त्री, मोतीलाल : सांस्कृतिक पंच व्याख्यान

अरविन्द : वेद रहस्य

नन्दकिशोर तथा सुभाष : संस्कृतनिबन्धपारिजातम्

शुक्ल, रमेशचन्द्र : प्रबन्धरत्नाकर

फतहसिंह : ढाई अक्षर वेद के

उपाध्याय, रामजी : संस्कृत निबन्धावलि

भार्गव, दयानन्द : वेद विज्ञान वीथिका, वैदिक अध्ययन केन्द्र, जोधपुर

Ghate : Lectures on Rigveda

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 : विकल्पसहित दो व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 2, 3 व 4 विकल्पसहित एक प्रश्न व एक टिप्पणी (10 + 5 अंक) पूछे जाये।

सेमेस्टर – 3

ग्रुप 'सी' : दर्शन

PAPER CODE- SANS-C-DN 301 (न्याय-वैशेषिक)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई – 1	न्यायसूत्र (वात्स्यायनभाष्य सहित) प्रथम अध्याय : प्रथम आह्निक
इकाई –2	भाषा परिच्छेद (न्यायसिद्धान्तमुक्तावली – विश्वनाथ , द्रव्य तथा साधर्म्य – वैधर्म्य पर्यन्त)
इकाई –3	भाषा परिच्छेद (न्यायसिद्धान्तमुक्तावली सहित) द्रव्य विवेचन – विश्वनाथ भट्टाचार्य
इकाई – 4	प्रशस्तपादभाष्य (प्रारम्भ से द्रव्य निरूपण तक,)

प्रश्न-पत्र का निर्माण निम्नानुसार होगा –
खण्ड 'अ' – 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' – 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

अनन्त ठाकुर : (सं.) न्यायदर्शनम् (प्रथमाध्यायात्मक, प्रथम भाग), मिथिला विद्यापीठ, दरभंगा (बिहार)

फणिभूषण भट्टाचार्य : न्यायदर्शन का परिचय

सूर्यनारायण शुक्ल : न्यायसिद्धान्तमुक्तावली (हिन्दी व्याख्या), चौखम्बा प्रकाशन, वाराणसी

धर्मन्द्रनाथ शास्त्री : (व्या.) न्यायसिद्धान्तमुक्तावली (प्रत्यक्ष खण्ड), मोतीलाल बनारसीदास, दिल्ली

दुर्गाशंकर झा (सं.) : प्रशस्तपादभाष्य (न्यायकन्दली सहित), सम्पूर्णानन्द संस्कृत विश्वविद्यालय, वाराणसी

श्रीनारायण मिश्र : वैशेषिक दर्शन : एक अध्ययन

खड्गनाथ मिश्र : शाब्दबोधविवादपंचकप्रकाश (प्रथम व द्वितीय भाग), केन्द्रीय संस्कृत विद्यापीठ, जयपुर

S.N. Das Gupta : History of Indian Philosophy (relevant Portion only)

Gopinath kaviraj : Gleanings from the History and Bibliography of Nyaya-Vaisesik Literature

D.D. Bhattacharya : History of navya Nyaya in Mithila

Sanghavi, Sukhlal : Acvanded Studies in Indian Logic and Methaphysics

H-ui : Vaisesika Philosophy

G. Bhattacharya : Studies in Nyaya Vaisesika Theism

B.K. Matilal : Navya Nyaya Doctrine of Negation

S. Bhaduri : Studies in Nyaya Vaisesika Metaphysics

अवस्थी, नरेन्द्र : वैशेषिक तथा अन्य भारतीय दर्शन (न्यायलीलावती के आलोक में) स्पिक एण्ड स्पैन पब्लिशर्स, नई दिल्ली

प्रश्न पत्र निर्माण के लिए निर्देश –

भाग – अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग – ब : इकाई – 1,2,3 व 4 (सभी इकाईयों में) : विकल्पसहित दो व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक), पूछे जाये।

PAPER CODE- SANS-C-DN 302 (सांख्य-योग-बौद्ध-जैन)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई – 1	सांख्यतत्त्वकौमुदी (1 से 15 वीं कारिकापर्यन्त)–वाचस्पति मिश्र
इकाई – 2	योगसूत्र (व्यासभाष्य सहित) समाधिपाद : (1 से 30 सूत्र) पतंजलि
इकाई – 3	योगसूत्र (व्यासभाष्य सहित) समाधिपाद : (31 से अन्त तक) पतंजलि
इकाई – 4	सर्वदर्शन संग्रह (बौद्ध दर्शन) : माधवाचार्य

प्रश्न-पत्र का निर्माण निम्नानुसार होगा –

खण्ड 'अ' – 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' – 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

आद्याप्रसाद मिश्र : सांख्यतत्त्वकौमुदी (हिन्दी व्याख्या)

अमलधारी सिंह : सांख्यतत्त्वप्रदीप, भारतीय विद्या प्रकाशन, वाराणसी

उदयवीर शास्त्री : सांख्य दर्शन का इतिहास

ब्रह्मलीन मुनि (व्या.) : योगसूत्र (व्यास भाष्य सहित), चौखम्बा प्रकाशन वाराणसी

उमाशंकर शर्मा 'ऋषि' : सर्वदर्शन संग्रह (हिन्दी व्याख्या)

J.R. Ballentyne : Yogasutra Patanjali

J.H. Woods : The Yoga System of Patanjali

S. Radhakrishnan : History of Indian Philosophy, Vol. I

प्रश्न पत्र निर्माण के लिए निर्देश –

भाग – अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग – ब : इकाई 1,2,3 व 4 (सभी इकाईयों में) : विकल्पसहित दो व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक) पूछे जायें।

PAPER CODE- SANS-C-DN 303 (वेदान्त तथा मीमांसा)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	ब्रह्मसूत्र (शांकरभाष्य सहित) : प्रथम अध्याय, प्रथम पाद, चतुःसूत्री
इकाई - 2	अर्थ संग्रह (अधिकार विधि तथा प्रयोगविधि)
इकाई - 3	अर्थ संग्रह (निषेध)
इकाई - 4	जैमिनि सूत्र (शाबर भाष्य सहित) : तर्कपाद मात्र - 1 से 17 सूत्र पर्यन्त

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

सत्यानन्द सरस्वती : ब्रह्मसूत्र शांकर भाष्य (हिन्दी व्याख्या), गोविन्दमल वाराणसी

युधिष्ठिर मीमांसक : शाबरभाष्य (व्याख्या)

दयाशंकर शास्त्री : अर्थसंग्रह (व्या.), साहित्य भण्डार, मेरठ

सत्यप्रकाश शर्मा : अर्थसंग्रह (व्या.) साहित्य भण्डार, मेरठ

उमाशंकर 'ऋषि' : मीमांसादर्शनम् (तर्कपादः) - हिन्दी व्याख्या

मण्डन मिश्र : मीमांसा दर्शन

राममूर्ति शर्मा : शंकराचार्य

अनन्तकृष्ण शास्त्री : मीमांसा शास्त्रसार

V.M. Apte. (English Tr.): ब्रह्मसूत्र शांकरभाष्य, Bombay, 1960

S.K. Raja: मानमेयोदय Madras, 1933

G.N. Jha : शाबरभाष्य, (Vol. I) Baroda, 1973

M.Rangacharya & M.B.V. Iyengar : The Vedant Sutras with the Sri Bhasya of Ramanuja (Tr. by)

Nungamba Kama, 1965

G.P. Bhatta ; Epistemology of the Bhatta School of Purva Mimansa

P.B. Satha : The Discussion on the Purva Mimansa System

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई 1,2,3 व 4 (सभी इकाईयों में) : विकल्पसहित दो व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

PAPER CODE- SANS-C-DN 304 (प्रकरण ग्रन्थ तथा दर्शनशास्त्र का इतिहास)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	विवेकचूडामणि (शंकराचार्य विरचित)
इकाई - 2	प्रकरण ग्रन्थ : व्योमवाद : पं. मधुसूदन ओझा
इकाई - 3	भारतीय दर्शन के सिद्धान्त- आत्मा, मोक्ष, प्रमाण, ईश्वरवाद, अनेकान्त, प्रतीत्यसमुत्पाद, अहिंसा
इकाई - 4	प्रमुख भारतीय दार्शनिक - आचार्य शंकर , गौतम , कणाद , वात्स्यायन , उमास्वति , वाचस्पति मिश्र, उद्द्योतकर , प्रभाकर मिश्र

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएंगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

अनन्त शर्मा : व्योमवाद, पं. मधुसूदन ओझा शोध प्रकोष्ठ, संस्कृत विभाग, जयनारायण व्यास विश्वविद्यालय, जोधपुर
उमाशंकर शर्मा 'ऋषि' : सर्वदर्शनसंग्रह : (हिन्दी व्याख्या)

उमेश मिश्र : भारतीय दर्शन

बलदेव उपाध्याय : भारतीय दर्शन

S.Radhakrishnan : History of Indian Philosophy

C.D. Sharma : A Critical survey of Indian Philosophy

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 व 2 : विकल्पसहित दो व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 3 व 4 : विकल्पसहित एक प्रश्न व एक टिप्पणी (10 + 5 अंक) पूछे जायें।

सेमेस्टर – 3

ग्रुप 'डी' : व्याकरण शास्त्र

PAPER CODE- SANS-D-VK 301 (वैयाकरण सिद्धान्तकौमुदी)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई – 1	वैयाकरणसिद्धान्तकौमुदी (संज्ञा प्रकरण)
इकाई –2	वैयाकरण सिद्धान्तकौमुदी (आत्मनेपद)
इकाई –3	वैयाकरण सिद्धान्तकौमुदी (भ्वादिगण) पङ्क्त्यंश को छोड़कर
इकाई – 4	वैयाकरण सिद्धान्तकौमुदी (दिवादि, स्वादिगण ,तुदादि) पङ्क्त्यंश को छोड़कर

प्रश्न-पत्र का निर्माण निम्नानुसार होगा –

खण्ड 'अ' – 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' – 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएंगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

- भट्टोजिदीक्षित : वैयाकरण सिद्धान्त कौमुदी (सम्पूर्ण)
गोपाल दत्त पाण्डेय : वैयाकरण सिद्धान्त कौमुदी (हिन्दी व्याख्या)
बालकृष्ण पंचोली : वैयाकरण सिद्धान्त कौमुदी (हिन्दी व्याख्या)
चारुदेव शास्त्री : व्याकरण चन्द्रोदय

Whitney : Sanskrit Grammar

प्रश्न पत्र निर्माण के लिए निर्देश –

भाग – अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग – ब : इकाई – 1 व 2 : विकल्पसहित दो पदों की सूत्र पूर्वक सिद्धि (4 + 4 अंक) एवं विकल्पसहित दो सूत्रों की व्याख्या (3 ½ + 3 ½ अंक)

इकाई – 3 व 4 विकल्पसहित पाँच पदों की प्रमुख सूत्रोंसहित सिद्धि (3 + 3 + 3 + 3 + 3 अंक)

PAPER CODE- SANS-D-VK 302 (वाक्यपदीय तथा वैयाकरण सिद्धान्तकौमुदी)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	वाक्यपदीय (ब्रह्मकाण्ड) : भर्तृहरि - 1 से 77 कारिका पर्यन्त
इकाई -2	वैयाकरण सिद्धान्तकौमुदी (अव्ययीभाव समास)
इकाई -3	वैयाकरण सिद्धान्तकौमुदी (तत्पुरुष समास)
इकाई - 4	वैयाकरण सिद्धान्तकौमुदी (कृत्यप्रक्रिया)

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

बालकृष्ण पंचोली : वैयाकरण सिद्धान्त कौमुदी (हिन्दी व्याख्या), चौखम्बा संस्कृत सीरीज, वाराणसी

रामसुरेश त्रिपाठी : संस्कृत व्याकरण दर्शन, राजकमल प्रकाशन, दिल्ली

दयाशंकर शास्त्री : न्याय सिद्धान्त मुक्तावली (शब्द खण्ड), मोतीलाल बनारसीदास, दिल्ली

रामचन्द्र द्विवेदी (अनु.) : भर्तृहरि, राजस्थान हिन्दी ग्रन्थ अकादमी, जयपुर

रघुनाथ शर्मा : वाक्यपदीयम् (अम्बाकर्त्री व्याख्या)

सूर्यनारायण शुक्ल : वाक्यपदीयम् (भावप्रकाश व्याख्या)

K.A.S. Iyer (Eng. Tr.): The Vakyapadiya of Bhartrihari with Vritti, Chapter I, Poona, 1965

Gauri Nath Shastri : Philosophy of Word and Meaning

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 : विकल्पसहित दो कारिकाओं की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 2, 3 व 4 में : विकल्पसहित दो पदों की सूत्र पूर्वक सिद्धि (5 + 5 अंक) एवं विकल्पसहित एक सूत्र की व्याख्या (5 अंक) पूछे जायें।

PAPER CODE- SANS-D-VK 303 (व्याकरणमहाभाष्य तथा वैयाकरण भूषणसार)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	व्याकरणमहाभाष्य (प्रथम अध्याय प्रथम पाद का प्रथम आह्निक)
इकाई -2	व्याकरणमहाभाष्य (प्रथम अध्याय प्रथम पाद का द्वितीय आह्निक)
इकाई -3	वैयाकरण भूषणसार (धात्वर्थ प्रकरण) कारिका संख्या 1 से 5
इकाई - 4	वैयाकरण भूषणसार (धात्वर्थ प्रकरण) कारिका संख्या 6 से 10

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

चारुदेव शास्त्री : व्याकरण- भाष्य (नवाह्निक)

भीमसेन शास्त्री (व्या.) : वैयाकरण - भूषणसार

खड्गनाथ मिश्र : शाब्दबोधादिवादपंचकप्रकाश (प्रथम व द्वितीय भाग), केन्द्रीय संस्कृत विद्यापीठ, जयपुर

S.K. Belvelkar : System of Sanskrit Grammar

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 व 2 में : विकल्पसहित दो उद्धरणों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 3 व 4 में विकल्पसहित दो कारिकाओं / उद्धरणों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

PAPER CODE- SANS-D-VK 304 (प्रकरणग्रन्थ तथा व्याकरणशास्त्र का इतिहास)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	गुप्ताशुद्धिप्रदर्शनम् (पं. अम्बिकादत्त व्यास रचित) 1-20 श्लोकपर्यन्त
इकाई -2	कारकसम्बन्धोद्घोत (रभसनन्दि) 1 - 10 कारिका
इकाई -3	पाणिनीय शिक्षा
इकाई - 4	पाणिनीय व्याकरण शास्त्र के सिद्धान्त - शब्दार्थसम्बन्ध, स्फोटवाद, शब्दब्रह्म, धात्वर्थनिर्णय , तिङ्निर्णय लकारार्थनिर्णय, व्याकरणशास्त्रानुसार वाक् का विवेचन,

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

गुप्ताशुद्धिप्रदर्शनम्, पं. अम्बिकादत्तव्यास रचित, व्यास पुस्तकालय, मानमन्दिर, वाराणसी

रभसनन्दि : कारकसम्बन्धोद्घोत, राजस्थान प्राच्य विद्या प्रतिष्ठान, जोधपुर

रामशंकर भट्टाचार्य : पाणिनीय व्याकरण का अनुशीलन, इण्डोलोजिकल बुक हाऊस, वाराणसी

युधिष्ठिर मीमांसक : व्याकरण शास्त्र का इतिहास

N.M. Ghosh (अनु.) : पाणिनीय शिक्षा, Delhi

The Hegue : Panini : A Survey of Research, Mouton Cardona George, 1966

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 : विकल्पसहित दो श्लोकों की व्याख्या (7 ½ + 7 ½ अंक)

इकाई - 2 विकल्पसहित दो कारिकाओं की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 3 : विकल्पसहित दो व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 4 विकल्पसहित दो प्रश्न पूछे जायेंगे (7 ½ + 7 ½ अंक)

सेमेस्टर – 3

ग्रुप 'ई' : प्राकृत तथा जैन-दर्शन

PAPER CODE- SANS-E-PJ 301 (जैन दर्शन)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई – 1	तत्त्वार्थसूत्र – विवेचक पं. सुखलाल संघवी (अध्याय 2)
इकाई –2	तत्त्वार्थसूत्र – विवेचक पं. सुखलाल संघवी (अध्याय 5)
इकाई –3	तत्त्वार्थसूत्र – विवेचक पं. सुखलाल संघवी (अध्याय 6)
इकाई – 4	स्याद्वादमंजरी (अन्ययोगव्यवच्छेद द्वात्रिंशिका के श्लोक 1 से 10 पर टीका)

प्रश्न-पत्र का निर्माण निम्नानुसार होगा –

खण्ड 'अ' – 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' – 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

उपाध्याय केवल मुनि : तत्त्वार्थ सूत्र, जैन दिवाकर दिव्य ज्योति कार्यालय, ब्यावर
सिद्धान्ताचार्य पं. फूलचन्द्र शास्त्री : तत्त्वार्थ सूत्र, श्री गणेशवर्णी शोध संस्थान, नरिया, वाराणसी
मघराज मुणोत (अनु.) : तत्त्वार्थसूत्र, श्री रत्नप्रभाकर ज्ञान पुष्पमाला, फलोदी
सुखलाल संघवी (व्या.) : तत्त्वार्थसूत्र, पार्श्वनाथ विद्यापीठ, वाराणसी
उमास्वारित : तत्त्वार्थसूत्र (भाष्य सहित), परमश्रुत प्रभावक मण्डल, अगास
जगदीशचन्द्र जैन (व्या.) : स्याद्वादमंजरी (मल्लिषेण), परमश्रुत प्रभावक मण्डल, श्रीमद् राजचन्द्र आश्रम, अगास

A.B. Dhruva : Syadvadamanjari

महेन्द्रकुमार जैन : जैन-दर्शन, श्री गणेशप्रसाद वर्णी जैन ग्रन्थमाला, वाराणसी

प्रश्न पत्र निर्माण के लिए निर्देश –

भाग – अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग – ब : इकाई – 1,2 व 3 में विकल्पसहित तीन सूत्रों की व्याख्या अथवा दो व्याख्या व एक टिप्पणी (5 + 5 + 5 अंक)

इकाई – 4 में विकल्पसहित दो श्लोकों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक) पूछे जाये

PAPER CODE- SANS-E-PJ 302 (आगम तथा आगमेतर साहित्य)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	आचारांगसूत्र- प्रथमश्रुत स्कन्ध (अध्ययन 1)
इकाई -2	प्रवचनसार - ज्ञेयतत्त्वाधिकार (1 से 26 गाथाएं)
इकाई -3	प्रवचनसार - ज्ञेयतत्त्वाधिकार (27 से 52 गाथाएं)
इकाई - 4	समयसार (1 से 30 गाथाएं) (जयसेनकृत टीका सहित)

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ'

- 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब'

- 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएंगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

आचारांग सूत्र : आगम प्रकाशन समिति, ब्यावर
महाप्रज्ञ : आचारांगभाष्यम्, जैन विश्वभारती संस्थान, लाडनूं
शीलाकाचार्य (टीका सहित) : आचारांग सूत्र, मोतीलाल बनारसीदास, दिल्ली
कमलचन्द सोगानी (सं.) : आचारांग चयनिका
प्रवचनसार : श्रीमद् राजचन्द्र आश्रम, अगास
समयसार : श्रीमद् राजचन्द्र आश्रम, अगास
डॉ. हुकमचन्द भारिल्ल : समयसार-अनुशीलन, टोडरमल स्मारक ट्रस्ट, जयपुर
Jacobi Hermana : Jain Sutras, Part I
K.K. Dixit : Early Jainism
H.S. Bhattacharya : Reals in the Jain Metaphysics

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 विकल्पसहित तीन उद्हरणों की व्याख्या अथवा दो व्याख्या एवं एक टिप्पणी (5 + 5+ 5 अंक)

इकाई - 2,3 व 4 विकल्पसहित दो गाथाओं की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक) पूछे जाये।

PAPER CODE- SANS-E-PJ 303 (जैन न्याय और प्राकृत व्याकरण)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	न्यायदीपिका - धर्मभूषण (प्रथम प्रकाश)
इकाई -2	न्यायदीपिका - धर्मभूषण (द्वितीय प्रकाश)
इकाई -3	प्रमाणमीमांसा (स्वोपज्ञवृत्ति सहित) - हेमचन्द्र, (प्रथम अध्याय का प्रथम आह्निक 1-22 सूत्र पर्यन्त)
इकाई - 4	प्राकृत प्रकाश - वररुचि (प्रथम से तृतीय परिच्छेद)

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

पं. दरबारीलाल कोठिया (व्या.) : न्यायदीपिका (धर्मभूषण), वीर सेवा मन्दिर, 21, दरियागंज, नई दिल्ली

पं. शोभाचन्द्र भारिल्ल (अनु.) : प्रमाण-मीमांसा, श्री तिलोकरत्न जैन धार्मिक परीक्षा बोर्ड, अहमदनगर

सुखलाल संघवी (व्या.) : प्रमाण-मीमांसा

प्राकृत प्रकाश (मनोरमा व्याख्या सहित), चौखम्बा संस्कृत संस्थान, वाराणसी

धर्मचन्द्र जैन : बौद्ध प्रमाणमीमांसा की जैनदृष्टि से समीक्षा, पार्श्वनाथ विद्यापीठ, वाराणसी

प्राकृत प्रकाश (दीप्ति हिन्दी व्याख्या), साहित्य भण्डार, सुभाष बाजार, मेरठ

पिशेल : प्राकृत-व्याकरण

पी.एल.वैद्य : हेमचन्द्र : प्राकृत व्याकरण

हरिवल्लभ चुन्नीलाल भायाणी : प्राकृत व्याकरणकारो

जार्ज ग्रियर्सन : प्राकृत धात्वादेश

कैलाशचन्द्र शास्त्री : जैन न्याय

सेठ हरगोविन्ददास त्रिविक्रमचन्द्र : पाइअ सद्महण्णवो

बेचरदास कोठिया : जैन-दर्शन में अनुमान विचार

A.C. Woolner : An Introduction to Prakrita

A.M. Ghatage : An Introduction to Ardhamagadhi

Satkari Mookerjee : The Jain Philosophy of Non-absolutism, Motilal Banarasidass, Delhi

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 व 2 : विकल्पसहित दो उद्धरणों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 3 विकल्पसहित दो सूत्रों/उद्धरणों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई – 4 विकल्पसहित दो पदों सूत्र पूर्वक सिद्धि एवं एक सूत्र की व्याख्या का प्रश्न (5 + 5+ 5 अंक)
पूछे जाये।

PAPER CODE- SANS-E-PJ 304 (प्रकरण ग्रन्थ तथा जैन आगम एवं दर्शन का इतिहास)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई – 1	जैनदर्शनसार – पं. चैनसुखदास न्यायतीर्थ (प्रथम अध्याय) – जीव, अजीव
इकाई –2	पुरुषार्थसिद्ध्युपाय (1 से 135 श्लोक)– अमृतचन्द्राचार्य
इकाई –3	उत्तराध्ययनसूत्र (24,28 अध्ययन)
इकाई – 4	जैनदर्शन के सिद्धान्त – जीव, अजीव, आस्रव, बन्ध, संवर, निर्जरा, मोक्ष, नय, प्रमाण, अनेकान्तवाद, द्रव्य, गुण, पर्याय, रत्नत्रय, अपरिग्रह, अहिंसा, त्रिगुप्ति, पंच समिति, स्याद्वाद (भारतीय चिन्तन की अपेक्षा से भी), जैन दर्शन की प्रासंगिकता

प्रश्न-पत्र का निर्माण निम्नानुसार होगा –

खण्ड 'अ' – 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' – 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

पं. चैनसुखदास न्यायतीर्थ : जैन-दर्शन सार, जयपुर
रामजी उपाध्याय : संस्कृत निबन्धावली
पुरुषार्थ सिद्ध्युपाय (अमृतचन्द्र) : टोडरमल स्मारक ट्रस्ट, जयपुर
पुरुषार्थ सिद्ध्युपाय : श्रीमद् राजचन्द्र आश्रम, अगास
उत्तराध्ययन सूत्र : सम्यग्ज्ञान प्रचारक मण्डल, जयपुर, उत्तराध्ययन सूत्र : नेमिचन्द्र टीका सहित
पं. सुखलाल संघवी : दर्शन और चिन्तन, गुजरात विद्यासभा, अहमदाबाद
पं. महेन्द्रकुमार जैन : जैन-दर्शन न्यायाचार्य श्री गणेशवर्णी दि. जैन-संस्थान, वाराणसी
आगम परिचय : आगम प्रकाशन समिति, ब्यावर
आचार्य देवेन्द्र मुनि : जैन आगम साहित्य : मनन और मीमांसा, तारक गुरु जैन ग्रन्थालय, उदयपुर
नवतत्त्व : तिलोक रत्न जैन, धार्मिक परीक्षा बोर्ड, अहमदनगर
जगदीशचन्द्र जैन : प्राकृत साहित्य का इतिहास
नेमीचन्द्र शास्त्री : प्राकृत भाषा और साहित्य का आलोचनात्मक इतिहास
कैलाशचन्द्र शास्त्री : जैन-साहित्य के इतिहास की पृष्ठभूमि
नाथूराम प्रेमी : जैन-साहित्य का इतिहास
अगरचन्द नाहटा : वीरगाथाकाल का जैन-साहित्य
जैन-साहित्य का वृहद् इतिहास (1-7 भाग), पार्श्वनाथ-विद्याश्रम शोध संस्थान, वाराणसी

प्रश्न पत्र निर्माण के लिए निर्देश –

भाग – अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

- भाग – ब :
- इकाई – 1 : विकल्पसहित दो उद्धरणों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न ($7 \frac{1}{2} + 7 \frac{1}{2}$ अंक)
- इकाई – 2 व 3 – विकल्पसहित दो श्लोकों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न ($7 \frac{1}{2} + 7 \frac{1}{2}$ अंक)
- इकाई – 4 विकल्पसहित दो प्रश्नों पूछे जायें ($7 \frac{1}{2} + 7 \frac{1}{2}$ अंक) पूछे जाये

जयनारायण व्यास विश्वविद्यालय, जोधपुर
संस्कृत – विभाग

एम. ए. संस्कृत द्वितीय वर्ष
सत्र – 2021-22

सेमेस्टर – 3

सामान्य निर्देश— द्वितीय वर्ष में दो सेमेस्टर (तृतीय एवं चतुर्थ) होंगे। सेमेस्टर तृतीय एवं चतुर्थ ग्रुप चयन के आधार पर होंगे। विद्यार्थी को ग्रुप ए,बी,सी,डी,ई में से एक ग्रुप का चयन करना होगा। प्रत्येक सेमेस्टर में चार प्रश्न-पत्र होंगे। प्रत्येक प्रश्न-पत्र 100 अंकों का होगा। जिनमें से 30 अंक टर्म टेस्ट, सेमिनार एवं उपस्थिति के लिए सुरक्षित होंगे तथा 70 अंक की सेमेस्टर के अन्त में मुख्य परीक्षा होगी।

ग्रुप 'अ' : साहित्य
PAPER CODE- SANS-A-SH- 301 (गद्य तथा काव्य)

नोट:— प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई – 1	कादम्बरी (चाण्डाल कन्या प्रवेश पर्यन्त)
इकाई – 2	कादम्बरी (चाण्डाल कन्या वर्णन के पश्चात् से अगस्त्याश्रम पर्यन्त)
इकाई – 3	नैषधीयचरितम् (प्रथम सर्ग- 1-75) : श्रीहर्ष
इकाई – 4	विक्रमांकदेवचरितम् (प्रथम सर्ग) : बिल्हण

प्रश्न-पत्र का निर्माण निम्नानुसार होगा –

खण्ड 'अ'

– 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब'

– 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

बाणभट्ट : कादम्बरी (कथामुख), साहित्य भण्डार, मेरठ

मोहन देव पन्त (व्या.): नैषधीयचरितम् (प्रथम सर्ग), मोतीलाल बनारसीदास, दिल्ली

श्रीहर्ष : नैषधीयचरितम्, निर्णय सागर, मुम्बई

श्रीहर्ष : नैषधीयचरितम् (मल्लिनाथ कृत 'जीवातु' व्याख्या युक्त), चौखम्बा संस्कृत सीरीज, वाराणसी, 1976

विश्वनाथ शास्त्री भारद्वाज : विक्रमांकदेवचरित (हिन्दी व्याख्या), बनारस हिन्दू विश्वविद्यालय, 1964

डॉ. हरिदत्त शास्त्री (व्या.) विक्रमांकदेवचरितम्, साहित्य भण्डार, सुभाष बाजार, मेरठ

पुष्पदन्ताचार्य : शिवमहिम्नःस्तोत्र

बलदेव उपाध्याय : संस्कृतसुकविसमीक्षा, चौखम्बा संस्कृत सीरीज, वाराणसी

सुधीर कुमार गुप्त : बाण तथा दण्डी

अमरनाथ पाण्डेय : बाणभट्ट का साहित्यिक अनुशीलन, भारतीय विद्या प्रकाशन, वाराणसी

भोलाशंकर व्यास : संस्कृत कवि दर्शन, चौखम्बा संस्कृत सीरीज, वाराणसी

Buehler George (Ed.) : विक्रमांकदेवचरितम्, Bombay Sanskrit Series, XIV, 1875

R.D. Karmarker : Bana

S.P. Dixit: Banabhatta-Life and Literature
A.N. Jani: A Critical Study of Naishadhiyacharitam

प्रश्न पत्र निर्माण के लिए निर्देश –

भाग – अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग – ब : इकाई – 1 व 2 में : विकल्पसहित दो उद्धरणों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न
(7 ½ + 7 ½ अंक) पूछे जाये।

इकाई – 3 व 4 में : विकल्पसहित दो श्लोकों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न
(7 ½ + 7 ½ अंक) पूछे जाये।

PAPER CODE- SANS-A-SH- 302 (नाटक तथा नाट्य शास्त्र)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	उत्तररामचरितम् - 1 से 3 अंक : भवभूति
इकाई - 2	रत्नावली (1,2 अंक) - हर्ष
इकाई - 3	रत्नावली (3,4 अंक) - हर्ष
इकाई - 4	दशरूपकम् (प्रथम प्रकाश) : धनंजय

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

तारिणीश झा : उत्तररामचरित (हिन्दी व्याख्या), रामनारायण वेणी माधव प्रकाशन
रमाकान्त त्रिपाठी (व्या.) : उत्तररामचरितम्, चौखम्बा संस्कृत प्रकाशन, वाराणसी
मोतीलाल बनारसीदास : रत्नावली (हिन्दी-संस्कृत व्याख्योपेत), दिल्ली
रमाशंकर त्रिपाठी : दशरूपक (हिन्दी व्याख्या), विश्वविद्यालय प्रकाशन, वाराणसी
बहुरूप मिश्र, (टीकाकार) : दशरूपक (दशरूपक दीपिका सहित) भारतीय विद्या प्रकाशन, जवाहर नगर, नई दिल्ली
रामजी उपाध्याय (व्या.) : दशरूपक
ए.बी. कीथ और उदयभानुसिंह (अनु.) : संस्कृत ड्रामा, मोतीलाल बनारसीदास
भोलाशंकर व्यास : संस्कृत कवि दर्शन, चौखम्बा संस्कृत सीरीज, वाराणसी
अयोध्याप्रसादसिंह : भवभूति की नाट्यकला

Indu Shekhar : Sanskrit Drama

Mankad : Types of Sanskrit Drama

N.P. Unni : Natya Shastra, Delhi, 1998

प्रश्न पत्र निर्माण के लिए निर्देश -

- भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।
- भाग - ब : इकाई - 1, 2 व 3 : विकल्पसहित दो श्लोको की व्याख्या एवं एक प्रश्न (5 + 5 + 5 अंक)
इकाई - 4 में विकल्पसहित दो कारिकाओं की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक) पूछे जाये।

PAPER CODE- SANS-A-SH- 303 (साहित्य शास्त्र)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	काव्यप्रकाश (1 व 2 उल्लास) : मम्मट
इकाई -2	काव्यप्रकाश (3 व 4 उल्लास) : मम्मट
इकाई - 3	ध्वन्यालोक (प्रथम उद्घोत- आठवीं कारिका पर्यन्त): आनन्दवर्धन
इकाई - 4	रसगंगाधर (काव्य लक्षण पर्यन्त) : पण्डितराज जगन्नाथ

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

आचार्य विश्वेश्वर : काव्यप्रकाश (हिन्दी व्याख्या), गजेन्द्र गडकर : काव्य प्रकाश
आर. एस. त्रिपाठी : ध्वन्यालोक, प्रथम उद्घोत (हिन्दी व्याख्या), दिल्ली
बद्रीनाथ शर्मा एवं शोभित मिश्र : ध्वन्यालोक (हिन्दी-संस्कृत व्याख्या), चौखम्बा संस्कृत सीरीज, वाराणसी
आचार्य विश्वेश्वर : ध्वन्यालोक (हिन्दी व्याख्या)
बद्रीनाथ झा एवं मदन मोहन झा : रसगंगाधर (हिन्दी-संस्कृत व्याख्या) वाराणसी, 1978
पी.वी. काणे: अलंकार शास्त्र का इतिहास, बलदेव उपाध्याय : भारतीय साहित्य शास्त्र
बी.टी. देशपाण्डे : भारतीय साहित्य शास्त्र
सुरजनदास स्वामी : रससिद्धान्त की शास्त्रीय समीक्षा, प्र. नीरज शर्मा, सी-82, रामदास मार्ग, तिलक नगर, जयपुर
डॉ. नगेन्द्र : रस सिद्धान्त, ठाकुरदत्त जोशी : संस्कृत साहित्य में लक्षणा का उद्भव तथा विकास

S.K.De : Sanskrit Poetics

S.K. De : Some Problems of Sanskrit Poetics

V.Raghavn : Some Concepts of Alankarashastra

V.Raghavan : Number of Rasas

V.S. Sukthandar : Kavya Prakasha

K.Krishnamoorthy : Anandavardhan's Dhavanyaloka, Delhi 1982

प्रश्न पत्र निर्माण के लिए निर्देश -

- भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।
- भाग - ब : इकाई - 1 व 2 : विकल्पसहित दो कारिकाओं की एक व्याख्या एवं एक प्रश्न (5 + 5 + 5 अंक)
इकाई - 3 में विकल्पसहित एक कारिका की व्याख्या तथा एक प्रश्न (7 ½ + 7 ½ अंक)
इकाई - 4 में विकल्पसहित दो व्याख्या (7 ½ + 7 ½ अंक)

पूछे जाये।

PAPER CODE- SANS-A-SH- 304 (प्रकरणग्रन्थ तथा अलंकारशास्त्र)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	इकाई 1 : वक्रोक्तिजीवितम् : कुन्तक - प्रथम उन्मेष - कारिका 1-24
इकाई -2	काव्यमीमांसा (1 से 3 अध्याय) : राजशेखर
इकाई - 3	अलंकार शास्त्र : से सम्बन्धित निम्नलिखित विषय काव्य लक्षण, काव्य हेतु, काव्य-प्रयोजन, रसनिष्पत्तिसूत्र की चार व्याख्यायें
इकाई - 4	काव्यसत्यालोक (प्रथम एवं पंचम उद्योत) - डॉ. ब्रह्मानन्द शर्मा

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएंगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

के. कृष्णमूर्ति (सम्पा) : वक्रोक्ति जीवित (प्रथम उन्मेष), धारवाड़, 1977

साधना पाराशर : काव्य मीमांसा (हिन्दी व्याख्या), दिल्ली, 2000

पं. विजयमित्र शास्त्री : काव्यमीमांसारहस्यम् (1.5 अध्याय), भारतीय विद्या प्रकाशन, जवाहर नगर, नई दिल्ली

पी. वी. काणे : अलंकार शास्त्र का इतिहास

बलदेव उपाध्याय : भारतीय साहित्य शास्त्र

जी.टी. देशपाण्डे : भारतीय साहित्य शास्त्र

डॉ. ब्रह्मानन्द शर्मा - काव्यसत्यालोक : (अनुवाद - डॉ. प्रवीण पण्ड्या) राजस्थान संस्कृत अकादमी - 2013- संस्करण

V.Raghavan: Some Concepts of Alankarshastra

S.K. De: Sanskrit Poetics

S.K. De : Some Problems of Sanskrit Poetics

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 में विकल्पसहित दो कारिकाओं की व्याख्या (7 ½ + 7 ½ अंक)

इकाई - 2 में विकल्पसहित दो व्याख्या अथवा एक व्याख्या व एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 3 में विकल्पसहित दो प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 4 में विकल्पसहित दो कारिकाओं की व्याख्या (7 ½ + 7 ½ अंक)पूछे जाये।

सेमेस्टर – 3

ग्रुप 'बी' : वैदिक वाङ्मय

PAPER CODE- SANS-B-VV- 301 (संहिता-साहित्य)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई – 1	ऋग्वेद शाकल-संहिताऋ (1) 16, 25, 38 ,143; (2) 39, 40 42, 43,
इकाई –2	ऋग्वेद शाकल-संहिताऋ-(3) 57, 59;(4) 9, 10, (5) 83, 84;
इकाई – 3	शुक्ल यजुर्वेद – सा. शु. य-31-1-22; 31-1-16; 34-1-6
इकाई – 4	शुक्ल यजुर्वेद के निर्धारित भाग से पदपाठ

प्रश्न-पत्र का निर्माण निम्नानुसार होगा –

खण्ड 'अ' – 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' – 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

न्यू वैदिक सेलेक्शन (भाग दो)
ऋग्वेद : (सायण भाष्य) (दयानन्द भाष्य)
यजुर्वेद तथा अथर्ववेद (सा. भा.)
सूर्यकान्त, मैकडॉनल: वैदिक देवशास्त्र
उपध्याय बलदेव : वैदिक साहित्य और संस्कृति
अरविन्द : वेदरहस्य
सातवलेकर : अथर्व का सुबोधभाष्य

प्रश्न पत्र निर्माण के लिए निर्देश –

भाग – अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग – ब : इकाई – 1 व 2 : विकल्पसहित दो मंत्रों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई – 3 विकल्पसहित दो मंत्रों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई – 4 विकल्पसहित दो मंत्रों के पदपाठ (7 ½ + 7 ½ अंक)

पूछे जायें।

PAPER CODE- SANS-B-VV- 302 (ब्राह्मण, आरण्यक एवम् उपनिषद्)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	ब्राह्मणसाहित्य शतपथब्राह्मण का 1, अ. 2, ब्रा. 5
इकाई -2	आरण्यक साहित्य : ऐतरेयारण्यक : द्वितीय प्रपाठक (प्राणविद्या)
इकाई - 3	बृहदारण्यकोपनिषद् 2,4,1-44
इकाई - 4	माण्डूक्योपनिषद्

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

शास्त्र, मोतीलाल : शतपथ ब्राह्मण

कीथ, ए.बी. (सम्पादित) : ऐतरेय ब्राह्मण

सत्यव्रत सामश्रमी (सम्पा.) : ऐतरेय ब्राह्मण, उपनिषद् संग्रह, गीता प्रेस, गोरखपुर

शर्मा शिवशंकर : बृहदारण्यकोपनिषद् भाष्यम् साहित्य संस्थान, रोहतक, हरियाणा

सातवलेकर दामोदरश्रीपाद : केनोपनिषद् माण्डूक्योपनिषद्, स्वाध्यायमण्डल, पारडी

Singh, S.P. : Symbolism of Upanisads

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1, 2, 3 व 4 (सभी इकाईयों में) : विकल्पसहित दो उद्धरणों / मंत्रों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक) पूछे जायें।

PAPER CODE- SANS-B-VV- 303 (निरुक्त, व्याकरण एवं वैदिक देवशास्त्र)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	निरुक्त (अष्टम से दशम अध्याय पर्यन्त)
इकाई -2	बृहद्देवता (प्रथम अध्याय)
इकाई - 3	ऋक्प्रातिशाख्य (प्रथम पटल)
इकाई - 4	वैदिक स्वरांकन

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएंगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

राजवाडे : निरुक्त

सामश्रमी सत्यव्रत : निरुक्तालोचनम्

मैक्डॉनल : बृहद्देवता

कीथ, ए.बी. : रिलीजन एण्ड फिलासफी ऑफ वेद एण्ड उपनिषद् (हिन्दी अनुवाद)

शास्त्री, मंगलदेव : ऋक्प्रातिशाख्य

रामगोपाल : वैदिक व्याकरण

मैक्डॉनल : द वैदिक ग्रामर

गोविन्दलाल, बन्शीलाल एवं शास्त्री सद्राम : वैदिक व्याकरण भास्कर

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 विकल्पसहित दो निर्वचन (5+5 अंक) एवं विकल्पसहित एक व्याख्या (5 अंक)

इकाई- 2 व 3 : विकल्पसहित दो उद्धरणो/मंत्रों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 4 विकल्पसहित दो प्रश्न (7 ½ + 7 ½ अंक)

पूछे जायें।

PAPER CODE- SANS-B-VV- 304 (प्रकरण ग्रन्थ, वेद व्याख्या पद्धति एवं वैदिक भाष्यकार)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	प्रकरण ग्रन्थ - महर्षिकुलवैभवम् भाग प्रथम (पं. प्रद्युम्न शर्मा सम्पादित)
इकाई -2	प्राचीन भाष्यकार : वैकटमाधव, सायण
इकाई - 3	आधुनिक व्याख्याकार - म. दयानन्द सरस्वती,
इकाई - 4	आधुनिक व्याख्याकार - पं. मधुसूदन ओझा

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

सायण : ऋग्वेद भाष्य

सरस्वती, दयानन्द : ऋग्वेदादिभाष्यभूमिका

शास्त्री, मोतीलाल : सांस्कृतिक पंच व्याख्यान

अरविन्द : वेद रहस्य

नन्दकिशोर तथा सुभाष : संस्कृतनिबन्धपारिजातम्

शुक्ल, रमेशचन्द्र : प्रबन्धरत्नाकर

फतहसिंह : ढाई अक्षर वेद के

उपाध्याय, रामजी : संस्कृत निबन्धावलि

भार्गव, दयानन्द : वेद विज्ञान वीथिका, वैदिक अध्ययन केन्द्र, जोधपुर

Ghate : Lectures on Rigveda

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 : विकल्पसहित दो व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 2, 3 व 4 विकल्पसहित एक प्रश्न व एक टिप्पणी (10 + 5 अंक)

पूछे जाये।

सेमेस्टर – 3

ग्रुप 'सी' : दर्शन

PAPER CODE- SANS-C-DN 301 (न्याय-वैशेषिक)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई – 1	न्यायसूत्र (वात्स्यायनभाष्य सहित) प्रथम अध्याय : प्रथम आह्निक
इकाई –2	भाषा परिच्छेद (न्यायसिद्धान्तमुक्तावली – विश्वनाथ , द्रव्य तथा साधर्म्य – वैधर्म्य पर्यन्त)
इकाई –3	भाषा परिच्छेद (न्यायसिद्धान्तमुक्तावली सहित) द्रव्य विवेचन – विश्वनाथ भट्टाचार्य
इकाई – 4	प्रशस्तपादभाष्य (प्रारम्भ से द्रव्य निरूपण तक,)

प्रश्न-पत्र का निर्माण निम्नानुसार होगा –

खण्ड 'अ' – 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' – 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

अनन्त ठाकुर : (सं.) न्यायदर्शनम् (प्रथमाध्यायात्मक, प्रथम भाग), मिथिला विद्यापीठ, दरभंगा (बिहार)

फणिभूषण भट्टाचार्य : न्यायदर्शन का परिचय

सूर्यनारायण शुक्ल : न्यायसिद्धान्तमुक्तावली (हिन्दी व्याख्या), चौखम्बा प्रकाशन, वाराणसी

धर्मन्द्रनाथ शास्त्री : (व्या.) न्यायसिद्धान्तमुक्तावली (प्रत्यक्ष खण्ड), मोतीलाल बनारसीदास, दिल्ली

दुर्गाशंकर झा (सं.) : प्रशस्तपादभाष्य (न्यायकन्दली सहित), सम्पूर्णानन्द संस्कृत विश्वविद्यालय, वाराणसी

श्रीनारायण मिश्र : वैशेषिक दर्शन : एक अध्ययन

खड्गनाथ मिश्र : शाब्दबोधविवादपंचकप्रकाश (प्रथम व द्वितीय भाग), केन्द्रीय संस्कृत विद्यापीठ, जयपुर

S.N. Das Gupta : History of Indian Philosophy (relevant Portion only)

Gopinath kaviraj : Gleanings from the History and Bibliography of Nyaya-Vaisesik Literature

D.D. Bhattacharya : History of navya Nyaya in Mithila

Sanghavi, Sukhlal : Acvanded Studies in Indian Logic and Methaphysics

H-ui : Vaisesika Philosophy

G. Bhattacharya : Studies in Nyaya Vaisesika Theism

B.K. Matilal : Navya Nyaya Doctrine of Negation

S. Bhaduri : Studies in Nyaya Vaisesika Metaphysics

अवस्थी, नरेन्द्र : वैशेषिक तथा अन्य भारतीय दर्शन (न्यायलीलावती के आलोक में) स्पिक एण्ड स्पैन पब्लिशर्स, नई दिल्ली

प्रश्न पत्र निर्माण के लिए निर्देश –

भाग – अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग – ब : इकाई – 1,2,3 व 4 (सभी इकाईयों में) : विकल्पसहित दो व्याख्या अथवा एक व्याख्या एवं एक

प्रश्न (7 ½ + 7 ½ अंक), पूछे जाये

PAPER CODE- SANS-C-DN 302 (सांख्य-योग-बौद्ध-जैन)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	सांख्यतत्त्वकौमुदी (1 से 15 वीं कारिकापर्यन्त)-वाचस्पति मिश्र
इकाई - 2	योगसूत्र (व्यासभाष्य सहित) समाधिपाद : (1 से 30 सूत्र) पतंजलि
इकाई - 3	योगसूत्र (व्यासभाष्य सहित) समाधिपाद : (31 से अन्त तक) पतंजलि
इकाई - 4	सर्वदर्शन संग्रह (बौद्ध दर्शन) : माधवाचार्य

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएंगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

आद्याप्रसाद मिश्र : सांख्यतत्त्वकौमुदी (हिन्दी व्याख्या)

अमलधारी सिंह : सांख्यतत्त्वप्रदीप, भारतीय विद्या प्रकाशन, वाराणसी

उदयवीर शास्त्री : सांख्य दर्शन का इतिहास

ब्रह्मलीन मुनि (व्या.) : योगसूत्र (व्यास भाष्य सहित), चौखम्बा प्रकाशन वाराणसी

उमाशंकर शर्मा 'ऋषि' : सर्वदर्शन संग्रह (हिन्दी व्याख्या)

J.R. Ballentyne : Yogasutra Patanjali

J.H. Woods : The Yoga System of Patanjali

S. Radhakrishnan : History of Indian Philosophy, Vol. I

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई 1,2,3 व 4 (सभी इकाईयों में) : विकल्पसहित दो व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक) पूछे जायें।

PAPER CODE- SANS-C-DN 303 (वेदान्त तथा मीमांसा)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	ब्रह्मसूत्र (शांकरभाष्य सहित) : प्रथम अध्याय, प्रथम पाद, चतुःसूत्री
इकाई - 2	अर्थ संग्रह (अधिकार विधि तथा प्रयोगविधि)
इकाई - 3	अर्थ संग्रह (निषेध)
इकाई - 4	जैमिनि सूत्र (शाबर भाष्य सहित) : तर्कपाद मात्र - 1 से 17 सूत्र पर्यन्त

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

सत्यानन्द सरस्वती : ब्रह्मसूत्र शांकर भाष्य (हिन्दी व्याख्या), गोविन्दमल वाराणसी

युधिष्ठिर मीमांसक : शाबरभाष्य (व्याख्या)

दयाशंकर शास्त्री : अर्थसंग्रह (व्या.), साहित्य भण्डार, मेरठ

सत्यप्रकाश शर्मा : अर्थसंग्रह (व्या.) साहित्य भण्डार, मेरठ

उमाशंकर 'ऋषि' : मीमांसादर्शनम् (तर्कपादः) - हिन्दी व्याख्या

मण्डन मिश्र : मीमांसा दर्शन

राममूर्ति शर्मा : शंकराचार्य

अनन्तकृष्ण शास्त्री : मीमांसा शास्त्रसार

V.M. Apte. (English Tr.): ब्रह्मसूत्र शांकरभाष्य, Bombay, 1960

S.K. Raja: मानमेयोदय Madras, 1933

G.N. Jha : शाबरभाष्य, (Vol. I) Baroda, 1973

M.Rangacharya & M.B.V. Iyengar : The Vedant Sutras with the Sri Bhasya of Ramanuja (Tr. by)

Nungamba Kama, 1965

G.P. Bhatta ; Epistemology of the Bhatta School of Purva Mimansa

P.B. Satha : The Discussion on the Purva Mimansa System

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई 1,2,3 व 4 (सभी इकाईयों में) : विकल्पसहित दो व्याख्या अथवा एक व्याख्या एवं एक प्रश्न

(7 ½ + 7 ½ अंक)

PAPER CODE- SANS-C-DN 304 (प्रकरण ग्रन्थ तथा दर्शनशास्त्र का इतिहास)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	विवेकचूडामणि (शंकराचार्य विरचित)
इकाई - 2	प्रकरण ग्रन्थ : व्योमवाद : पं. मधुसूदन ओझा
इकाई - 3	भारतीय दर्शन के सिद्धान्त- आत्मा, मोक्ष, प्रमाण, ईश्वरवाद, अनेकान्त, प्रतीत्यसमुत्पाद, अहिंसा
इकाई - 4	प्रमुख भारतीय दार्शनिक - आचार्य शंकर , गौतम , कणाद , वात्स्यायन , उमास्वति , वाचस्पति मिश्र, उद्द्योतकर , प्रभाकर मिश्र

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

अनन्त शर्मा : व्योमवाद, पं. मधुसूदन ओझा शोध प्रकोष्ठ, संस्कृत विभाग, जयनारायण व्यास विश्वविद्यालय, जोधपुर
उमाशंकर शर्मा 'ऋषि' : सर्वदर्शनसंग्रह : (हिन्दी व्याख्या)

उमेश मिश्र : भारतीय दर्शन

बलदेव उपाध्याय : भारतीय दर्शन

S.Radhakrishnan : History of Indian Philosophy

C.D. Sharma : A Critical survey of Indian Philosophy

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 व 2 : विकल्पसहित दो व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 3 व 4 : विकल्पसहित एक प्रश्न व एक टिप्पणी (10 + 5 अंक)

पूछे जायें।

सेमेस्टर – 3

ग्रुप 'डी' : व्याकरण शास्त्र

PAPER CODE- SANS-D-VK 301 (वैयाकरण सिद्धान्तकौमुदी)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई – 1	वैयाकरणसिद्धान्तकौमुदी (संज्ञा प्रकरण)
इकाई –2	वैयाकरण सिद्धान्तकौमुदी (आत्मनेपद)
इकाई –3	वैयाकरण सिद्धान्तकौमुदी (भ्वादिगण) पङ्क्त्यंश को छोड़कर
इकाई – 4	वैयाकरण सिद्धान्तकौमुदी (दिवादि, स्वादिगण ,तुदादि) पङ्क्त्यंश को छोड़कर

प्रश्न-पत्र का निर्माण निम्नानुसार होगा –

खण्ड 'अ'

– 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब'

– 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएंगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

भट्टोजिदीक्षित : वैयाकरण सिद्धान्त कौमुदी (सम्पूर्ण)

गोपाल दत्त पाण्डेय : वैयाकरण सिद्धान्त कौमुदी (हिन्दी व्याख्या)

बालकृष्ण पंचोली : वैयाकरण सिद्धान्त कौमुदी (हिन्दी व्याख्या)

चारुदेव शास्त्री : व्याकरण चन्द्रोदय

Whitney : Sanskrit Grammar

प्रश्न पत्र निर्माण के लिए निर्देश –

भाग – अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग – ब : इकाई – 1 व 2 : विकल्पसहित दो पदों की सूत्र पूर्वक सिद्धि (4 + 4 अंक) एवं विकल्पसहित दो सूत्रों की व्याख्या (3 ½ + 3 ½ अंक)

इकाई – 3 व 4 विकल्पसहित पाँच पदों की प्रमुख सूत्रोंसहित सिद्धि (3 + 3 + 3 + 3 + 3 अंक)

PAPER CODE- SANS-D-VK 302 (वाक्यपदीय तथा वैयाकरण सिद्धान्तकौमुदी)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	वाक्यपदीय (ब्रह्मकाण्ड) : भर्तृहरि - 1 से 77 कारिका पर्यन्त
इकाई -2	वैयाकरण सिद्धान्तकौमुदी (अव्ययीभाव समास)
इकाई -3	वैयाकरण सिद्धान्तकौमुदी (तत्पुरुष समास)
इकाई - 4	वैयाकरण सिद्धान्तकौमुदी (कृत्यप्रक्रिया)

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर **संस्कृत** में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

बालकृष्ण पंचोली : वैयाकरण सिद्धान्त कौमुदी (हिन्दी व्याख्या), चौखम्बा संस्कृत सीरीज, वाराणसी
रामसुरेश त्रिपाठी : संस्कृत व्याकरण दर्शन, राजकमल प्रकाशन, दिल्ली
दयाशंकर शास्त्री : न्याय सिद्धान्त मुक्तावली (शब्द खण्ड), मोतीलाल बनारसीदास, दिल्ली
रामचन्द्र द्विवेदी (अनु.) : भर्तृहरि, राजस्थान हिन्दी ग्रन्थ अकादमी, जयपुर
रघुनाथ शर्मा : वाक्यपदीयम् (अम्बाकर्त्री व्याख्या)
सूर्यनारायण शुक्ल : वाक्यपदीयम् (भावप्रकाश व्याख्या)

K.A.S. Iyer (Eng. Tr.): The Vakyapadiya of Bhartrihari with Vritti, Chapter I, Poona, 1965

Gauri Nath Shastri : Philosophy of Word and Meaning

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 : विकल्पसहित दो कारिकाओं की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 2, 3 व 4 में : विकल्पसहित दो पदों की सूत्र पूर्वक सिद्धि (5 + 5 अंक) एवं विकल्पसहित एक सूत्र की व्याख्या (5 अंक) पूछे जायें।

PAPER CODE- SANS-D-VK 303 (व्याकरणमहाभाष्य तथा वैयाकरण भूषणसार)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	व्याकरणमहाभाष्य (प्रथम अध्याय प्रथम पाद का प्रथम आह्निक)
इकाई -2	व्याकरणमहाभाष्य (प्रथम अध्याय प्रथम पाद का द्वितीय आह्निक)
इकाई -3	वैयाकरण भूषणसार (धात्वर्थ प्रकरण) कारिका संख्या 1 से 5
इकाई - 4	वैयाकरण भूषणसार (धात्वर्थ प्रकरण) कारिका संख्या 6 से 10

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

चारुदेव शास्त्री : व्याकरण- भाष्य (नवाह्निक)

भीमसेन शास्त्री (व्या.) : वैयाकरण - भूषणसार

खड्गनाथ मिश्र : शाब्दबोधादिवादपंचकप्रकाश (प्रथम व द्वितीय भाग), केन्द्रीय संस्कृत विद्यापीठ, जयपुर

S.K. Belvelkar : System of Sanskrit Grammar

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 व 2 में : विकल्पसहित दो उद्धरणों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 3 व 4 में विकल्पसहित दो कारिकाओं / उद्धरणों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न

(7 ½ + 7 ½ अंक)

PAPER CODE- SANS-D-VK 304 (प्रकरणग्रन्थ तथा व्याकरणशास्त्र का इतिहास)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	गुप्ताशुद्धिप्रदर्शनम् (पं. अम्बिकादत्त व्यास रचित) 1-20 श्लोकपर्यन्त
इकाई -2	कारकसम्बन्धोद्घोत (रभसनन्दि) 1 - 10 कारिका
इकाई -3	पाणिनीय शिक्षा
इकाई - 4	पाणिनीय व्याकरण शास्त्र के सिद्धान्त - शब्दार्थसम्बन्ध, स्फोटवाद, शब्दब्रह्म, धात्वर्थनिर्णय, तिङ्गर्थनिर्णय लकारार्थनिर्णय, व्याकरणशास्त्रानुसार वाक् का विवेचन,

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

गुप्ताशुद्धिप्रदर्शनम्, पं. अम्बिकादत्तव्यास रचित, व्यास पुस्तकालय, मानमन्दिर, वाराणसी

रभसनन्दि : कारकसम्बन्धोद्घोत, राजस्थान प्राच्य विद्या प्रतिष्ठान, जोधपुर

रामशंकर भट्टाचार्य : पाणिनीय व्याकरण का अनुशीलन, इण्डोलोजिकल बुक हाऊस, वाराणसी

युधिष्ठिर मीमांसक : व्याकरण शास्त्र का इतिहास

N.M. Ghosh (अनु.) : पाणिनीय शिक्षा, Delhi

The Hegue : Panini : A Survey of Research, Mouton Cardona George, 1966

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 : विकल्पसहित दो श्लोकों की व्याख्या (7 ½ + 7 ½ अंक)

इकाई - 2 विकल्पसहित दो कारिकाओं की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 3 : विकल्पसहित दो व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 4 विकल्पसहित दो प्रश्न पूछे जायेंगे (7 ½ + 7 ½ अंक)

सेमेस्टर – 3

ग्रुप 'ई' : प्राकृत तथा जैन-दर्शन

PAPER CODE- SANS-E-PJ 301 (जैन दर्शन)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई – 1	तत्त्वार्थसूत्र – विवेचक पं. सुखलाल संघवी (अध्याय 2)
इकाई –2	तत्त्वार्थसूत्र – विवेचक पं. सुखलाल संघवी (अध्याय 5)
इकाई –3	तत्त्वार्थसूत्र – विवेचक पं. सुखलाल संघवी (अध्याय 6)
इकाई – 4	स्याद्वादमंजरी (अन्ययोगव्यवच्छेद द्वात्रिंशिका के श्लोक 1 से 10 पर टीका)

प्रश्न-पत्र का निर्माण निम्नानुसार होगा –
खण्ड 'अ' – 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' – 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

उपाध्याय केवल मुनि : तत्त्वार्थ सूत्र, जैन दिवाकर दिव्य ज्योति कार्यालय, ब्यावर
सिद्धान्ताचार्य पं. फूलचन्द्र शास्त्री : तत्त्वार्थ सूत्र, श्री गणेशवर्णी शोध संस्थान, नरिया, वाराणसी
मघराज मुणोत (अनु.) : तत्त्वार्थसूत्र, श्री रत्नप्रभाकर ज्ञान पुष्पमाला, फलोदी
सुखलाल संघवी (व्या.) : तत्त्वार्थसूत्र, पार्श्वनाथ विद्यापीठ, वाराणसी
उमास्वारित : तत्त्वार्थसूत्र (भाष्य सहित), परमश्रुत प्रभावक मण्डल, अगास
जगदीशचन्द्र जैन (व्या.) : स्याद्वादमंजरी (मल्लिषेण), परमश्रुत प्रभावक मण्डल, श्रीमद् राजचन्द्र आश्रम, अगास

A.B. Dhruva : Syadvadamanjari

महेन्द्रकुमार जैन : जैन-दर्शन, श्री गणेशप्रसाद वर्णी जैन ग्रन्थमाला, वाराणसी

प्रश्न पत्र निर्माण के लिए निर्देश –

भाग – अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग – ब : इकाई – 1,2 व 3 में विकल्पसहित तीन सूत्रों की व्याख्या अथवा दो व्याख्या व एक टिप्पणी (5 + 5 + 5 अंक)

इकाई – 4 में विकल्पसहित दो श्लोकों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½

अंक)

पूछे जाये

PAPER CODE- SANS-E-PJ 302 (आगम तथा आगमेतर साहित्य)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	आचारांगसूत्र- प्रथमश्रुत स्कन्ध (अध्ययन 1)
इकाई -2	प्रवचनसार - ज्ञेयतत्त्वाधिकार (1 से 26 गाथाएं)
इकाई -3	प्रवचनसार - ज्ञेयतत्त्वाधिकार (27 से 52 गाथाएं)
इकाई - 4	समयसार (1 से 30 गाथाएं) (जयसेनकृत टीका सहित)

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ'

- 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब'

- 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

आचारांग सूत्र : आगम प्रकाशन समिति, ब्यावर
महाप्रज्ञ : आचारांगभाष्यम्, जैन विश्वभारती संस्थान, लाडनूं
शीलाकाचार्य (टीका सहित) : आचारांग सूत्र, मोतीलाल बनारसीदास, दिल्ली
कमलचन्द सोगानी (सं.) : आचारांग चयनिका
प्रवचनसार : श्रीमद् राजचन्द्र आश्रम, अगास
समयसार : श्रीमद् राजचन्द्र आश्रम, अगास
डॉ. हुकमचन्द भारिल्ल : समयसार-अनुशीलन, टोडरमल स्मारक ट्रस्ट, जयपुर

Jacobi Hermana : Jain Sutras, Part I

K.K. Dixit : Early Jainism

H.S. Bhattacharya : Reals in the Jain Metaphysics

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 विकल्पसहित तीन उद्हरणों की व्याख्या अथवा दो व्याख्या एवं एक टिप्पणी (5 + 5+ 5 अंक)

इकाई - 2,3 व 4 विकल्पसहित दो गाथाओं की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक) पूछे जाये।

PAPER CODE- SANS-E-PJ 303 (जैन न्याय और प्राकृत व्याकरण)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	न्यायदीपिका - धर्मभूषण (प्रथम प्रकाश)
इकाई -2	न्यायदीपिका - धर्मभूषण (द्वितीय प्रकाश)
इकाई -3	प्रमाणमीमांसा (स्वोपज्ञवृत्ति सहित) - हेमचन्द्र, (प्रथम अध्याय का प्रथम आह्निक 1-22 सूत्र पर्यन्त)
इकाई - 4	प्राकृत प्रकाश - वररुचि (प्रथम से तृतीय परिच्छेद)

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -
खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

पं. दरबारीलाल कोठिया (व्या.) : न्यायदीपिका (धर्मभूषण), वीर सेवा मन्दिर, 21, दरियागंज, नई दिल्ली

पं. शोभाचन्द्र भारिल्ल (अनु.) : प्रमाण-मीमांसा, श्री तिलोकरत्न जैन धार्मिक परीक्षा बोर्ड, अहमदनगर

सुखलाल संघवी (व्या.) : प्रमाण-मीमांसा

प्राकृत प्रकाश (मनोरमा व्याख्या सहित), चौखम्बा संस्कृत संस्थान, वाराणसी

धर्मचन्द्र जैन : बौद्ध प्रमाणमीमांसा की जैनदृष्टि से समीक्षा, पार्श्वनाथ विद्यापीठ, वाराणसी

प्राकृत प्रकाश (दीप्ति हिन्दी व्याख्या), साहित्य भण्डार, सुभाष बाजार, मेरठ

पिशेल : प्राकृत-व्याकरण

पी.एल.वैद्य : हेमचन्द्र : प्राकृत व्याकरण

हरिवल्लभ चुन्नीलाल भायाणी : प्राकृत व्याकरणकारो

जार्ज ग्रियर्सन : प्राकृत धात्वादेश

कैलाशचन्द्र शास्त्री : जैन न्याय

सेठ हरगोविन्ददास त्रिविक्रमचन्द्र : पाइअ सहमहण्णवो

बेचरदास कोठिया : जैन-दर्शन में अनुमान विचार

A.C. Woolner : An Introduction to Prakrita

A.M. Ghatage : An Introduction to Ardhamagadhi

Satkari Mookerjee : The Jain Philosophy of Non-absolutism, Motilal Banarasidass, Delhi

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 व 2 : विकल्पसहित दो उद्धरणों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 3 विकल्पसहित दो सूत्रों/उद्धरणों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 4 विकल्पसहित दो पदों सूत्र पूर्वक सिद्धि एवं एक सूत्र की व्याख्या का प्रश्न (5 + 5 + 5 अंक)

पूछे जाये

PAPER CODE- SANS-E-PJ 304 (प्रकरण ग्रन्थ तथा जैन आगम एवं दर्शन का इतिहास)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	जैनदर्शनसार - पं. चैनसुखदास न्यायतीर्थ (प्रथम अध्याय) - जीव, अजीव
इकाई -2	पुरुषार्थसिद्ध्युपाय (1 से 135 श्लोक)- अमृतचन्द्राचार्य
इकाई -3	उत्तराध्ययनसूत्र (24,28 अध्ययन)
इकाई - 4	जैनदर्शन के सिद्धान्त - जीव, अजीव, आस्रव, बन्ध, संवर, निर्जरा, मोक्ष, नय, प्रमाण, अनेकान्तवाद, द्रव्य, गुण, पर्याय, रत्नत्रय, अपरिग्रह, अहिंसा, त्रिगुप्ति, पंच समिति, स्याद्वाद (भारतीय चिन्तन की अपेक्षा से भी), जैन दर्शन की प्रासंगिकता

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएंगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

पं. चैनसुखदास न्यायतीर्थ : जैन-दर्शन सार, जयपुर

रामजी उपाध्याय : संस्कृत निबन्धावली

पुरुषार्थ सिद्ध्युपाय (अमृतचन्द्र) : टोडरमल स्मारक ट्रस्ट, जयपुर

पुरुषार्थ सिद्ध्युपाय : श्रीमद् राजचन्द्र आश्रम, अगास

उत्तराध्ययन सूत्र : सम्यग्ज्ञान प्रचारक मण्डल, जयपुर, उत्तराध्ययन सूत्र : नेमिचन्द्र टीका सहित

पं. सुखलाल संघवी : दर्शन और चिन्तन, गुजरात विद्यासभा, अहमदाबाद

पं. महेन्द्रकुमार जैन : जैन-दर्शन न्यायाचार्य श्री गणेशवर्णी दि. जैन-संस्थान, वाराणसी

आगम परिचय : आगम प्रकाशन समिति, ब्यावर

आचार्य देवेन्द्र मुनि : जैन आगम साहित्य : मनन और मीमांसा, तारक गुरु जैन ग्रन्थालय, उदयपुर

नवतत्त्व : तिलोक रत्न जैन, धार्मिक परीक्षा बोर्ड, अहमदनगर

जगदीशचन्द्र जैन : प्राकृत साहित्य का इतिहास

नेमीचन्द्र शास्त्री : प्राकृत भाषा और साहित्य का आलोचनात्मक इतिहास

कैलाशचन्द्र शास्त्री : जैन-साहित्य के इतिहास की पृष्ठभूमि

नाथूराम प्रेमी : जैन-साहित्य का इतिहास

अगरचन्द्र नाहटा : वीरगाथाकाल का जैन-साहित्य

जैन-साहित्य का वृहद् इतिहास (1-7 भाग), पार्श्वनाथ-विद्याश्रम शोध संस्थान, वाराणसी

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 : विकल्पसहित दो उद्धरणों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 2 व 3 - विकल्पसहित दो श्लोकों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 4 विकल्पसहित दो प्रश्नों पूछे जायें (7 ½ + 7 ½ अंक) पूछे जायें

जयनारायण व्यास विश्वविद्यालय, जोधपुर
संस्कृत – विभाग

एम. संस्कृत द्वितीय वर्ष – 2022–23
सेमेस्टर – 4

ग्रुप 'अ' साहित्य

PAPER CODE- SANS-A-SH- 401 (गद्य तथा काव्य)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई – 1	कादम्बरी (परम्पासरोवरवर्णन से शुक जन्म तक)
इकाई – 2	कादम्बरी (शुक जन्म के बाद से जाबालिवर्णनम् तक)
इकाई – 3	नैषधीयचरितम् (प्रथम सर्ग- 76 से अंत तक) : श्रीहर्ष
इकाई – 4	शिवमहिम्नःस्तोत्रम् : पुष्पदन्ताचार्य

प्रश्न-पत्र का निर्माण निम्नानुसार होगा –
खण्ड 'अ' – 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' – 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

बाणभट्ट : कादम्बरी (कथामुख), साहित्य भण्डार, मेरठ
मोहन देव पन्त (व्या.): नैषधीयचरितम् (प्रथम सर्ग), मोतीलाल बनारसीदास, दिल्ली
श्रीहर्ष : नैषधीयचरितम्, निर्णय सागर, मुम्बई
श्रीहर्ष नैषधीयचरितम् (मल्लिनाथ कृत "जीवातु" व्याख्या युक्त), चौखम्बा संस्कृत सीरीज, वाराणसी, 1976
विश्वनाथ शास्त्री भारद्वाज : विक्रमांकदेवचरित (हिन्दी व्याख्या), बनारस हिन्दू विश्वविद्यालय, 1964
डॉ. हरिदत्त शास्त्री (व्या.) विक्रमांकदेवचरितम्, साहित्य भण्डार, सुभाष बाजार, मेरठ
पुष्पदन्ताचार्य : शिवमहिम्नःस्तोत्र
बलदेव उपाध्याय : संस्कृतसुकविसमीक्षा, चौखम्बा संस्कृत सीरीज, वाराणसी
सुधीर कुमार गुप्त : बाण तथा दण्डी
अमरनाथ पाण्डेय : बाणभट्ट का साहित्यिक अनुशीलन, भारतीय विद्या प्रकाशन, वाराणसी
भोलाशंकर व्यास : संस्कृत कवि दर्शन, चौखम्बा संस्कृत सीरीज, वाराणसी
Buehler George (Ed.) : विक्रमांकदेवचरितम्, Bombay Sanskrit Series, XIV, 1875
R.D. Karmarker : Bana
S.P. Dixit: Banabhatta-Life and Literature
A.N. Jani: A Critical Study of Naishadhiyacharitam

प्रश्न पत्र निर्माण के लिए निर्देश –

भाग – अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग – ब : इकाई – 1 व 2 : विकल्पसहित दो उद्धरणों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई – 3 व 4 विकल्पसहित दो श्लोकों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक) पूछे जाये।

PAPER CODE- SANS-A-SH- 402 (नाटक तथा नाट्य शास्त्र)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	उत्तररामचरितम् - 4 से 7 अंक : भवभूति
इकाई -2	दशरूपकम् (द्वितीय प्रकाश) : धनंजय
इकाई - 3	दशरूपकम् (तृतीय प्रकाश) : धनंजय
इकाई - 4	दशरूपकम् (चतुर्थ प्रकाश) : धनंजय

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

तारिणीश झा : उत्तररामचरित (हिन्दी व्याख्या), रामनारायण वेणी माधव प्रकाशन
रमाकान्त त्रिपाठी (व्या.) : उत्तररामचरितम्, चौखम्बा संस्कृत प्रकाशन, वाराणसी
मोतीलाल बनारसीदास : रत्नावली (हिन्दी-संस्कृत व्याख्योपेत), दिल्ली
रमाशंकर त्रिपाठी : दशरूपक (हिन्दी व्याख्या), विश्वविद्यालय प्रकाशन, वाराणसी
बहुरूप मिश्र, (टीकाकार) : दशरूपक (दशरूपक दीपिका सहित) भारतीय विद्या प्रकाशन, जवाहर नगर, नई दिल्ली
रामजी उपाध्याय (व्या.) : दशरूपक
ए.बी. कीथ और उदयभानुसिंह (अनु.) : संस्कृत ड्रामा, मोतीलाल बनारसीदास
भोलाशंकर व्यास : संस्कृत कवि दर्शन, चौखम्बा संस्कृत सीरीज, वाराणसी
अयोध्याप्रसादसिंह : भवभूति की नाट्यकला

Indu Shekhar : Sanskrit Drama

Mankad : Types of Sanskrit Drama

N.P. Unni : Natya Shastra, Delhi, 1998

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1, 2 व 3 : विकल्पसहित दो श्लोको की व्याख्या एवं एक प्रश्न (5 + 5 + 5 अंक)

इकाई - 4 में विकल्पसहित दो कारिकाओं की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न

(7 ½ + 7 ½ अंक) पूछे जाये।

PAPER CODE- SANS-A-SH- 403 (साहित्य शास्त्र)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	काव्यप्रकाश (5 उल्लास) : मम्मट
इकाई -2	काव्यप्रकाश (7वां(रसदोष) एवं 8वां उल्लास) : मम्मट
इकाई - 3	ध्वन्यालोक (प्रथम उद्द्योत- नवमी कारिका से अन्त तक): आनन्दवर्धन
इकाई - 4	अभिनवकाव्यालंकार सूत्र प्रथम प्रथमाधिकरणम् - प्रथम अध्याय डॉ. राधावल्लभ त्रिपाठी

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

आचार्य विश्वेश्वर : काव्यप्रकाश (हिन्दी व्याख्या)

गजेन्द्र गडकर : काव्य प्रकाश

आर. एस. त्रिपाठी : ध्वन्यालोक, प्रथम उद्द्योत (हिन्दी व्याख्या), दिल्ली

बद्रीनाथ शर्मा एवं शोभित मिश्र : ध्वन्यालोक (हिन्दी-संस्कृत व्याख्या), चौखम्बा संस्कृत सीरीज, वाराणसी

आचार्य विश्वेश्वर : ध्वन्यालोक (हिन्दी व्याख्या)

बद्रीनाथ झा एवं मदन मोहन झा : रसगंगाधर (हिन्दी-संस्कृत व्याख्या) वाराणसी, 1978

पी.वी. काणे: अलंकार शास्त्र का इतिहास

बलदेव उपाध्याय : भारतीय साहित्य शास्त्र

बी.टी. देशपाण्डे : भारतीय साहित्य शास्त्र

सुरजनदास स्वामी : रससिद्धान्त की शास्त्रीय समीक्षा, प्र. नीरज शर्मा, सी-82, रामदास मार्ग, तिलक नगर, जयपुर

डॉ. नगेन्द्र : रस सिद्धान्त

ठाकुरदत्त जोशी : संस्कृत साहित्य में लक्षणा का उद्भव तथा विकास

डॉ. राधावल्लभ त्रिपाठी : अभिनवाकाव्यालंकारसूत्र : सम्पूर्णनन्द संस्कृत विश्वविद्यालय, वाराणसी

डॉ. राधावल्लभ त्रिपाठी : अभिनवाकाव्यालंकारसूत्र - हिन्दी भाष्य - डॉ. रामाकान्त पाण्डेय, जगदीश पुस्तकालय, जयपुर

S.K.De : Sanskrit Poetics

S.K. De : Some Problems of Sanskrit Poetics

V.Raghavn : Some Concepts of Alankarashastra

V.Raghavan : Number of Rasas

V.S. Sukthandar : Kavya Prakasha

K.Krishnamoorthy : Anandavardhan's Dhavanyaloka, Delhi 1982

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 व 2 : विकल्पसहित दो कारिकाओं की एक व्याख्या एवं एक प्रश्न (5 + 5 + 5 अंक)

इकाई - 3 में विकल्पसहित एक कारिका की व्याख्या तथा एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 4 में विकल्पसहित दो व्याख्या (7 ½ + 7 ½ अंक) पूछे जाये।

PAPER CODE- SANS-SH- A-404 (प्रकरणग्रन्थ तथा अलंकारशास्त्र)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	वक्रोक्तिजीवितम् : कुन्तक - प्रथम उन्मेष - कारिका 25-57
इकाई - 2	काव्यमीमांसा (4,5 अध्याय) : राजशेखर
इकाई - 3	अलंकार शास्त्र : से सम्बन्धित निम्नलिखित विषय काव्य के तीन प्रमुख गुण, काव्य की प्रमुख रीतित्रय, अलंकार सम्प्रदाय, ध्वनिसम्प्रदाय, रीति सम्प्रदाय, औचित्य सम्प्रदाय, वक्रोक्ति सम्प्रदाय, रससम्प्रदाय
इकाई - 4	काव्यालंकारकारिका (1-11 कारिका पर्यन्त) - डॉ. रेवाप्रसाद द्विवेदी, अभिराजयशोभूषण (काव्यलक्षण पर्यन्त) - डॉ. अभिराज राजेन्द्र मिश्र

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ'

- 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब'

- 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

के. कृष्णमूर्ति (सम्पा) : वक्रोक्ति जीवित (प्रथम उन्मेष), धारवाड़, 1977

साधना पाराशर : काव्य मीमांसा (हिन्दी व्याख्या), दिल्ली, 2000

पं. विजयमित्र शास्त्री : काव्यमीमांसासहस्यम् (1.5 अध्याय), भारतीय विद्या प्रकाशन, जवाहर नगर, नई दिल्ली

पी. वी. काणे : अलंकार शास्त्र का इतिहास

बलदेव उपाध्याय : भारतीय साहित्य शास्त्र

जी.टी. देशपाण्डे : भारतीय साहित्य शास्त्र

प्रो. रेवाप्रसाद द्विवेदी : काव्यालंकारकारिका - कालिदास संस्थान, 28 महामना पुरी, वाराणसी

डॉ. अभिराज राजेन्द्र मिश्र - अभिराज यशोभूषण - वैजयन्त प्रकाशनम् - 8, बाघम्बरि मार्ग, भरद्वाजपुरम्, इलाहाबादम्
-2006 संस्करण

V.Raghavan: Some Concepts of Alankarshastra

S.K. De: Sanskrit Poetics

S.K. De : Some Problems of Sanskrit Poetics

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 में विकल्पसहित दो कारिकाओं की व्याख्या (7 ½ + 7 ½ अंक)

इकाई - 2 में विकल्पसहित दो व्याख्या अथवा एक व्याख्या व एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 3 में विकल्पसहित दो प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 4 में विकल्पसहित दो कारिकाओं की व्याख्या (7 ½ + 7 ½ अंक पूछे जाये।

सेमेस्टर – 4

ग्रुप 'बी' : वैदिक वाङ्मय

PAPER CODE- SANS-B-VV- 401 (संहिता-साहित्य)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई – 1	ऋग्वेद शाकल-संहिता – (6) 53; (7) 83, 103;
इकाई – 2	ऋग्वेद शाकल-संहिता –(8) 48; (9) 1; (10) 71,84
इकाई – 3	अथर्ववेद सौ 1.29; 38; 3.17; 3.30; 6.64; 19.51
इकाई – 4	अथर्ववेद के निर्धारित भाग से पदपाठ

प्रश्न-पत्र का निर्माण निम्नानुसार होगा –

खण्ड 'अ' – 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' – 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

न्यू वैदिक सेलेक्शन (भाग दो)

ऋग्वेद : (सायण भाष्य) (दयानन्द भाष्य)

यजुर्वेद तथा अथर्ववेद (सा. भा.)

सूर्यकान्त, मैक्डॉनल: वैदिक देवशास्त्र

उपध्याय बलदेव : वैदिक साहित्य और संस्कृति

अरविन्द : वेदरहस्य

सातवलेकर : अथर्व का सुबोधभाष्य

प्रश्न पत्र निर्माण के लिए निर्देश –

भाग – अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग – ब : इकाई – 1 व 2 : विकल्पसहित दो मंत्रों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई – 3 विकल्पसहित दो मंत्रों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई – 4 विकल्पसहित दो मंत्रों के पदपाठ (7 ½ + 7 ½ अंक) पूछे जायें।

PAPER CODE- SANS-B-VV- 402 (ब्राह्मण, आरण्यक एवम् उपनिषद्)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	ब्राह्मणसाहित्य ऐतरेय ब्राह्मण-प्रथम पंजिका, प्रथमाध्याय
इकाई - 2	आरण्यक साहित्य : तैत्तिरीयारण्यक : द्वितीय प्रपाठक (स्वाध्याय, पंच महायज्ञ)
इकाई - 3	श्वेताश्वतरोपनिषद्-3, 1-21
इकाई - 4	केनोपनिषद्

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

शास्त्र, मोतीलाल : शतपथ ब्राह्मण

कीथ, ए.बी. (सम्पादित) : ऐतरेय ब्राह्मण

सत्यव्रत सामश्रमी (सम्पा.) : ऐतरेय ब्राह्मण, उपनिषद् संग्रह, गीता प्रेस, गोरखपुर

शर्मा शिवशंकर : वृहदारण्यकोपनिषद् भाष्यम् साहित्य संस्थान, रोहतक, हरियाणा

सातवलेकर दामोदरश्रीपाद : केनोपनिषद् माण्डूक्योपनिषद्, स्वाध्यायमण्डल, पारडी

Singh, S.P. : Symbolism of Upanisads

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1, 2, 3 व 4 (सभी इकाईयों में) : विकल्पसहित दो उद्धरणों / मंत्रों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक) पूछे जायें।

PAPER CODE- SANS-B-VV- 403 (निरुक्त, व्याकरण एवं वैदिक देवशास्त्र)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	निरुक्त (एकादश से द्वादश अध्याय पर्यन्त)
इकाई - 2	बृहद्देवता (द्वितीय अध्याय के 25 वर्ग)
इकाई - 3	ऋक्प्रातिशाख्य (द्वितीय पटल)
इकाई - 4	प्रमुख वैदिक द्वन्द्व

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

राजवाडे : निरुक्त

सामश्रमी सत्यव्रत : निरुक्तालोचनम्

मैकडॉनल : बृहद्देवता

कीथ, ए.बी. : रिलीजन एण्ड फिलासफी ऑफ वेद एण्ड उपनिषद् (हिन्दी अनुवाद)

शास्त्री, मंगलदेव : ऋक्प्रातिशाख्य

रामगोपाल : वैदिक व्याकरण

मैकडॉनल : द वैदिक ग्रामर

गोविन्दलाल, बन्शीलाल एवं शास्त्री सद्राम : वैदिक व्याकरण भास्कर

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 विकल्पसहित दो निर्वचन (5+5 अंक) एवं विकल्पसहित एक व्याख्या (5 अंक)
इकाई- 2 व 3 : विकल्पसहित दो उद्धरणो /मंत्रों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न
(7 ½ + 7 ½ अंक)

इकाई - 4 विकल्पसहित दो प्रश्न (7 ½ + 7 ½ अंक) पूछे जायें।

PAPER CODE- SANS-B-VV- 404 (प्रकरण ग्रन्थ, वेद व्याख्या पद्धति एवं वैदिक भाष्यकार)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	प्रकरण ग्रन्थ - महर्षिकुलवैभवम् भाग द्वितीय (पं. प्रद्युम्न शर्मा सम्पादित)
इकाई - 2	प्राचीन भाष्यकार : उव्वट और महीधर
इकाई - 3	पाश्चात्य व्याख्याकार - मैक्समूलर, रॉथ
इकाई - 4	आधुनिक व्याख्याकार - श्री अरविन्द,

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

सायण : ऋग्वेद भाष्य

सरस्वती, दयानन्द : ऋग्वेदादिभाष्यभूमिका

शास्त्री, मोतीलाल : सांस्कृतिक पंच व्याख्यान

अरविन्द : वेद रहस्य

नन्दकिशोर तथा सुभाष : संस्कृतनिबन्धपारिजातम्

शुक्ल, रमेशचन्द्र : प्रबन्धरत्नाकर

फतहसिंह : ढाई अक्षर वेद के

उपाध्याय, रामजी : संस्कृत निबन्धावलि

भार्गव, दयानन्द : वेद विज्ञान वीथिका, वैदिक अध्ययन केन्द्र, जोधपुर

Ghate : Lectures on Rigved

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 : विकल्पसहित दो व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 2, 3 व 4 विकल्पसहित एक प्रश्न व एक टिप्पणी (10 + 5 अंक) पूछे जाये।

सेमेस्टर – 4

ग्रुप 'सी' : दर्शन

PAPER CODE- SANS-C-DN 401 (न्याय-वैशेषिक)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई – 1	न्यायसूत्र (वात्स्यायनभाष्य सहित) प्रथम अध्याय : द्वितीय आहिनक
इकाई –2	भाषा परिच्छेद (न्यायसिद्धान्तमुक्तावली सहित) प्रत्यक्ष खण्ड- प्रत्यक्ष निरूपण – विश्वनाथ भट्टाचार्य
इकाई –3	भाषा परिच्छेद (न्यायसिद्धान्तमुक्तावली सहित) अनुमान खण्ड : विश्वनाथ भट्टाचार्य
इकाई – 4	प्रशस्तपादभाष्य (सामान्य से समवाय तक)

प्रश्न-पत्र का निर्माण निम्नानुसार होगा –

खण्ड 'अ' – 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' – 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

अनन्त ठाकुर : (सं.) न्यायदर्शनम् (प्रथमाध्यायात्मक, प्रथम भाग), मिथिला विद्यापीठ, दरभंगा (बिहार)

फणिभूषण भट्टाचार्य : न्यायदर्शन का परिचय

सूर्यनारायण शुक्ल : न्यायसिद्धान्तमुक्तावली (हिन्दी व्याख्या), चौखम्बा प्रकाशन, वाराणसी

धर्मन्द्रनाथ शास्त्री : (व्या.) न्यायसिद्धान्तमुक्तावली (प्रत्यक्ष खण्ड), मोतीलाल बनारसीदास, दिल्ली

दुर्गाशंकर झा (सं.) : प्रशस्तपादभाष्य (न्यायकन्दली सहित), सम्पूर्णानन्द संस्कृत विश्वविद्यालय, वाराणसी

श्रीनारायण मिश्र : वैशेषिक दर्शन : एक अध्ययन

खड्गनाथ मिश्र : शाब्दबोधदिवादपंचकप्रकाश (प्रथम व द्वितीय भाग), केन्द्रीय संस्कृत विद्यापीठ, जयपुर

S.N. Das Gupta : History of Indian Philosophy (relevant Portion only)

Gopinath kaviraj : Gleanings from the History and Bibliography of Nyaya-Vaisesik Literature

D.D. Bhattacharya : History of navya Nyaya in Mithila

Sanghavi, Sukhlal : Acvanded Studies in Indian Logic and Methaphysics

H-ui : Vaisesika Philosophy

G. Bhattacharya : Studies in Nyaya Vaisesika Theism

B.K. Matilal : Navya Nyaya Doctrine of Negation

S. Bhaduri : Studies in Nyaya Vaisesika Metaphysics

अवस्थी, नरेन्द्र : वैशेषिक तथा अन्य भारतीय दर्शन (न्यायलीलावती के आलोक में) स्पिक एण्ड स्पैन पब्लिशर्स, नई दिल्ली

प्रश्न पत्र निर्माण के लिए निर्देश –

भाग – अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग – ब : इकाई 1,2,3 व 4 में (सभी इकाईयों में) : विकल्पसहित दो व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7

½ + 7 ½ अंक) पूछे जाये।

PAPER CODE- SANS-C-DN 402 (सांख्य-योग-बौद्ध-जैन)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	सांख्यतत्त्वकौमुदी (16 से 30वीं कारिकापर्यन्त)-वाचस्पति मिश्र
इकाई -2	योगसूत्र (व्यासभाष्य सहित) साधनपाद
इकाई -3	योगसूत्र (व्यासभाष्य सहित) कैवल्यपाद
इकाई - 4	सर्वदर्शनसंग्रह (जैन दर्शन) : माधवाचार्य

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

आद्याप्रसाद मिश्र : सांख्यतत्त्वकौमुदी (हिन्दी व्याख्या)

अमलधारी सिंह : सांख्यतत्त्वप्रदीप, भारतीय विद्या प्रकाशन, वाराणसी

उदयवीर शास्त्री : सांख्य दर्शन का इतिहास

ब्रह्मलीन मुनि (व्या.) : योगसूत्र (व्यास भाष्य सहित), चौखम्बा प्रकाशन वाराणसी

उमाशंकर शर्मा 'ऋषि' : सर्वदर्शन संग्रह (हिन्दी व्याख्या)

J.R. Ballentyne : Yogasutra Patanjali

J.H. Woods : The Yoga System of Patanjali

S. Radhakrishnan : History of Indian Philosophy, Vol. I

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : - 1,2,3 व 4 (सभी इकाईयों में) : विकल्पसहित दो व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक) पूछे जाये।

PAPER CODE- SANS-C-DN 403 (वेदान्त तथा मीमांसा)

नोट:— प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	इकाई 2 - ब्रह्मसूत्र (शांकरभाष्य सहित) प्रथम अध्याय, प्रथम पाद (पंचम सूत्र से अन्त तक)
इकाई -2	अर्थ संग्रह (नामधेय)
इकाई -3	अर्थ संग्रह (अर्थवाद)
इकाई - 4	जैमिनि सूत्र (शाबर भाष्य सहित) : तर्कपाद मात्र

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

सत्यानन्द सरस्वती : ब्रह्मसूत्र शांकर भाष्य (हिन्दी व्याख्या), गोविन्दमल वाराणसी

युधिष्ठिर मीमांसक : शाबरभाष्य (व्याख्या)

दयाशंकर शास्त्री : अर्थसंग्रह (व्या.), साहित्य भण्डार, मेरठ

सत्यप्रकाश शर्मा : अर्थसंग्रह (व्या.) साहित्य भण्डार, मेरठ

उमाशंकर 'ऋषि' : मीमांसादर्शनम् (तर्कपादः) - हिन्दी व्याख्या

मण्डन मिश्र : मीमांसा दर्शन

राममूर्ति शर्मा : शंकराचार्य

अनन्तकृष्ण शास्त्री : मीमांसा शास्त्रसार

V.M. Apte. (English Tr.): ब्रह्मसूत्र शांकरभाष्य, Bombay, 1960

S.K. Raja: मानमेयोदय Madras, 1933

G.N. Jha : शाबरभाष्य, (Vol. I) Baroda, 1973

M.Rangacharya & M.B.V. Iyengar : The Vedant Sutras with the Sri Bhasya of Ramanuja (Tr. by) Nungamba Kama, 1965

G.P. Bhatta ; Epistemology of the Bhatta School of Purva Mimansa

P.B. Satha : The Discussion on the Purva Mimansa System

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई 1,2,3 व 4 (सभी इकाईयों में) : विकल्पसहित दो व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक) पूछे जाये।

PAPER CODE- SANS-C-DN 404 (प्रकरण ग्रन्थ तथा दर्शनशास्त्र का इतिहास)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	विवेकचूडामणि (शंकराचार्य विरचित)
इकाई -2	सर्वदर्शन संग्रह (प्रत्यभिज्ञा दर्शन) : माधवाचार्य
इकाई -3	भारतीय दर्शन के सिद्धान्त- निष्काम कर्म , श्रेय एवं प्रेय , जीवन्मुक्त , अनुबन्धचतुष्टय , न्यायसम्मत प्रमेय
इकाई - 4	प्रमुख भारतीय दार्शनिक - हेमचन्द्राचार्य , सदानन्द योगीन्द्र , अन्नम्भट्ट , पं . मधुसूदन ओझा, धर्मकीर्ति, लौगाक्षिभास्कर, उदयनाचार्य , गंगेश, कुमारिल भट्ट

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

अनन्त शर्मा : व्योमवाद, पं. मधुसूदन ओझा शोध प्रकोष्ठ, संस्कृत विभाग, जयनारायण व्यास विश्वविद्यालय, जोधपुर
उमाशंकर शर्मा 'त्रयषि' : सर्वदर्शनसंग्रह : (हिन्दी व्याख्या)

उमेश मिश्र : भारतीय दर्शन

बलदेव उपाध्याय : भारतीय दर्शन

S.Radhakrishnan : History of Indian Philosophy

C.D. Sharma : A Critical survey of Indian Philosophy

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 व 2 : विकल्पसहित दो व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 3 व 4 : विकल्पसहित एक प्रश्न व एक टिप्पणी (10 + 5 अंक) पूछे जायें।

सेमेस्टर – 4
ग्रुप 'डी' : व्याकरण शास्त्र

PAPER CODE- SANS-D-VK 401 (वैयाकरण सिद्धान्तकौमुदी)

नोट:— प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई – 1	वैयाकरणसिद्धान्तकौमुदी (स्त्रीप्रत्यय प्रकरण)
इकाई –2	वैयाकरण सिद्धान्तकौमुदी (परस्मैपद प्रकरण)
इकाई –3	वैयाकरण सिद्धान्तकौमुदी(अदादि, जुहोत्यादि) पङ्क्त्यंश को छोड़कर
इकाई – 4	वैयाकरण सिद्धान्तकौमुदी (रुधादि, तनादि, क्र्यादि एवं चुरादिगण) पङ्क्त्यंश को छोड़कर

प्रश्न-पत्र का निर्माण निम्नानुसार होगा –

खण्ड 'अ' – 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' – 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

भट्टोजिदीक्षित : वैयाकरण सिद्धान्त कौमुदी (सम्पूर्ण)
गोपाल दत्त पाण्डेय : वैयाकरण सिद्धान्त कौमुदी (हिन्दी व्याख्या)
बालकृष्ण पंचोली : वैयाकरण सिद्धान्त कौमुदी (हिन्दी व्याख्या)
चारुदेव शास्त्री : व्याकरण चन्द्रोदय

Whitney : Sanskrit Grammar

प्रश्न पत्र निर्माण के लिए निर्देश –

भाग – अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग – ब : इकाई – 1 व 2 : विकल्पसहित दो पदों की सूत्र पूर्वक व्युत्पत्ति (4 + 4 अंक) विकल्पसहित दो सूत्रों की व्याख्या (3 ½ + 3 ½ अंक)

इकाई – 3 व 4 विकल्पसहित पाँच पदों की प्रमुख सूत्रोंसहित सिद्धि (3 + 3 + 3 + 3+ 3 अंक)
पूछे जाये

PAPER CODE- SANS-D-VK 402 (वाक्यपदीय तथा वैयाकरण सिद्धान्तकौमुदी)

नोट:— प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	वाक्यपदीय (ब्रह्मकाण्ड) : भर्तृहरि- 78 से 156 कारिका पर्यन्त
इकाई -2	वैयाकरण सिद्धान्तकौमुदी (बहुव्रीहि से सर्वसमासशेष प्रकरणपर्यन्त)
इकाई -3	भाषापरिच्छेद -(न्यायसिद्धान्तमुक्तावली सहित) - शब्दखण्ड - शाब्दबोध प्रकार से जातिशक्तिवाद खण्डन : विश्वनाथ भट्टाचार्य
इकाई - 4	भाषापरिच्छेद (न्यायसिद्धान्तमुक्तावली सहित) - शब्दखण्ड : - शक्तपद से तात्पर्य निरूपण पर्यन्त : विश्वनाथ भट्टाचार्य

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -
खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर **संस्कृत** में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

बालकृष्ण पंचोली : वैयाकरण सिद्धान्त कौमुदी (हिन्दी व्याख्या), चौखम्बा संस्कृत सीरीज, वाराणसी
रामसुरेश त्रिपाठी : संस्कृत व्याकरण दर्शन, राजकमल प्रकाशन, दिल्ली
दयाशंकर शास्त्री : न्याय सिद्धान्त मुक्तावली (शब्द खण्ड), मोतीलाल बनारसीदास, दिल्ली
रामचन्द्र द्विवेदी (अनु.) : भर्तृहरि, राजस्थान हिन्दी ग्रन्थ अकादमी, जयपुर
रघुनाथ शर्मा : वाक्यपदीयम् (अम्बाकर्त्री व्याख्या)
सूर्यनारायण शुक्ल : वाक्यपदीयम् (भावप्रकाश व्याख्या)

K.A.S. Iyer (Eng. Tr.): The Vakyapadiya of Bhartrihari with Vritti, Chapter I, Poona, 1965

Gauri Nath Shastri : Philosophy of Word and Meaning

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 : विकल्पसहित दो कारिकाओं की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 2, 3 व 4 : विकल्पसहित दो पदों की सूत्र पूर्वक सिद्धि (5 + 5 अंक) विकल्पसहित एक सूत्र की व्याख्या (5 अंक) पूछे जायेंगे।

PAPER CODE- SANS-D-VK 403 (व्याकरणमहाभाष्य तथा वैयाकरण भूषणसार)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	व्याकरणमहाभाष्य (प्रथम अध्याय प्रथम पाद का तृतीय आह्निक)
इकाई -2	व्याकरणमहाभाष्य (प्रथम अध्याय प्रथम पाद का चतुर्थ आह्निक)
इकाई -3	वैयाकरण भूषणसार (धात्वर्थ प्रकरण) कारिका संख्या 11 से 15
इकाई - 4	वैयाकरण भूषणसार (धात्वर्थ प्रकरण) कारिका संख्या 16 से 21

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

चारुदेव शास्त्री : व्याकरण- भाष्य (नवाह्निक)

भीमसेन शास्त्री (व्या.) : वैयाकरण - भूषणसार

खड्गनाथ मिश्र : शाब्दबोधादिवादपंचकप्रकाश (प्रथम व द्वितीय भाग), केन्द्रीय संस्कृत विद्यापीठ, जयपुर

S.K. Belvelkar : System of Sanskrit Grammar

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 व 2 में विकल्पसहित दो उद्धरणों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 3 व 4 में विकल्पसहित दो कारिकाओं / उद्धरणों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक) पूछे जाये।

PAPER CODE- SANS-D-VK 404 (प्रकरणग्रन्थ तथा व्याकरणशास्त्र का इतिहास)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	गुप्ताशुद्धिप्रदर्शनम् (पं. अम्बिकादत्त व्यास रचित) 1-130 गुप्ताशुद्धि वाक्यपर्यन्त
इकाई -2	कारकसम्बन्धोद्घोत (रभसनन्दि) 11-15 कारिका
इकाई -3	प्रमुख वैयाकरण - पाणिनि, कात्यायन, व्याडि, पतंजलि, कैयट, भर्तृहरि, वामन, जयादित्य, भट्टोजिदीचित, कौण्डभट्ट, विश्वेश्वर सूरि, नागेश भट्ट, हरदत्त, वैद्यनाथ-पायगुण्ड, ज्ञानेन्द्र सरस्वती, वासुदेव दीक्षित, नारायण भट्ट, धर्मकीर्ति, वरदराज, पुरुषोत्तमदेव
इकाई - 4	विभिन्न संस्कृत व्याकरण - कातंत्र व्याकरण, चान्द्र व्याकरण, शाकटायन व्याकरण, जैनेन्द्र व्याकरण, भोज व्याकरण, हैम व्याकरण, सारस्वत व्याकरण, मुग्धबोध - व्याकरण, आचार्य पाणिनि से पूर्ववर्ती वैयाकरण परम्परा

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

गुप्ताशुद्धिप्रदर्शनम्, पं. अम्बिकादत्तव्यास रचित, व्यास पुस्तकालय, मानमन्दिर, वाराणसी

रभसनन्दि : कारकसम्बन्धोद्घोत, राजस्थान प्राच्य विद्या प्रतिष्ठान, जोधपुर

रामशंकर भट्टाचार्य : पाणिनीय व्याकरण का अनुशीलन, इण्डोलोजिकल बुक हाऊस, वाराणसी

युधिष्ठिर मीमांसक : व्याकरण शास्त्र का इतिहास

N.M. Ghosh (अनु.) : पाणिनीय शिक्षा] Delhi

The Hegue : Panini : A Survey of Research, Mouton Cardona George, 1966

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 : विकल्पसहित दो श्लोकों की व्याख्या (7 ½ + 7 ½ अंक)

इकाई - 2 विकल्पसहित दो कारिकाओं की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 3 : विकल्पसहित दो प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 4 विकल्पसहित दो प्रश्न पूछे जायेंगे (7 ½ + 7 ½ अंक) पूछे जाये।

सेमेस्टर – 4

ग्रुप 'ई' : प्राकृत तथा जैन-दर्शन

PAPER CODE- SANS-E-PJ 401 (जैन दर्शन)

नोट:— प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई – 1	तत्त्वार्थसूत्र – विवेचक पं. सुखलाल संघवी (अध्याय 7)
इकाई – 2	तत्त्वार्थसूत्र – विवेचक पं. सुखलाल संघवी (अध्याय 8)
इकाई – 3	तत्त्वार्थसूत्र – विवेचक पं. सुखलाल संघवी (अध्याय 9 , 10)
इकाई – 4	स्याद्वादमंजरी (अन्ययोगव्यवच्छेद द्वात्रिंशिका के श्लोक 21 से 30 पर टीका)

प्रश्न-पत्र का निर्माण निम्नानुसार होगा –

खण्ड 'अ' – 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' – 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

उपाध्याय केवल मुनि : तत्त्वार्थ सूत्र, जैन दिवाकर दिव्य ज्योति कार्यालय, ब्यावर

सिद्धान्ताचार्य पं. फूलचन्द्र शास्त्री : तत्त्वार्थ सूत्र, श्री गणेशवर्णी शोध संस्थान, नरिया, वाराणसी

मघराज मुणोत (अनु.) : तत्त्वार्थसूत्र, श्री रत्नप्रभाकर ज्ञान पुष्पमाला, फलोदी

सुखलाल संघवी (व्या.) : तत्त्वार्थसूत्र, पार्श्वनाथ विद्यापीठ, वाराणसी

उमास्वास्ति : तत्त्वार्थसूत्र (भाष्य सहित), परमश्रुत प्रभावक मण्डल, अगास

जगदीशचन्द्र जैन (व्या.) : स्याद्वादमंजरी (मल्लिषेण), परमश्रुत प्रभावक मण्डल, श्रीमद् राजचन्द्र आश्रम, अगास

A.B. Dhruva : Syadvadamanjari

महेन्द्रकुमार जैन : जैन-दर्शन, श्री गणेशप्रसाद वर्णी जैन ग्रन्थमाला, वाराणसी

प्रश्न पत्र निर्माण के लिए निर्देश –

भाग – अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग – ब : इकाई – 1, 2 व 3 : विकल्पसहित तीन सूत्रों की व्याख्या अथवा दो व्याख्या व एक टिप्पणी (5 + 5 + 5 अंक)

इकाई – 4 विकल्पसहित दो श्लोकों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक) पूछे जाये।

PAPER CODE- SANS-E-PJ 402 (आगम तथा आगमेतर साहित्य)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	आचारांगसूत्र- प्रथमश्रुत स्कन्ध (अध्ययन 2 एवं 9)
इकाई -2	प्रवचनसार - ज्ञेयतत्त्वाधिकार (53 से 80 गाथाएं)
इकाई -3	प्रवचनसार - ज्ञेयतत्त्वाधिकार (81 से 108 गाथाएं)
इकाई - 4	समयसार (31 से 68 गाथाएं) (जयसेनकृत टीका सहित)

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

आचारांग सूत्र : आगम प्रकाशन समिति, ब्यावर
महाप्रज्ञ : आचारांगभाष्यम्, जैन विश्वभारती संस्थान, लाडनूं
शीलांकाचार्य (टीका सहित) : आचारांग सूत्र, मोतीलाल बनारसीदास, दिल्ली
कमलचन्द्र सोगानी (सं.) : आचारांग चयनिका
प्रवचनसार : श्रीमद् राजचन्द्र आश्रम, अगास
समयसार : श्रीमद् राजचन्द्र आश्रम, अगास
डॉ. हुकमचन्द्र भारिल्ल : समयसार-अनुशीलन, टोडरमल स्मारक ट्रस्ट, जयपुर
Jacobi Hermana : Jain Sutras, Part I
K.K. Dixit : Early Jainism
H.S. Bhattacharya : Reals in the Jain Metaphysics

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 विकल्पसहित तीन उद्हरणों की व्याख्या अथवा दो व्याख्या एवं एक टिप्पणी (5 + 5+ 5 अंक)

इकाई - 2,3 व 4 विकल्पसहित दो गाथाओं की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक) पूछे जाये।

PAPER CODE- SANS-E-PJ 403 (जैन न्याय और प्राकृत व्याकरण)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	न्यायदीपिका - धर्मभूषण (तृतीय प्रकाश)
इकाई - 2	प्रमाणमीमांसा (स्वोपज्ञवृत्ति सहित) - हेमचन्द्र, (प्रथम अध्याय का प्रथम आहिनक मात्र)
इकाई - 3	प्राकृत प्रकाश - वररुचि (चतुर्थ से सप्तम परिच्छेद)
इकाई - 4	प्राकृत प्रकाश - वररुचि (अष्टम से द्वादश परिच्छेद)

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

पं. दरबारीलाल कोठिया (व्या.) : न्यायदीपिका (धर्मभूषण), वीर सेवा मन्दिर, 21, दरियागंज, नई दिल्ली

पं. शोभाचन्द्र भारिल्ल (अनु.) : प्रमाण-मीमांसा, श्री तिलोकरत्न जैन धार्मिक परीक्षा बोर्ड, अहमदनगर

सुखलाल संघवी (व्या.) : प्रमाण-मीमांसा

प्राकृत प्रकाश (मनोरमा व्याख्या सहित), चौखम्बा संस्कृत संस्थान, वाराणसी

धर्मचन्द्र जैन : बौद्ध प्रमाणमीमांसा की जैनदृष्टि से समीक्षा, पार्श्वनाथ विद्यापीठ, वाराणसी

प्राकृत प्रकाश (दीप्ति हिन्दी व्याख्या), साहित्य भण्डार, सुभाष बाजार, मेरठ

पिशेल : प्राकृत-व्याकरण

पी.एल.वैद्य : हेमचन्द्र : प्राकृत व्याकरण

हरिवल्लभ चुन्नीलाल भायाणी : प्राकृत व्याकरणकारो

जार्ज ग्रियर्सन : प्राकृत धात्वादेश

कैलाशचन्द्र शास्त्री : जैन न्याय

सेठ हरगोविन्ददास त्रिविक्रमचन्द्र : पाइअ सहमहण्णवो

बेचरदास कोठिया : जैन-दर्शन में अनुमान विचार

A.C. Woolner : An Introduction to Prakrita

A.M. Ghatage : An Introduction to Ardhamagadhi

Satkari Mookerjee : The Jain Philosophy of Non-absolutism, Motilal Banarasidass, Delhi

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 व 2 : विकल्पसहित दो उद्धरणों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 3 विकल्पसहित तीन सूत्रों की व्याख्या (5 + 5 + 5 अंक)

इकाई - 4 विकल्पसहित तीन पदों की सूत्र पूर्वक सिद्धि (5 + 5 + 5 अंक) पूछे जाये

PAPER CODE- SANS-E-PJ 404 (प्रकरण ग्रन्थ तथा जैन आगम एवं दर्शन का इतिहास)

नोट:- प्रश्न-पत्र तीन घण्टे की अवधि तथा 70 अंकों का होगा। प्रश्न-पत्र का निर्माण संस्कृत भाषा में होगा, किन्तु विशेष निर्देश के अभाव में प्रश्न-पत्र का उत्तर हिन्दी, संस्कृत अथवा अंग्रेजी में दिया जा सकता है।

इकाई - 1	जैनदर्शनसार - पं. चैनसुखदास न्यायतीर्थ - (प्रथम अध्याय - जीव, अजीव को छोड़ कर)
इकाई - 2	पुरुषार्थसिद्ध्युपाय (136 से 226 श्लोक पर्यन्त) - अमृतचन्द्राचार्य
इकाई - 3	उत्तराध्ययनसूत्र (32 वां अध्ययन)
इकाई - 4	जैनागम और जैनाचार्य - आचारांग, सूत्रकृतांग, व्याख्याप्रज्ञप्ति, ज्ञाताधर्मकथा, औपपातिक सूत्र, राजप्रश्नीय, मूलसूत्र, छेदसूत्र, हेमचन्द्राचार्य, सिद्धसेन, समन्तभद्र, कुन्दकुन्द, उमास्वाति, वररुचि, अकलंक, पूज्यपाद, प्रभाचन्द्र, यशोविजय

प्रश्न-पत्र का निर्माण निम्नानुसार होगा -

खण्ड 'अ' - 10 अंक

1. इस खण्ड के सभी प्रश्न अनिवार्य हैं।
2. सभी प्रश्नों का उत्तर संस्कृत में देना होगा।
3. प्रश्नों के उत्तर की अधिकतम सीमा 30 शब्द होगी।

खण्ड 'ब' - 60 अंक

1. प्रत्येक इकाई से दो प्रश्न पूछे जाएँगे।
2. प्रत्येक इकाई से एक प्रश्न का उत्तर देना अनिवार्य है, इस प्रकार कुल चार प्रश्नों के उत्तर देने हैं।

सहायक पुस्तकें

पं. चैनसुखदास न्यायतीर्थ : जैन-दर्शन सार, जयपुर, रामजी उपाध्याय : संस्कृत निबन्धावली
पुरुषार्थ सिद्ध्युपाय (अमृतचन्द्र) : टोडरमल स्मारक ट्रस्ट, जयपुर, पुरुषार्थ सिद्ध्युपाय : श्रीमद् राजचन्द्र आश्रम, अगास
उत्तराध्ययन सूत्र : सम्यग्ज्ञान प्रचारक मण्डल, जयपुर
उत्तराध्ययन सूत्र : नेमिचन्द्र टीका सहित, पं. सुखलाल संघवी : दर्शन और चिन्तन, गुजरात विद्यासभा, अहमदाबाद
पं. महेन्द्रकुमार जैन : जैन-दर्शन न्यायाचार्य श्री गणेशवर्णी दि. जैन-संस्थान, वाराणसी
आगम परिचय : आगम प्रकाशन समिति, ब्यावर
आचार्य देवेन्द्र मुनि : जैन आगम साहित्य : मनन और मीमांसा, तारक गुरु जैन ग्रन्थालय, उदयपुर
नवतत्त्व : तिलोक रत्न जैन, धार्मिक परीक्षा बोर्ड, अहमदनगर, जगदीशचन्द्र जैन : प्राकृत साहित्य का इतिहास
नेमीचन्द्र शास्त्री : प्राकृत भाषा और साहित्य का आलोचनात्मक इतिहास
कैलाशचन्द्र शास्त्री : जैन-साहित्य के इतिहास की पृष्ठभूमि
नाथूराम प्रेमी : जैन-साहित्य का इतिहास, अगरचन्द नाहटा : वीरगाथाकाल का जैन-साहित्य
जैन-साहित्य का वृहद् इतिहास (1-7 भाग), पार्श्वनाथ-विद्याश्रम शोध संस्थान, वाराणसी

प्रश्न पत्र निर्माण के लिए निर्देश -

भाग - अ : प्रत्येक इकाई से कम से कम दो प्रश्न पूछे जायेंगे। कुल दस प्रश्न पूछे जायेंगे।

भाग - ब : इकाई - 1 : विकल्पसहित दो उद्धरणों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 2 व 3 - विकल्पसहित दो श्लोकों की व्याख्या अथवा एक व्याख्या एवं एक प्रश्न (7 ½ + 7 ½ अंक)

इकाई - 4 विकल्पसहित दो प्रश्नों पूछे जायें (7 ½ + 7 ½ अंक) पूछा जाये।

CBCS SYLLABUS (SOCIOLOGY)
2018-19
SEMESTER FIRST

Course No. SOC-101
Basic Concepts in Sociology

Unit-I Emergence of Sociology
Meaning, Origin and Nature of Sociology.
Sociological Perspectives: Evolutionary,
Positivist, Functional, Conflict.
Basic Concepts: Community, Institution,
Association, Culture, Norms & Values.

Unit II Social Structure and Social Group
Social Structure: Status and Role, Multiple Roles,
Role Set, Status Set, Role Conflict.
Social Group: Meaning, Types; Primary-
Secondary, Ingroup- Outgroup, Reference Group.

Unit-III Social Institutions
Education, Economy, Polity and Religion

Unit-IV Society and Social Stratification
Society, Socialization, Social Stratification &
Social Mobility.

Prescribed Readings:

1. Maclver & Page, Society, Introductory Analysis, MacMillan, Delhi, 2001.
2. Giddens. A, Sociology: A Textbook for the Nineties, Polity press, 1990.
3. Davis, Kingsley, Human society, Surjit Pub., Delhi, 2004.
4. Madan & Majumdar, An Introduction to Social anthropology, Mayur, 1999.
5. Bottomore, T.B.: Sociology: A Guide to Problems and Literature, Blackie and Sons, Bombay, 1986.
6. Berger, P, Invitation to Sociology.
7. Mills, C.W, Sociological Imagination.
8. Worsley, P, Introducing Sociology, Penguin, 1987.
9. Burger & Burger, Sociology: An introduction.
10. Inkeles, Alex, What is Sociology? New Delhi, Prentice

Course No. SOC-102
Methodology of Social Research

Unit-I Scientific Method in Social Research:
Methodology, Methods, Techniques-Conceptual clarification, Theory building, Objectivity/Value neutrality, Hypothesis, Facts & Values.

Unit-II Quantitative methods & Survey research:
Survey techniques, Research designs, sampling, questionnaire, schedule, interview, scaling.

Unit-III Qualitative Research Techniques:
Observation, Case study method, Content analysis, Life history (genealogy). Validity and reliability in qualitative research.

Unit –IV Data Analysis: Coding, Editing & Tabulation,
Measures of Dispersion, Correlation.

(One Numerical must be asked from this unit)

Prescribed Readings:

1. Black and champion (1976) Methods and Issues in Social Research.
2. Kerlinger. F. N. (1973), Foundations of Behavioural Research, Surjit Pub., Delhi, 2000
3. Moser, Se and G. Kalton, Survey Methods in Social Investigation, Heineman, London, 1971.
4. Bailey, K, Methods of Social Research The Free Press, 1978.
5. Madge, J The Tools of Social Science, Longman, London, 1976
6. Singh, Jaspal- Introduction to Methods of Social Research, Sterling, New Delhi.
7. Young, P.V. Scientific Social Surveys and Research, Prentice Hall, New Delhi, 1969
8. Goode, W.J. and Hatt. P.K. Methods in Social
24
Research Mcgraw Hill, New York, 1981.
9. Cohen and Nagel An Introduction to Logic and Scientific Method. New Delhi. Allied, 1984.
10. Epstein. A.L. (ed) Crafts of Social Anthropology, Tawi Stock, London, 1976 .
11. Selltitz Jahoda, Morton and Cook Research methods in Social Relations, New York, 1959.
12. Maynitz and Huebner Introduction to Empirical Sociology, Penguin, 1976.

Course No. SOC-103
Classical Sociological Tradition

Unit -I Karl Max:

Dialectical Materialism, Materialistic interpretation of History, Emergence of Classes and Class Conflict, Theory of Surplus Value; Alienation in the capitalist society.

Unit -II Emile Durkheim:

Methodology: Social Facts, Division of labour: Mechanical and Organic Solidarities, Suicide. Theory of Religion: Sacred and Profane.

Unit -III Max Weber:

Methodology: Verstehen and Ideal types, Social Action: Types, Types of Authority and Bases of their Legitimacy, Bureaucracy, Protestant Ethic and the Emergence of Capitalism.

Unit-IV Vilfredo Pareto:

Contribution to the Methodology - Logico - Experimental Method, Logical and Non-Logical Action, Residues and Derivatives, Types of Elites: Circulation of Elites.

Prescribed Readings:

1. Abraham F. & Morgan. J.H. Sociological thoughts, Ms Millan India Ltd. (1985).
2. Aron, Raymond: Main currents in sociological thought Vol. I & II Penguin, 1965 & 1967.
3. Collins, Randall: Sociological theory, Rawat Publications, Jaipur (1997).
4. Coser, Lewis: Masters of Sociological thought, Rawat Publications, Delhi (1996).
5. Giddens, Anthony, Capitalism and Modern Social Theory: An analyses of writings of Marx, Durkheim and Weber, Cambridge University Press, (1997).
6. Ritzer, George: Sociological theory, New York, McGraw Hill, Singapore (1992)
7. Turner J.H.: The structure of sociological theory, Rawat Publication ,Jaipur «1995).

Course No. SOC-104
Perspectives on Indian Society

Unit -I Conceptualizing Indian Society:
Hindu society and Diverse society (Regional, Linguistic, Religious diversities); Peoples of India- Groups and Communities; Unity in diversity; Ethnicity and ethnic identities.

Unit -II Theoretical perspectives I:
Indological/ Textual (G.S. Ghurye, L. Dumont
Structural- Functional (M.N. Srinivas, S.C. Dube).
Marxian (D.P. Mukherjee, A.R. Desai)

Unit -III Theoretical perspectives II:
Civilizational view (N.K Bose, Surjit Sinha).
Subaltern perspective (B.R. Ambedkar, David
Hardiman), Gandhian Perspective.

Unit-IV Current Debates:
Ideology, Theory & Methods in Indian Sociology,
Social conditioning of Indian Sociology, Sociology
in India, For a Sociology of India, Indigenization
of Sociology.

Prescribed Readings:

1. Dhanagare. D.N.: Themes and perspectives in Indian sociology. Rawat Publication. Jaipur, 1993.
2. Dube. S.C. ; The Indian Villages R & KP, London, 1967.
3. Dumont. Louis Homo Hyerrchicus : The Caste System and its implications. Vikas publications, New Delhi, 1970.
4. Hardiman, David: The coming of the Devi : Adivasi Assertion in western India. Oxford University Press, 1987.
5. Marrott. Mckim: India through Hindu categories. Sage publication, Delhi, 1990.
6. Momin. A. R. : The legacy of G.S. Ghurye. A cemennial festschrift. Popular prakashan. Bombay. 1996.
7. Mukherjee. D.P. Diversities. Peoples publication house. Delhi. 1958.
8. Singh. Y: Indian Sociology social conditioning and emerging concerns. Vistaar publication. Delhi. 1996.
9. Singh. Y: Modernisation of Indian tradition. Thomson 20 press. Delhi. 1973.
10. Singh. KS. : The Peoples of India. An introduction. Seagull books. Calcutta. 1992.
11. Srinivas. M.N.: India's Villages. Asia publishing house. Bombay. 1960.
12. Singh Y. Identity & Theory in Indian Sociology, Rawat Publication, Jaipur, 2004

SEMESTER II

. Course No. SOC-201 Sociological Theory

Unit -I Functionalism. Social System and Functional Analysis

B. Malinowski: Culture Functionalism. Talcott Parsons: Functional dimensions of social system. R.K. Merton: Critique and Reformulation of Functional Analysis.

Unit -II

Structural-Functionalism and Structuralism
A.R. Radcliffe- Brown — The idea of social structure. S.F. Nadel- Social structure & the problem of Role Analysis: Levi-Strauss- Structural Analysis.

Unit - III Conflict Theory

R. Dahrendorf - Critique of Marxian Theory of conflict: L. Coser-Functional Analysis of Conflict: R. Collins-Conflict and Social change.

Unit - IV Theory of Action and Interaction

Talcott Parsons -General Theory of Action: Symbolic Interactionism: G.M. Mead & H. Blumer.

Prescribed Readings:

1. Levi Strauss. Claude (1953), Social Structure; in A.L. Kroeber's edited Anthropology today, Chicago University Press.
2. Majumdar. D.N. & T.N. Madan. An Introduction to Social Anthropology. New York.
3. Radcliffe-Brown. A.R., (1952), Structure & Function in Primitive Societies (edited by E.E. Evans-Pritchard): The English Language Book Society & Cohen & West Ltd. London.
4. Ritter. G (1998). Sociological Theory. N.Y. Macgraw Hill.
5. Turner, J.H. The Structure of Sociological Theory. Homewood. Dorsey Press.
6. Abraham and Morgan, Sociological Thought: Macmillan India Limited.
7. Abraham. Francis. Modern Sociological theory: Oxford University Press.
8. Upadhyay & Pandey. History of Anthropological Thought. Concept Publishing Company, New Delhi.
9. Makhanjha. An Introduction to Anthropology.
10. B. Malinowski A Scientific Theory of Culture, Crape I Hill, University of North California Press.
11. Parsons. 1 (195 I) The Social System, Glenoce. III The Free Press.
12. Max Black-Social Theories of Talcott Parsons.

COURSE NO.SOC202

SOCIAL ANTHROPOLOGY

Unit 1 : Anthropology : Nature, scope and its branches, changing frontier of Anthropology from tribal to non-tribal with introductory reference to Redfield. Applied Anthropology : Introductory study of various areas of application.

Unit 2 : Culture as a key concept : Brief discussion of contributions of Kroeber, Kluckhohn and Herskovits. Integrational approach; main contributions of Ruth Benedict. Morris Opler and Whorf, Culture and personality; national character.

Unit 3 : Theory and Methods in Anthropology : Evolutionism and diffusionism-old and new; structural functional approach; main contributions of Malinowski, Redcliffe Brown, Firth, Nadel and Levi-Strauss.

Unit4 : Kinship structure : Family and marriage, alliance and descent theory in analysis of kinship and marriage. Economy, social control, magic and religion.

Prescribed Readings:

- 1.Bantom : Relevance of Models in Anthropology
2. Beals, R.L. and Hoijer, H. : An Introduction to Anthropology
- 3.Bidney, David : Theoretical Anthropology
- 4.Bohannan : Social Anthropology
- 5.Dumont : 'Marriage Alliance,' International Encyclopaedia of Social Sciences
- 6.Evans-Pritchard : Social Anthropology (Hindi translation also)
- 7.Firth, R. : Elements of Social Organisation
- 8.Herskovits, J.J. : Man and His Works
- 9.Kessing, Felix M. : Cultural Anthropology
- 10.Kluckhon : Culture and Behaviour
- 11.Kroeber, A.L.(ed) : Anthropology Today
- 12.Levi Strauss : Structural Anthropology
- 13.Madan T.N. and Saran, G.(ed.) : Indian Anthropology
- 14.Majumdar and Madan : An Introduction to Social Anthropology
- 15.Max Gluckman : Politics, Law and Ritual in Tribal Society
- 16.Murdock, G.P. : Social Structure
- 17.Nadel : Theory of Social Structure
- 18.Piddigton, Ralph : An Introduction to Social Anthropology
- 19.Robin Fox : Kinship and Marriage
- 20.Hasnain N. : Tribal in India
- 21.Singh K.S. : Tribal Society

COURSE NO. SOC-203
Sociology of Development.

Unit-I Meaning and Forms of Social Change and Development

Concepts: Evolution, Diffusion, Progress & Development, Human Development and Social Development, Sustainable Development, Multiple Sustainability.

Unit-II Theories and factors of Social Change

Theories: Linear, Cyclical, Dialectical
Factors: Demographic, Biological, Economic, Technological and Cultural.

Unit-III Critique of Mainstream theories of Development

Ideal Type Index; Bipolar theory, pattern variable Approach, Gender & Development, Marginality & Development.

Unit-IV Sociology of Modernization and Development/ Underdevelopment

Concept of Modernization and Development, Center-Periphery, World System, Development of Underdevelopment thesis-G.Frank, World Modern System Theory Wallerstein.

Prescribed Readings:

1. Abraham, M.F. 1990. Modern Sociological Theory: An Introduction. New Delhi: CUP.
2. Agarwal, Bina. 1994. A Field of One's Own: Gender and Land Rights in South Asia, Cambridge: Cambridge University Press.
3. Appadurai, Arjun, 1997. Modernity at Large: Cultural Dimensions of Globalization. New Delhi: OUP.
4. Derezé, Jean and Amartya Sen. 1996. India: Economic development and Social Opportunity, New Delhi: OUP.
5. Desai, A.R. 1985. India's Path of Development : A Marxist Approach. Bombay: Popular Prakashan (Chapter 2).
6. Dube, S.C. 1992. Understanding Change. Delhi. Vikas Publishing House Pvt. Ltd.
7. Ilaq, Mahbub Ul. 1991. Reflections on Human Development. OUP.
8. Harrison, D. 1989. The Sociology of Modernization and Development. New Delhi. Sage.
9. Moor, Wilbert and Robert Cook. 1967. Social Change. New Delhi, OUP.
10. Shanna, S.L. 1986. Development: Socio-Cultural Dimensions. Rawat Jaipur (Chapter 1).
11. Singer and Cohn (eds.). 1968. Structure and Change in Indian Society.
12. Singh, Yogendra 1993. Social Change In India: Crises

- and Resilience. Delhi. Mend.
13. Singh, Yogendra 2000. Culture Change in India, Rawat.
 14. Singh, Yogendra. 1973. Modernization of Indian Tradition Jaipur. Rawat.
 15. Srinivas, M.N. 1966. Social Change in Modern India. Berkley: University of Berkely.
 16. UNDP. 1997. Human Development Report. New York: OUP.
 17. Wallerstein Immanuel. 1974. The World Modern System. New York: OUP.
 18. World Bank, 1995. World Development Report. New York.

COURSE NO. SOC 204

INDIAN SOCIOLOGY

Unit 1 : Changing Caste Stratification : Caste and class, caste and Politics

Unit 2 : Power Structure : Leadership, Factions, Dominant caste, Conceptual analysis relevant to rural-urban structure : Little community, Folk culture and Folk-urban continuum. Little and great Traditions, Universalization and parochialisation.

Unit 3 : Sanskritisation, westernization, secularization, urbanization, Globalization.

Unit 4 : Tradition and modernity in India : Paradigm of Social Change
Controversy regarding the development of Sociology in India with special reference to Dumont and others.

Prescribed Readings:

1. Bailey : Tribe, Caste and Nation
2. Barter (ed.) : Political System
3. Beteille : Caste, Class and Power
4. Bose, Ashish : Urbanisation in India
5. Brass , I.P. : Family and Social Change in Mahuva
6. Dumont and Pocock : Contribution to Indian Sociology
7. Gore : Urbanisation and family Change
8. Kapadia : Marriage and Family in India
9. Kothari, Rajni (ed.) : Caste and Politics in India
10. Oommen T.K. and P.N. Mukherji : Indian Sociology : Reflections and Introspections.
11. Madan (ed.) : Contribution to Indian Sociology, New Series
12. Rao, M.S.A. : Urbanisation and Social Change
13. Redfield : Cultural Role of Cities
14. Rose, Allen D. : Changing Family in Urban Setting
15. Singer and Cohen : Social Structure and Change in India
16. Singh, Y : Modernisation of Indian Tradition
17. Srinivas : Caste in Modern India
18. Srinivas : Social Change in Modern India
19. Unnithan, T.K.N. et.al. (ed) : Sociology for India

SEMESTER – THIRD

Course No. Soc. 301

Contemporary Sociological Theory

Unit - I Phenomenology :

Alfred Shultz : Intersubjectivity, Actions and Motives, Peter Berger and Thomas Luckmann : Social construction of reality.

Unit - II Ethnomethodology

Grafinkel and Goffman - Role Distance, Presentation of self in every day life.

Unit - III Neo-functionalism and Neo-Marxism :

J. Alexander, Habermas - Public sphere and communicative action, Althusser - Contradiction and structure.

Unit - IV Structuration and Post Modernism :

Giddens. Derrida-deconstruction, Foucault-Discourse, Knowledge and Power.

PRESCRIBED READINGS :

1. Bertens, Hans, Postmodernism : The Key Figure 2002, Blackwell Publishers.
2. Derrida. J. Writing and Difference (1981), University of Chicago.
3. Giddens Anthony & H.T. Kenneth, Modern Social Theory, Sage Publications.
4. Giddens, Anthony, The Constitution of Society, Polity Press.
5. Lechte, John Fifty Key Sociological Thinkers 1996, Routledge Publications.
6. RasMussen, David. Reading Habermas (1995) Blackwell Publishers.
7. Rhoads. K.John, Critical Issues in Social Theory (1991). Pennsylvania Press.
8. Ritzer, G.Classical Sociological Theory, Mc Graw Hill Publication.
9. Ritzer, G. Modern Sociological Theory, Mc Graw Hill Publication.
10. Stones, Rob (1998) Key Sociological Thinkers, Mac Millan Press Ltd.
11. Turner, J.H and C.H. Powers (1995) The Emergence of Sociological theory, Wordsworth Publishing Company.
12. Woodiwiss, Anthony, Social Theory after Postmodernism, 1990, Pluto Press.
13. Zeitlin, Irving, M. Rethinking Sociology: A critique of Contemporary theory (1996), Rawat Publications.

Course No. SOC-302
Social Stratification & Mobility

Unit-I Meaning & Elements of social stratification :-
Social stratification - Meaning, Characteristics
& Dimensions, Social Differentiation, Hierarchy,
Inequality.

Unit -II Forms of social stratification:-
Caste, Class, Estate, Gender, Ethnicity & Race.

Unit-III Theoretical perspectives:-
Weberian, Functional-Parsons, Davis & Moore,
Marxian and Dahrendorf

Unit-IV Social Mobility:-
Nature & type of social mobility, Measurement of
social mobility, Mobility within caste & class
system. Emergence of middle class

Prescribed Readings:

1. Bendix & Upset. 1976. *Class, Status and Power*. London: R&KP.
2. Beteille, Andre. 1969. *Social Inequality*. New Delhi: Penguin Books.
3. Dumont, Louis. 1970. *Homo Hierarchicus : The Caste System and Its Implications*. New Delhi: Vikas Publications.
4. Gupta, Dipankar. (ed). 1991. *Social Stratification*. New Delhi: Oxford University Press.
5. Sharma, K L.(ed). 1980. *Essays on Social Stratification*. Jaipur: Rawat Publications.
6. Sharma, K L.(ed). 1997. *Social Stratification in India*. New Delhi: Sage Publications.
7. Singh, Y. 1998. *Modernization of India Tradition*. Jaipur: Rawat Publications.
8. Singer & Cohen. (eds). 2001. *Structure and Change in Indian Society*. Jaipur: Rawat Publications.
9. Tumin, MM. 1999. *Social Stratification*. New Delhi: Prentice Hall.

ELECTIVE PAPER

Course No. SOC-303

Crime & Society

Unit-I Conceptual approaches to crime:

Legal, Behavioral & Sociological, Juvenile Delinquency, Types of Crime - White Collar, Professional, Political, Organised.

Unit-II Perspectives on crime causation:

Biological, Psychological, Marxian, Sociological-Differential Association Theory by Sutherland, Strain Theory by Merton and Labelling Theory by Becker.

Unit-III Changing profile of crime & criminal:

Factors in Crime, Changing Trends of Crime in India, Crime against women & children, Cyber Crime, Terrorism and Crime.

Unit-IV Correctional measures:

Theories of Punishment - Retributive, Preventive, Deterrent & Reformative. Correctional Programmes in Prison, Alternative to Imprisonment-Probation, Parole & Open Jails.

Prescribed Readings:

1. Ahuja, Ram. 2005. *Criminology*. Jaipur and New Delhi: Rawat Publications.
2. Clinard, M. 1963. *Sociology of Deviant Behaviour*. New York.
3. Giddens, A. 2006. *Sociology*. U.K.: Polity Press.
4. Macionis, John J. 2001. *Sociology*. New Jersey:- Prentice Hall.
5. Pranje, N V. 2008: *Criminology and Penology*. Allahabad: Central Law Publication.
6. Schaefer & Lamm. 1992. *Sociology*. New York: Mc Graw- Hill.
7. Singh, Ranbir & Ghanshyam Singh. 2004. *Cyber Space & the Law: Issues and Challenges*. Hyderabad: Nalsar University.

OR

Course No. Soc. 303
Rural Society & Development in India

Unit - I Population and society :

Origin and scope of rural sociology; village studies in India; Rural - Urban differences, Peasant studies & their significance.

Unit - II Agrarian Social Structure :

Basic characteristic of Agrarian society; Settlement, Rural family, Rural Religion, Caste. Agrarian Class Structure-tenancy lands and Agrarian Relations.

Unit - III Rural social issues :

Rural poverty, Bonded labour, Migrant labour. Depeasantization, Globalization & its impact on agriculture.

Unit – IV Rural Development :

Rural development strategies, Land reform, Panchayati Raj, CDP, Cooperatives, Changing rural society.

PRESCRIBED READINGS :

1. Bouton, M.M. 1985 ; Agrarian Radicalism in South India; Princeton University Press.
2. Chitambar, J.B. 1993, Introductory Rural Sociology, New Age International.
3. Desai, A.R. 1969, Rural Sociology in India, Popular Prakashan, Bombay.
4. Diwakar, D.M. 2000; Emerging Agrarian Relations in India, Manak Publication Pvt. Ltd.
5. Doshi, S.L. & P.C. Jain, 1999, Rural Sociology, Rawat Publications.
6. Habib, Irfan, 1999. The Agrarian system of Mughal India, Oxford University Press.
7. Joshi, P.C. 1976 ; Land Reform in India, Allied Publisher Ltd. Bombay.
8. Krishan Murthy. J: 2000 ; Rural Development - Challenges and Opportunities, Rawat Publication.
9. Lea, A.M. & D.P. Chaudhari (ed) 1983 ; Rural Development and the Methusen & Co. Ltd. London.
10. Sharma, K.L. 1997, Rural Society in India, Rawat Publication.
11. Sunderam, S.I. 1997, Rural Development; Himalayan Publishing House.
12. Surjeet H.S. 1992 ; Land Reform in India - Promises and Performance, National Book Center.

ELECTIVE PAPER

Course No. Soc. 304

Social Development Indian Experience

Unit - I Social Development in India : (Pre - Independence) :

Issues of Equity during 19th century ; Brahma & Prathana Samaj ; Satya Shodhak of J.B. Phule; Social Development - M.K. Gandhi, Development of Untouchables - B.R. Ambedkar.

Unit - II Social Development (Post - Independence):

The Nehruvian vision : Planning for Development. A Brief account of the Five Year Plans with special reference to Social dimensions; Equality, National Integration and Secularism in India; Participatory Development.

Unit - III Development of Disadvantaged Groups :

Problem and Policy for the SC, ST and Backward Classes, Nation Building in India.

Unit – IV Social Implications of Globalization on India ;

ethnic resurgence; gender concerns; Environmental stress, cultural imperialism; impact on agriculture and labour.

PRESCRIBED READINGS :

1. Ambedkar B.R. (1984) The Untouchables : Who were they and why they became untouchables, Delhi, Amrit Book Company.
2. Basu, A.R. (1985) Tribal Development Programmes and Administration in India, New Delhi, National Book Organisation, (Chapters 2 & 15).
3. Basu, D.K. and R.Sisson (eds) 1986 Social and Economic Development in India: A Reassessment, New Delhi, Sage, (Chapters by Ser & Galanter).
4. Desai. A.R. (1985), India's Path of Development : A Marxist Approach, Bombay Popular Parkashan (Chapter 2).
5. GO, (1993) "Farmers Movement : Fighting of Liberalisation", Economy and Political Weekly, December 11 (pp2078-2710).
6. Khan, Murtaz Ali (1980) Scheduled Caste and their Status, New Delhi, ICSSR, (Introduction).
7. Mathur, H.M. (1997), Participatory Development Sociological Bulletin; Vol 46 (1).
8. Misra, S.K. and V.K. Puri (1994) Indian Economy ; Its Development Experience, Bombay, Himalayan Pub.
9. Mowli, V.C (ed) (1990) Role of Voluntary Organizations in Social Development, New Delhi, Sterling Pub. (Preface & Conclusion).
10. Petras, James (1994) "Cultural Imperialism in Late 20th Century, Economic and Political Weekly, Aug.6 (pp.2070-2073).
11. Pimpley, P.N. (1988) "Voluntaristic Approach to Development" Unpublished monograph.
12. Singh, A.K. (1984) Tribal Development in India, New Delhi, Amar Prakashan (Chapters 2,7,8).
13. Singh, S.N. (1994) Reservations : Problems and Prospects, New Delhi, Uppal Pub. House, (Introduction & Chapter 13).
14. Symposium on Implications of Globalization, (1995) Sociological Bulletin. Vol.44 (articles by Mathew, Panini& Pathy).

OR

Course No. Soc. 304

Gender & Society

Unit - I

Social Construction of Gender :

Gender vs. Biology, Equality vs. Difference, Women in the family; Socialization, Gender roles, and Private-public dichotomy. Patriarchy as ideology and practice.

Unit -II

Explanation of Gender Inequality :

Biological, Cultural, Marxian, Feminist and Post modernist.

Gender based division of labour/work :

Production vs. Reproduction, household work, Invisible work.

Unit -III

Women in India :

The changing status of woman in India-precolonial, colonial and post-colonial, womens movement, Constitutional provision and state initiatives.

Unit - IV

Social issues in India :

Health, Education, Land Rights, Personal Laws & Civil code. Empowerment & Development. Ecology, Violence.

Prescribed Readings :

1. Channana Karuna (1988) - Socialisation, Education and Women, Exploration in Gender Identity, Orient Longman, New Delhi.
2. Delamont, Sara - The Sociology of women, George Allen & Unwin, London.
3. Desai, Neera and Krishanaraj Maithreyi - Women and Society in India, Ajanta Pub., Delhi.
4. Dube, Leela and Parliwal. Rajni (1990) - Structures and Strategies. Women, Work and Family, Sage Publications, New Delhi.
5. Glover, David and Kaplan Cora : Genders, Routledge, London.
6. India, Government of (1975) Towards Equality, a Report of the Committee on the Status of Women in India, Ministry of Education & Social Welfare, New Delhi.
7. Indira, R (ed) Gender & Society in India, Manak Pub., 1999.
8. Krishna Raj. M. Gender & the Household domain, Sage Publications, New Delhi.
9. Maya Unnithan Kumar, Identity, Gender & Poverty Rawat Publication, Jaipur 2001.
10. Oakley Ann-Sex Gender and Society, Harper and Row, New York.

SEMESTER IV

Course No. Soc. 401 Sociology of Religion.

Unit – I Concepts

Definition of religion; Magic, religion, science, Sacred & Profane, church, cult and sect; priest, shamans and prophets.

Unit - II Sociological interpretation of Religion

Origin of religion (Evolutionary); Durkheim and sociological functionalism, Weber and phenomenology; Marx and dialectical materialism.

Unit - III Religion of India

Hinduism, Islam, Buddhism, Christianity and Sikhism; Lokayat study in ancient Indian Materialism.

Unit - IV Contestation over religion in India :

Fundamentalism, Communalism, Secularism; Socio-religious Movement and Social Change.

PRESCRIBED READINGS :

1. Haralambus, M. 1980; Sociology-Themes and Perspectives, Oxford University Press.
2. Madan, T.N. 1991; Religion in India, Oxford University Press.
3. Madan, T.N. 1997; Modern Myths, Locked Minds, Oxford University Press.
4. Macionis J.J. 1997; Sociology, Prentice Hill, Inc.
5. Schaeffer, R.T. and Lamm, R.P. 1992; Sociology, Mcgraw Hill Inc.
6. Giddens, A 1989; Sociology, Blackwell Publisher Ltd.
7. Gore, M.S. 1991; Secularism in India, Indian academy of social science.
8. Jain, M.S. 2000; Muslim ethos, Rawat Publication.
9. Weber, M; Sociology of Religion.
10. Chattopadyaya, D.P. 1959 Lokyat: A Study in Ancient Indian Materialism, People's Publishing House

Course No. Soc402
Comparative Sociology

Unit - I The Emergence and Growth of Sociology in the West :

Historical and social context, the Eurocentric Moorings of western sociological tradition, Americanization of sociology, the impact of western sociology on the development of sociology in India.

Unit -II Comparative Method in Sociology :

Comparative method in classical writings : Durkheim, Radcliffe-Brown and Max Weber ; Comparative Method in sociological research, the Fieldwork tradition, Sociology and Area study (South Asia).

Unit -III Central Themes in Comparative Sociology :

Modernity, Development, Diversity, Pluralism & Multi-Culturalism, Secularism, Nation-State and Nation-Building Gender, Environment & Globalization.

Unit -IV Comparative Sociology : The Colonial and the Post-colonial context :

Bearing of Colonial context on the development of sociology ; the debate on decolonization; contextualization and indigenization; national and regional concerns - India and South Asia.

PRESCRIBED READINGS :

1. Beteille, Andre 1987 : Essays in Comparative Sociology, Oxford University Press, New Delhi.
2. Beteille, Andre 1992 : Society and Politics in India. Essays in Comparative Perspective, Oxford University Press, New Delhi.
3. Beteille, Andre 2002 ; Sociology; Essays on approach and Method, Oxford University Press, New Delhi.
4. Dube, S.C. 1973: Social Sciences in Changing Society (Lucknow).
5. Kothari, Rajni, 1988 : Rethinking Development : In Search of Humane Alternatives, Ajanta, Delhi.
6. Oomen, T.K. and P.N. Mukherjee, eds 1986 : Indian Sociology : Reflections and Intropections, Popular Prakashan, Bombay.

ELECTIVE PAPER

Course No. Soc. 403

Political Sociology

Unit - I Definition and subject matter of Political Sociology, Distinctive approach of political sociology, Basic concepts - Bureacracy, Power, Authority, Legitimacy, Violence, State, Nation-State.

Unit - II Changing definition of politics and power in Political Sociology, Functional analysis, Marxist tradition, Weberian tradition, Elite and Pluralist theory, Discourse theory and Culture politics.

Unit – III Conceptualizing nation and Nationality, state and civil society, Democratic and totalitarian systems, Political socialization Political parties, Pressure and interest groups.

Unit – IV Political sociology in India - The Power structure, the crises of governance, Ethnicity and politics, Regionalism and language, the making of Indian Nation and National Identity, Caste and Politics, Communalism in India.

PRESCRIBED READINGS :

1. Mukhopadhyay, A.K. 1977: Political Sociology - An Introduction Analysis, K.P. Bagchi and Company.
2. Lipset, S.M. 1959; Political Man, Mercury Books, London.
3. Lapalombaa, J.ed. 1964; Bureaucracy and PoliticalDevelopment, Princeton University Press.
4. Mehden, F.R. Vonder 1964; Politics of the developing Nations, Prentice Hall, Inc.
5. Easton, D. 1953; the Political System - An Inquiry into the state of Political Science, Scientific Book Agency, Calcutta.
6. Bottomore, T. 1979; Political Sociology, B.I. Publication Bombay.
7. Gupta, D. 1995; Political Sociology in India -Contemporary trends, Orient Longman.
8. Kothari, R. 1970; Politics in India, Orient Longman.
9. Kaviraj, S.ed 1997; Politics in India, Oxford India paperback.
10. Nash, K. 2000 Contemporary Political Sociology -Globalization, Politics and Power, Black well Publishers.
11. Kumar, A.Ed 1999; Nation Building in India - Culture,Power and Society, Radiant Publishers, Delhi.

OR

Course No. Soc. 403

Sociology of Marginalized Communities

Unit - I Marginalization and its socio-economic indices :

Poverty, relative isolation, exploitation, discrimination, displacement, educational backwardness, inequality, Critical view of caste system.

Unit - II The social structure and culture of the Marginalized communities:

The status of schedule castes, schedule tribes, nomadic castes and tribes, denotified tribes, problems of social development and social mobility, identity formation, affirmative action and empowerment.

Unit - III Perspectives on Marginalization

Role of ideology in Marginalization, the views of Jotirao, Phule, Baba Saheb Ambedkar, Ram Manohar Lohiya.

Unit - IV

Social Movement among Marginalized Communities :

Nature and dynamics; perspectives on social movements - protests, reform, sub-nationalism, nativism, millenarism, Role of Christian missionaries, Role of NGO's.

PRESCRIBED READINGS :

1. Beteille, Andre 1992: The Backward Classes in Contemporary India, Delhi : Oxford University Press.
2. Charsley, S.R. and G.K. Karanth, 1988-eds, Challenging Untouchability, Delhi:Sage.
3. Gore, M.S. 1993: The Social Context of an Ideology :The Social and Political Thoughts of BabasahebAmbedkar, New Delhi, Sage.
4. Gupta, Dipankar, 1991: Social Statification, New Delhi:Oxford University Press.
5. Omvedt, Gale, 1995: Dalit Visions : The anti-castemovement and the construction of an Indian Identity New Delhi : Orient Longman.
6. Omvedt, Gale 1999 : Dalits and the DemocraticRevolution, New Delhi, Sage.
7. Shah, Ghansham, 1990 : Social Movements in India : A Review of Literature, Delhi : Sage.
8. Singh, K.S. 1995 : The Scheduled Tribes, Delhi : Oxford University Press.
9. Singh, K.S. 1998 : The Scheduled Castes, Delhi :Anthropological Survey in India.
10. Zelliott, Eleanor, 1995 : From Untouchable to Dalit :Essays on the Ambedkar Movement New Delhi :Manohar.

ELECTIVE PAPER

Course No. Soc. 404 Education & Society

Unit - I Sociology of Education ; Definition, Subject matter, Growth and Development; Relationship of Education with Sociology; Education as a social institution.

Unit - II Theories and Perspective in the Sociology of Education; Functionalist, Conflict, Marxist, Interactionist, Cultural Reproduction (Bourdieu), Deschooling society (Ivan Illich).

Unit - III Society and Education : Socialization, Family and Social Class, Social stratification, Social change and social mobility, Gendering Inequalities; Education of girls and women.

Unit - IV Sociology of Education in India; Socio - historical context : Education in pre-colonial and colonial India. Education, diversities and disparities; region, tribe, caste, gender, ruralurban residence, Equity and Equality, Positive discrimination and reservations, New Education Policy - A critique.

PRESCRIBED READINGS :

1. Aikara Jacob, (1994) Sociology of Education, ICSSR, New Delhi.
2. Banerjee, B.N. (1990) Education cannot wait - A critical study of the new education policy, B.R. Publishing Corporation, Delhi.
3. Chanana, Karuna 1998, Socialization, Education & Women : Explorations in Gender Identity, New Delhi, Orient Longman.
4. Dreze, Jean and Amartya Sen 1995. India Economic development and social opportunity, Oxford : Oxford University Press.
5. Giddens, Anthony (1997) Sociology - third edition, Blackwell Publishers, Oxford.
6. Halsay, A.H. et al. (1961) Education, Economy & Society; A reader in the sociology of education, New York, Free Press.
7. Haralambos, M. and Heald, R.M. (1980) Sociology - Themes and Perspectives, Oxford University Press, Delhi.
8. Illich, Ivan, 1973 Deschooling Society, London, Penguin.
9. Jayaram, N. (1990) Sociology of education in India. Bombay : Somaiya.
10. Pandey, Ram Shakal (1994) New Dimensions of education, Indian Publishers Distributors Delhi.
11. Kamat, A.R. 1985 Educational & social change in India. Bombay : Somaiya.
12. Ruhela, Saryu (1999) Sociological perspectives on Indian Higher Education, Indian Publishers Distributors, Delhi.
13. Schaefer & Lamm, (1992) Sociology - Fourth Edition, Mc Graw Hill Inc. New York.
14. Sen, Amartya (1992) Inequality Re-examined. Delhi. Oxford University Press.
15. Shah, B.V. and Shah, K.B. (1998) Sociology of Education, Rawat Publication, Jaipur.
16. University News (UN) (1998), Society, Education & Development, Association of Indian Universities, New Delhi.

OR

Course No. Soc. 404

Social Statistics

Unit - I Quantitative Methods and Survey Research :

Measures of central tendency : mean, median and mode, survey technique, Research design, Measurement and scaling, Reliability and Validity.

Unit - II Sampling

Meaning, methods of sampling, Sampling distribution, Procedure of testing a hypothesis, Tests of significance - Student's t test, f - test and Chi - square test.

Unit - III Statistics in social research

Correlational analysis, Analysis of Variance Association of Attributes.

Unit - IV Miscellaneous:

Statistical data and use of computers, SPSS. Normal Distribution, Probability Theory: Addition and Multiplication, Binomial Distribution.

PRESCRIBED READINGS :

1. Argyrous, G. (1997) Statistics for social Research, Mc Millan Press Ltd.
2. Goods, W.J. & Hatt P.K. (1981) Methods in Social Research, Mc Graw Hill New York.
3. Gupta, S.C. (1981) : Fundaments of Statistics, Himalaya Publishing House, Bombay.
4. Gupta, S.P. (1995) ; Statistical Methods, Sulata Chand & Sons, New Delhi.
5. Loether, H.J. & Tavish D.G. (1974) Descriptive statistics for Sociologist : An Introduction, Allyn & Bacon Boston.
6. Muller, J & K.F. Shusessler, (1961) Statistical Reasoning in Sociology, Oxford and IBH Publishing Co. Delhi.
7. Nachmias C.F & D Nachmias (1996) Research Methods in the Social Sciences, Arnold.
8. Ram, B. (1994) Computer Fundamentals – Architecture & Organization, New Age International (P) Ltd. Delhi.
9. Weiss, Roberts (1968) Statistics in Social Research, John Wiley & Sons, Inc. New York.
10. Xavier, C. (1996) Introduction to Computers and Basic Programming, New Age International (P) Ltd. Delhi.
11. Young, P.V. (1969) Scientific Social Survey and Research, New Delhi, Prentice Hall.

OR
Course No. Soc. 404

DISSERTATION

1. To Those Candidates securing cumulative SGPA **6** In previous three semesters will be allowed to opt this paper.
2. Dissertation to be submitted with in **10** days of last theory paper examination .

Skill Courses

COURSE NO. SOC 501 BASIC METHODS IN POPULATION STUDIES

Unit-I Sources of Demographic Data: Census, Civil Registration, Population Surveys, and UN Sources of Demographic Data. Nature and Quality of these Data Sources. Changes in Population Size: Intercensal Change, Average Annual Growth Rate, Linear Growth Rate, Geometric Growth Rate, Exponential Growth Rate; Interpolation and Extrapolation.

Unit-II Population Composition and Distribution: Literacy Rate, Rural-Urban, Labour Force Participation Rate.

Age and Sex Composition: Problems related to Age Data, Age Distribution, Age Heaping Effects, and Adjustment of Age Data. Dependency Ratios. Construction of Age-sexpyramids, Sex Ratio.

Unit-III Measures of Mortality: Computation of Crude Death Rate, Age-Specific Death Rates; Infant Mortality Rate, Perinatal, Neonatal, Post-Neonatal Mortality Rate. Direct and Indirect Standardized Death Rate. Life-Table Method: Types of Life Tables, Basic Columns of Life Tables and their computation. Relationship between various life-table columns, Life Table Stationary Population. Application of Life Table approach.

Unit-IV Measures of Fertility: Computation of Crude Birth Rate and its uses, General Fertility

Rate, Age-specific Fertility Rate, Total Fertility Rate, Gross Reproduction Rate, Net Reproduction Rate, Child Woman Ratio

Contraceptive Prevalence Rate, Abortion Rate & Foetal Wastage

Measure of Marriage & Divorce: Crude Marriage Rate, Divorce Rate. Mean and Median Age at Marriage from Census and Survey Data.

PRESCRIBED READINGS :

1. Census of India, *Age and Life Tables*, Series of India, Paper 2 , GOI, 1974.
2. Hanp, Arthur and Thomas, T. (2001) *Population Reference Bureaus*, Population Handbook, 4th ed., Washington, PR3.
3. Mishra, Bhaskar D. (1993) *Introduction to the Study of Population*. New Delhi, National Book Population Reference Bureau, Trust (Latest Edition)
4. Shryock, Henry S. Jacob S. Siegel and Others (1976) *Methods and Materials of Demography*. (Condensed Edition) Harcourt Brace, Academic Press.
5. Spiegelman, Mortimer, (1968) *Introduction to Demography*, Cambridge, Harvard University Press.
6. *UN Manuals* Nos. 1, 2 & 3 , United Nations.
7. Cox, Peter (1959), *Demography*, London: Cambridge University.
8. Haupt, A. and Kane, T. (1998), *Population Handbook*, Washington DC, Population Reference Bureau.
9. Newell, Colin (1988), *Methods and Models in Demography*, London, Belhaven Press.

COURSE NO. : SOC 502

SOCIAL PSYCHOLOGY

UNIT I: Introduction to the field of Social Psychology & Applied Social Psychology:

Subject matter, Nature, Level of Analysis and scope.

Group Processes: Group Behavior, Group effectiveness, Group dynamics, group cohesiveness, Group influence, Group Morale

UNIT- II Social Cognition: Self, Person perception, Attribution, Attitude and behavior Stereotype, Prejudice and Discrimination

UNIT III: Psychology of Social Issues/ Situations: Crowd, Public opinion, Rumour

UNIT IV: Application of Social Psychology to Social Problems: Aggression & Violence, Poverty, Social tension /group conflict, Crime

Prescribed Readings:

- 1.Aronson, E., Wilson, T.D. and Akert, R.M. (2010). Social Psychology (7th ed.). Boston: Prentice Hall.
- 2.Baron, R.A., Branscombe, N.R., Byne, D. and Bhardwaj, G.(2010). Social Psychology (12th Edition). Delhi, Pearson.
- 3.Misra, G. (2009). Psychology in India: Social and Organisational Processes. Delhi. Pearson.
- 4.Myers, D.G. (2005). Social Psychology (8th ed.). New Delhi : Tata McGraw Hill Pub. Co. Ltd.

Unit -I:

Non- Government Organization—An Introduction, Concept; Historical development of NGOs in India, Functions and types of NGO, NGOs and social work; Importance of co-operation between National and International NGOs.

Unit- II:

Functioning of NGOs- Registration of NGO; Budgeting, accounting, auditing, Record keeping and documentation; Staffing- Capacity Building, Training and Development

Unit- III:

Resource Mobilization and management- Mobilizing human and material resources; Fund raising and Grant-in-aid; Managing Material Resources; Human Resource Management; Formulation of project proposals; Project implementation; Project appraisal -Social, Financial and Environmental

Unit- IV

Working Area of NGO and societal development- Improving the Social Development Indices/ Indicators- Education & Human Rights, Health, Women and child welfare

Readings:-

1. Clark, John, 1991 *Voluntary Organisations: Their Contribution to Development*. London, Earth Scan.
2. Dorothea, Hilhorbt, 2003 *The real World of NGOs: Discourses, Diversity and Development*. Zed Books Ltd.
3. Drucker, Peter, 1993 *Managing the NGO: Principles and Practices*, New Delhi: Macmillan Publication.
4. Ginberg, Leon, H., 2001 *Social Work Evaluation: Principles and Methods*. Singapore: Allyn and Bacon.
5. Julie Fisher, 2003 *Governments, NGOs and the Political Development of the Third World*, Jaipur: Rawat Publications.
6. Kandasamy, M., 1998 *Governance and Financial Management in Non-Profit Organizations*. New Delhi: Caritas India.
7. Kapoor, K. K., (Ed.), 1986 *Directory of Funding Organizations*. New Delhi: Information and News Network.
8. Kumar, A., 2003 *Social Change through NGOs*. New Delhi: Anmol Publishers.
9. Lawant, B. T., 1999 *NGOs in Development*. Jaipur: Rawat Publications.
10. Mukherjee, Amitara (Ed.), 1995 *Participatory Rural Appraisal: Methods and Application in Rural Planning*. New Delhi: Vikas Publishing Co.

COURSE NO. SOC 504**HUMAN RESOURCE DEVELOPMENT IN RURAL SECTOR**

UNIT-I: Concept of Human Resource -Development (H.R.D) Importance of H.R.D. in Rural Development - Human Capital Formation Importance, Efforts and Achievements -investment for Raising Nutritional and Educational Standards - Population Composition in rural areas

UNIT- II: Dimensions of H.R.D. for Rural Development Health. Education, Energy, Agriculture and Allied Activities - Human Development Index Components and Measurements

UNIT-III: Manpower Requirements and Planning for Rural Development: Agriculture. Rural Industries, Business and Service Sectors Importance of Training for HRD in Rural Areas Institutional Arrangements for the Promotion of HRD: Farmers Training Centres, Krishi Vignana Kendras, Governmental and Non-Governmental agencies (CAPART, NIRD and KVIC)

UNIT-IV: Educational Programmes for Promoting HRD: Vocational Education. Non Formal Education. Functional Literacy, Distance Education National Literacy Mission: Total Literacy Campaign, Post literacy programme. continuing education, Jan Sikshana sansthans, Zilla Saksharatha Samithis. State resource centres

Prescribed Readings:

- 1.Mehta M R : Human Resource Development Planning with Special Reference to Asia
- 2.Alexander V Alex : Human Capital Approach in Economic Development
- 3.Batra V P : The Economic and Human Resources ILO : Employment Promotion with Special Reference to Rural Areas
- 4.George Tobias : Human Resources in India
- 5.Gerold M Mcier : Leading Issues in Economic Development
- 6.Gyan Chand : Population in Perspective
- 7.World Bank : World Development Report, 1001
- 8.Govindappa K : Adult Education Impact of National Literacy Mission
- 9.UNDP : Human Development Report(s) 1998. 1999, 2000.

SYLLABUS

**MASTER OF LAWS
LL.M. (CBCS) Semester- I – IV
Examination 2020-21 & 2021-22**

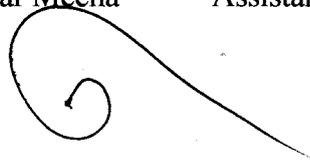


**JAINARAINVYASUNIVERSITY
JODHPUR**

(Dr. P. K. Mishra)

**FACULTY OF LAW
LIST OF TEACHING STAFF**

S.No.	Name	Designation	Qualification
1.	Prof. (Dr.) Chandan Bala	Professor, Head & Dean	LL.M., Ph.D.
2.	Prof. (Dr.) Sunil Asopa	Professor	LL.M., Ph.D.
3.	Dr. V.K. Bagoria	Assistant Professor	LL.M., Ph.D.
4.	Dr. S.P. Meena	Assistant Professor	LL.M., DCLL, Ph.D.
5.	Dr. Nidhi Sandal	Assistant Professor	LL.M., Ph.D.
6.	Dr. Dalpat Singh	Assistant Professor	LL.M., DCLL, Ph.D.
7.	Dr. P.K. Musha	Assistant Professor	LL.M., Ph.D.
8.	Dr. Kuchata Ram	Assistant Professor	LL.M., Ph.D.
9.	Dr. Vinod Kumar Meena	Assistant Professor	LL.M., Ph.D.



A. LL.M. (Master of Laws)

For the purpose of admissions in LL.M. Programme of Faculty of Law, Jai Narain Vyas University will conduct **Law Entrance Tests** (hereinafter referred to as LET). Admissions will be made according to merit of the LET. Eligibility requirements for entrance test and availability of seats are as under:

1. LL.M. (Two Year Scheme) also known as regular course

Duration of the Course: Two years

No. of Seats: 60 (Regular)

60 (Self Finance)

Minimum eligibility criteria

3-Year LL.B. after Graduation under *at least* 10+2+3 pattern or five years LL.B. Integrated Course under 10+2+5 recognized by the Bar Council of India securing a minimum of 55% marks. However, admission may be given to a candidate who has secured 50% marks in LL.B. in self finance Section according to merit. The eligibility criteria for candidates, who have got degree of LL.B. from any university other than any university of Rajasthan will be at least 60% marks in LL.B.

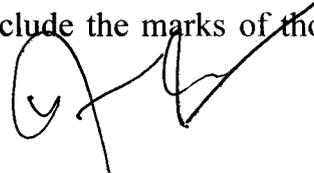
I) Candidates appearing in the Final Year of the Qualifying Examination may also apply and appear in the Test. However, the candidate will be required to produce the original mark sheet of the qualifying examination at the time of counseling for getting admission.

II) If the applicant has passed the qualifying Exam where grades are awarded and:

A) where the Grade Sheet does not mention the equivalent percentage of marks from grade points, the candidate should submit such a Certificate of conversion from the concerned Institution mentioning either the converted percentage, or the formula for the actual conversion of grade point average to percentage of marks;

B) where the Grade Sheet itself mentions the equivalent percentage of marks from grade points, or the formula for such conversion, the candidate should get both sides of the Degree/Grade Sheet photocopied showing the equivalent percentage of marks/conversion formula.

“**Aggregate percentage of marks**” will **also** include grace marks awarded to a candidate. **However, it will not** include the marks of those subjects



where only pass marks are required such as compulsory language, compulsory environmental studies etc. and which do not contribute to the total in the final (degree) mark sheet. Similarly marks of additional subject (if any) for improvement of aggregate percentage/division will not be considered for calculating the aggregate percentage for admission in the University. Decision of the University in regards to such calculation shall be final.”

No rounding off of percentage of marks will be permitted.

Reservation and Relaxation Rules

Reservation and Relaxation in Minimum Eligibility for SC/ST/OBC/SOBC/EWS/Physically Challenged (PC) Candidates/ University Wards etc. will be provided as per University Rules for Government Approved (Regular) Seats only. No relaxation in minimum eligibility that is 50% in LL.B. will be provided for admission on SFS Seats to SC/ST/OBC/SOBC/EWS/Physically Challenged (PC) Candidates/ University Wards etc.

Entrance Test Structure : *There will be separate Test Paper for the admission in the Programme. Admission to the programme will be made on the basis of merit of LET.*

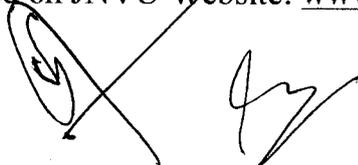
LL.M.

There shall be one paper of 120 minutes duration carrying 300 marks containing 100 multiple-choice questions on Jurisprudence, Constitutional Law, Law of Contract, Company Law, Transfer of Property, Law of Torts, Law of Crimes, Environmental Law, Public International Law, Indian Evidence Act, Hindu Law and Muslim Law and laws related to IPR, Human Rights and Labour Laws.

Entrance test Centre: Jodhpur Only.

Evaluation & Result:

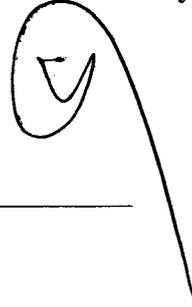
Three marks shall be awarded for each correct answer while one mark shall be deducted for each incorrect answer. Unattempted question will be awarded zero mark. Candidate shall be selected in order of merit on the basis of aggregate marks secured in the Entrance Test (LET) provided he/she fulfils the minimum eligibility criteria i.e. at least 55% marks for GAS and at least 50% marks for SFS. Merit list of the candidates selected/waitlisted for admission, will be notified on the official notice board of the department and university website by the Head of the Department. The University will try to announce the result as soon as possible which will be notified on JNVU Website: www.jnvu.iuims.in.



Entrance Test Fee:

Entrance Test Fee for SC and ST is Rs. 1500/- and for others it is Rs. 2000/-
Fee will be non refundable on non appearance in LET.

Note : In matters not covered above, the University rules will be followed.

A handwritten signature in black ink, consisting of a large loop and a tail, positioned above a horizontal line.

The two year degree programme of LL.M. will consist of Four Semesters. One academic session of one year will be divided into two semesters. Candidate shall be admitted to LL.M. First Semester only and thereafter required to qualify all four semesters. In first semester and second semester, three core courses and one skill course will be taught in the academic session 2020-21.

In the academic year 2021-22, a candidate appearing in the LL.M. Third and Fourth Semester shall be examined in any one of the three groups of specialization i.e. Human Rights, Business Law and Constitution & Legal Order. The Head of the Department may open one or more groups out of these three groups in Third and Fourth semester examinations. A group will open only when there will be minimum 15 students.

Details of CBCS system for LL.M. Two Years Programme to be effective from session 2020-21:

GUIDELINES FOR CHOICE BASED CREDIT SYSTEM:

Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student need to select **two elective papers** offered by the Department in which he/she is doing core course this shall be part of core programme during third and fourth semester. Each student has to complete **four skill courses**: two within the Department and two from other Department within JNV University or the Universities approved by JNV University
3. **Course:** Usually referred to, as 'papers' is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ project work/ self-study etc. or a combination of some of these.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period of teaching (lecture or tutorial) or two periods of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.
12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/ December and even semester from December/January to May.

Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May.

13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will

display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly, the Faculty of Science resolves the following:

- a. All internal assessments shall be open assessment system only and that are based on Viva voce, term test, seminar, paper writing, paper presentation and for core courses of Dissertation/Thesis (Doctrinal) and Dissertation/Thesis (Non-Doctrinal), they will comprise of material collection and its interpretation.
- b. Attendance shall carry the prescribed marks in all papers and Practical examination CCA
- c. In each semester at least 40 percent of theoretical component University examination shall be undertaken by external examiners from outside the university conducting examination, who may be appointed by the competent authority

Note-1 : Minimum students for admission in LL.M. course will be 20 and to run branch, minimum students must be 15, if not, the students will be merged in Faculty of Law.

For running a group, if the number of students less than 15, one group will run and if exceed 15 then second group may be started only if the remaining students are 15 in number or more. If the number of students in LL.M. remains less than 15 then these students may be merged in the Faculty of Law of Jai Narain Vyas University.

Note-2 : Strength for LL.M. class in affiliated college, where cadre strength of teachers is less than 12, will be 30 students.

Note-3 : Only permanent selected teachers and retired Law teachers may take classes in LL.M. Course. Part time/class basis or contractual teachers other than retired teachers cannot be engaged for LL.M. course.

Grievances and Redressal Mechanism

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head/Principal of the College or the Chairperson of the University Department concerned as the case may be clearly stating in writing the reason(s) for the complaint / appeal.
- b) The appeal will be assessed by the Chairman and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Dean, Faculty of Law and two other teachers of the Faculty and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.
- d) Each component marks will be added without rounding and the total thus obtained is ratio by a factor of six. This value shall be rounded.

Table I: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	'O'	Outstanding	10
2	'A+'	Excellent	9
3	'A'	Very Good	8
4	'B+'	Good	7
5	'B'	Above Average	6
6	'C'	Average	5
7	'P'	Pass	4.5
8	'F'	Fail	0
9	'Ab'	Absent	0

- i. A student obtaining Grade F in a paper shall be considered failed and will be required to reappear in the University End Semester examination.
- ii. For noncredit courses (Skill Courses) 'Satisfactory' or "Unsatisfactory" shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment

- = and > 95 % marks Grade Point 10.0
- 90 to less than 95 % marks Grade Point 9.5
- 85 to less than 90 % marks Grade Point 9.0
- 80 to less than 85 % marks Grade Point 8.5
- 75 to less than 80 % marks Grade Point 8.0
- 70 to less than 75 % marks Grade Point 7.5
- 65 to less than 70 % marks Grade Point 7.0
- 60 to less than 65 % marks Grade Point 6.5
- 55 to less than 60 % marks Grade Point 6.0
- 50 to less than 55 % marks Grade Point 5.5
- 45 to less than 50 % marks Grade Point 5.0
- 40 to less than 45 % marks Grade Point 4.5

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,
i.e.

$$SGPA (S_i) = \frac{\sum (C_i \times G_i)}{\sum C_i}$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,
i.e.

$$CGPA = \frac{\sum (C_i \times S_i)}{\sum C_i}$$

where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.

- iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

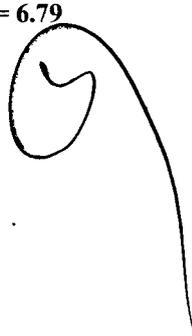
S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	4	B	6	4 x 6 =24
2	Course 2	4	B+	7	4 X 7 =28
3	Course 3	4	B	6	4X 6 = 24
4	Course 4	4	O	10	4 X 10 =40
5	Course 5- Practical I	4	C	5	4 X 5 =20
6	Course 6 - Practical II	4	B	6	4 X 6 = 24
	Total	24			24+28+24+40+20+24 =160

Thus, SGPA = 160/24 = 6.67

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	6.67	7.25	7	6.25

$$\text{CGPA} = (24 \times 6.67 + 24 \times 7.25 + 24 \times 7 + 24 \times 6.25) / 96$$

$$652.08 / 96 = 6.79$$


Semesterwise theory papers / Continuous Comprehensive Assessment (CCA)/ skill components

Semester-wise Theory Papers/ Continuous Comprehensive Assessment (CCA)/ Skill component

Semester-I

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Core course 1	LL.M. 101	Law and Social Transformation in India	6	6	30	70	100
Core course 2	LL.M. 102	Indian Constitutional Law: The New Challenges	6	6	30	70	100
Core course 3	LL.M. 103	Law Development and Decentralization	6	6	30	70	100
*Skill Course I		Environmental Law	2				
Total			20	18	90	210	300

Semester-II

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Core course 1	LL.M. 201	Judicial Process	6	6	30	70	100
Core course 2	LL.M. 202	Legal Education and Research Methodology	6	6	30	70	100
Core Course 3	LL.M. 203	Principles of Legislation & Interpretation of Statutes	6	6	30	70	100
*Skill Course II		Legal Aid, Para Legal Services and Public Interest Litigation	2				
Total			20	18	90	210	300

Semester III Group-A - Business Law

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Core course 1	LL.M. 301B	Law of industrial and Intellectual Property	6	6	30	70	100
Core course 2	LL.M. 302B	Legal Regulation of Economic Enterprises	6	6	30	70	100
Core course 3	LL.M. 303B	Law of Export Import Regulation	6	6	30	70	100
Core course 4	LL.M. 304B	Dissertation/Thesis (Doctrinal) & Viva Voce	6	6	30	70	100
*Skill Course III		Administrative Law	2				
Total			26	24	120	280	400

Semester III Group-B - Human Rights

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Core course 1	LL.M. 301H	Concept and Development of Human Rights	6	6	30	70	100
Core course 2	LL.M. 302H	Human Rights in International and Regional Perspective	6	6	30	70	100
Core course 3	LL.M. 303H	Human Rights : Enforcement Mechanism	6	6	30	70	100
Core Course 4	LL.M. 304H	Dissertation/Thesis (Doctrinal) & Viva Voce	6	6	30	70	100
*Skill Course III		Administrative Law	2				
Total			26	24	120	280	400

Semester III Group-C - Constitution and Legal Order

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Core course 1	LL.M. 301C	Mass Media Law	6	6	30	70	100
Core course 2	LL.M. 302C	Public Utilities Law	6	6	30	70	100
Core course 3	LL.M. 303C	Union State Financial Relations	6	6	30	70	100
Core course 4	LL.M. 304C	Dissertation/Thesis (Doctrinal) & Viva Voce	6	6	30	70	100
*Skill Course III		Administrative Law	2				
Total			26	24	120	280	400

Semester IV Group-A - Business Law

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Core course 1	LL.M. 401B	Banking Law	6	6	30	70	100
Core course 2	LL.M. 402B	Insurance Law	6	6	30	70	100
Core course 3	LL.M. 403B	Corporate Finance	6	6	30	70	100
Core course 4	LL.M. 404B	Dissertation/Thesis (Non-Doctrinal) & Viva Voce	6	6	30	70	100
*Skill Course IV		Criminology, Penology & Victimology	2				
Total			26	24	120	280	400

Semester IV Group-B - Human Rights

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Core course 1	LL.M. 401H	Human Rights and Special Interest Groups : Women & Children	6	6	30	70	100
Core course 2	LL.M. 402H	International Humanitarian Law and Refugee Law	6	6	30	70	100
Core course 3	LL.M. 403H	Science, Technology and Human Rights	6	6	30	70	100
Core course 4	LL.M. 404H	Dissertation/Thesis (Non-Doctrinal) & Viva Voce	6	6	30	70	100
*Skill Course IV		Criminology, Penology & Victimology	2				
Total			26	24	120	280	400

Semester IV Group-C - Constitution and Legal Order

Type of course	Course code	Title of the Course	Lecture-Tutorial-Practical/Week	No. of credits	Continuous Comprehensive Assessment (CCA)	End-Semester Examination (ESE) [University Examination]	Total
Core course 1	LL.M. 401C	Constitutionalism: Pluralism and Federalism	6	6	30	70	100
Core course 2	LL.M. 402C	Human Rights	6	6	30	70	100
Core course 3	LL.M. 403C	National Security, Public Order and Rule of Law	6	6	30	70	100
Core course 4	LL.M. 404C	Dissertation/Thesis (Non-Doctrinal) & Viva Voce	6	6	30	70	100
*Skill Course IV		Criminology, Penology & Victimology	2				
Total			26	24	120	280	400

** The student will submit Non-Doctrinal Research Dissertation .
Mode of Non-Doctrinal Research Dissertation will be decided by the Head of the Department.

The Department of Law shall offer one skill course per semester. They are as follows:

1. Skill Course-I – Environmental Law
2. Skill Course –II – Legal Aid, Para Legal Services and Public Interest Litigation
3. Skill Course- III – Administrative Law
4. Skill Course –IV – Criminology, Penology & Victimology

For Semester-I & II, there will be 6 lectures for core courses and 2 lectures for skill courses.

For Semester III & IV, for courses, 1-3 - there will be 6 lectures per week and for skill courses 2 lectures will be per week and for preparation for Dissertation/Thesis (Doctrinal) in the III semester and Dissertation/Thesis (Non-Doctrinal) in the IV semester – 6 periods per week will be allotted.

The duration of period will be 55 minutes.

All courses involve an evaluation system of students that has been the following two components:

1. Continuous Comprehensive Assessment (CCA) – Accounting for 30% of the final grade that a student gets in a course and practical i.e. Dissertation/Thesis (Doctrinal) and Dissertation/Thesis (Non-Doctrinal).
2. End Semester Examination (ESE) – Accounting for remaining 70% of the final grade that a student gets in a course.
3. Viva Voce and evaluation of Dissertation/Thesis (Doctrinal) and Dissertation/Thesis (Non-Doctrinal) – Accounting for 70 % of final grade that a student gets in a course (50 marks for evaluation of Dissertation/Thesis and 20 marks will be for Viva Voce examination).

Continuous comprehensive assessment will have the following components:

1. Term Test : One term test shall be arranged for each course prior to end semester examination. Examination duration shall be 3 hours.

Continuous comprehensive assessment for I & II Semester would have the following components:

A. Term Test	–	70 marks (Duration 3 hours)
B. Paper preparation	–	35 marks
C. Paper presentation	–	30 marks
D. Viva voce	–	30 marks
E. Attendance	-	15 marks

Total = 180 marks – Reduced to 30

Continuous Compressive Assessment for III & IV Semester for 1-3 courses shall be as follows:

A. Term Test	-	70 marks
B. Seminar Paper Preparation	-	50 marks
C. Seminar Paper Presentation	-	45 marks
D. Attendance	-	15 marks
Total =		180 marks (Reduced to 30)

For Dissertation/Thesis (Doctrinal) and Dissertation/Thesis (Non-doctrinal) in Paper-IV i.e. 304 and 404 in III & IV Semester respectively, the CCA will be as under:

A. Collection of material	-	85 marks
B. Interpretation of material collected for preparation of Dissertation/Thesis (Doctrinal) or Dissertation/Thesis (Non-Doctrinal/Report of the field visit) as the case may be	-	80 marks
C. Attendance	-	15 marks
Total =		180 marks (Reduced to 30)

Term test shall be arranged for each course prior to end semester examination. Examination duration shall be 3 hours. Continuous Comprehensive Assessment shall be completed prior to term test for all courses. All students will have to attend a minimum of 75% lectures. Each student will have to attend a minimum of 75% lectures. A student having less than 75% attendance will not be allowed to appear in semester examination. The attendance marks will be awarded by following the system proposed below:

75% - 80%	-	3
80% - 85%	-	6
85% - 90%	-	9
90% - 95%	-	12
95% - 100%	-	15

Condonation of Shortage of attendance shall be governed in accordance with the provisions in the Act and Statute of the University vide Ordinance 78 to Ordinance 80 as amended from time to time.

Skill course evaluation: Based on the performance of the candidate, the department shall declare the result as satisfactory or non-satisfactory. Each student need to get a minimum 3 (satisfactory) declaration for the course completion.

For the Term test and end semester examination – there will be two parts in the question paper. In the first part i.e. A Part, 10 questions will be asked selecting at least 2 questions from each unit. All the 10 questions will be compulsory and each question will carry 1 mark the word limit for answers will be 50 words each and in Part-B, 2 questions will be asked from each unit with internal choice and each question will carry 15 marks. The word limit for answer will be 500 words each.

Note: Students will appear in odd skill course in the Department of Law and in even skill course in other department of the University.

Qualifying for Next semester

- 1. A student acquiring minimum of 40% in total of the CCA is eligible to join next semester.**
- 2. A student who does not pass the examination (CCA+ESE) in any course(s) (or due to some reason as he/she not able to appear in the ESE, other conditions being fulfilled, and so is considered as 'Fail'), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held for the same semester.**
- 3. A student who fails in one or more courses in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time, i.e. three additional chances for each paper; the student is ineligible for the Postgraduate degree in the Subject in which he/she is admitted. For additional chances examination fee shall be on additive basis.**

A student, who does not pass the examination i.e. CCA + ESE in any course (S) or due to some reason as he/she is not able to appear in ESE other condition being fulfilled, and so is considered as "Fail" shall be permitted to appear in such failed courses or viva voce for III & IV semester in the

subsequent ESE to be held. Every student shall have the opportunity to improve credit through university examination only.

Improvement Option:

Every student shall have the opportunity to improve Credit through University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final.

Result Declaration:

The ESE (End Semester Examination/University Examination) results shall be declared as soon as possible. The Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation. **A student will be declared passed only when he secures 40% marks in individual course including CCA and theory examination and 50% in aggregate of all the courses in each semester. A student, who does not secure 50% marks in aggregate of all the courses will have to reappear in all the courses again. His marks of CCA's will be carried over if he wishes so or he may reappear in that semester. If a student secures 50% marks in aggregate of all the courses but could not secure 40% marks in any course may reappear in those courses only. His marks of CCA's may be carried over or he may reappear if he wishes so.**

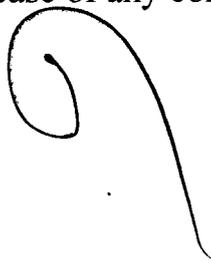
A student who could not secure 50% marks in aggregate of all the courses in third and fourth semester, he will have to reappear in all the courses, however, in third and fourth semester if the student has prepared his dissertation for course fourth and submitted the same and appeared in the viva voce, his/her marks of dissertation and viva voce, and CCA's relating to this course may be carried over or he/she may prepare the same again if he/she wishes so. He may again show the collected material and interpret it to the supervisor to whom he has been allotted who will award marks for the same. A student, who was not allowed to appear in the End Semester examination because he could not secure 40% marks in CCA's will have to appear in all the CCA's and End Semester examination of that semester.

Students Failed in CCA:

Any student declared "Not Eligible" by the Department based on CCA in Semester I, II, III or IV and accordingly did not appear in ESE; can be readmitted as an additional student in that Semester in the **following year only**. Such student need to deposit the annual university fee as prescribed for that academic year.

For preparation of dissertation in third and fourth semester, the Head of the Department in the Faculty of Law shall assign the teachers of the Faculty, the list of the students whom they will have to supervise and for affiliated colleges, the Principal shall assign the teachers the list of the students to whom they will supervise. The Dissertation/Thesis (Doctrinal) in the III Semester and Dissertation/Thesis (Non-Doctrinal) in the IV Semester shall be submitted to the Registrar of the University through the Head of the Department positively 15 days before the commencement of the theory examination. The Vice-Chancellor on the recommendation of the Head of the Department shall appoint two examiners, one of whom shall be the Head of Department or any other teacher of the Department nominated by him and there will be one external examiner. The Examiners shall report to the Registrar their award on the Dissertation/Thesis (Doctrinal) and Dissertation/Thesis (Non-Doctrinal) within the time prescribed in that behalf. If there is difference of 20% in marking, the matter will be referred to third examiner.

The Head of the Department shall have power regarding interpretation of rules in case of any confusion.



SEMESTER FIRST

PAPER I

LL.M. 101 LAW AND SOCIAL TRANSFORMATION IN INDIA

Objectives of the Course

This course is designed to offer the teacher and the taught with (i) awareness of Indian approaches social and economic problems in the context of law as a means of social control and change; and (ii) a spirit of inquiry to explore and exploit law and legal institutions as a means to achieve development within the framework of law. The endeavour is to make the students aware of the role of the law has played and has to play in the contemporary Indian society.

- Unit 1: Concept of Social Change and Social Transformation
Relation between Law and Public Opinion
Law as an instrument of social change
Law tradition and culture. Impact of common law on Indian Tradition & Culture.
Sociological school and its applicability in India.
Principles of social legislation
- Religion and the Law :
Religion-its meaning and relationship with law
Evaluation of Religion as an integrative and divisive factor
Concept of Secularism in Indian Perspective
Religious minorities and the law
Principles of social legislation
- Unit 2 : Language and the Law :
Multi-linguistic culture and its impact on policy in governance
Role of Language in society
Formation of linguistic states-critical evaluation
Constitutional guarantee to linguistic minorities
Language policy and the Constitution; Official language
Community and the Law :
Caste as a socio-cultural reality and role of caste as a divisive and integrative factor
Non-discrimination on the ground of caste
Acceptance of caste as a factor to undo past injustices-An objective analysis
Protective discrimination; Scheduled Castes, tribes and backward classes
Reservation Policy, Statutory Commissions and Problems of National Integration
- Unit 3 : Regionalism and the Law :
Role of Regionalism as a divisive and integrative factor
Concept of India as one unit
Right of Movement, residence and business, impermissibility of state or regional barriers
Equality in matters of employment; the slogan "Sons of the soil" and its practice
Admission to educational institutions; preference to residents of a state

Women and the Law:
Position and role of women in Indian society
Crimes against women
Gender injustice and its various forms, causes and remedies
Women's Commission
Empowerment of women; Constitutional and other legal provisions

Unit 4 :

Children and the Law:
Child labour
Sexual exploitation
Adoption, maintenance and related problems
Children and education-a constitutional mandate

Modernisation and the Law:
Modernisation as a value: Constitutional perspectives
Modernisation of social institutions through law
Reform of family law
Agrarian reform-Industrialisation of agriculture
Criminal Law : Plea bargaining; compounding and payment of compensation to victims
Civil Law (ADR) Confrontation v. Consensus; mediation and conciliation; Lok Adalat

SELECT BIBLIOGRAPHY

- Marc Galanter (ed.) : Law and Society in Modern India (1997), Oxford
Robert Lingat : The Classical Law of India (1998), Oxford
U. Baxi : The Crisis of the Indian Legal System (1982). Vikas, New Delhi
U. Baxi; (ed.): Law and Poverty Critical Essay (1988)
Tripathy, Bombay
Manushi : A Journal About Women and Society
Duncan Derret : The State, Religion and Law in India (1999) Oxford University Press, New Delhi
H.M. Seervai : Constitutional Law in India (1999) Tripathi
D.D. Basu: Shorter Constitution of India (1996), Prentice Hall of India (P) Ltd., New Delhi
Sunil Deshta and Kiran Deshta : Law and Menace of Child Labour; (2000) Anmol Publications, Delhi
Savitri Gurasekirare : Children, Law and Justice (1997), Sage
Indian Law Institute : Law and Social Change : Indo-American Reflection; (1988). Tripathi, Mumbai.
J. B. Kriplani : Gandhi-His Life and Thought 1970, Ministry of Information and Broadcasting, Government of India
M.P. Jain : Outlines of Indian Legal History (1993), Tripathi, Bombay
Aguas, Flavia : Law and Gender Inequality : The Politics of Women's Rights in India (1999), Oxford



PAPER II

LL.M. 102 INDIAN CONSTITUTIONAL LAW :

THE NEW CHALLENGES

Objectives of the Course

The Constitution, a living document, is said to be always in the making. The judicial process of constitutional interpretation involves a technique of adapting the law to meet changing social mores. Constitution being the fundamental law an insight into its new trends is essential for a meaningful understanding of the legal system and processes. The post-graduate students in law who had the basic knowledge of Indian Constitutional Law at LL.B level, should be exposed to the new challenges and perspectives of constitutional development while they are allowed to choose an area of law specialisation. Obviously, topics under this paper require modification and updating from time to time.

Unit 1: Federalism:

- Creation of new states
- Allocation and share of resources
- The inter-state disputes on resources
- Rehabilitation of internally displaced persons and Centre's responsibility
- Freedom of Trade, Commerce and Intercourse
- Services under Union
- Emergency Provisions
- Federal Comity
- Special status of certain States, Tribal Areas, Scheduled Areas

Unit 2: "State" Meaning and Scope in Modern Perspective

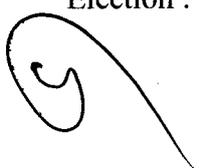
- Right to equality: Privatization and its impact on affirmative action
- Freedom of Press and challenges of new scientific development
- i) Freedom of speech
- ii) Right to strike, hartal and bandh
- iii) Emerging regime of new right and remedies-Right to Education;
Right to Information and Right to Privacy, Right to Health
- iv) Reading Directive Principles and Fundamental Duties into Fundamental Rights
- v) Compensatory jurisprudence
- vi) Right to life and liberty and Criminal Jurisprudence
- vii) Commercialisation of education and its impact

Unit 3 :

- Stresses and Strains of Governance
- Right of minorities
- Secularism and religious fanaticism
- Separation of powers : stresses and strain
- Judicial activism and judicial restraint
- PIL : Implementation
- Judicial independence
- Appointment, transfer and removal of judges
- Accountability : Executive and judiciary
- Tribunals : Need, Necessity and Constitutionality

Unit 4 :

- Democratic Process :
- Nexus of politics with criminals and the business
- Election : Mechanism and Procedure

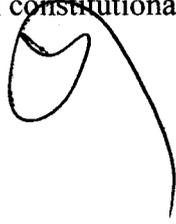


Election Commission : Status
Electoral Reforms : Accountability, Transparency,

Coalition Government, stability, durability, corrupt practice
Grassroot democracy, Democratic decentralization and local self-government
Free and Fair, Election and remedies

SELECT BIBLIOGRAPHY

No specific bibliography is suggested for this course since the course materials depends upon the latest developments. These developments in the areas specialized in course can be gathered from the recent material such as case law, changes and amendments of laws, critical comments, studies and reports, articles and research papers and lastly contemporary emerging ethos impacting on constitutional values.



PAPER III

LL.M. 103 LAW, DEVELOPMENT AND DECENTRALIZATION

Objectives: The students of Law at post-graduate level should study and understand the inter-relationship of law, development and democratic decentralization of power upto grass root level. The instrumentality of law is a key driver for promoting socio-economic growth in orderly manner of the nation. Students need to be sensitized and their understanding of legal dynamics should be enriched. The benefits of development can best be percolated through the process of decentralization. The people of country must have effective role in the governance. Therefore, this paper will provide the students of LL.M. Part-I an opportunity to study and learn the legal skills, tools and techniques for the around development of nation. This will help in fostering research also.

The subject is divided into four units:

- Unit1: Constitutional mandate for Development and Democratic decentralization.
International Trends of Legal processes ensuring development and distribution of power.
Survey of major legislative efforts made towards promotion of developmental jurisprudence.
Role of Education-Primary, Secondary & Higher Education in promoting developmental goals.
Policy decisions & legitimate expectations.
- Unit 2: Institutional Infrastructure and Development
Revitalizing Growth and Competitiveness
Study of Human Development Issues
Public Private Partnership Model
Environment and Development
Development and Environmental Issues
Development and issues of dislocation, displacement and other Human Rights
Sustainable Development and Environment
- Unit 3: Analytical & Critical study of Constitutional Provisions ensuring decentralization of power.
Legal Framework at State Level- Panchayat Raj Institution-Law and Practice
Empirical study of Panchayat Raj Institution in Rajasthan
Role of Public Opinion,
Public Participation and Civil Society in Promoting effective decentralization of Power
- Unit 4 : Role of Intellectual Property in Development
Corporate Governance
The politics of power and constitutional contradictions
Need for Labour Reforms
Reforms in Taxation

Suggested Readings:

1. Re-emerging India, N.Jadhav, Rajiv Ranjan and SujanHajra The ICFAI Uni. Press. 2005
2. Agricultural and Economic Reform: Growth & welfare

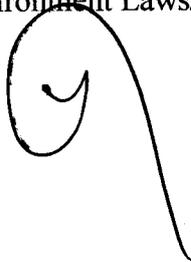
3. Indian Urbanization and Economic Growth Becker Charles, M. Jeffrey Baltimore, Jhon. Hop. Uni. Press.
4. Law and Social Transformation, P. IswarBhatt EBC 2009.

Journals :

1. Indian Journal of Legal Studies
2. GNLU Journal of Law, Development & Politics GNLU
3. Indian Journal of International Economic Law NLUSI
4. Socio Legal Review NLUSI
5. Journal of Indian Law Institute ILI

Act, Statute/Reports

- Constitution of Indian
- Law Relating to Intellectual Property Rights
- Corporate Laws Companies Act
- Labour Laws/Environment Laws/Forest Act, Planning Commission Report/UN MDG.



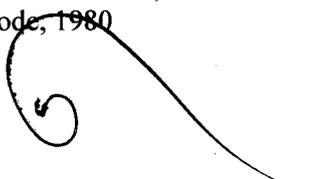
SKILL COURSE – I

Environmental Law

Unit-I	Environmental Pollution-Meaning, definition and kinds, sources and causes of environmental pollution, Effects of environment degradation.
Unit-II	Civil Law- The Constitutional Law of India-Preamble, Articles 21, 48-A and 51-A(g), The Code of Civil Procedure-Section 9 Order 39, Rule 1 to 5 Law relating to nuisance.
Unit-III	The Water (Prevention and Control of Pollution) Act, 1974 The Air (Prevention and Control of Pollution) Act, 1981
Unit-IV	The Environment (Protection) Act, 1986 Aims and Objects; Definition; General Powers of the Central Government Prevention, Control and abatement of Environmental Pollution

BOOKS RECOMMENDED

VR. Krishna Iyer : Environmental Pollution and the Law
Lall's Commentaries on Water and Air Pollution Laws
Suresh Jain and Vimal Jain : Environmental Laws in India
Citizen Report, Published by the Centre for Science and Environment, New Delhi
Marudhar Mridul : Public Interest Litigation-A Profile
The Water (Prevention and Control of Pollution) Act, 1974.
The Air(Prevention and Control of Pollution)Act, 1981
The Environment (Protection)Act, 1986
The Wild Life (Protection) Act, 1972 The Police Act, 1861
The Insecticide Act, 1961
The Motor Vehicles Act, 1988 The Income Tax Act, 1961
The Public Liability Insurance Act, 1968
The Forest Conservation Act, 1980
Paras Diwan : Law and Environment
ILI Publication Editor Dr. S.N. Jain : Seminar Proceedings of Environment Protection Law
Rahimatulla Khan: Law, Science and Environment
M.C.J., Kagzi (Editor) : Environmental Pollution and Law, Published by University Studies in Law, Jaipur
The Code of Civil Procedure, 1908
The Code of Criminal Procedure, 1973
The Indian Penal Code, 1980



SEMESTER SECOND

PAPER I

LL.M. 201 JUDICIAL PROCESS

Objectives of the Course

A lawyer, whether academic or professional, is expected to be competent to analyse and evaluate the legal process from a broader juristic perspective. Hence a compulsory paper on Judicial Process is essential in the LL.M. curriculum. The objective of this paper is to study the nature of judicial process as an instrument of social ordering. It is intended to highlight the role of court as policy maker participant in the power process and as an instrument of social change. This paper further intends to expose the intricacies of judicial creativity and the judicial tools and techniques.

Since the ultimate aim of any legal process or system is pursuit of justice, a systematic study of the concept of justice and its various theoretical foundations is required. This paper, therefore, intends to familiarise the students with various theories different aspects and alternative ways of attaining justice.

Unit 1: Nature of Judicial Process :

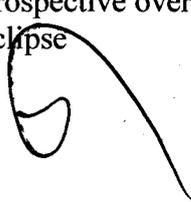
Judicial process as an instrument of social change
Judicial process and creativity in law-common law model,
Legal Reasoning and growth of law change and stability
The tools and techniques of judicial creativity precedent
Legal development and creativity through legal reasoning
Legal development and creativity through statutory and codified systems
Notions of judicial review
Role of judiciary in constitutional adjudication-various theories of judicial role
Judicial Behaviour and constitutional adjudication
Judicial Process in India:
Judicial accountability-Problems and Prospects

Unit 2: Judicial Process in India:

Indian debate on the role of judges and on the notion of judicial review
The "independence" of judiciary
"Political" nature of judicial process
Development of Human Rights jurisprudence by judiciary
Judicial activism and creativity of the Supreme Court-the tools and techniques of creativity
Judicial process in pursuit of constitutional goals and values
New dimensions of judicial activism
Judicial activism and structural challenges
Institutional liability of courts scope and limits
Judicial Review and Principles of Constitutional Interpretation

Unit 3: The Concept of Justice:

Principle of pith and substance
Principle of colourable legislation
Principle of territorial nexus
Principle of severability
Principle of prospective overruling
Principle of eclipse



Concept of Rights and Justice

The concept of justice or Dharma in Indian thought

Dharma as the foundation of legal ordering in Indian thought

The concept and various theories of justice in the western thought

Various theoretical basis of justice : The liberal contractual tradition,

The liberal utilitarian tradition

The liberal moral tradition

Unit 4 : Relation between Law and Justice :

Equivalence Theories-Justice as nothing more than the positive law of the stronger class

Dependency theories

The independence of justice theories

The independence of justice mean's to an end,

Relationship of law and justice - The relationship in the context of the Indian Constitutional ordering

Judicial process as influenced by theories of justice

Analysis of selected cases of Supreme Court where the judicial process can be seen as influenced by theories of justice

SELECT BIBLIOGRAPHY

Julius Store : The Province and Function of Law, Part II, Chs. 1-8-16 (2000), Universal, New Delhi

Cardozo : The Nature of Judicial Process (1995), Universal, New Delhi

Henry J. Abraham : The Judicial Process (1998), Oxford

J. Stone : Precedent and the Law : Dynamics of Common Law Growth (1985), Butterworths

W. Friedmann : Legal Theory (1960), Stevens, London

Bodenheimer : Jurisprudence - The Philosophy and Method of the Law (1997), Universal, Delhi

J. Stone : Legal System and Lawyer's Reasoning (1999), Universal, Delhi

U. Baxi : The Indian Supreme Court and Politics (1980), Eastern, Lucknow

Rajeev Dhavan : The Supreme Court of India - A Socio-Legal Critique of its Juristic Techniques (1977), Tripathi, Bombay

John Rawls : A Theory of Justice (2000), Universal, Delhi

Edward, H. Levi : An Introduction to Legal Reasoning (1970), University of Chicago



PAPER II
LL.M. 202 LEGAL EDUCATION AND RESEARCH
METHODOLOGY

Objectives of the Course

A Post-graduate student of Law should get an insight into the objectives of legal education. He should have an exposure to programmes like organization of seminars, publication of Law Journals and holding of legal aid clinics

Law is taught in different ways in different countries. The LL.M. course, being intended also to produce lawyers with better competence and expertise, it is imperative that the student should familiarise himself along with the different systems of legal education. The lecture method both at LL.B. level and LL.M. level has many demerits. The existing lacunae can be eliminated by following other methods of learning such as case methods, problem method, discussion method, seminar method and a combination of all these methods.

The student has to be exposed to those methods so as to develop his skills. Growth of legal science in India depends on the nature and career of legal research. The syllabus is also designed to develop skills in research and writing in a systematic manner.

- Unit 1 : Objectives of Legal Education
Lecture Method of Teaching-Merits and demerits
The problem method
Discussion method and its suitability at postgraduate level teaching
The seminar method of teaching
Examination system and problems in evaluation -external and internal assessment
Student participation in, law school programmes, Organization of seminars, publication of journal and assessment of teachers
Clinical legal education-legal aid, legal literacy, legal survey and law reform
- Unit 2 : Research Method :
Socio Legal Research
Doctrinal and non-doctrinal
Relevance of empirical research
Induction and deduction

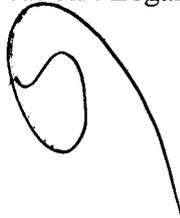
Identification of problem of research what is a research problem
Survey of available literature and preparation of bibliography
Legislative materials including subordinate legislation,
Notification and policy statements
- Unit 3 : Decisional materials including foreign decisions; methods of discovering the "rule of the case"
Juristic writings-a survey of juristic literature its relevance in selection of problems in India and foreign periodicals
Compilation of list of reports or special studies conducted relevant to the problems
Formulation of the Research problem

Devising tools and techniques for collection of data
Methods for the collection of statutory and case material and juristic literature
Use of historical and comparative research material
Use of observation studies
Use of questionnaires/interview
Use of case studies
Sampling procedures. design of sample, types of sampling to be adopted
Use of scaling techniques

Unit 4 : Jurimetrics
Computerized Research-A study of legal research programmes such as
Lexis and West law coding
Classification and Tabulation of data
Use of cards for data collection.
Rules for tabulation,
Explanation of tabulated data
Analysis of data-Qualitative and Quantitative
Report writing

SELECT BIBLIOGRAPHY

High Brayai, NegelDunean and Richard Crimes : Clinical Legal Education : Active Learning
in, your LawSchool (1998), Blackstone Press Ltd., London
S.K. Agarwal (ed.) : Legal Education in India (1993), Tripathi, Bombay
N.P. Madhava Menun (ed.) : A Handbook of Clinical Legal Education (1998). Eastern Book
Company. Lucknow
M.O. Price, H. Bitner and Bysicqicz : Effective Legal Research (1978)
Pauline V. Young : Scientific Social Survey and Research (1962)
William, J. Grade and Paul, K. Hatt : Methods in Social Research, McGraw Hill Book
Company, London
H.M. Hymae : Interviewing in Social Research (1965)
Payne : The Art of Asking Questions (1965)
Erwin, C., Surrency, B. Field, J. Crea : A Guide to Legal Research
Morris, L. Cohan : Legal Research in Nutshell (1996), West Publishing Company
Harvard Law Review Association : Uniform System of Citations
1L1 Publication : Legal Research and Methodology



**LL.M. 203 PRINCIPLES OF LEGISLATION AND INTERPRETATION OF
STATUTES**

Objectives of the Course

Unit 1 : Principles of Legislation

Law-making – the legislature, executive and the judiciary Principle of utility, Relevance of John Rawls and Robert Nozick- Individual interest to community interest, Operation of these principles upon legislation, and Distinction between morals and legislation. Interpretation of Statutes : Meaning of the term 'statutes', Commencement, Operation and repeal of statutes, and purpose of interpretation of statutes.

Unit 2 : Construction of Fiscal Statutes

- (i) Strict construction of taxing statutes
- (ii) General Principles of Strict Construction
- (iii) Illustrative Cases

Evasion of Statutes

Remedial and Penal Statutes

- (i) Remedial and Penal Statutes – Distinction
- (ii) Liberal Construction of Remedial Statutes
 - (a) General Principles
 - (b) Illustrative Cases
- (iii) Strict Construction of Penal Statutes
 - (a) General Principles
 - (b) Illustrative cases
 - (c) Welfare Legislation & statutes

Unit 3: Maxims of Statutory Interpretation

Delegatus non protest delegare, Expressio unius est exclusio alterius, Generalia specialibus non derogant, In pari delicto potior est econditio possidentis, Ut res magis valeat quam pareat, Expressum facit cessare tacitum, In bonam partem.

Interpretation with reference to the subject matter and purpose . Restrictive and beneficial construction, Taxing statutes, Penal statutes, Welfare legislation.

Unit 4: Interpretation with reference to the subject matter and purpose

Interpretation of substantive and adjective statutes

Interpretation of directory and mandatory provisions,

Interpretation of enabling statutes, Interpretation of codifying and consolidating statutes, Interpretation of statutes conferring rights, Interpretation of statutes conferring powers.

Principles of Constitutional Interpretation

Harmonious Construction, Doctrine of pith and substance, Colourable legislation, Ancillary powers, "Occupied Field" Residuary power, Doctrine of repugnancy.

PAPER-IV

Skill Course-II - Legal Aid, Para Legal Services and Public Interest Litigation

Unit-I	Legal Aid – Meaning, Nature, Scope and Development, Legal Aid and Constitution of India
Unit-II	Legal services Authorities Act – objections, establishment of Authorities and their powers, Eligibility for Legal Aid
Unit-III	Legal Aid to accused at State expenses (303-304 of the Cr.P.C.) Public Interest Litigation – Meaning, Scope, Necessity
Unit-IV	Locus-standi, Lok Adalats and their working opart Legal Counselling, Meaning, Necessity, Scope, Training for Para-Legal Services

BOOKS RECOMMENDED:

Constitution of India : J.N. Pandey

Legal Services Authority Act, 1987

Bare Act of Constitution of India as amended upto date

Shukla, VN. : Constitution of India

Jain, M.P. : Constitutional Law of India

Basu. D.D. : Introduction to the Constitution of India

Dr. N.V. Paranjape : Public Interest Litigation, Legal Aid & Services, Lok-Adalats & Para Legal Services.

Dr. Chandan Bala: Lead Aid, Pubic Interest Litigation & Para legal Services

Dr. S.S. Sharma : Legal Services, Public Interest Litigations & Para-Legal Services

SEMESTER - III

GROUP A - BUSINESS LAW

LL.M. 301B : LAW OF INDUSTRIAL AND INTELLECTUAL

PROPERTY

- Unit 1 : Nature of Intellectual Property Rights (IPR) and need for their protection, IPR and International perspectives, salient international conventions and treaties on IPR. Role of WIPO in promotion of IPR, WTO-TRIPS as global binding charter of IPR and its impact on national legislation, Dispute Settlement System in WTO.
- Unit 2 : Copyright, Nature and scope of copyright. Term of copyright, computer software-special position under copyright law and patent law, copy right societies, infringement of copyright and remedies thereof.
International copyright order, Trademark, service mark and Internet Domain Name, Registration of trademark, Infringement and passing off action in trade mark, Intellectual Property Appellate Board, Geographical indications and their registration.
- Unit 3 : Patent, Patentable and non patentable inventions, procedure for obtaining patent, compulsory license, emerging issues in patent such as patent in the field of biotechnology, life form, human genome, infringement of patent and remedies thereof.
Patent Cooperation Treaty (PCT).
Protection of plant varieties, and farmers' right. UPOV convention, principle of benefit sharing.
- Unit 4 : Intellectual Property and Human Rights, Protection of the rights of indigenous people, protection of human rights of impoverished masses, IPR protection and its impact on right to food security and public health, Environmental protection.
Protection of Bio-diversity and Traditional Knowledge-economic, social, cultural and ethical dimensions.

Important Acts

1. Patents Act, 1970 (As amended)
2. Protection of Plant Varieties and Farmer's Right Act, 2001 (As amended)
3. Geographical Indications of Good (Registration and Protection) Act, 1999 (As amended)
4. Biological Diversity Act, 2002 (As amended)

Suggested Readings

Intellectual Property and International Trade (1998), Kluwer Patent Cooperation treaty Hand Book (1998), Sweet and Maxwell Christopher Wadlow : The Law of Passing Off (1998). Sweet and Maxwell.
W.R. Cornish : Intellectual Property Law (1999), Sweet and Maxwell.

Elizabeth Verke : Law of Patents (2005) Eastern Book Company, Lucknow.
S.K. Verma and Raman Mittal (Ed.) - Intellectual Property Right : A Global Vision (2006) Indian Law Institute Publication, New Delhi.
Shiv Sahai Singh (Ed.)- The Law of Intellectual Property Right. (2004) Deep and Deep Publication, New Delhi.
Shahid Khan and Ragunath Mashelkar : Intellectual Property and Competitive Strategies in the 21st Century, (2006), Kluwer Law International.
P.S. Narayan : Intellectual Property Law in India. (2006) Gogia Law Agency, Hyderabad.

Important Acts

1. Copy Rights Act, 1970 (As amended)
2. Trade Marks Act, 1999 (As amended)
3. Patents Act, 1970 (As amended)

SELECT BIBLIOGRAPHY

Intellectual Property and International Trade (1998), Kluwer Patent Cooperation treaty Hand Book (1998), Sweet and Maxwell Christopher Wadlow : The Law of Passing Off (1998). Sweet and Maxwell.
W.R. Cornish : Intellectual Property Law (1999), Sweet and Maxwell.
Elizabeth Verke : Law of Patents (2005) Eastern Book Company, Lucknow.
S.K. Verma and Raman Mittal (Ed.) - Intellectual Property Right : A Global Vision (2006) Indian Law Institute publication, New Delhi.
Shiv Sahai Singh (Ed.)- The Law of Intellectual Property Right. (2004) Deep and Deep Publication, New Delhi.
Shahid Khan and Ragunath Mashelkar : Intellectual Property and Competitive Strategies in the 21st Century, (2006), Kluwer Law International.
P.S. Narayan : Intellectual Property Law in India. (2006) Gogia Law Agency, Hyderabad.

LL.M. 302B : LEGAL REGULATION OF ECONOMIC ENTERPRISES

- Unit 1 : The new economic policy-Industrial Policy-old and new. Its legal framework. Public Sector, Private Sector, Joint Sector-Globalisation, Liberalisation: Meaning, dimensions, implications and impact of globalization.
- Unit 2 : Depository System
Definition and Meaning-Objectives, Depository in international market. GDR, ADR, FCCB.
Depository system in India-Its Legal Frame Work. Dematerialization of Securities.
- Unit 3 : Regulatory Authorities
Telecom/Broadcasting Regulatory Authority, Industrialization and Environmental Regulation:
Environment Clearance
Environment Audit
Environment Impact Assessment
Public Liability Insurance Act
Sustainable Development, New Dimensions of Environmental protection, role of the Judiciary.
Competition Commission
- Unit 4 : Investment Scheme for NRI : portfolio investments for NRI, purchase and sale of shares/convertible debentures or other securities on Non-repatriation basis.
Foreign Institutional Investment. Foreign Direct Investment, Joint Venture and Transfer of Technology FEMA.

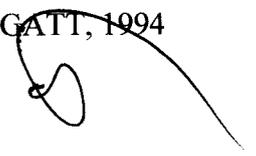
SELECT BIBLIOGRAPHY

- S. Aswani Kumar: The Law of Indian Trade Mark: (2041), Commercial Law House, Delhi-
Industrial Policy Resolution-, of 1948, 1956. 1991 Industrial Licensing Policy 1970. 1975
Industrial Policy Statements; 1973. 1977, 1980
Reports of Committees on Public : undertakings of Parliament
Industries (Development and Regulation) Act, 1951
U.Baxi & A. Dhanda : Valiant Victims and Lethal Litigation : The Bhopal Case (1989)
Indian Law Institute, Law of International Trade Transaction (1973)

LL.M. 303B: LAW OF EXPORT IMPORT REGULATION

- Unit 1 : Basic Need of Export and Import Trade, Theories of International Trade, Free Trade. Protection Principles. WTO & GATT.
Dispute Settlement Mechanism Trade Policy Review Mechanism-Anti Dumping Subsidies and Countervailing Duties.
- Unit 2 : Control of Export and Import in India, The Foreign Trade Regulation Act, 1992- Exim policy, Pre-Liberalization and Post Liberalization Era in Trade, Power of the Central Govt. to control foreign trade.
Appointment and powers of Director General of Foreign Trade. powers of the Reserve Bank of India to control foreign trade, Export promotion councils, Export oriented units and Export processing zones.
- Unit 3 : Non Tariff Barriers, Export Import Bank of India, Export Credit Guarantee Corporation of India Limited
Promotion of Foreign trade, agricultural products, textile and cloths.
- Unit 4 : The custom Act, 1962 : Prohibition on importation and exportation of goods.
The Conservation of Foreign Exchange and Preventions of Smuggling Activities Act-control of smuggling activities in export and import trade.

SELECT BIBLIOGRAPHY

- Government of India. Handbook of Import Export Procedures Government of India Import and Export Policy (1997-2002)
- Foreign Trade Development and Regulation Act 1992 and Rules Foreign Exchange Management Act 1999
- Customs Manual (Latest edition)
- Final Treaty of GATT, 1994
- 

LL.M. 304B : DISSERTATION/THESIS (DOCTRINAL) & VIVA - VOCE

Dissertation/Thesis (Doctrinal)	: 30 Marks (CCA)
Evaluation of Dissertation/Thesis and Viva Voce	: 70 Marks (50 Marks for evaluation of Dissertation/Thesis (Doctrinal) and 20 Marks for Viva Voce Examination.)

The topic for preparation of dissertation will be allotted to the students by their supervisors. Viva voce will be conducted by two examiners appointed by the Head of the Department. First examiner will be appointed from among the teachers, who is not related to the University (excluding retired teachers) or affiliated colleges and second examiner will be appointed from among the regular faculty members of the Faculty of Law for affiliated colleges and Faculty of Law both.

Skill Course-III - Administrative Law

Unit-I	Definition, Nature, Scope, Rule of Law, Separation of powers, sources of Administrative Law
Unit-II	Delegated Legislation, Nature, Scope, Forums, Necessity, subdelegation
Unit-III	Principles of Natural Justice and their Control, Doctrine of Bias, Audi Alteram Partem, Right to Consult, Reasoned Decision
Unit-IV	Judicial Control of Administrative Action : Habeas Corpus, Mandamus, Certiorari, Prohibition and Quo Warranto writs.

BOOKS RECOMMENDED

Joshi, K.C. : Administrative Law

Kagzi & Jain, M.C. : The Administrative Law

Massey : Administrative Law

Jain & Jain : Administrative Law

Kesari, U.P.D. : Administrative Law .

केसरी यू.पी.डी. : प्रशासनिक विधि

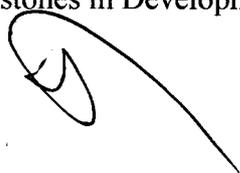
जोशी के.सी. : प्रशासनिक विधि

GROUP B :

HUMAN RIGHTS

LL.M. 301 H : CONCEPT AND DEVELOPMENT OF HUMAN RIGHTS

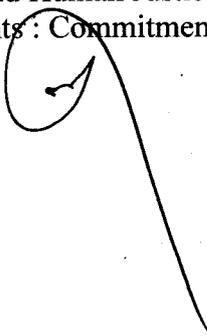
- Unit 1 : Human Rights: Jurisprudence of Human Rights
Concept of 'Right' and 'Duty'.
Jural relationship, and
Problem in International Law of Rights without Remedy.
Meaning and Diversifications of Human Rights :
Meaning derived from Scope: How to determine which human rights are
Important General or Universal?
- Unit 2 : Justificatory Theories
Theology:
Natural Law and Natural Rights:
Positivist Theory :
Marxist Theory :
Utilitarian Theory:
Sociological Process :
Contribution of Modern Theories of Human Rights in shaping the concept:
Modern Approaches:
Priori Approach.
Universal Perspectives Approach.
Ideal Observer Approach.
Rational Contract Approach.
Revived natural Rights Theory:
- Unit 3 : Theories based on Distributive Justice:
Rawls theory on Social Justice.
Ackerman's theory of Egalitarianism pursued.
Cahn's approach of identifying injustice.
Theories based on Autonomy:
Gewirth theory of liberal approach.
Nozick's theory of libertarianism.
Theories based on Equal Respect:
Dworkin's Theory of equality and liberty.
Claims flow from human dignity.
Application of various theories to key values.
Collective Rights :
Are Collective rights as human rights?
Right to Solidarity, Development and Peace.
Balancing Collective rights and individual human rights.
Role of Jurists
Sociological/Functional Approaches in Jurisprudence, Realist Movement and
Judicial Process : A study of selected ideas. Thomas Pain, Locke, J. S. Mill,
Jeremy Bentham.
A study of selected ideas- Laski, Dworkin, Nozick and Gandhi
- Unit 4 : Evolution of Human Rights
Milestones in Development of Human Rights, Thought on International Plane



Evolution of Human Rights Thinking, contributions of Ancient Civilizations, Magna Carta, The British Bill of Rights, French and American Declarations. Universal Declaration of Human Rights, 1948 (Article 29), UN General Assembly Declaration on the Right and Responsibility of Individuals, Groups and Organs of Society to Promote and Protect Universally Recognized Human Rights and Fundamental Freedoms 1999, UNESCO Declaration on the Responsibilities of the Present Generation Towards Future Generations 1997.

Suggested Readings :

Angela Hegarty : Siobhan Leonard, Human Rights an Agenda for the 21st Century (1999)
Lalit Parmar : Human Rights (1998)
Rama Jis : Human Rights : Bhartiya Values (1998)
David P. : Forsythe, Human Rights in International Relations Lon L. Fuller, The Morality of Law
John Finnis : Natural law and Natural Rights (1980)
Julius Stone : Human Law and Human Justice (2000), Universal, New Delhi
M.G. Chitkara : Human Rights : Commitment and Batrayal (1966)



LL.M. 302 H : HUMAN RIGHTS IN INTERNATIONAL AND REGIONAL PERSPECTIVES

Unit 1 Emerging Trends of Different Rights in Contemporary international Scenario.

Including economic, social, and cultural rights with special reference to :

Rights of the People and nations to Self-Determination.

Freedom from Discrimination

Right to Work

Right to Education

Right to health

Right to Adequate food

Right to Adequate shelter and services

Right to Culture

Right to Clean Environment

Right to Development

Unit 2 Civil and Political Rights :

Right to Life, Liberty and Security of person:

UN General Assembly resolution of Summary or arbitrary Executions, 1984, International Convention against Taking of Hostages, 1979, UN General Assembly Declaration on the Protection of All Persons from Enforced disappearance, 1992, Vienna Declaration on Human Rights, 1993, Vienna Declaration on Crime and Justice: Meeting the challenges of the Twenty-first Century, 2000.

Freedom from Torture:

Convention on Prevention and Punishment of the Crime of Genocide, 1948, Declaration on the Protection of Women and children in emergency and Armed Conflict, 1974, Declaration on standard Minimum Rules for Treatment of prisoners, 1957. Convention on the Protection of All Persons from Being Subjected to Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment, 1984, Code of conduct for Law Enforcement Officials, 1979, WHO Guidelines for Medical Doctors Concerning Torture or punishment in relation to detention or Imprisonment, 1975, UN Trust Fund for Victims for Torture, 1981, Declaration of Minimum Humanitarian Standards (Institute for Human Rights, Oslo) 1994.

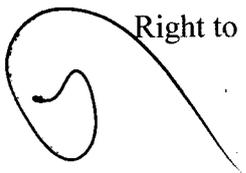
Unit 3 Freedom from Slavery:

Slavery Convention, 1926 and supplementary Convention, 1956, Convention for the Suppression of Traffic in Persons and of Exploitation of the prostitution of Others, 1949, Forced Labour Convention, 1957.

Administration of Justice by states:

Vienna Declaration on Crime and Justice: Meeting the challenges of the Twenty-first Century, Five Yearly UN congresses on the prevention of Crime and the Treatment of Offenders. Principles relating to Independence of Judiciary, Caracas, 1980. Declaration of Basic Principles of Justice for Victims of Crime and Abuse of Power, 1985.

Right to Freedom of Opinion and Expression:



Convention on the International right of Correction, 1952, UNESCO Declaration on Fundamental Principles concerning the Contribution of the Media to Strengthening Peace and international Understanding to the Promotion of Human rights, 1978.

Freedom of Association including Trade Union Rights :

ILO Conventions on the Freedom of Association and Protection of the Right to Organize, 1948, the Right to Organize and Collective Bargaining, 1949, Workers' Representatives, 1971, the Rural Workers Organizations, 1975, the Labour Relations (Public Services) 1978, the Collective Bargaining, 1981.

Right to participation in governance

Rights of Minorities and Disadvantaged groups

Rights of Ethnic, Religious or Linguistic Minorities:

Declaration on the Right of Persons Belonging to Ethnic, Religious and Linguistic Minorities, 1992.

Rights of the Elderly:

World Assembly on Ageing, Vienna, 1982

Rights of the Indigenous People:

UN Voluntary Fund for Indigenous populations, 1985, Declaration on the Indigenous People, 1995

Rights of Migrant Workers:

Convention on the protection of the Rights of All Migrant Workers and Members of their Families, 1990, ILO Convention on Migrant Workers

Unit 4 Rights of the Disabled:

UN General Assembly Declaration on the Rights of the disabled Persons, 1975, Declaration on the Rights of mentally retarded persons, 1971, Resolution on the rights of the disabled persons adopted by the Coordinating Committee of National Institutions for the Promotion and Protection of Human Rights, 1993.

Human Rights and Terrorism: UN General Assembly resolution 54/164 on Human Rights and Terrorism, 2000

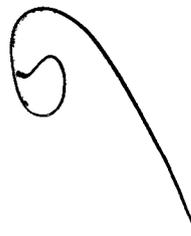
Human Rights under regional charters

Asian charter

African charter

European charter

American charter



Suggested Readings

- UN, *Human Rights : A Compilation of international Instruments* (New York : UN Publication Division, 1983).
- UN Centre for Human Rights, *International Human Rights standards for Law Enforcement* (Geneva : World Campaign for Human Rights, 1996).
- UN, *The Standard Rules on the Equalization of Opportunities for Persons with Disabilities* (New York : UN Publication division, 1994).
- UN World Campaign for Human Rights. *The African Charter on Human and people's rights* (Geneva, 1990).
- Aggarwal, Amita, "Human Rights of Women in India and International Standards", in M.P. Dube and Neeta Bora, eds, *Perspectives on Human Rights* (New Delhi : Anamika Publishers, 2000), pp. 97-106.
- Jenks, W., *Human Rights and international labour Standards* (London :Stevens, 1960).
- Ghai, Yash, "Human rights and Asian Values", *Journal of Indian Law Institute*, vol. 40, nos. 1-4, 1998, pp. 67-86
- Gandhi, Sandy, "Spare the Rod : Corporal Punishments in Schools and the European Convention on Human Rights", *International and Comparative Law Quarterly*, vol. 33, no.2 , 1984, pp. 488-94.
- The Rome Statute of the International Criminal Court* (Oxford: Clarendon Press, 2000).
- Cerna, Christina, M., "The Structure and Functioning of the Inter-American Court of Human Rights", *British Yearbook of International Law*, vol. 63, 1992, pp. 135-229.
- Evans, Malcolm and Rod Mergan, "The European Convention for the Prevention of Torture: Operational Practice", *International and Comparative Law Quarterly*, vol.41, no.3, 1992, pp. 590-614.
- "The European and American Conventions : A Comparison", *Human Rights Law Journal*, vol. 1, no.1, 1980, pp. 44-58.
- Ghai, Yash, "Human Rights and Asian Values", *Journal of Indian Law Institute* , vol. 40, nos. 1-4, 1998, pp. 67-86.
- Gittleman, Richard, "The African charter on Human and People's Rights : A Legal Analysis", *Virginia Journal of international Law*, vol. 22, no.4, 1982, pp. 667-714.
- Madhusudhanana V., "European System for the protection of Human Rights (The Hague :MartinusNijhoff, 1977)
- Mani, V.S., "The European unknown's Approach to Human Rights: Implications on India's Trade". In H.S. Chopra, ed., *India and the European Unknown in the 21st Century* (New Delhi: ICWA, 1998), pp. 134-53.
- Padilla, Davidj., "the Inter-American System for the Promotion and Protection of Human Rights" *Georgia Journal of International and comparative Law Quarterly*, vol.20, no.2, 1990, pp. 407-12
- Schegan, I.R. "The Inter-American Commission on Human Rights". *American Journal of International Law*, vol 64, no. 2, 1965, pp.335-48

LL.M. 303H : HUMAN RIGHTS : ENFORCEMENT MECHANISM

- Unit 1 Human Rights : Implementation and Supervision by the United Nations Organisation
National measures of Implementation and Supervision.
International Measures for Implementation and Supervision
Periodic reporting system.
Procedure for dealing with Inter-state Complaints.
References to International Court of Justice.
References to European and Inter-American Court of Human Rights.
Fact-finding and Conciliation.
Procedure for consideration of Private Communications.
Conflicts between various Implementation Procedures
United Nations Human Rights Council
United Nations High Commissioner for Human Rights
United Nations Commission on Human Rights
- Unit 2 Human Rights and the International Labour Organization
Permanent Supervision of the Application of the I.L.O. Standards.
- Information and Reports
Information on submission of Conventions and Recommendations to the competent authorities.
Reports on unratified Conventions and Recommendations.
Reports on ratified Conventions.
Involvement of Employers' and Workers' Organizations in the Supervisory Procedures.
Supervisory Bodies:
The Committee of Experts on application of the Conventions and Recommendations.
The Conference committee on application of the Conventions and Recommendations.
The System of Direct Contract.
Contentious Procedures
Representations against Members.
Complaints against Members.
Special Freedom of Association Procedure.
The Committee of Freedom Association.
The Fact Finding and Conciliation Commission on Freedom of Association.
Non-Contentious Procedures.
- Unit 3 Human Rights: Implementation under the Regional Instruments
European Commission of Human Rights.
European Court of Human Rights
Inter-American Commission on Human Rights.
Inter-American Court on Human Rights.
O.A.S. General Assembly and the Committee of Ministers.
International Non-Governmental Organizations :
Meaning of International Non-governmental Organizations
Role of International Non-governmental Organizations in Implementation of Human Rights.
Diplomatic Interventions and Mission by NGOs.
Public discussions of Human Rights Violations
Contribution to International Investigative Procedures.
AIDS and Human Rights

Activities at Local levels.
Contribution to Development of Human Rights Norms.

Unit 4 Human Rights : Implementation Mechanism in India and role of :
Executive
Legislature
Judiciary.
National Human Rights Commission, State Human Rights Commission(s), Other
Commissions and Committees at Central and State level
Human Rights Court.
Information Media and Education
Role of N.G.Os. in Promotion and Protection of Human Rights in India.
Activities at Local levels for promotion of Human Rights

Suggested Readings:

D.D. Basu : Human Rights in Indian Constitutional Law (1994)

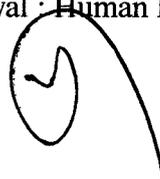
Vijay Chitnis (et al.) : Human Rights and the Law : National and Global Perspectives (1997)

B.P. Singh Sehgal : Law Judiciary and Justice in India (1993) James Vadakkumchery : Human
Rights and the Politics in India (1996)

Saxena : Tribals and the law (1997)

Poornima Advani : Indian Judiciary : a Tribute (1997)

Justice Venkataramiah : Human Rights in the Changing World (1998);, Paramjit S. Jaiswal
and Neshtha Jaiswal : Human Rights and the Law (1996)



LL.M. 304H : DISSERTATION/THESIS (DOCTRINAL) & VIVA-VOCE

Dissertation/Thesis (Doctrinal) : 30 Marks (CCA)

Evaluation of Dissertation/Thesis and Viva Voce : 70 Marks
(50 Marks for evaluation of Dissertation/Thesis (Doctrinal) and 20 Marks for Viva Voce Examination.)

The topic for preparation of dissertation will be allotted to the students by their supervisors. Viva voce will be conducted by two examiners appointed by the Head of the Department. First examiner will be appointed from among the teachers, who is not related to the University (excluding retired teachers) or affiliated colleges and second examiner will be appointed from among the regular faculty members of the Faculty of Law for affiliated colleges and Faculty of Law both.

Skill Course-III - Administrative Law

Unit-I	Definition, Nature, Scope, Rule of Law, Separation of powers, sources of Administrative Law
Unit-II	Delegated Legislation, Nature, Scope, Forums, Necessity, subdelegation
Unit-III	Principles of Natural Justice and their Control, Doctrine of Bias, Audi Alteram Partem, Right to Consult, Reasoned Decision
Unit-IV	Judicial Control of Administrative Action : Habeas Corpus, Mandamus, Certiorari, Prohibition and QuoWarranto writs.

BOOKS RECOMMENDED

Joshi, K.C. : Administrative Law
Kagzi & Jain, M.C. : The Administrative Law
Massey : Administrative Law
Jain & Jain : Administrative Law
Kesari, U.P.D. : Administrative Law .
केसरी यू.पी.डी. : प्रशासनिकविधि
जोशी क.सी. प्रशासनिकविधि



GROUP C :

CONSTITUTION AND LEGAL ORDER

301C : MASS MEDIA LAW

- Unit 1 : Mass Media-Types Press Films, Radio, Television: Ownership patterns, Press, private, public, Ownership patterns, films, private, Ownership patterns-Radio & Television, Public, Difference between visual and non visual media - impact on people's minds, Press: Freedom of Speech and Expression - Article 19 (1) (a) : Includes Freedom of the Press, Laws of defamation, obscenity, blasphemy and sedition, The relating to employees wages and service conditions, Price and Page Schedule Regulation, Newsprint Control Order, Advertisement - is it included within freedom of speech and expression? Press and the Monopolies and Restrictive Trade Practices Act
- Unit 2: Films - How far included in freedom in of speech and expression? Censorship of film - constitutionality, The Abbas Case, Difference Between films and press- why pre censorship valid for films but not for the press? Censorship under the Cinematograph Act
- Unit 3: Radio and Television - Government monopoly : Why government department? Should there be an autonomous corporation? Effect of television on people, Report of the Chanda Committee, Government policy, Commercial advertisement, Internal scrutiny of serials, etc. Judicial Review of Doordarshan decisions: Freedom to telecast
- Unit 4 : Constitutional Restrictions : Radio and television subject to law of defamation and obscenity, Power to legislate - Article 246 read with the Seventh Schedule, Power to impose tax - licensing the licensing fee

SELECT BIBLIOGRAPHY

- M.P. Jain : Constitutional Law of India (Latest Edn.), Wadhwa H.M.Seervai : Constitutional law of India Vol. 1 (1991), Tripathi, Bombay
- John, B. Howard: The Social Accountability of Public Enterprises' in Law and Community Control in New Development Strategies (International Center for law in Development, 1980)
- Rajeev Dhavan : 'On the Law of the Press in India', 26 JILI288 (1984) Rajeev Dhavan : 'Legitimizing Government Rhetoric: Reflections on Some Aspects of the Second Press Commission', 26 JILI 391 (1984)
- D.S. Basu : The Law of Press of India (1980)
- 

302 C : PUBLIC UTILITIES LAW

- Unit 1 : Public Utilities: Railways, Electricity, Gas, Road Transport, Telephone, Post and Telegraph Service, Police, Fire Brigade, Banking service etc. Public Utilities-Why Government Monopoly? Government and Parliamentary Control, Constitutional division of power to legislate
- Unit2: Utilities Legislation - Patterns of: Administrative Authorities -Structure of the Administrative Authorities, Subordinate legislation, Public Utilities and Fair Rearing : Quasi-judicial decision -Administrative Discretion
- Unit 3 : Public Utilities and Consumer Protection : Exclusion from M.R.T.P. Act, Rights of consumers protected by the Consumer Protection Act, Rights arising from law of Contract and law of Torts, Public Utilities and Their Employees : Application of Articles 16. Application of Industrial law -right to strike.
- Unit 4: Public Utilities and Fundamental Rights : The right to equality: the airhostess case, Are public utilities "State" for the purpose of article 12 of the Constitution? Extension or the concept of state. Liabilities and special privileges of public utilities: In contract, In tort, In criminal law

SELECT BIBLIOGRAPHY

P.M. Bakshi : Television and the Law (1986)

Vasant Kelkar: 'Business of Postal Service' 33 IJPA, pp. 133-141 (1987)

G. Ramesh : 'Characteristic of Large Service Organization in a Developing Country like India' 32 IJPA, 77 (1986)

Nalini Paranjpe : 'Planning for Welfare in the Indian Railways' 31 IJPA, 171-180(1985)

Arvind K. Sharma : Semi-Autonomous Enterprise: Conceptual Portrait - Further Evidence on the Theory of Autonomy, 33 IJPA. p.99-113

Jain & Jain : Principles of Administrative Law (1986) Bhaumik : The Indian Railways Act (1981)

Law Commission of India, 38th Report : Indian Post Office Act, 1898 (1968)



303 C : UNION-STATE FINANCIAL RELATIONS

- Unit 1: Federalism-Essentials'. Models of Federal Governments, Australia, Canada. Difference between federation and confederation, Evolution of federal government in India, Distribution of Legislative Power/Administrative Power: Indian Constitution, Centre-State relations, Factors responsible for subordination of states. Administrative relations
- Unit 2: Distribution of Fiscal Power : Scheme of Allocation of taxing power, Extent of Union power of taxation, Residuary power-inclusion of fiscal power, Restrictions of Fiscal Power: Fundamental Rights, Inter-government tax immunities, Difference between tax and fee, Distribution of Tax Revenues: Tax-sharing under the Constitution, Finance commission -Specific purpose grants (Article 282)
- Unit 3: Borrowing Power of the State : Borrowing by the Government of India, Borrowing by the States, Inter-State Trade and Commerce : Freedom of inter-state trade and commerce, Restrictions on legislative power of the Union and States with regard to trade and commerce, Planning and Financial Relations : Planning Commission, National Development Council, Plan grants
- Unit 4: Cooperative Federalism, Full faith and credit, Inter-state Council, Zonal Councils, Inter-state disputes, Federal Government in India : Model of Jammu and Kashmir. Sarkaria Commission Report, What reforms are necessary ?

SELECT BIBLIOGRAPHY

- H.M. Seervai : Constitutional Law of India (1991), Tripathi Bombay Sudha Bhatnagar : Union-State Financial Relation and Finance Commission (1979)
- Ashok Chandra : Federalism in India (1965)
- V.D. Sebastain : Indian Federalism: The Legislative Conflicts, Chs.7 and 8 (1980)
- Chandrapal : Centre-State Relations and Cooperative federalism Chs. 5 and 8 (1983)
- G.C.V Subha Rao : Legislative Power in Indian constitutional Law, Chs. 37, 38; 39 (1982)
- K.P. Krishna Shetty : The Law of Union-State Relations and the Indian Federalism Ch. 9(1981)
- Administrative Reforms Commission on Centre-State Relations : Ch.3 (1969)
- L.M. Singhvi (ed.) : Union State Relations in India, 124-154 (1969) D.T. Lakadwala : Union-State Financial Relations (1967)
- M.P. Jain : Indian Constitutional Law (Latest Edn.)
- Wadhwa K. Subba Rao : The Indian Federation (1969) K.C. Wheare : Federal Government (1963)

LL.M. 304C : DISSERTATION/THESIS (DOCTRINAL) & VIVA-VOCE

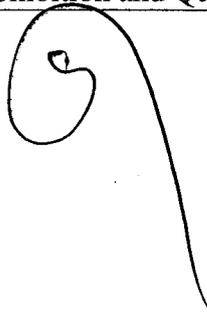
Dissertation/Thesis (Doctrinal) : 30 Marks (CCA)

Evaluation of Dissertation/Thesis and Viva Voce : 70 Marks
(50 Marks for evaluation of Dissertation/Thesis (Doctrinal) and 20 Marks for Viva Voce Examination.)

The topic for preparation of dissertation will be allotted to the students by their supervisors. Viva voce will be conducted by two examiners appointed by the Head of the Department. First examiner will be appointed from among the teachers, who is not related to the University (excluding retired teachers) or affiliated colleges and second examiner will be appointed from among the regular faculty members of the Faculty of Law for affiliated colleges and Faculty of Law both.

Skill Course-III - Administrative Law

Unit-I	Definition, Nature, Scope, Rule of Law, Separation of powers, sources of Administrative Law
Unit-II	Delegated Legislation, Nature, Scope, Forums, Necessity, subdelegation
Unit-III	Principles of Natural Justice and their Control, Doctrine of Bias, Audi Alteram Partem, Right to Consult, Reasoned Decision
Unit-IV	Judicial Control of Administrative Action : Habeas Corpus, Mandamus, Certiorari, Prohibition and Quo Warranto writs.



IV - SEMESTER

GROUP A - BUSINESS LAW

LL.M. 401B : Banking Law

- Unit 1 : Introduction
Nature and Development of Banking in India and other countries.
Functions of Banking, various theories and objectives of Banking.
Global Banking Institutions - New Dimensions, CSR & Banking in India.
Increasing Corruption in Banking Sector.
The Banking (Regulation) Act, 1949. Its main provisions, social control, nationalization of Banks.
- Unit 2 : Central Bank, Evolution, Characteristics and Functions, Reserve Bank of India and It's Role, Securitization and Reconstruction of Financial assets, Cash reserve and Statutory Liquidity ratios in Bank.
- Bank as borrowers :
Forms of borrowing, Types of Deposit, Accounts, Electronics, Withdrawal. Money Transfer and e-Banking.
Deposit Insurance Corporation Act, 1962.
- Unit 3 : Bank and Customer Relationship.
Banking Operations Lending by Banks, Collection and Payments of Cheques.
- Transformation of Banking Sector
- E-Banking and E-Fraud
- Responsibility of Banks in fraudulent transaction
Banking Process
Negotiable Instrument & their characteristics, Cheques, Dishonor of Cheques, Appropriation of payments.
Interference by third parties.
Attachment, Mareva Injunctions, Bank and Garnishee, set off.
- Unit 4 : Social Banking
Basal II norms
Letter of Credit
Recovery of Debts Due to Banks.
Banking Ombudsman Scheme 2002. Debt Recovery Tribunal Act.
Recent Trends of Banking System in India.

SELECT BIBLIOGRAPHY

- Basu, A. : Review of Current Banking Theory and Practice (1998) Mac Miilan
M. Hapgood (ed.) : Paget's lawoF Banking (1989) Butterworths, London
R. Goode : Commercial Law,(1995) Penguin, London
Ross Cranston : Principles of Banking Law (1997) Oxford
L.C. Goyle : The Law of Banking and Bankers (1995) Eastern
M.L. Tannan :Tannan's Banking Law and Practice in India (1997), India Law House. New Delhi, 2 Volumes
K.C. Shekhar : Banking Theory and Practice (1998), UBS Publisher Distributors Ltd.. New Delhi

M. Dasesse, S. Isaacs and G, Pen ; E.G. Banking Law..(1994), Lloyds of London Press, London

V. conti and Hamaui (eds.) : Financial Markets Liberalization and the Role of Banks' Cambridge University Press, Cambridge (1993)

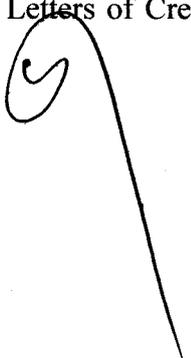
J. Dermine (ed.) : European Banking in the 1990's (1993) Blackwell, Oxford

K. Subrahmanyam Banking Reforms in India (1997), Tata McGraw Hill, New Delhi

R.S. Narayanna : The Recovery of Debts due to Banks and Financial Institution Act, 1993 (51 of 1993), Asia Law House, Hyderabad

M.A. Mir : The Law Relating to Bank Guarantee in India (1992) Metropolitan Book, New Delhi

Mitra : The Law Relating to Bankers' Letters of Credit and Allied Laws (1998), University Book Agency, Allahabad



LL.M. 402B : INSURANCE LAW

- Unit 1 : Introduction ; Nature of insurance contract, various kinds of insurance, proposal, policy, parties consideration, need for utmost good faith, insurable interest. indemnity, Insurance policy, law of contract and law of torts - future of insurance : need, importance and place of insurance.
Constitutional perspective- the Entries 24, 25, 29, 30, 47 of List 1 Union List: 23, 24 of List III, General Principles of Law of insurance: Definition. nature and history. The risk commencement, attachment and duration, Assignment alteration, Settlement of claim and subrogation, Effect of war upon politicians, Indian Insurance Act 1938.
- Unit 2 : Insurance Regulatory Authority Act, 2000 : Mutual Insurance Companies and cooperative life insurance societies, Double insurance and re-insurance, Life Insurance: Nature and scope, Event- insured against life insurance contract, Circumstances affecting the risk Amounts recoverable under life policy. Persons entitled to payment.
Settlement of- claim and payment of money, Marine Insurance : Nature and Scope. Classification of marine policies, The Marine insurance Act, 1963, Marine Insurance, Insurable interest, insurable value, Marine insurance policy-condition-express warranties construction of terms of policy. Voyage deviation, Perils of the sea, Assignment of Policy, Partial laws of ship and of freight, salvage, general average, particular charges, Return of premium.
- Unit 3: Insurance against Accidents : The Fatal Accidents Act, 1855, Objects and reasons. Assessment of compensation, Contributory negligence. Apportionment of compensation and liability, The Personal Injuries (Compensation insurance) Act 1963, Compensation payable under the Act, Compensation insurance scheme under the Act Compulsory, insurance. Property insurance: Fire Insurance, The Emergency Risks (Factories) Insurance, The Emergency Risks (Goods) Insurance, (policies covering risk of explosion, Policies covering accidental loss. damage to property, Policies covering risk of storm and tempest, Glass-plate policies, Burglary and theft policies, Live stock policies, Goods in transit insurance. Agricultural insurance
- Unit 4: Insurance against Third Party Risks : The Motor Vehicles Act, 1988, Nature and Scope, Effect of Insolvency or death on claims of insolvency and death of parties. certificate of insurance, Claims tribunal : Constitution, functions, application for compensation. procedure powers and award.
Liability Insurance : Nature and kinds of such insurance, Public liability insurance. Professional negligence insurance. Miscellaneous Insurance Schemes: New Dimensions : Group life insurance, Mediclaim sickness insurance

Suggested Readings

- John Hanson and Christophe Henly : All Risks Property Insurance (1999), LLP Asia Hongkong
- Peter Mac Donald Eggers and Patricia Foss : Good faith and Insurance Contracts (1998) LLP Asia, Hongkong

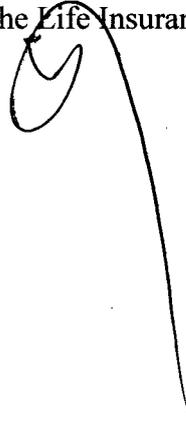
Banjeree : Law of Insurance (1994). Asia Law House, Hyderabad
Mtra, B.C. : Law Relating to Marine Insurance (1997), Asia Law House, Hyderabad

Brids : Modern Insurance (1997), Sweet & Maxwell

International Labour Office, Administration Practice of Social Insurance(1985)

E.R. Hardy Ivamy : General Principles of insurance Law (1979) Edwin, W. Patterson : Cases and Materials On Law of (nsurance (1955)

M.N. Sreenivasan : Law and the Life Insurance Contract (19 14)



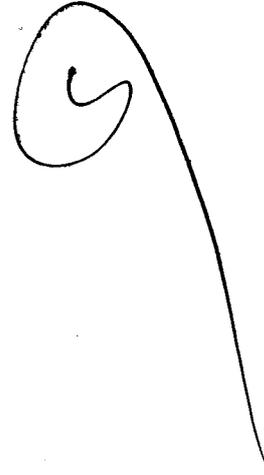
LL.M. 403B: CORPORATE FINANCE

- Unit 1 : Introduction : Meaning, importance and scope of corporate finance, Capital needs-capitalization-working capital securities- borrowing, deposits, debentures. Objectives of corporate finance-profit maximization and wealth maximization. Constitutional perspectives-the entries 37, 38, 43, 44, 45, 46, 47, 52, 82, 85 and 86 of List 1- Union List; entry 24 of List II State List.
Equity Finance : Share Capital, Prospects- information disclosure Issue and allotment, shares without monetary consideration, Money laundering, Non-opting equity shares. Debt Finance : Debentures, nature, issue and class, Deposits and acceptance, Creation of charges, Fixed and floating charges, Mortgages, Convertible debentures
- Unit 2 : Conservation of Corporate Finance : Regulation by Disclosure, Control on payment of dividends, managerial remuneration, Payment of commissions and brokerage. Inter-corporate loans and investments, Pay-back of shares, Other corporate spending, Protection of creditors: need for creditor protection.
Preference in payment, Rights in making company decision affecting creditors. interests, insider trading Creditors self-protection, Incorporation of favourable terms in lending contracts, Right to nominate directors, Control over corporate spending, corporate governance.
- Unit 3 : Protection of Investors : Individual share holder right, Corporate membership right, Derivative actions, Qualified membership right.
Conversion, consolidation and reorganization of shares, Transfer and transmission of securities, Dematerialization of securities, prevention of oppression and mis-management, Role of SEBI.
- Unit 4 : Corporate Fund Raising: Depositories IDR (Indian Depository Receipts), ADR (American Depository Receipts). GDR (Global Depository Receipts), Public financing institutions IDBI, ICICI, IFC and SFC, Mutual Fund and other collective investment schemes.
Institutional investment-LIC, UTI and banks, FDI and NRI investment. Administrative Regulation on Corporate Finance : Inspection of accounts, SEBI. Central Government control, control by registrar of companies, RBI control. Copex plan and Corporate Fund Raising.

Suggested Readings

- Alastair Hundson : The Law on Financial Derivatives (1998), Sweet & Maxwell
Eil's Ferran : Company Law and Corporate Finance (1999), Oxford
Jonathan Charkham : Fair Shares : The Future of Shareholder Power and Responsibility (1999). Oxford
Ramaiya A : Guide to the Companies Act (1998). Vol. I, II and III H.A.J. Ford and A.I'. Austen : Ford's principle of Corporations Law (1999). Butterworths
J.H. Farrar and B.M. Hanniyan : Farrar's Company Law (1998), Butterworths
Austen R.P.: The Law Of Public Company Finance (1986), LBC
R.M. Goode : Legal Problems of Credit and Security (1988), Sweet and Maxwell
Altman and Subrahmanyam : Recent Advances in Corporate Finance (1985), LBC

Gilbert Harold: Corporation Finance (1956) Henry E. Hogland : Corporation Finance (1947)
Maryin M. Kristein : Corporate Finance (1975) R.C. Osborn : Corporation Finance (1959)
S.C. Kuchhal : Corporation Finance: Principles and Problems (6th ed. 1966)
VG. Kulkarni : Corporate Finance (1961)
Y.D. Kulshreshta : Government Regulation of Financial Management of Private Corporate
Sector in India (1986)



LL.M. 404B : DISSERTATION/THESIS (NON-DOCTRINAL) & VIVA – VOCE

Dissertation/Thesis (Non-Doctrinal) : 30 Marks (CCA)

Evaluation of Dissertation/Thesis and Viva Voce : 70 Marks
(50 Marks for evaluation of Dissertation/Thesis (Non-Doctrinal) and 20 Marks for Viva Voce Examination.)

The topic for preparation of dissertation will be allotted to the students by their supervisors. Viva voce will be conducted by two examiners appointed by the Head of the Department. First examiner will be appointed from among the teachers, who is not related to the University (excluding retired teachers) or affiliated colleges and second examiner will be appointed from among the regular faculty members of the Faculty of Law for affiliated colleges and Faculty of Law both.



Skill Course-IV - Criminology, Penology and Victimology

Unit-I	Criminology : Definition, Nature and Scope, Methods of studying criminal behaviour , Crime : Definition and Nature
Unit-II	classification of crime, organised and professional crime, Control of Crime : Police and Law Courts, Prevention of crime
Unit-III	Theories of punishment. Relationship between criminology and penology, History of punishment. Kinds of Punishment, White collar criminals, Female offenders, Juvenile Delinquency
Unit-IV	Victimology : Definition and types of the victim, Persons vulnerable to victimization 1.Elderly, 2. Children, 3. Female. Compensation to victims.

SUGGESTED READINGS

- Barnes, H.B. and Tectors : New Horizons in Criminology
Vold, G.S. : Theoretical Criminology
Pillai, K.S. : Criminology
R. Teft, Donald: Criminology
Edwin, H. Sutherland and Donald R. Grussey : Principles of Criminology
HormanMannhaim : Pioneers in Crimmology
Hon-Barren, Mays: Crime and the Social Structures
Ahmed Siddiqui : Criminology-Problems and Perspectives
Lord Pakenham : Causes of Crime
S. VenugopalaRao : Facts of Crime in India
Komm, R.R. and Mogorble : Law-Criminology and Penology Grunhut : Criminal Justice and Reconstruction
Madolm : Criminal Justice and Reconstruction
Gorden Rose: The Struggle for Penal Reform
LL.T. : Essays on Indian Penal Code
Ben-Penology: Old and New-Tagore Law Lectures
Clict : Conflicting Penal Theories in Statutory Criminal Law
Shamsul Huda : Tagore Law Lectures on Criminal Law
Lawburse : Crime, Its Causes and Remedies
Dequires : Modern Theories of Criminology
Gillin : Criminology and Penology
Beccaria : Crime and Punishment
The Criminal Procedure Code
The Constitution of India
- 

IV - SEMESTER

GROUP B - HUMAN RIGHTS

LL.M. 401H : HUMAN RIGHTS AND SPECIAL INTERESTS GROUPS: WOMEN AND CHILDREN

- Unit-1 Philosophical and Social Perspectives of Status of Women in Contemporary Indian Society
Poverty, Illiteracy, Lack of Independence, oppressive Social Customs and gender Violence against and abuse of Women in public and private domains
- International Norms for Protection of Women
ILO Conventions for protection of Female Labour
UNESCO Convention against Discrimination in Education, 1960
UN Convention on Political Rights of Women 1952, Convention on Elimination on all Forms of Discrimination against Women, 1979. Convention on Nationality of Married Women, 1957, Convention on Consent to marriage, Minimum Age of Marriage and Registration of Marriages, 1962, Convention for the Suppression of the Traffic in Persons and of the Exploitation of the Prostitution of Others, 1949. Declaration on the Elimination of Violence against Women, 1993, Convention on Political Rights of Women, 1952
Declaration on the Participation of Women in Promoting International Peace Cooperation, 1982
Documents of the Four World Conferences on Women: Mexico, 1975, Copenhagen, 1980, Nairobi, 1985, Beijing, 1995
Protection of women in armed conflicts
Other relevant development
- Unit 2 The Constitution of India and Status of Women
Women and Fundamental Rights and Directive Principles and Fundamental Duties under the Constitution, Special provisions for the protection of women: Article 15(3), Article 39(d) & (e), Article 42, Articles 243-D & 243-T.
Special Laws and Policies for Protection of Women
Suppression of Immoral Traffic Act, 1956, Indecent Representation of Women (Prohibition) Act, 1986, Commission of Sati (Prevention) Act, 1982, Medical Termination of Pregnancy Act, 1971 Maternity Benefit Act, 1961. Other laws having a direct bearing on protection of women
- Special Laws and Policies for Protection of Women
Gaps between International Norms and Indian Law, if any
Women and public policy: female health and family welfare, literacy programmes. Labour Welfare; Issue of current public debate political rights of women (reservations and protection of women) personal Laws and status of women
Institutional Mechanism for Protection of the Women
Constitutional Mechanisms: Legislature, Executive and Judiciary (special contribution of judiciary)
Statutory mechanism: National Commission for Women, National Human Rights Commission, State Commissions
The Non-governmental organizations
the Information Media
Role of Education

Unit-3 Philosophical and Social Perspectives of Status of Children in Contemporary Indian Society

Impact of problems of Poverty and Illiteracy

Social and Cultural practices regarding Girl Child: Foeticide, Child Marriage

Child Labour in unorganized sectors, Forced labour, Sale of Children

Child abuse inside and outside homes, trafficking in Children, Children and Custodial Crimes

Street Children: Child and Crime

International norms for Protection of Children

ILO conventions on restrictions and prohibition on child labour including ILO Convention on Child Labour, 1999.

UN Convention on the Rights of the Child, 1989, Optional Protocol on the Involvement of Children in Armed conflict, and Optional Protocol on Sale of Children, Child Prostitution and Child Pornography, 2000. Declaration of Social and Legal Principles relating to the Protection and Welfare of Children with Special Reference to Foster, Placement and Adoption, 1986

UNESCO: International Charter of Physical Education and Sports, 1978, Convention on Technical and Vocational Education, 1989. Convention and Recommendation against Discrimination in Education, 1960, Universal Declaration on the Human Genome and Human Rights, 1997. Declaration on the Responsibilities of the Present Generation towards Future Generations, 1997

World Summit for Children: Declaration and Plan of Action

Other relevant developments

Unit-4 1. The Constitution of India and Status of Children

Fundamental rights and Directive Principles under Indian Constitution

Special Protection for the child: article 15(3), Article 24, Article 39 (e) & (f), Article 45

Judicial Endeavor and Children

2. Special Laws and Policies for Protection of the Child

Child Labour (Prohibition and Regulation) Act, 1986, Children (Pledging of Labour) Act, 1933, Young Persons (Harmful Publications) Act, 1956, Child Marriage Restraint Act, 1929, Pre-natal Diagnostic Techniques (Regulation and Prevention of Misuse) Act, 1956, Children's Act, 1960, Orphanages and Other Charitable Homes (Supervision and Control) Act, 1960, Juvenile Justice (Care & Protection of Children) Act 2015.

Other Laws relevant to protection of the Child

Gaps between International norms and the Indian Law, if any

Government Policies

Institutional Mechanism for Protection of Child

Constitutional Mechanisms: Legislature, Executive, Judiciary (Special contribution of judiciary)

National Human Rights Commission, National Commission for Rights of the Child

Non-Governmental organizations

The Information Media

Role of Education



Suggested Readings

UN Centre for Human Rights, *The Rights of the child* (Geneva : World Campaign for Human Rights 1996).

UN High Commissioner for human Rights, *Sexual Exploitation of Children* (Geneva : UN Publication Division, 1996).

UN, *Convention on the Rights of the Child* (New York : UN Department of Public Information, 1999)

UNICEF, *The Child and the Law* (New Delhi : UNICEF, 1994).

UNICEF, *The Media and the Children's Rights : A Practical Introduction for Media Professionals* (New Delhi: UNESCO, 2000).

UNICEF, *The State of World's Children 2001* (New York: UNICEF, 2001).

Agarwal, S.P., *Handbook on Child* (New Delhi : Concept Publishing Company, 1992).

Dennis, Michael J., "Newly Adopted Protocols to the convention on the rights of the Child", *American Journal of International Law*, Vol. 94, 2000, pp. 789-96.

Diwan, Paras and Peeyushi Diwan, *Children and Legal protection* (New Delhi : Deep and Deep Publishers, 1994).

Gupta, Srinivas, "Rights of Child and Child Labour : A Critical Study". *Journal of Indian law Institute*, Vol. 37, No. 4, Oct. to Dec. 1995, pp. 531-42.

Khanna, S.K., *children and the Human Rights* (New Delhi: Commonwealth, 1998).

Kumar, Bindal, *Problems of Working Children* (New Delhi : APH Publications, 2000).

Mehta, P.L. and S.s. Jaswal, *Child Labour and the Law* (New Delhi : Deep and Deep Publications 19660.

Misra, Ranganath, "Rights of the Child", in K.P. Saksena, ed., *Human Rights : Fifty Years of India's Independence* (New Delhi : gyan Publishing House, 1999), pp. 38-46.

Pachauri, S.K. *Children and Human Rights* (New Delhi : APH Publishing Corporation. 1999).

Pal, R.M. "Wrong and Rights of the Child", in K.P. Saksena, ed., *Human Rights: Fifty years of India's Independence* (New Delhi : Gyan Publishing House, 1999), pp. 47-58.

Raina, B.K., "child and Human Rights : An Insight" in B.P. Singh Sehgal, ed., *Human Rights in India : Problem and Perspective* (New Delhi ; Deep and Deep Publications, 1999), pp. 182-86.

Sachar, Rajinder, "Rights of the Child", *Wood Focus*, vol. 13, No. 3, March 1992, pp. 22-23.

Saksena, Anu, *Human Rights and Child Labour in Indian Industries* (New Delhi, Shipra Publications, 1999).

Saksena, K.P., "Recent Supreme Court Judgement on Child Labour : A Critique", in K.P. Saksena, eds., Human Rights : Fifty years of India's Independence (New Delhi : Gyan Publishing House, 1999), pp. 73-78.

Saxen, Ira, "Needs of the Child : Education for Pleasure", in K.P. Saksena, ed., Human Rights in Asia : Problems and Perspective (New Delhi: HURITER, 1984), pp. 101-110.

Seth, Leila, "Rights of the Child", India International Centre Quarterly, vol. 20, no. 4, 1993, pp. 79-90. Shams, Shamusuddin, Women, Law and Social Change (1997).

Sharma, A.K., "Human Rights Violations of Street Children and Child Labour in India", in B.P. Singh Sehgal ed. Human Rights in India : Problem and Perspectives (New Delhi : Deep and Deep publications, 1995), pp. 187-91.

Weisner, The Child and the State in India (Delhi : Oxford University Press, 1991)

1. Indrani Sen Gupta – Human Rights of Minority and Women, ISHA Books, Delhi, 2005 Vol. 4.
2. Dr. Poonam Bawa, Editor- Pure Politics and women in India, Books Treasures, Jodhpur, First Edition 2011.
3. T Lavnya : Women Empowerment through Entrepreneurship – New Century Publication, New Delhi, 2010.
4. MamtaRao : Law Relating to Women and Children Eastern Book Company, 2ndEdn. 2008, Reprint 2010.
5. Shukla V.N. : Constitutional Law of India.
6. M.P. Jain : Constitutional Law of India
7. D.D. Basin : Introduction to the Constitutional of India.
8. The Universal Declaration of Human Rights, 1948.
9. The International Covenant on Civil and Political Rights, 1966.
10. The International Covenant on Economic, Social and Cultural Rights.
11. Convention on elimination of all forms of discrimination against women.

LL.M. 402H : INTERNATIONAL HUMANITARIAN LAW AND REFUGEE LAW

Unit-1 International Humanitarian Law (IHL)

Origin and development of IHL with contribution of Indian ethos
Sources of IHL
International armed conflict and International Humanitarian Law.
Doctrine of military necessity versus the principles of humanity
Role of IHL in non-international armed conflicts
National perspectives on IHL
Role of International Red Cross and NGOs

Unit-2 Implementation and Enforcement of IHL

Concept of Protecting Power
United Nations
International Criminal Court and Tribunals
Unilateralism humanitarian intervention versus state sovereignty
Humanitarian assistance
State obligations in times of peace and during armed conflicts-national implementation of the Geneva conventions. National Legislation with penal repression of violation of International Humanitarian Law.
Universal Jurisdiction for the breach of IHL.
Relation between International Humanitarian Law and Human Rights Law

Unit-3 International Humanitarian and Refugee Laws

History of refugee law : Definition and description
Meaning
Refugee for the purpose of United Nations
Development of Statutory definition and extension of mandate
Other regional and related instruments
Determination of Refugee Status: Under the Refugee Convention 1951 and Protocol of 1967
Problem of Refugees in non-armed conflict situations
(economic, environmental, natural disasters)
Protection to refugees under International law
Right of non-refoulement
Principle of non-refoulement
Non-refoulement and its relation with admission and non rejection at the frontier,
Extradition,
Expulsion
Illegal entry
Measures not amounting to non-refoulement.
Right to Asylum
UNHCR and Refugee protection

Unit-4 Loss and denial of Refugee status and its benefits

Voluntary acts of individual
Change of circumstances
Protection or assistance by other States or UN agencies
Undeserving Cases

Protection to Refugees in India
Protection without legislation and judicial determination: case law
Status of refugees in India under UNHCR

India and 1951 Convention
Solution to Refugee Problem
Resettlement in third country
Repatriation: voluntary or Forced
Local assimilation
Protective zones
International Law and Internally displaced Persons: UN Guiding Principles on
Internal displacement 1998
Rights and Duties of the International Community
Concept of burden sharing
Finding durable solutions: roots of refugee problem

Suggested Readings

- Independent Commission on International Humanitarian Issues, Modern Wars : the Humanitarian Challenge, Report presented by Mohammed Bedjaoni (London : Zed Books, 1986)
- International Committee of the Red Cross and Henry Dunant Institute, Bibliography of International Humanitarian Law Applicable in Armed Conflict (Geneva : International Committee of the Red Cross, 1987)
- International Committee for the Red Cross and international federation of Red Cross and Red Crescent Societies, Handbook of the International red Cross and red Crescent movement (Geneva, 13th ed., 1994.)
- International Committee for the Red cross, Fundamental Rules of International Humanitarian Law applicable in armed Conflict (1979).
- UN Centre for Human Rights, Human Rights and Refugees (Geneva : World Campaign for Human Rights, 1993)
- UN centre for Human Rights, international Humanitarian Law and Human Rights (Geneva, : World Campaign for Human Rights, 1992).
- UN Centre for Human Rights, Spectal issue on Human Rights and Humanitarian Law and Human Rights and Refugee law (New York, 1992).
- UNESCO, International Dimensions of Humanitarian Law (Paris : UNESCCO, 1988)
- UNHRC, Collection of International Instruments, and other Legal tests Concerning Refugee and Displaced Persons (UNHRC, 1995)
- UNHCR, The State of World's Refugee : A Humanitarian Agenda (1997-98).
- Abi-Saab, Rozemary, "The Principles of Humanitarian Law according to the international Court Justice'. International Review of the Red Cross, no. 259, 1987, pp. 367-78.
- Bankowski, I, ed. International Ethical Guidelines for Biomedical Research Involving Human Subjects (Geneva : WHO, 1993).
- 

- Bhagwati, P.N., "International Aspect of Rights to Life, peace and Development". Denver journal International Law and Policy vol. 19. no. 1, Fall 1990, pp. 67-76.
- Bond, B.E. Harrel, Imposing Aid emergency Assistance to Refugees (Oxford University Press, 1985).
- Carlier, Jean, "Who is a Refugee" A Comparative Case Law Study (The Hague: Kluwar law International, 1971).
- Cassese, Antonio, "Wards of national Liberation and Humanitarian Law", in Studies and Essays on International Humanitarian Law and Red Cross Principles in Honour of Jean Pictet (The Hague :MartinusNijhoff, 1984), pp. 313-24.
- Chakraborty, Manik, Human Rights and Refugees, Problems, Law and Practices (New Delhi : Deep and Deepa, 1998).
- Chhangani, R.C., "Discrimination of Refugees Status in Nigeria", Indian Journal of International Law, vol. 34, 1994, pp. 455-56.
- Chimni, B.S., International Refugee Law : A Reader (New Delhi : Sage Publications, 2000).

Suggested Readings

1. Schwargenberger : International Law Stevens & Sons, London
2. J.G. Starla : Introduction to International Law.
3. S. Oppenthain, International Law, A Treatise London.
4. R.S. Pathak & RP. Dhokaliya (Editors): International Law in Transition Lancers Books, New Delhi.
5. J.L. Brierly : The Law of Nations VI Edition, Clarendum Press,Oxford.
6. IAN Brownlie : Principles of Public International Law, IInd Edition, Clarendum Press, Oxford.
7. Dr. S.K. Kapoor :Internatioal Law & Human Rights. Central Law Agency, 20th Edition, 2016.
8. Hargue, Geneva Conventions relating to Warfare (Marine, Land and Aerial Warfare).

LL.M. 403H : SCIENCE, TECHNOLOGY AND HUMAN RIGHTS

- Unit 1: Inter relationship of Science. Technology and Human Rights Implication of Development of Science and Technology on human Rights, Rights to environment and the development of science and technology.
Rights to development and the advancement of science and technology, Rights to human health and impact of development in medical sciences
- Unit 2: Medicine and the Law : Organ transplantation, Experimentation on human beings, Euthanasia (mercy killing), Gene Therapy
- Unit 3: Issue of Human Rights Ethics in Scientific and technological Development : Sex determination test, Induced abortion, Reproductive Technology, Cloning, invitro fertilization, Artificial insemination.
Surrogate motherhood, Development in Information Technology and Human Rights
- Unit-4: Impact of Scientific and Technological Progress on Human Rights : Normative Response of the International Community, Right to life, Right to privacy, Right to physical integrity, Right to information. Right to benefit from scientific and technological progress, Right to adequate standard of living

SELECT BIBLIOGRAPHY

- Suresh T. Viswanathan : The Indian Cyber Law (2000)
The International Dimensions of Cyberspace Law (2000), UNESCO publication
D.P. Mittal : Law of Information Technology (Cyber Law) (2000) Kamenka, E.: Ideas and Ideologies Human rights (1978)
Akbar, M.J. : Riots after Riots (1988)
Baxi, U. (ed.) : Rights to be Human (1986)
Kadhavtirtha : Human Rights (1453)
Swarup, J.: Human Rights and Fundamental Freedoms (1975) Nagandra Singh : Human Rights and International Cooperation (1969)
Kashyap, S.C. : Human Rights and Parliament (1978)
Khare, S.C. : Human Rights and United Nations (1977)
Menon, I. (ed.) : Human Rights in International Law (1985)
Krishnalyer, V.R., Human Rights - A Judge's Miscellany (1995) Rama Jois M.: Human Rights: Bharatiya Values (1998)

Suggested Readings

- Suresh T. Viswanathan : The Indian Cyber Law (2000)
The International Dimensions of Cyberspace Law (2000), UNESCO publication
D.P. Mittal : Law of Information Technology (Cyber Law) (2000) Kamenka, E.: Ideas and Ideologies Human rights (1978)

Akbar, M.J. : Riots after Riots (1988)

Baxi, U. (ed.) : Rights to be Human (1986)

Kadhavtirtha : Human Rights (1453)

Swarup, J.: Human Rights and Fundamental Freedoms (1975) NagandraSingh : Human Rights and International Cooperation (1969)

Kashyap, S.C. : Human Rights and Parliament (1978)

Khare, S.C. : Human Rights and United Nations (1977)

Menon, I. (ed.) : Human Rights in International Law (1985)

Krishnalyer, V.R., Human Rights - A Judge's Miscellany (1995) Rama Jois M.: Human

Rights: Bharatiya Values (1998)

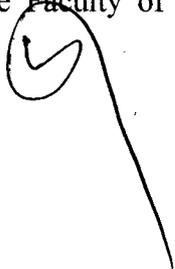


LL.M. 404H : DISSERTATION/THESIS (NON-DOCTRINAL) & VIVA-VOCE

Dissertation/Thesis (Non-Doctrinal) : 30 Marks (CCA)

Evaluation of Dissertation/Thesis and Viva Voce : 70 Marks
(50 Marks for evaluation of Dissertation/Thesis (Non-Doctrinal) and 20 Marks for Viva Voce Examination.)

The topic for preparation of dissertation will be allotted to the students by their supervisors. Viva voce will be conducted by two examiners appointed by the Head of the Department. First examiner will be appointed from among the teachers, who is not related to the University (excluding retired teachers) or affiliated colleges and second examiner will be appointed from among the regular faculty members of the Faculty of Law for affiliated colleges and Faculty of Law both.



Skill Course-IV - Criminology, Penology and Victimology

Unit-I	Criminology : Definition, Nature and Scope, Methods of studying criminal behaviour , Crime : Definition and Nature
Unit-II	classification of crime, organised and professional crime, Control of Crime : Police and Law Courts, Prevention of crime
Unit-III	Theories of punishment. Relationship between criminology and penology, History of punishment. Kinds of Punishment, White collar criminals, Female offenders, Juvenile Delinquency
Unit-IV	Victimology : Definition and types of the victim, Persons vulnerable to victimization 1.Elderly, 2. Children, 3. Female. Compensation to victims.

SUGGESTED READINGS

- Barnes, H.B. and Tectors : New Horizons in Criminology
Vold, G.S. : Theoretical Criminology
Pillai, K.S. : Criminology
R. Teft, Donald: Criminology
Edwin, H. Sutherland and Donald R. Grussey : Principles of Criminology
HormanMannhaim : Pioneers in Crimmology
Hon-Barren, Mays: Crime and the Social Structures
Ahmed Siddiqui : Criminology-Problems and Perspectives
Lord Pakenham : Causes of Crime
S. VenugopalaRao : Facts of Crime in India
Komm, R.R. and Mogorble : Law-Criminology and Penology Grunhut : Criminal Justice and Reconstruction
Madolm : Criminal Justice and Reconstruction
Gorden Rose: The Struggle for Penal Reform
LL.T. : Essays on Indian Penal Code
Ben-Penology: Old and New-Tagore Law Lectures
Clict : Conflicting Penal Theories in Statutory Criminal Law
Shamsul Huda : Tagore Law Lectures on Criminal Law
Lawburse : Crime, Its Causes and Remedies
Dequires : Modern Theories of Criminology
Gillin : Criminology and Penology
Beccaria : Crime and Punishment
The Criminal Procedure Code
The Constitution of India



IV - SEMESTER

GROUP C – CONSTITUTION & LEGAL ORDER

401C : CONSTITUTIONALISM: PLURALISM AND FEDERALISM

- Unit 1 : Constitutionalism : Authoritarianism-Dictatorship Democracy - Communism, Limited Government -concept limitations on government power, What is a constitution Development of a democratic government in England Historical evolution of constitutional government Conventions of constitutionalism - Law and convention_ Written Constitutions : USA, Canada, Australia, Switzerland South Africa and India, Separation of powers Montesquieu. Rule of Law: Concept and new horizon Marxist concept of constitutionalism, Dictatorship of if proletariat, Communist State from Stalin to Gorbache. Fundamental Rights : Human Rights, Judicial Review: European Court of Human Rights, Human Right: International Conventions, Limits and doctrine of domestic jurisdiction in international law
- Unit 2: Federalism : What is a federal government ? Difference: between confederation and federation, Conditions requisite for federalism. Patterns of federal government-US, Australia, Canada, India. Judicial review - for federal umpiring, New trends in federalism: Cooperative federalism, India - Central Control V. State Autonomy, Political factors influencing federalism, Plural aspects of Indian Federalism: Jammu & Kashmir, Punjab, Assam, Dynamic of Federalism
- Unit 3 : Pluralism : What is a pluralistic society? Ethnic. Linguistic, cultural. political pluralism, Individual rights - right to dissent, Freedom of speech and expression, Freedom of the press, Freedom of association, Rights to separateness, Freedom of religion, Rights of the religious and linguistic minorities, Compensatory discrimination for backward classes, Women-rights to equality and right to special protection, Scheduled Tribes, Distinct Identity - protection against exploitation - NSIS - Exclusion from Hindu Law, Uniform Civil Code: Non-State Law (NSLS) and State Law System- Problem of a Uniform Code v. Personal Laws - vertical federalism
- Unit 4 : Equality in Plural Society: Right of equality and reasonable classification, Prohibition of discrimination on ground of religion, caste, sex, language, abolition of untouchability, Secularism - constitutional principles, Tribal Groups and Equality, Pluralism and International Concerns, International Declaration of Human Rights, Conventions against genocide, Protection of religious, ethnic and linguistic minorities, state intervention for protection of human rights, Right of self-determination

SELECT BIBLIOGRAPHY

- Upendra Baxi : Law, Democracy and Human Rights, 5 Lokayan Bulletin 1, (1987)
VM. Dandekar : Unitary Elements in a Federal Constitution, 22 EPW 1865 (1988)
Rajeev Dhavan : The Press and the Constitutional Guarantee of Free Speech and Expression 28 JILI299 (1986)
M.A. Fazal : Drafting A British Bill of Rights, 27 JILI, 423 (1985) M.P. Jain : Indian Constitutional Law Wadhwa
H.M. Seervai:Constitutional Law of India (1993), 'Tripathi, Bombay

402 C : HUMAN RIGHTS

- Unit 1 : Panoramic View of Human Rights: Human Rights is Non Western Thought. Awareness of Human Rights during the nationalist movement, Universal Declaration of Human, Rights, Constituent Assembly and Part 111, drafting process. Subsequent developments in International Law and the Position in India (e.g.) Convention of Social discrimination. torture, gender discrimination, environment and the me human rights covenants), Fundamental Right: Jurisprudence as incorporating Directive Principles : The dichotomy of Fundamental Rights (F.R.) and Directive Principles (D.P.), The Interaction between F.R. and D.P. Resultant expansion of basic needs oriented human rights in India
- Unit 2 : Right not be subject to Torture, Inhuman or Cruel treatment Conceptions of torture, third-degree methods, Justification for it, Outlawry of torture at international and constitutional. law level, Incidence of torture in India, Judicial attitudes. Law Reform - proposed and pending, Minority Rights Conception of minorities, Scope of protection, The position of minority "Women" and their basic rights, Communal Riots as involving violation of rights, Rights t. development of Individuals and Nations : The UN Declaration on Right to Development, 1987. The need for constitutional and legal changes in India from human rights standpoint
- Unit 3: People's Participation in Protection and Promotion of Human Rights: Role of International NGOs, Amnesty International, Minority Rights Groups, International Bars Association. Law Asia, Contribution of these groups to protection and promotion of human rights in India. Development Agencies and Human Rights : Major international funding agencies and their operations in India. World Bank lending and resultant violation/ promotion human rights, Should development assistance be tied to observance of human rights (as embodied in various UN Declarations), Comparative Sources of Learning : EEC Jurisprudence. The Green Movement in Germany, The International Peace Movement, Models of Protection of the right of indigenous peoples : New Zealand (Maori) Australia, Aborigines and Canada (Indiana)
- Unit 4 : Freedoms : Free Press - Its role in protecting human rights, Rights of association, Right to due process of law, Access and Distributive justice, Independence of the Judiciary : Role of the Legal profession, Judicial appointments tenure of judges, Qualifications of judges, Separation of judiciary from executive. European convention of Human Rights: European Commission Court of Human Rights, Amnesty International, PUCL.PUDR, Citizens for Democracy, Minorities Commission. Human Rights Commission, Remedies against Violation of Human Rights

SELECT BIBLIOGRAPHY

- M.J. Akbar : Riots after Riots (1988)
U. Baxi (ed.) : The Rights to be Human (1986)
U. Baxi : The Crisis of the Indian Legal System (1982) Vikas Publishing House, New Delhi
Madhavtirtha : Human Rights (1953)
Nagendra Singh : Human (ights and International cooperation (1969)
S.C. Kashyap : Human Rights and Parliament (1978)
S.C. Khare : Human Rights and United Nations (1977)

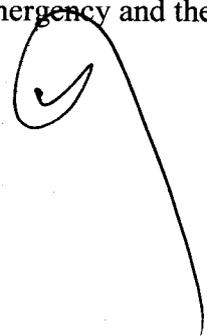


Upendra Baxi : Human Rights, Accountability and Development, Indian Journal of International Law, 279 (1978)

403 C : NATIONAL SECURITY, PUBLIC ORDER AND RULE OF LAW

- Unit 1 : Nation; Security, Public Orders and Rule of Law: Emergency Detention I England - Civil Liberties, Subjective satisfaction or objective assessment, Pre independence law, Preventive Detention and Indian Constitution : Article 22 of the Constitution, Preventive Detention and Safeguards, Declaration of Emergencies, 1962, 1965 and 1970 Emergencies, 1975 Emergency
- Unit 2: Exceptional Legislation: COFEPOSA and other legislation to curb economic offenders, TADA: the draconian Law - comments of NIIRC, Special courts and tribunals, Due process and special legislation
- Unit 3: Civil Liberties and Emergency : Article 19 : Meaning of Security of State, Meaning of Public Order, Suspension of Article 19 rights on declaration of emergency, President's Right to suspend right to move any court, Article 21-special importance-its non-suspendability. Suspendability-44th amendment
- Unit 4: Access to Courts and Emergency : Article 359 ups and downs of judicial review, Constitution (Forty-fourth) Amendment Act, 1978, Constitution (Fifty ninth) Amendment Act, 1988. Marital Law: Provisions in English Law, Provisions in the Constitution

SELECT BIBLIOGRAPHY

- G.O. Koppell : The Emergency, The Courts and Indian Democracy, 8 JILL, 287 (1966)
- H.M. Seervai: The Emergency, Future Safeguards and the habeas Corpus: A Criticism (1978)
- N.C. Chatterji and Parameshwar Rao: Emergency and the Law (1966)
- 

404 C : DISSERTATION/THESIS (NON-DOCTRINAL) & VIVA-VOCE

Dissertation/Thesis (Non-Doctrinal) : 30 Marks (CCA)

Evaluation of Dissertation/Thesis and Viva Voce : 70 Marks
(50 Marks for evaluation of Dissertation/Thesis (Non-Doctrinal) and 20 Marks for Viva Voce Examination.)

The topic for preparation of dissertation will be allotted to the students by their supervisors. Viva voce will be conducted by two examiners appointed by the Head of the Department. First examiner will be appointed from among the teachers, who is not related to the University (excluding retired teachers) or affiliated colleges and second examiner will be appointed from among the regular faculty members of the Faculty of Law for affiliated colleges and Faculty of Law both.



Skill Course-IV - Criminology, Penology and Victimology

Unit-I	Criminology : Definition, Nature and Scope, Methods of studying criminal behaviour , Crime : Definition and Nature
Unit-II	classification of crime, organised and professional crime, Control of Crime : Police and Law Courts, Prevention of crime
Unit-III	Theories of punishment. Relationship between criminology and penology, History of punishment. Kinds of Punishment, White collar criminals, Female offenders, Juvenile Delinquency
Unit-IV	Victimology : Definition and types of the victim, Persons vulnerable to victimization 1.Elderly, 2. Children, 3. Female. Compensation to victims.

SUGGESTED READINGS

- Barnes, H.B. and Tectors : New Horizons in Criminology
Vold, G.S. : Theoretical Criminology
Pillai, K.S. : Criminology
R. Teft, Donald: Criminology
Edwin, H. Sutherland and Donald R. Grussey : Principles of Criminology
HormanMannhaim : Pioneers in Crimmology
Hon-Barren, Mays: Crime and the Social Structures
Ahmed Siddiqui : Criminology-Problems and Perspectives
Lord Pakenham : Causes of Crime
S. VenugopalaRao : Facts of Crime in India
Komm, R.R. and Mogorble : Law-Criminology and Penology Grunhut : Criminal Justice and Reconstruction
Madolm : Criminal Justice and Reconstruction
Gorden Rose: The Struggle for Penal Reform
LL.T. : Essays on Indian Penal Code
Ben-Penology: Old and New-Tagore Law Lectures
Clict : Conflicting Penal Theories in Statutory Criminal Law
Shamsul Huda : Tagore Law Lectures on Criminal Law
Lawburse : Crime, Its Causes and Remedies
Dequires : Modern Theories of Criminology
Gillin : Criminology and Penology
Beccaria : Crime and Punishment
The Criminal Procedure Code
The Constitution of India
- 

SYLLABUS

As per Choice Based Credit System (CBCS)
Applicable for Regular Students

2019-2021

DEPARTMENT OF ACCOUNTING



JAI NARAIN VYAS UNIVERSITY

JODHPUR

MASTER OF COMMERCE (M.COM.) – ACCOUNTING

ACADEMIC SESSION 2019 – 2021

DEPARTMENT OF ACCOUNTING FACULTY OF COMMERCE & MANAGEMENT STUDIES, JAI NARAIN VYAS UNIVERSITY, JODHPUR

When Jodhpur University was established in 1962, there was single department of commerce and united faculty of commerce. Then for expansion in 1990 the Faculty of Commerce and Management Studies was divided into four departments: (1) Department of Accounting, (2) Business Finance and Economics, (3) Business Administration and (4) Management Studies. The rapid growth of Department of Accounting is reflected in its expansion with more than 18,000 students as passed out. It has produced more than 100 Ph.D. and equal number of students is registered for Ph.D. The department is running the following programmes: (1) M.Com. (Accounting), (2) B.Com. Honors (Accounting), (3) M.Phil. Accounting, (4) Post Graduate Diploma in Computer Accounting and Auditing, (5) Post Graduate Diploma in Tax Practice, (6) Post Graduate Diploma in Cost and Management Accounting.

The Department of Accounting focuses on integrated, interdisciplinary themes of fundamental importance to every aspect of decision making. The department and its expert faculty educate future business leaders. The department is dedicated to instilling the critical thinking necessary to succeed in business. A rich learning environment is enhanced by experiential learning opportunities.

RESEARCH PROGRAMME

The department provides facilities for full time M.Phil / Ph.D. / D.Lit. programmes in Accounting. The research programs in the department promote innovation; focus on activities that can make a difference to problems that matter to industry & society. These research programme continue to attract researchers of excellent caliber.

TEACHING FACULTY

The Department of Accounting is headed by Professor Jas Raj Bohra with rich teaching experience of over 36 years. The department is supported by Two Professors and four Assistant Professors. Our teaching faculties are widely acknowledged as leaders in research in varied Accounting and Finance Streams. The faculty members have authored various books, produce academic papers, and written an array of articles for general accounting and business publications. The research and consultancy are translated into a classroom experience that is theoretically grounded, evidence-based, practically and forward looking. The teaching team comprises of:

S.NO	NAME	DESIGNATION
1.	Dr. J.R. Bohra, Head	Professor
2.	Dr. V.K. Sharma	Professor
3.	Dr. Virendra Tater	Assistant Professor
4.	Dr. Anil Verma	Assistant Professor
5.	Mr. Yashpal Meena	Assistant Professor
6.	Dr. Mangu Ram	Assistant Professor

NEW INITIATIVES AND FUTURE VISION

From the session 2016-17, M. Com. course has been changed in Choice Based Credit System (CBCS) mode from the annual scheme examination, dividing the whole course into 4 semesters. During the semesterization of the courses, the overall structure has been improved to provide an insight of research in Accounting, Business Statistics, Auditing, Income Tax and interdisciplinary areas.

As per the new structure, there are 4 papers in each semester. In the third and fourth semester, there are 2 compulsory papers in each semester. As per the area of interest, the students are required to choose one optional group in the beginning of third semester. The structure for the groups has been designed with intent to provide advanced level specialization in the respective field.

Admission:

The minimum qualification for admission to M.Com. Course is B.Com. (10+2+3) degree. The details of eligibility conditions and admission procedure are given at University website. The admission will be done on the basis of merit calculated by the aggregate marks obtained at the B.Com. level including the marks awarded under the category (a) and (b) mentioned in the admission form [i.e. (a) benefit to the candidates who are resident of Rajasthan, and (b) benefit for candidates of J.N. Vyas University, Jodhpur]. Reservation of Scheduled Caste / Scheduled Tribes / Disabled / OBC / SBC and wards of University employees will be as per University rules.

Medium of Instruction:

The language medium of instructions and examination in each course shall be English and Hindi.

Name of the Program: Master of Commerce (M.Com.) in Accounting.

Program Structure:

The M.Com. Program is divided into two parts as under. Each Part will consist of two semesters.

		Semester	Semester
Part – I	First Year	Semester I	Semester II
Part – II	Second Year	Semester III	Semester IV

- There will be 6 lecture periods of 45 minutes each of teaching per week for each paper.
- Duration of End Semester Examination of each paper shall be 3 hours.
- Each paper will be of 100 marks out of which 70 marks shall be allocated for End Semester Examination (ESE) and 30 marks for Continuous Comprehensive Assessment (CCA).

The Schedule of papers prescribed for various semesters shall be as follows:

TYPE OF COURSE	COURSE CODE	TITLE OF THE COURSE	LECTURE- PER WEEK	NO. OF CREDITS	CCA	ESE	TOTAL
SEMESTER I							
Core course 1	Actg101	Advanced Accounting - I	6	6	30	70	100
Core course 2	Actg102	Advanced Cost Accounting	6	6	30	70	100
Core course 3	Actg103	Advanced Business	6	6	30	70	100

		Statistics					
Core course 4	Actg104	Taxation Law and Practice	6	6	30	70	100
Skill Course I	E- Filing Returns		2				
Total				24	120	280	400
SEMESTER II							
Core course 5	Actg201	Advanced Accounting - II	6	6	30	70	100
Core course 6	Actg202	Goods and Services Tax	6	6	30	70	100
Core course 7	Actg203	Operation Research	6	6	30	70	100
Core course 8	Actg204	Advanced Financial Management	6	6	30	70	100
Skill course II	Investing in Stock Markets		2				
Total				24	120	280	400
SEMESTER III							
Core course 9	Actg301	Financial Reporting and Analysis	6	6	30	70	100
Core course 10	Actg302	Advanced Auditing	6	6	30	70	100
Discipline Specific Elective 1	Elective Paper I (Both two papers of any one chosen group) 1. Cost Management 2. Cost Analysis and Control		6	6	30	70	100
Discipline Specific Elective 2	Elective Paper II (Both two papers of any one chosen group) 1. Tax Planning and Tax Management 2. Cost and Management Audit		6	6	30	70	100
Skill course III	Financial and Research Software Packages		2				
Total				24	120	280	400
SEMESTER IV							
Core course 11	Actg401	Research Methodology	6	6	30	70	100
Core course 12	Actg402	Strategic Financial Management	6	6	30	70	100
Discipline Specific Elective 3	Elective Paper III (Both two papers of any one chosen group. The papers will be from the same group as chosen in Semester III) 3. Cost accounting for Managerial Decision 4. Advanced Management Accounting		6	6	30	70	100
Discipline Specific Elective 4	Elective Paper IV (Both two papers of any one chosen group. The papers will be from the same group as		6	6	30	70	100

	chosen in Semester III) 3. Business Taxation 4. Auditing and Professional Ethics					
Skill course IV	Accounting and Auditing in Computer Environment	2				
Total			24	120	280	400

CCA – Continuous Comprehensive Assessment

ESE – End Semester Examination (University Examination)

Note:

- The elective group in the Semester IV will remain the same as the one selected in Semester III.
- Once a group has been selected, no change in selected group will be allowed later.

LIST OF OPTIONAL GROUPS:

The Department will announce in the beginning of the respective semester, the list of elective groups which will be offered during the semester depending upon the availability of faculty members and demand of electives.

GROUP A : COST AND MANAGEMENT ACCOUNTING

- Paper I : Cost Management
 Paper II : Cost Analysis and Control
 Paper III : Cost accounting for Managerial Decision
 Paper IV : Advanced Management Accounting

GROUP B : TAXATION AND AUDITING

- Paper I : Tax Planning and Tax Management
 Paper II : Cost and Management Audit
 Paper III : Business Taxation
 Paper IV : Auditing and Professional Ethics

LIST OF SKILL COURSES:

1. E-Filing Returns
2. Investing in Stock Markets
3. Financial and Research Software Packages
4. Accounting and Auditing in Computer Environment

Teaching Methods:

A combination of different teaching methods such as Lectures; Case Discussions; Seminars; Presentations, Individual and Group Exercises and Assignments etc will be used.

Teaching Faculties:

Faculty will be drawn from within the Jai Narain Vyas University of Jodhpur and outside subject to availability considering nature of the subject and availability of resources as the case may be. In addition, an attempt will be made to draw Professionals from Business, Industry and other institutions to share their experience with Participants.

Key Guidelines:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.

2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student needs to select **elective group** offered by the Department of Accounting as part of core programme during third and fourth semester. The elective group in the Semester IV will remain the same as the one selected in Semester III. Once a group has been selected, no change in selected group will be allowed later. **Each student has to complete four skill courses: two within the Department of Accounting (Semester I and III) and two from other Department within J.N.Vyas University or the Universities approved by J.N.Vyas University (Semester II and IV).**
3. **Course:** Usually referred to, as 'papers' is a component of a programme.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period of teaching (lecture or tutorial) or two periods of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.
12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/December and even semester from December/January to May.
Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May.
13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester.

Assessment:

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly:

- a. All internal assessments shall be open assessment system only and that are based on quizzes, term test and seminar.

- b. Attendance shall carry the prescribed marks in all papers.
- c. In each semester two out of four theoretical components of the University examinations shall be undertaken by external examiners from outside JNV University, who may be appointed by the competent authorities.

Grievances and Redressal Mechanism:

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head, Department of Accounting in writing the reason(s) for the complaint / appeal.
- b) The appeal will be assessed by the Head and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Head, Department of Accounting comprising of the senior most Professor from Department of Accounting and one teaching staff nominated by the Head and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	'O'	Outstanding	10
2	'A+'	Excellent	9
3	'A'	Very Good	8
4	'B+'	Good	7
5	'B'	Above Average	6
6	'C'	Average	5
7	'P'	Pass	4
8	'F'	Fail	0
9	'AB'	Absent	0

- i. A student obtaining Grade F in a paper shall be considered failed and will be required to reappear in the University End Semester examination.
- ii. For noncredit courses (Skill Courses) 'Satisfactory' or "Unsatisfactory" shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment:

- = and > 95 % marks Grade Point 10.0
- 90 to less than 95 % marks Grade Point 9.5
- 85 to less than 90 % marks Grade Point 9.0
- 80 to less than 85 % marks Grade Point 8.5
- 75 to less than 80 % marks Grade Point 8.0
- 70 to less than 75 % marks Grade Point 7.5
- 65 to less than 70 % marks Grade Point 7.0
- 60 to less than 65 % marks Grade Point 6.5
- 55 to less than 60 % marks Grade Point 6.0
- 50 to less than 55 % marks Grade Point 5.5
- 45 to less than 50 % marks Grade Point 5.0

40 to less than 45 % marks Grade Point 4.5
 35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,
 i.e.

$$\text{SGPA (Si)} = \frac{\sum (Ci \times Gi)}{\sum Ci}$$

Where Ci is the number of credits of the ith course and Gi is the grade point scored by the student in the ith course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,
 i.e.

$$\text{CGPA} = \frac{\sum (Ci \times Si)}{\sum Ci}$$

where Si is the SGPA of the ith semester and Ci is the total number of credits in that semester.

- iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	6	B	6	6 x 6 =36
2	Course 2	6	B+	7	6 X 7 =42
3	Course 3	6	B	6	6X 6 = 36
4	Course 4	6	O	10	6 X 10 =60
	Total	24			36+42+36+60=174

Thus, $\text{SGPA} = 174/24 = 7.25$

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	7.25	7.25	7	6.25

$$\text{CGPA} = \frac{(24 \times 7.25 + 24 \times 7.25 + 24 \times 7 + 24 \times 6.25)}{96}$$

$$666/98 = 6.94$$

*** Department of Accounting shall offer one skill course per semester from the list of skill courses approved for the Department.**

In view of the course content, the Department of Accounting has distributed the lecture as under per paper

- 6 (six lectures only per week) – For Theory Paper
- 2 (two lectures) - For Skill course

The Duration of the lecture shall be forty five minutes.

Course Evaluation (Evaluation of the Students):

All courses (Core/ Elective) involve an evaluation system of students that has the following two components:-

- (i) **Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
- (ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.

Continuous Comprehensive Assessment (CCA): This would have the following components:

- a. **Quizzes:** Two quizzes shall be arranged for each paper during the semester. The maximum marks for each quiz will be 5 for each quiz per paper.
- b. **Term Test:** One term test shall be arranged for each paper during the semester. The maximum marks for term test will be 10 for each paper.
- c. **Seminar:** Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 5. The seminar shall be completed prior to term test for all the papers.
- d. **Classroom Attendance –** Each student will have to attend a minimum of 75% Lectures. A student having less than 75% attendance (on the basis of cumulative attendance of all the course papers and individual course basis) will not be allowed to appear in the End-Semester Examination (ESE).
Attendance shall have 5 marks and will be awarded by following the system proposed below:

Those having greater than 75% attendance (condonation of shortage of attendance shall be governed in accordance with the provisions in the Act and Statute of the University vide Ordinance 78 to 80 as amended from time to time) will be awarded CCA marks as follows:-

75% to 80%	=	1 marks
80% to 85%	=	2 marks
85 to 90%	=	3 marks
90% to 95%	=	4 marks
> 95%	=	5 marks

Each student’s cumulative attendance shall be displayed in the Department Notice Board every month.
- e. CCA is based on open evaluation system without any bias to any student
- f. Any grievance received in the Department from student shall be placed before the **Grievance Redressal Committee** with adjudicated comments

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective Department shall declare the result as “Satisfactory” or “Non-Satisfactory”; each student need to get a minimum of three “Satisfactory” declaration for the course completion.

For the ESE:

ESE paper shall be divided into three parts that is **Part A, Part B and Part C.**

Part A

Ten short questions (Definitions, illustrations, functions, short explanations, etc; up to 25 words) for two marks each $10 \times 2 = 20$ marks; two questions from each Unit; no choice in this part.

20 marks

Part B

Five short answer (up to 250 words) type questions for four marks each. $5 \times 4 = 20$ marks; one question from each Unit with internal choice

20 marks

Part C

Five questions of long/explanatory answer (up to 500 words) type, one drawn from each Unit; student needs to answer any three; ten marks each; $3 \times 10 = 30$ marks

30 marks

70 marks

Qualifying for Next semester:

1. A student acquiring minimum of 40% in total of the Continuous Comprehensive Assessment (CCA) will be eligible to join next semester. The candidates who fail in CCA shall not be promoted to next semester.
2. A student who does not pass the examination (CCA + ESE) in any course(s) (or due to some reason as he/she has not been able to appear in the ESE, other conditions being fulfilled, and so is considered 'Fail'), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case maybe.
3. A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time, i.e. three additional chances for each paper; the student is ineligible for the Postgraduate degree in the subject.
4. Students failed in CCA: Any student declared "Not Eligible" by the department based on CCA in Semester I, II, III or IV and accordingly did not appear in ESE; can be readmitted as an additional student in that semester in the following year only. Such student need to deposit the annual university fee as prescribed for that academic year.
5. The consolidated mark-sheet of the M.Com. (Accounting) will be issued and the degree will be awarded only after completing all the requirements i.e. satisfactorily passing the Skill Papers, CCA and ESE. For grace-marks and revaluation, the rules and regulations declared by the University from time to time will be applicable.

Improvement Option:

Every student shall have the opportunity to improve Credit through University Examination only. Improvement opportunity for each paper is only with two additional chances; the credit obtained in improvement examination shall be final. There shall be no improvement opportunity in practical examinations.

Commencement of next Semester:

The Theory Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation.

**M.COM. ACCOUNTING
SESSION: 2019-2020**

**SEMESTER – I
PAPER NO. ACTG 101: ADVANCED ACCOUNTING – I**

Unit I	Accounting Theory – Classical or Normative theory, market-based theories and positive theory; concept of theory – role , demand, frame of reference v/s paradigm; theory development; levels, procedure, reasoning and approaches; theory of accounting policy choice , considerations, determinants
Unit II	Accounting for business combinations and Corporate Restructuring including Inter-Company holdings (Ind AS 103)
Unit III	Financial reporting in Inflationary economy, Segment Reporting, Related Party Disclosure, Robotic Accounting and Forensic Accounting
Unit IV	Green Accounting, Social Accounting, Hotel Accounting, Farm Accounting
Unit V	Earning Per Share (EPS) (Ind AS-33), Events after the reporting period (Ind AS-10), Leases (Ind AS-17), Fair Value Accounting (Ind AS113)

SUGGESTED READINGS

Badiboi: Advanced Accounting
Shukla , M.C. & Grewal, T.S. : Advanced Accounts
Gupta, R.L. : Advanced Accountancy
Jain and Narang: Advanced Accountancy
Chakraborty , H: Advanced Accountancy
Nambiar, M.C.K.: Advanced Accountancy
Agarwal, A.N.: The Higher Science of Accountancy
William Pickles: Accountancy
Agarwal, S.D. : Financial Accounting Advanced.
Study material of ICAI

SEMESTER – I
PAPER NO. ACTG 102: ADVANCED COST ACCOUNTING

Unit I	Overview of Cost Accounting: Cost terms and Concept, Cost Behavior, Pattern, Segregation, the component of fixed, variable, semi variable and step cost, classification of cost
Unit II	Costing of Service Sectors – determination of cost and prices of services of following sectors – transports, hospital, hotels, canteen /restaurants
Unit III	Process/Operation Costing – Process cost recording, process loss, abnormal gain and losses, equivalent production (FIFO and Average Cost Method) inter process profit, valuation of WIP, Joint Product and By-Product, Methods of Apportionment of joint cost
Unit IV	Integrated and non- integrated cost accounts (cost ledger or cost control accounts) reconciliation of cost and financial accounts
Unit V	Uniform costing and inter firm comparisons, reporting requisites of reports, interpretation and uses by management

SUGGESTED READING:

Prasad, N.K.: Principles and Practice of Cost Accounting
Horngren : Cost Accounting A Managerial Emphasis
Saxena V.K., Vashist C.D.: Cost Accounting, Sultan Chand and Sons, New Delhi
Bhattacharyya Asish K., Principles and Practice of Cost Accounting, Wheller Publishing, N. Delhi
Bhar, B.K. : Cost Accounting Method of Problems
Icwa of India : Break Even Concept and Practical Dimensions
Roychoudhary and Bhattacharya : Cost and Management Accountancy Methods and Techniques
Batty, J.: Management Accounting
Kisahr Ravi M. : Advanced Cost Acctg. and Cost System
Guru Prasad Murthy : Accounting For Management
Backer and Jacobson : Dicisional Phenomena and the Management Accountants
H. Maynand : Top Management Hand Book
Anthony, R.N. : Management Accounting : Text and Cases
Oswal, Srivastava and Bidawat : Advanced Costing Problems Shillinglow Gordon : Cost Accounting
Analysis and Control Mariz Curry and Frank : Cost Accounting
Neumner : Cost Accounting
Study material of ICAI

SEMESTER – I
PAPER NO. ACTG 103: ADVANCED BUSINESS STATISTICS

Unit I	Probability: Basic concepts and its types, Probability Rules, Probability under condition of statistical independence and statistical dependence, Bay's Theorem, Mathematical Expectations, Theoretical Frequency Distribution: Binomial, Poisson and Normal Distributions: Choosing the correct Probability Distribution
Unit II	Correlation and Regression Analysis: Simple, Multiple and Partial Correlation, Simple and Multiple Linear Regression, Association of Attributes: Class frequencies, Association between attributes, consistency of data and Methods
Unit III	Sampling and Sampling Distribution: Introduction to sampling and basic concepts for Hypothesis Testing Procedure and Estimation of parameter, Testing of Hypothesis and Estimation of Parameter for large samples (Attributes and Variables)
Unit IV	Testing of Hypothesis and estimation of parameter for small samples (Variables) with student's t-test, Z-transformation, F-test, Analysis of Variance (ANOVA) Test
Unit V	Statistical Quality Control - Concept, Control Charts - Mean, Standard Deviation and Range Chart, P-Chart, np-Chart and C-Chart ; Chi-Square Test for Independence and for Goodness of fit, Sign-test, One Sample Runs Test and Rank Correlation Test

SUGGESTED READINGS

Croxtan and Cowden : Applied General Statistics
Cochran , W.G. : Sampling Techniques
Elhance D.N. : Fundamentals of Statistics
Karmel, P.H.: Applied Statistics for Economics
Nagar , K.N. : Sankhyaki ke Mool Tatva
Gupta s.p. statistical methods
Sancheti and Kapoor : Statistical Method
Gupta, B.N.: Statistics
Sharma, K.R.: Research Methodology
Levin, Richard I: Statistics for Management
Clarks and Jorden: Intoduction to Business and Economics
Statistics, Southern Western, USA
Jean, D Gibbons: Non-Parametric Statistical Inference

SEMESTER – I
PAPER NO. ACTG 104: TAXATION LAW AND PRACTICE

Unit I	Income Tax Law, Scheme of Taxation, Important Concepts, Scope of Total Income and Residential Status, Income which do not form part of Total Income, Income under the Head "Salaries", Income from House Property
Unit II	Income under the Head: Profits and Gains of Business or Profession, Capital Gains, Income from other Sources, Clubbing of Income, Carry Forward and Set off of Losses, Deductions under Sections 80, Rebate and Relief
Unit III	Assessment: Individuals, Hindu Undivided Family (HUF), Firms and Association of Person/ Body of Individual (AOP/BOI)
Unit IV	Assessment of Companies, Co-operative Societies and Trusts
Unit V	Filing of Income Tax Return and Procedure of Assessment (Sections 139 to 154), Appeals and Revision, Penalties and Prosecutions, Income Tax Authorities, Taxation of Non-Residents, Settlement Commission, Double Taxation Avoidance Agreements (DTAA), Authorities on Advance Ruling

SUGGESTED READING

Singhania, V.K.: Direct Taxes Law and Practice, Taxman Publication (Pvt.) Ltd. Delhi
Dr. Ahuja Girish, Dr. Gupta Ravi: Direct Taxes, Law and Practice, Bharat Law House Pvt. Ltd. New Delhi
Sukumar Bhattacharya : Indian Income Tax Law and Practice , Wadhwa and Co. Agra, Nagpur
Srinivas, E.A. : Corporate Tax Planning, Tata McGraw Hill Publishing Co., Ltd.
Palkiwala , N.A. and Palkiwal, B.A. : Law and Practice of Income Tax , N.M. Tripathi , Bombay
Iyengar Sampat , A.C. : Law of Income Tax , Bharat Publishing House , Allied Publishers
Shah , D.D. : A Treatise on Tax Planning , N.M. Tripathi , Bombay
Lakhotia , A.N. : How to Save Income Tax by Tax Planning Asia Pub. House , Calcutta
Raina , H.P. : Corporate Taxation A Hand Book , Orient Law House , New Delhi/ Allahabad
Lakhotia , R.N. : Tax Management , A Pitmans Publication , Calcutta

SEMESTER – I
SKILL COURSE PAPER 1: E-FILING RETURNS

Unit I	Meaning of e-filing: difference between e-filing and regular filing of returns; benefits and limitation of e-filing, types of e-filing; e-filing process; relevant notifications
Unit II	Introduction to income tax – basic terminology, types of assessee, income taxable under different heads, basis of computation of total income and tax liability, deductions available from gross total income, PAN card, due date of filing of income tax return
Unit III	Instructions for filing out from ITR-1, ITR-2, ITR-3, ITR-4, ITR-5, ITR-6 introduction to income tax Portal; preparation of electronic return (practical workshop)
Unit IV	Introduction to the concept of TDS; provision regarding returns of TDS; types of forms for filing TDS return; practical workshop of e-filing of TDS returns
Unit V	Introduction to Goods and Services Tax: relevant notifications regarding e-filing of goods and services tax returns; steps for preparing goods and services tax return; practical workshop on e-filing of goods and services tax returns

SUGGESTED READINGS:

Ahuja, Girish., and Gupta, Ravi. Systematic Approach to Income Tax. Bharat Law House, Delhi.

Softwares:

Excel Utility available at incometaxindiafiling.gov.in

M.COM. ACCOUNTING
SESSION: 2019-2020
SEMESTER – II
PAPER NO. ACTG 201: ADVANCED ACCOUNTING - II

Unit I	Accounting for Employee Stock Option Plan (ESOP), Determination of ESOP, provision and related disclosure and settlement of ESOP, Buy Back of Securities, Equity Shares with Differential Rights
Unit II	Indian Accounting Standards: Revenue from contractions with customers (Ind AS 115); Provision, Contingent Liabilities and Contingent Assets (Ind AS-37), Accounting Policies, Changes in Accounting Estimates and Errors (Ind AS – 8)
Unit III	Valuation of Intangibles including Brand Valuation (Ind AS 38), Valuation of Shares and Goodwill, Valuation of Business
Unit IV	Government Accounting – General Principles, Role of Comptroller and Auditor General of India, Role of Public Accounts Committee, review of accounts, Government Accounting Standards Advisory Boards (GASAB), Government Accounting and Reporting
Unit V	Productivity Accounting, Share Based Payments (Ind AS 102) - meaning, equity settled transactions, transaction with employees and non employees, vesting conditions, determination of fair value of options

SUGGESTED READINGS

Badiboi: Advanced Accounting
Shukla , M.C. & Grewal, T.S. : Advanced Accounts
Gupta, R.L. : Advanced Accountancy
Jain and Narang: Advanced Accountancy
Chakraborty , H: Advanced Accountancy
Nambiar, M.C.K.: Advanced Accountancy
Agarwal, A.N.: The Higher Science of Accountancy
William Pickles: Accountancy
Agarwal, S.D. : Financial Accounting Advanced
Study material of ICAI

SEMESTER – II
PAPER NO. ACTG 202: GOODS AND SERVICE TAX

Unit I	Basic concept and Overview of GST, Definitions ,Threshold Exemption, Levy of GST, Meaning of Supplies, Non –Taxable Supplies, Time of Supply
Unit II	Registration Process of GST, Valuation in GST, Payment of Tax and Interest, Due Dates under GST Law , TDS scheme, Job Work under GST, Electronic Commerce and TCS
Unit III	Input tax credit – concept, eligibility and conditions for taking input tax credit, computation of GST liability, Concept of E-way bill, Procedure of Generation of E-way Bill
Unit IV	Maintenance of Records and Books, Types of Returns, Filing of returns and assessment, payment of tax, reverse charges and refund
Unit V	Administration of Goods and Services tax, demand, recovery, audit, inspection, search, seizure and arrest, penalties, prosecution and appeals, concept of GSTN

SUGGESTED READINGS:

The Central Goods and Services Tax Act, 2017.

CGST Rules 2017 – Central Board of Excise and Customs.

Rajasthan GST Act, 2017.

The Integrated Goods and Services Tax Act, 2017.

GST Ready Reckoner by CA. Keshav R. Garg, Bharat Law House, Delhi.

GST one nation one tax one market by LVR Prasad and GJ Kiran kumar.

GST Ready Reckoner By V.S. Datay.

GST and Customs Law by Niti Bhasin and Sameer Lama, Taxman Publications

SEMESTER – II
PAPER NO. ACTG 203: OPERATION RESEARCH

Unit I	Fundamental of Decision Making: Types of decisions; steps in decision making; different type of methods and their uses; model building steps. Linear Equations: Solution by reduction method and Cramer's Rule
Unit II	Linear Programming: Basic concept, mathematical formulation and application; solution of LP problems using graphical, simplex and two phase method; duality in Linear Programming, Game theory, Sensitivity Analysis
Unit III	Transportation and Assignments: Formulation, Solving Transportation and Assignment Problems, Decision Theory, Replacement Problems
Unit IV	Project Scheduling: Concept of PERT and CPM Techniques, determining critical paths, calculation of Floats, time-cost trade off; resource allocation and resource leveling, Queuing Theory, Simulation Problem
Unit V	Operation with Interest rates: Simple Interest, Compound Interest, Flat rate and Effective Rate of Interest, Present Value of Money, Annuity, Simple applications of present value concept to leasing, EMI calculation and amortization, Investment and Risk analysis

SUGGESTED READINGS

Khandelwal, Gupta, Ahmad, Sharma: Operation Research; Ajmera Book Company, Jaipur
Leonard, W. Hein : the Quantitative Approaches to Managerial Decisions
Sesieni, Mauriee , Yespan, Arthur and Friedman, Lawrence : Operation Research Method and Problems
Churchman, C.W. Ackoff, R.L. and Asnoff, E.L. : Introduction to Operation Research
Miller, R.W. : Schedule , Cost and Profit With Pert
Loomba, N. Paul : Linear Programming
Gupta , P.K. and Hira, D.S. : Operations Research : an Introduction (Published by Sultan Chand and Company Ltd. New Delhi)
Ravi M Kishore : Financial Management
Prasanna Chandra : Financial Management Theory and Practice

SEMESTER – II
PAPER NO. ACTG 204: ADVANCED FINANCIAL MANAGEMENT

Unit I	Environment of Business Finance : modern approach to financial management, significance of financial management, financial planning and decision making process, financial sector reforms, techniques of financial management
Unit II	Investment Alternatives: Choice Galore, Investment Attributes, Approaches to Investment Decision Making, Proverbial Investment Wisdom. Special Problems Relating to Financing and Management of Small and Medium Enterprises
Unit III	Introduction to Capital Market in India including Depositories, Introduction to Capital Market Instruments Including Options (Option Pricing Theory), Futures and Derivatives; Risk Return Relationship, Financial services in India including merchant banking, Portfolio Management; Credit Rating; Consumer Finance Mutual Fund; Operations and Regulations, Venture Capital
Unit IV	Foreign collaborations and joint ventures, Introduction to International Financial Management including Raising of Capital Abroad (ADRs, GDRs, ECB), Foreign exchange exposure and risk management, foreign exchange markets and dealing therein
Unit V	Money Markets and their Operations, Special Feature of Financial Management in Public Sector Undertakings

SUGGESTED READING

Giotman, L.J. : Fundamental of Financial Management
Pandey, I M. : Financial Management
Khan, M.Y. and Jain. P.K. : Financial Management
Venhorne J.C. : Financial Management and Policy
Ezra Soloman : Financial Management
Agarwal, M.D : Vitiya Prabandh
Kulshreshtha, R.S. : Vitiya Prabandh
Kulkarni, P.V. : Financial Management
Study material of ICAI

SEMESTER – II
SKILL COURSE PAPER NO II: INVESTING IN STOCK MARKETS

Unit I	Type of investment – Equity Shares, IPO/FPO, Bonds, Indian Securities Market: the market participants, trading of securities, Security market indices, sources of financial information, Role of Stock Exchange, Stock exchanges in India: BSE, NSE, MCX, Buying and selling of stocks: using brokerage and analysis recommendation, Use of limit order and market order
Unit II	Online trading of stocks, Understanding stock quotations, types and placing or order, Risk: its valuation and mitigation, Analysis of the company: financial characteristics (as explained by ratio analysis, future prospects of the company, assessing quality of management using financial and non-financial data, balance sheet of quarterly results, cash flows and capital structure)
Unit III	Comparative analysis of companies, Stock valuations: using ratios like PE ratio, PEG ratio, Price Revenue ratio, Use of historic prices, simple moving average, basic and advanced interactive charts, Examining the shareholding pattern of company, Pitfalls to avoid while investing: high P/E stocks, low price stocks, stop loss, excess averaging
Unit IV	Background of Mutual Funds: Advantages of investing in Mutual Funds, Motives of mutual fund investments, Net Asset Value, Types of Mutual funds: Open ended, close ended, equity, debt, hybrid, money market, Load vs. no load funds, Factors affecting choice of mutual funds, CRISIL Mutual fund Ranking and its Usage
Unit V	Future, Options, trading in futures and options, Understanding stock market quotes on futures and options, Types of orders, Put and Call options: How Put and Call options work, Commodities, Derivatives of commodities, trading of commodity derivatives on MCX, Currency derivatives and its trading

SUGGESTED READINGS:

Gitman and Joehnk. Fundamentals of Investing. Pearson.

Madura. Jeff. Personal finance. Pearson.

Chandra. Prasanna. Investment Analysis and Portfolio Management. Tata McGraw Hill.

Damodaran, Aswath, Investment Valuation: Tool and Techniques for Determining the Value of Any Asset. Wiley Finance

Bodie, Alex, Marcus and Mohanty. Investments. McGraw Hill Publishing Co.

M.COM. ACCOUNTING
SESSION: 2020-2021
SEMESTER III
PAPER NO. ACTG 301: FINANCIAL REPORTING AND ANALYSIS

Unit I	Introduction of Indian Accounting Standards(Ind AS) and International Financial Reporting Standards(IFRS), Comparative study of Ind AS and IFRS. Relative view of Ind AS v/s IFRS, Recent Developments in Financial Reporting System
Unit II	Corporate Financial Reporting – Issues and Problems with Special Reference to Published Financial Standards, Value Added Statement, market value added and share holders value added
Unit III	Reporting of Financial Statements: Meaning, recognition, de-recognition and offset, compound financial instruments, measurement of financial instruments
Unit IV	Financial Reporting of Mutual Funds, Non Banking Finance Companies, Merchant Bankers, Stock and Commodity Market Intermediaries
Unit V	Consolidated Financial Statement (Ind AS 110) : Concept of Group, purposes of consolidated financial statements, consolidated procedures, minority interest, goodwill, treatment of pre-acquisition profit and post acquisition profit and concept of fair value at the time of acquisition, consolidation with two or more subsidiaries, consolidation with foreign subsidiary impact on group financial statement at the point of acquisition, treatment of investment in associates in consolidated financial statements

SUGGESTED READINGS

Badiboi: Advanced Accounting
Shukla , M.C. & Grewal, T.S. : Advanced Accounts
Gupta, R.L. : Advanced Accountancy
Jain and Narang: Advanced Accountancy
Chakraborty , H: Advanced Accountancy
Nambiar, M.C.K.: Advanced Accountancy
Agarwal, A.N.: The Higher Science of Accountancy
William Pickles: Accountancy
Agarwal, S.D. : Financial Accounting Advanced
Study material of ICAI

SEMESTER III
PAPER NO. ACTG 302: ADVANCED AUDITING

- Unit I Concept and philosophy of auditing and its importance in present business scenario, internal control system- Review and Evaluation of Internal control System, Efficacy of Accounting Information System, flow charting, Reporting to clients on Internal Control weakness, Planning and Development of Audit Programme and audit techniques
- Unit II Company Audit : Auditor's appointment, functions and duties, Planning the Company Audit with special reference to Managerial Remuneration, Loans to Companies under same management, Inter-company Investment, Issue of Bonus Shares, Contingencies and events occurring after Balance sheet date and prior- period items. Treatment for Excise duties, Ramification of accounting policy Changes, Indian Accounting Standard
- Unit III Audit of Special entities such as Banks, Insurance Companies and Hotels, Non-profit-organizations like clubs, trusts, educational institutions, Co-operative Societies. Tax Audit
- Unit IV Investigation and Due Diligence: Concept and types, Audit standards and Accounting standards, SA, Indian Accounting Standards (IND ASs), Salient features of Sarbanes Act with reference to reporting on internal control.
- Unit V Auditor's Report : Contents, Qualifications and Notes, Distinction between Audit Report and Audit Certificate Report under Company Audit Report Order (CARO-2016), Companies (Auditor's Report) Order 2016, Audit Committee and Corporate Governance.

SUGGESTED READINGS

Gupta, Kamal : Contemporary Auditing , Tata McGraw Hill Publishing Co. Ltd. Delhi
Ghatalia, S.V. : Spicer and Pegler's Practical Auditing, Allied Publishers
Tandon, B.N. : A Hand Book of Practical Auditing, S. Chand and Co., Delhi
Sharma, T.R. : Higher Auditing, Sahitya Bhawan, Agra
Publication of the Institutes of Chartered Accountants of India Relating to Audit Practices
Study material of ICAI

SEMESTER III
DISCIPLINE SPECIFIC ELECTIVE 1 PAPER NO. 1: COST MANAGEMENT

Unit I	Introduction of cost management, Cost Control and Cost Regulation, Basis, Process, Methods and Techniques of Cost Reduction, Target Costing, Balance Score Card , and Value Chain Analysis
Unit II	Life Cycle Costing, Kaizen Costing
Unit III	Throughput Costing, Business Process Re-engineering
Unit IV	Back Flush Accounting, Lean Accounting, Socio Economics Costing
Unit V	Activity Based Costing (ABC) - Concept, Characteristics, Allocation of Overheads, Kaplan and Cooper's Approach, Cost Drivers and Cost Pools, Merits and Demerits of ABC

SUGGESTED READINGS

Charles T. Horngren and George Foster, Cost Accounting A Managerial Emphasis, Prentice Hall of India, New Delhi.

N.D. Vohra, Quantitative Techniques in Management, Tata McGraw Hill Book Co. Ltd.

Ashish K. Bhattacharya, Principles and Practices of Cost Accounting, A. H. Wheeler publisher

M.Y.Khan and Prof. P.K.Jain, Cost Accounting and Financial Management,

Maheshwari S.N., Cost and Management Accounting

Study material of ICAI

SEMESTER III
DISCIPLINE SPECIFIC ELECTIVE 1 PAPER NO. 2: COST ANALYSIS AND CONTROL

Unit I	Cost Accounting an overview, Techniques of cost Accounting, cost analysis for various function of management
Unit II	Just-In-Time (JIT) - Introduction, benefits use of JIT in Measuring the Performance, Enterprise Resource Planning (ERP) - its applications in strategic cost management - Bench Marking
Unit III	Total Quality Management- Basics, Stages, Principals, Control, Corrective Actions, Problem identification, Ranking Analysis, Innovation, Solution and Evaluation (PRAISE-steps), Problems, Implementation, Quality Costs, PARETO Analysis
Unit IV	Budgetary Control – Introduction, Meaning and Definition of Budgetary Control, Objectives, Advantages and Disadvantages of Budgetary Control, Types of Budget, Responsibility Accounting, Performance Budgeting, Zero Base Budgeting (ZBB)
Unit V	Statistical Tools in Strategies Decision Making, Cost Information and Cost Analysis for Managerial Decisions, Research and Development Costs, Learning Curve

SUGGESTED READING

Bhabatosh Banerjee : Cost Accounting , World Press. P. Ltd.
Prasad, N.K. : Principles, and Practice of Cost Accounting, Book Syndicate Pvt. Ltd.
Bhar, B.K. : Cost Accounting Methods and Problems, Academic Publishers
Horngren, C. T.: Cost Accounting: A Managerial Emphasis Prentice Hall of India
Kamal Gupta : Contemporary Audit , Tata McGraw Hill and Co. Pvt. Ltd.
Rose, T.G. : Management Audit, Gee and Co. Ltd.
Tikhe J. : Cost Audit and Management Audit, Bangalore Chapter of Cost Accountants
Mariz, A. and Usry, M.F.: Cost Accounting Planning and Control
Lawrence, D. Schall and Charlew, W. Haley: Introduction to Financial Management , Tata Mcgraw Hill Pub. Co. Ltd.
Keshu, Ravi M. : Advanced Cost Accounting Cost System Taxation
Study material of ICAI

SEMESTER III

DISCIPLINE SPECIFIC ELECTIVE 2 PAPER NO 1: TAX PLANNING AND TAX MANAGEMENT

Unit I	Recognised Methods of Tax Planning, Problems of Tax Planning and Tax Management
Unit II	Tax Planning for Individuals and Hindu Undivided Family (H.U.F.)
Unit III	Tax Planning For Non-corporate entities, Partnership firms and Association of person
Unit IV	Corporate Tax Planning - Tax Planning for Corporate entities, Public and Private Companies, Tax incentives, Tax incentives for Industrial growth, tax holidays and other reliefs and rebates
Unit V	Assessment of Charitable Trust, Assessment of Non-Resident, Special procedure for assessment of search cases, Application of Computer technique in Tax Management

SUGGESTED READINGS

Singhania, V.K. : Direct Taxes Law and Practice, Taxman Publications (Pvt.) Ltd., Delhi
Sukumar Bhattacharya : Indian Income Tax Law and Practice, Wadhwa and Co., Agra Nagpur
Srinivas, E.A.: Corporate Tax Planning, Tata Mcgraw Hill Publishing Co. Ltd.
Palkiwala, N.A. and Palkiwala, B.A.: Law and Practice of Income Tax, N M. Tripathi Bombay
Iyengar Sampat, A.C.: Law of Income Tax, Bharat Publishing House Allied Publishers
Shah, D.D. : A Treatise on Tax Planning N.M. Tripathi , Bombay
Lakhotia, R.U. : How to Save Income Tax by Tax Planning , Asia Pub. House, Calcutta
Raina, H.P. : Corporate Taxation A Hand Book , Orient Law House , New Delhi/ Allahabad
Lakhotia , R.N. : Tax Management , A Pitmans Publication, Calcutta
Study material of ICAI

SEMESTER III
DISCIPLINE SPECIFIC ELECTIVE 2 PAPER NO. 2: COST AND MANAGEMENT AUDIT

Unit I	Cost Audit – Nature, Scope, Objectives and Advantages, Companies (Cost Records and Audit) Rules, (2014)(with amendment rules), Professional Ethics, Misconduct, Offences and Penalties
Unit II	Cost audit Programme, Cost Accounting Record Rules and Verification
Unit III	Cost Accounting Standards (format of Cost Audit Report-XBRL, Salient Features) Cost Audit Reports and its Review
Unit IV	Management Reporting issues under Cost Audit- Performance, Appraisal Report. Management Audit: Meaning, Nature, Scope, Need for Management Audit and Reporting under Management Audit, Energy Audit, Efficiency Audit, Propriety Audit and Systems Audit
Unit V	Evaluation of Corporate Image - Corporate Development Audit, Corporate Strategy Audit, Impact of Environmental Pollution, Social Cost Benefit Analysis, Corporate Social Audit and Safety Audit

SUGGESTED READINGS

Berry , J.P. : How A Company Should Plan for Cost Audit, the Cost and Management Consultancy Bureas.

Gupta, Kamal: contemporary Audit, Teta Megraw Hill & Co. Pvt. Ltd.

Rose, T.G. Management Audit, Gee & Co. Publishers Ltd.

Tikhe, J.G. : Cost Audit and Manageemnt Audit, Ramesh Book Depot. , Jaipur

Khandelwal, M.C.: Prabandhkiya Ankekshan, Ramesh Book Depot., Jaipur.

Choudhary, D: Management Audit and Cost Audit

Ramnathan: Cost and Management Audit, Tata Megraw Hill, New Delhi

Study material of ICAI

SEMESTER III
SKILL COURSE PAPER NO. 3: FINANCIAL AND RESEARCH SOFTWARE PACKAGES

Unit I	Fundamentals of Accounting software, Vouchers Entry and Generation of Reports, and Security Controls, Export, import and splitting of Data and Printing Reports
Unit II	Advanced Accounting and inventory in Accounting Software, Job Costing and Job order Processing, Tax Deducted at Sources (TDS)
Unit III	Reading external raw data, Reading more complicated raw data - a hierarchical data set, LEAVE statement. Conditional input statements, Common errors, Saving a data file, Reading a data file, Another way to read a hierarchical file, Matching (merging) data files, More on errors and error detection, Using a real social science data set. Matching with renaming, Calculating new variables using Do Repeats, Selecting a subset of cases
Unit IV	Defining variables, data entry, descriptive analysis of data, cross tabs, frequency tables, graphic representation of data, correlation, regression (simple and multiple), chi –square test and other data analysis techniques (factor, cluster, discernment conjoint etc.), using software
Unit V	Running a program in batch mode, Making tables for publication, Using real case study and analysis and present the collected data using appropriate software

SUGGESTED READINGS:

Tally ERP 9 in Simple Steps, by kogent learning Solutions Inc.

Computerised Accounting using Tally. ERP 9 by Tally Education Pvt. Ltd.

Spss in Simple Steps, by Kiran Pandya, Smruti Bulsari, Sanjay Sinha. (Kogent Learning Solutions Inc.)

Dr. Gupta S.L., Gupta Hitesh, SPSS 17.0 for researches, Book House Pvt. Ltd.

George Darren, Mallery Paul, SPSS for windows step by step, Pearson Publication.

Handbook on SPSS for Research work BY Anil Kumar Mishra, (Himalaya Publishing House)

M.COM. ACCOUNTING
SESSION : 2020-2021
SEMESTER IV
PAPER NO. ACTG 401: RESEARCH METHODOLOGY

Unit I	Research : Meaning , Objectives, Importance and Types of Research, Meaning and Concept of Research Methodology, Research Process, Review of Literature, Preparation of Proposal, Ethics in Research, Problems Faced by Researchers in India
Unit II	Hypothesis - Meaning and Formulation, Investigation - Census v/s Sample, Research Design – Meaning, Types, Essentials, Sample and Analysis Design. Data - Types, Methods of Collection - Observation, Interview, Schedules, Questionnaire; Survey - Meaning, Procedure; Case Study - Meaning, Assumptions, Procedure, Merits and limitations
Unit III	Communication and Evaluation of Research - Report Writing and the Writing of Research Papers, Presentation of Research Proposals, Evaluation of Research Report, Reference Section
Unit IV	Data Analysis Tools - Use of Spreadsheet, use of SPSS – Frequencies, Bar Chart, Histogram, Descriptive statistics, cross tabulation and Chi-square test, correlation, regression, t-test, ANOVA, Non parametric tests
Unit V	Citation Analysis Tools, Citation and Anti Plagiarism Tools, Online Data Search

SUGGESTED READINGS

Pauline V. Young : Scientific Social Surveys and Research Prentice Hall of India
Kothari, C.R. : Research Methodology : Methods and Techniques, Wiley Eastern Ltd.
Sadhu, An. and Amarjit Singh : Methodogy in Social Sciences, Himalaya Pub. House
Wilkinson and Bhandarkar : Methodology and Techniques
of Social Research Himalaya Pub. House
Sharma, B.A.V. Et Al. : Research Methods in Social Sciences Sterling Publishers
Moser, C.A. : Survey Methods in Social Investigation , Elbs, Heinmann
Campbell: form and Style in Thesis Writing , William Gileo Satpal Ruhela : Sarvekshan Anusandhan
aur Sankhyiki, Vikas Publishing
Elhance D.N. : Fundamentals of Statistics, Kitab Mahal, Allahabad
Mukherji, Ravindra Nath : Samajik Sarvekshan Va Shodh, Sarswati Sadan , Delhi
Kapil, H.K. : Anusandhan Vidhiyan, Harprasad Bhargava, Agra
Trivedi, R.N. and Shukla, D.P. : Research Methodology Hindi Ed, College Book Depot, Jaipur
Croxtton, Cowdan and Klein : Applied General Statistics Festinger and Katz (Ed.) : Research Method
in Behavioural Science, Amerined Publishing
Goode and Hatt : Methods in Social Research, Mcgraw Hill
Sharma K.R. : Research Methodology, Natural Publishing, New Delhi

SEMESTER IV
PAPER NO. ACTG 402: STRATEGIC FINANCIAL MANAGEMENT

Unit I	Investment Decisions, Project Planning and Control - Estimation of project cash flow, Relevant cost analysis for projects, Project appraisal Methods – DCF and Non DCF Techniques, Capital Rationing, Social cost benefit analysis
Unit II	Leasing Decisions - Lease Financing, Evaluation of Lease v/s Buy Options, Break-Even Lease, rental determination, Cross Boarder leasing, Sale and Lease Back
Unit III	Instruments in Financial Market - Money Market Instruments – Call money, Treasury Bills, Commercial Bills, Commercial paper, Certificate of Deposits, Repo, Reverse Repo and Promissory Notes, Government Securities, Bonds, Valuation of Bonds, Price Yield Relationship, Hedge Funds; Mutual Funds – Computation of NAV and Evaluation of Mutual Fund's Performance
Unit IV	Capital Markets - Primary and Secondary markets and its instruments, Optionally convertible debentures, Deep discount bonds, Clearing house operations, Dematerialization, Re-materialization and Depository system, Initial Public Offering (IPO) / Follow on Public Offer (FPO) , Book Building , Insider Trading; Credit Rating – Credit rating agencies in India
Unit V	Social, Environmental and Economic Responsibilities of Business - National Voluntary Guidelines on Social, Environmental and Economic Responsibilities of Business; Corporate Social Responsibility(CSR) – Nature of Activities, Evaluation of CSR Project

SUGGESTED READINGS:

Giotman, L.J: Fundamental of Financial Management.
Pandey, I.M. : Financial Management
Khan, M.Y. & Jain P.K. : Financial Management
Venhorne J.C: Financial Management and Policy
Ezra Soloman: Financial Management
Agarwal, M.D. : Vitiya Prabandh
Kulshreshtha, R.S. : Vitiya Prabandh
Kulkarni, P.V. : Financial Management
Study material of ICAI

SEMESTER IV
DISCIPLINE SPECIFIC ELECTIVE 3
PAPER NO. 3 COST ACCOUNTING FOR MANAGERIAL DECISION

Unit I	Decisions Based on Differential Cost, Relevant Cost Analysis, Statistical and other Applications for Cost Control
Unit II	Pricing Strategies and Pricing Decisions; Product and Production Decisions
Unit III	Decision Relating to Factors of Production, Marketing Cost Analysis and Decision Making
Unit IV	Responsibility Accounting and Profit Centre, Learning Curve Theory
Unit V	Cost of Knowledge based Assets, Accounting of Certain Overheads, Cost Reports for Managerial Needs

SUGGESTED/FURTHER READINGS

Prasad, N.K. : Principles and Practice of Cost Accounting

Horngren : Cost Accounting A Managerial Emphasis

Saxena V.K. , Vashist C.D.: Cost Accounting, Sultan Chand & Sons, New Delhi

Bhattacharyya Asish K., Principles & Practice of Cost Accounting , Wheller publishing, N. Delhi

Bhar, B.K.: Cost Accounting Method of Problems

Study material of ICAI

DISCIPLINE SPECIFIC ELECTIVE 3
PAPER NO 4 ADVANCED MANAGEMENT ACCOUNTING

Unit I	Meaning and Concept of Marginal Costing: Break Even Analysis and Differential Costing; Valuation of stock under marginal costing and absorption costing; Production decisions based on marginal costing and Differential Costing
Unit II	Pricing Decisions based on marginal costing and differential costing; Marketing decision and other decision Such as own or lease, repair or replace, now or Later, Shut down or Continue etc., based on marginal costing and differential costing
Unit III	Transfer Pricing - objectives, methods, advantages and disadvantage, criteria for setting transfer prices, transfer price in different situations, situation causing conflicts and resolving the conflicts; Relevant Cost Analysis - relevant cost, irrelevant cost - Sunk or Historical cost, committed cost, absorbed cost, situations when fixed cost become relevant for decision - making and its related implications
Unit IV	Standard Costing- Introduction, meaning and definition of standard cost and standard costing; variance analysis- material, labour, overhead and sales variance
Unit V	Working Capital Management - estimation of working capital requirements, inventory management, receivables management, cash management, management of retained earnings and dividend decisions

SUGGESTED READINGS:

Johnson and Kaplan: 'Relevance Lost: The Rise and Fall of Management Accounting'
William L Ferrara: 'Cost/Management Accounting: The 21st Century Paradigm.'
'Tomorrow's Company: The Role of Business in Changing World' a Report of the Society of Encouragement of Arts, Manufactures and Commerce, London, 1995.
Information for Better Markets – Institute of Chartered Accountants of England of Wales.

SEMESTER IV
DISCIPLINE SPECIFIC ELECTIVE 4 PAPER NO 3: BUSINESS TAXATION

Unit I	Custom Act : Basic concepts of customs law, Territorial waters, high seas; Types of custom duties – Basic, Countervailing and Anti – Dumping Duty, Protective duty, Safeguard Duty; Classification of goods; Warehousing – special provisions of warehousing; Valuation, Customs Procedures, Import and Export procedures ,Baggage, Exemptions from custom duty
Unit II	FEMA : Definition, Authorised person, Provision of Bank Account in Indian Rupee, Foreign Currency Bank A/c, Restrictions, Realization, repatriation and surrender of Foreign Exchange, Capital A/c transaction GDR/ADR/FCCB, Different types of forms used in FEMA
Unit III	Black Money Act – 2015 : Introduction to Black Money Act and Highlights of Black Money Act
Unit IV	GST: Tax Invoice, Credit & Debit notes, Administration under GST, GST compliance rating, Anti-Profitteering Measure, Transitional Provisions, Migration of existing taxpayers to GST; Advance Ruling, Appeals & Revision, Offences & Penalties
Unit V	IGST Act 2017 – Definitions, Levy and Collection Tax, Determination of Nature of Supply, Place of supply of Goods and Services, Zero rated Supply, Apportionment of Tax and Settlement of Funds

SUGGESTED READINGS:

Singhania, Vinod K. and Singhania, Monica. Students' Guide to Indirect Taxes. Delhi: Taxmann Publications Pvt. Ltd.

Datey, V.S. Indirect Tax Law and practice. Delhi Taxmann Publications Pvt. Ltd.

Kumar, Sanjeev. Systematic Approach to Indirect Taxes.

Gupta, S.S. Service Tax – How to meet your obligation. Delhi: Taxmann Publications Pvt. Ltd.

Ahuja. Girish and Gupta, Dr. Ravi. Indirect Taxes. Flair publication Pvt. Ltd.

Systematic Approach to Income Tax and Central Sales Tax Girish Ahuja and Ravi Gupta, Bharat Law House

The Central Goods and Services Tax Act, 2017.

CGST Rules 2017 – Central Board of Excise and Customs.

Rajasthan GST Act, 2017.

The Integrated Goods and Services Tax Act, 2017.

GST Ready Reckoner by CA. Keshav R. Garg, Bharat Law House, Delhi.

GST one nation one tax one market by LVR Prasad and GJ Kiran kumar.

GST Ready Reckoner By V.S. Datay.

SEMESTER IV
DISCIPLINE SPECIFIC ELECTIVE 4 PAPER NO 4: AUDITING AND PROFESSIONAL ETHICS

Unit I	Auditing Standards, Statement and Guidance Notes - Auditing and Assurance Standards (AASs); Statements and Guidance Notes on Auditing issued by the ICAI; Significant differences between Auditing and Assurance Standards and International Standards on Auditing
Unit II	Audit Strategy, Planning and Programming - Planning the flow of audit work; audit strategy, planning programme and importance of supervision; review of audit notes and working papers; drafting of reports; principal's ultimate responsibility; extent of delegation; control over quality of audit work; reliance on the work of other auditor , internal auditor or an expert
Unit III	Audit under computerized information system (CIS) environment - Special aspects of CIS Audit Environment, need for review of internal control especially procedure controls and facility controls. Approach to audit in CIS Environment, use of computers for internal and management audit purposes; audit tools, test packs, computerized audit programmes; Special Aspects in Audit of E-Commerce Transaction
Unit IV	Special features of audit of banks, insurance companies, co-operative societies and non-banking financial companies
Unit V	Professional Ethics – Code of Ethics with special reference to the relevant provisions of the Chartered Accountants Act, 1949 and the Regulations there under

SUGGESTED READINGS

Gupta, Kamal : Contemporary Auditing , Tata McGraw Hill Publishing Co. Ltd. Delhi
Ghatalia, S.V. : Spicer and Pegler's Practical Auditing, Allied Publishers
Tandon, B.N. : A Hand Book of Practical Auditing, S. Chand and Co., Delhi
Sharma, T.R. : Higher Auditing, Sahitya Bhawan, Agra
Publication of the Institutes of Chartered Accountants of India Relating to Audit Practices
Study material of ICAI

SEMESTER IV

SKILL COURSE PAPER NO 4: ACCOUNTING AND AUDITING IN COMPUTER ENVIRONMENT

- Unit I Computer Environment: An Introduction, Computer Fundamentals, Software and Hardware Concepts, System and Application Software, Operating Systems, Computing Environment
- Unit II Software Application in Accounting
Word processing applications in preparing financial and audit reports. Spread sheet Applications in Preparing and analysis financial and cost statements
- Unit III Data Base for Accounting
Data base Management System (DBMS): Introduction and application in creating data base for accounting information and analysis
- Unit IV Accounting in E- Environment
Accountants role in E-Environment, Internet technology, Concept and how it works; Introduction to e-commerce, Advantages and growth of e-commerce, business issues in E-Commerce, security considerations, role of an Accountant
- Unit V Auditing in Computer Environment
Audit approach in a Computerized Information System (CIS) Environment, Internal Control System (ICS) and Internal Control Requirements in a CIS environment, Computer Assisted Audit Techniques, Review of Checks and Control

SUGGESTED READINGS

- Deitel : Operating System , Addison Wesley
Sanjay Saxena : Ms Office, Vikas Publishing House
R.K. Taxali : Pc Software For Windows, Tata Mcgraw Hill
Kalakota : E-Business Readmap for Success, Longman
Kalakota : Frontiers of Electronics Commerce, Longman
Gupta , Kamal : Comtemporary Auditing , Tata Mcgraw Hill
Ghatolia, S.V.: Spicer And Pegler's Practical Auditing (Allied)
Tondon, B.N. : A Hand Book Of Practical Auditing , S. Chand And Co.
Sharma, T.R. : Higher Auditing, Sahitya Bhawan

SYLLABUS

DEPARTMENT OF
BUSINESS FINANCE AND ECONOMICS

M. Com. (B.F.E.) Previous Examination, 2020

M. Com. (B.F.E.) Final Examination, 2021
(Two Years)

As per Choice Based Credit System (CBCS)
Applicable for the Regular Students



JAI NARAIN VYAS UNIVERSITY JODHPUR

MASTER OF COMMERCE (M.COM.) – BUSINESS FINANCE & ECONOMICS

As per Choice Based Credit System (CBCS)

Applicable for the Regular Students

ACADEMIC SESSION 2019-21

DEPARTMENT OF BUSINESS FINANCE & ECONOMICS

FACULTY OF COMMERCE & MANAGEMENT STUDIES,

JAI NARAIN VYAS UNIVERSITY, JODHPUR

The 'Department of Business Finance & Economics' came into existence on 3rd February 1990 as a result of restructuring of the then 'Faculty of Commerce' into four teaching departments, namely (1) Department of Accounting, (2) Department of Business Administration, (3) Department of Business Finance and Economics, and (4) Department of Management Studies. Since then the Department of Business Finance & Economics has grown both academically and professionally. We have had a long journey of two decades taking the department to greater heights over the years. The Department offers **M.Com, M.F.C, B.Com.(Hons.), P.G.Diplomas in I.B.F., B.I.O.M., C.M.F and S.A.P.M, M.Phil, Ph.D & D.Litt** in Business Finance & Economics. At the undergraduate level, the Department offers B.Com and BBA Degree courses in combination with sisters departments. Four separate Post Graduate Diploma Courses, namely, PG Diploma in International Business Finance, P.G.Diploma in Banking Insurance Organisation and Management, P.G.Diploma in Corporate Managerial Finance and P.G. Diploma in Security Analysis and Portfolio Management have been running successfully on self-financing basis. Both the diplomas have proved quite useful as professional job oriented courses for past 20 years. Apart from the other post-graduate and research courses, M.Com & M.F.C. are most exalted two year full time post-graduate programmes in business finance & Economics. These courses provides an extreme and rigorous base for teaching, research and allied business finance & economics. These programmes are well received in the industry and for years had been serving the needs of managerial cadre in Indian and abroad. These courses serve the needs of academics and prepare students for research and teaching. The Alumni of these courses are well placed in business, academics and administration in the country as well as abroad.

Prof.(Dr.) Raman Kumar Dave is Head of Department. Among 14 Faculty Members of the Department, presently we have six Professors, five Associate Professor and three Assistant Professors.

TEACHING STAFF OF THE DEPARTMENT

Sr.	Name of Teacher	Designation
1.	Dr.Mahendra Singh Rathore	Professor
2.	Dr.Raman Kumar Dave	Professor & Head of Department
3.	Dr. Ram Singh Meena	Professor
4.	Dr. Sunil Mehta	Professor
5.	Dr. D.S. Kheechee	Professor
6.	Dr. (Mrs.) Jatan Kanwar Jain	Associate Professor
7.	Dr.Mahendra Kumar	Associate Professor
8.	Dr.Navneeta Singh	Associate Professor
9.	Dr.Krishn Awatar Goyal	Associate Professor
10.	Dr.(Mrs.)Anju Agarwal	Assistant Professor
11.	Dr.Kshitiz Maharshi	Assistant Professor
12.	Dr.Rajendra Prasad Meena	Assistant Professor

In the year 2016, this course has been changed from annualized to Choice Based Credit System (CBCS)

mode dividing the whole course into 4 semesters. During the semesterization of the course, the overall structure has been improved to provide an insight of research in business finance & economics and interdisciplinary areas.

As per the new structure, there are 4 papers in each semester. In the second year, there are 2 compulsory papers in each semester. As per the area of interest, the students are required to choose one optional group in the beginning of 2nd year i.e. in the III and IV Semester. The selective/choice group shall consist of 4 papers to be studied in 3rd and 4th semester. The structure for the groups has been designed with intent to provide advanced level specialization in the respective field.

Admission

The minimum qualification for admission to M.Com. Course is B.Com. (10+2+3) degree / B.Com.(Hons.) /B.B.A./ B.A./B.Sc with Economics. The details of eligibility conditions and admission procedure are given in the admission form. The admission will be done on the basis of merit calculated by the aggregate marks obtained at graduate level including the marks awarded under the category (a) and (b) mentioned in the admission form [i.e. (a) benefit to the candidates who are resident of Rajasthan, and (b) benefit for candidates of J.N. Vyas University, Jodhpur]. Reservation of Scheduled Caste / Scheduled Tribes / Disabled / OBC / SBC and Teacher candidates will be as per University and Government rules.

Medium of Instruction:

The language medium of instructions and examination in each course shall be English and Hindi.

Name of the Program: Master of Commerce (M.Com.) in Business Finance & Economics

Agency conducting the course:

Department of Business Finance & Economics, Faculty of Commerce and Management Studies, Jai Narain Vyas University, Jodhpur

Program Structure:

The M.Com. Program is divided into two parts as under. Each Part will consist of two semesters.

		<i>Semester</i>	<i>Semester</i>
Part – I	First Year	Semester I	Semester II
Part - II	Second Year	Semester III	Semester IV

- There will be 6 lecture hours of teaching per week for each paper.
- Duration of End Semester Examination of each paper shall be 3 hours.
- Each paper will be of 100 marks out of which 70 marks shall be allocated for End Semester Examination (ESE) and 30 marks for Continuous Comprehensive Assessment (CCA)

The Schedule of papers prescribed for various semesters shall be as follows:

TYPE OF COURSE	COURSE CODE	TITLE OF THE COURSE	LECTURE / WEEK	NO. OF CREDITS	CCA	ESE	TOTAL
SEMESTER I							
Core course 1	BF&E-101	Economic Environment of India	6	6	30	70	100
Core course 2	BF&E -102	Micro Economics I	6	6	30	70	100
Core course 3	BF&E -103	Principles of Financial Management	6	6	30	70	100
Core course 4	BF&E -104	International Trade and Foreign Exchange	6	6	30	70	100

TYPE OF COURSE	COURSE CODE	TITLE OF THE COURSE	LECTURE / WEEK	NO. OF CREDITS	CCA	ESE	TOTAL
Skill Course I	E-Commerce		2				
Total				24	120	280	400
SEMESTER II							
Core course 5	BF&E -201	Micro Economics II	6	6	30	70	100
Core course 6	BF&E -202	Indian Financial System	6	6	30	70	100
Core course 7	BF&E -203	Economic theory of Distribution	6	6	30	70	100
Core course 8	BF&E -204	Business Budget & Budgetary Control	6	6	30	70	100
Skill course II	Personality Development & Communication Skills		2				
Total				24	120	280	400
SEMESTER III							
Core course 9	BF&E -301	Development of Financial Institution	6	6	30	70	100
Core course 10	BF&E -302	Quantitative Technique	6	6	30	70	100
Discipline Specific Elective 1	Elective Paper : GROUP A						
	1. ECONOMY OF RAJASTHAN		6	6	30	70	100
	2. RURAL ECONOMY OF INDIA		6	6	30	70	100
OR							
Discipline Specific Elective 2	Elective Paper : GROUP B						
	1. PUBLIC FINANCE		6	6	30	70	100
	2. WORKING CAPITAL MANAGEMENT		6	6	30	70	100
Skill course III	Micro Finance		2				
Total				24	120	280	400
SEMESTER IV							
Core course 11	BF&E -401	Policies of Government of India	6	6	30	70	100
Core course 12	BF&E -402	Research Methodology	6	6	30	70	100
Discipline Specific Elective 3	Elective Paper : GROUP A (The papers will be from the same group as chosen in Semester III)						
	3. MODERN BANKING		6	6	30	70	100
	4. COOPERATIVE MOVEMENT IN RAJASTHAN AND INDIA		6	6	30	70	100
OR							
Discipline Specific Elective	Elective Paper : GROUP B (Both two papers of any one chosen						

TYPE OF COURSE	COURSE CODE	TITLE OF THE COURSE	LECTURE / WEEK	NO. OF CREDITS	CCA	ESE	TOTAL
4		group. The papers will be from the same group as chosen in Semester III)					
		3. INDUSTRIAL AND LABOUR ECONOMICS	6	6	30	70	100
		4. ECONOMICS OF INDUSTRIAL RELATIONS	6	6	30	70	100
Skill course IV		Investing in Stock Market	2				
Total				24	120	280	400

CCA – Continuous Comprehensive Assessment

ESE – End Semester Examination (University Examination)

Note:

- The elective group in the Semester IV will remain the same as the one selected in Semester III.
- Once a group has been selected, no change in selected group will be allowed later.

LIST OF OPTIONAL GROUPS:

The Department will announce in the beginning of the respective semester, the list of elective groups which will be offered during the semester depending upon the availability of faculty members and demand of electives.

GROUP A : RURAL DEVELOPMENT & COOPERATION

PAPER I : ECONOMY OF RAJASTHAN

PAPER II : RURAL ECONOMY OF INDIA

PAPER III : MODERN BANKING

PAPER IV : COOPERATIVE MOVEMENT IN RAJASTHAN AND INDIA

GROUP B : FINANCE AND LABOUR ECONOMICS

PAPER I : PUBLIC FINANCE

PAPER II : WORKING CAPITAL MANAGEMENT

PAPER III : INDUSTRIAL AND LABOUR ECONOMICS

PAPER IV : ECONOMICS OF INDUSTRIAL RELATIONS

Teaching Methods:

A combination of different teaching methods such as Lectures; Case Discussions; Seminars; Presentations, Individual and Group Exercises and Assignments etc will be used.

Teaching Faculties:

Faculty will be drawn from within the Jai Narain Vyas University of Jodhpur and outside subject to availability considering nature of the subject and availability of resources as the case may be. In addition, an attempt will be made to draw Professionals from Business, Industries to share their experience with Participants.

Key Guidelines

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student needs to select separate **elective group** offered by the Department of Business Finance & Economics as part of core programme during third and fourth semester. The elective group in the Semester IV will remain the same as the one selected in Semester III. Once a group has been selected, no change in selected group will be allowed later. Each student has to complete **four skill courses:** two within the Department of Business Finance & Economics (Semester I and III) and two from other Department within JNV University or the Universities approved by JNV University (Semester II and IV).
3. **Course:** Usually referred to, as 'papers' is a component of a programme.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period of teaching (lecture or tutorial) or two periods of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.
12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/ December and even semester from December/January to May.
Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May.
13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester.

Fairness in Assessment

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly the Faculty of Commerce & Management Studies resolves the following:

- a. All internal assessments shall be open assessment system only and that are based on term test and seminar.
- b. Attendance shall carry the prescribed marks in all papers.

- c. In each semester two out of four theoretical components of the University examinations shall be undertaken by external examiners from outside JNV University, who may be appointed by the competent authorities.

Grievances and Redressal Mechanism

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head, Department of Business Finance & Economics in writing the reason(s) for the complaint / appeal.
- b) The appeal will be assessed by the Head and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Head, Department of Business Finance & Economics comprising of the senior most Professor from Department of Business Finance & Economics and one teaching staff nominated by the Head and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	'O'	Outstanding	10
2	'A+'	Excellent	9
3	'A'	Very Good	8
4	'B+'	Good	7
5	'B'	Above Average	6
6	'C'	Average	5
7	'P'	Pass	4
8	'F'	Fail	0
9	'Ab'	Absent	0

- i. **A student obtaining Grade F in a paper shall be considered failed and will be required to reappear in the University End Semester examination.**
- ii. **For noncredit courses (Skill Courses) 'Satisfactory' or "Unsatisfactory' shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA**

Grade Point assignment

- = and > 95 % marks Grade Point 10.0
- 90 to less than 95 % marks Grade Point 9.5
- 85 to less than 90 % marks Grade Point 9.0
- 80 to less than 85 % marks Grade Point 8.5
- 75 to less than 80 % marks Grade Point 8.0
- 70 to less than 75 % marks Grade Point 7.5
- 65 to less than 70 % marks Grade Point 7.0
- 60 to less than 65 % marks Grade Point 6.5
- 55 to less than 60 % marks Grade Point 6.0
- 50 to less than 55 % marks Grade Point 5.5
- 45 to less than 50 % marks Grade Point 5.0
- 40 to less than 45 % marks Grade Point 4.5
- 35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,
i.e.

$$\text{SGPA (Si)} = \frac{\sum (C_i \times G_i)}{\sum C_i}$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,
i.e.

$$\text{CGPA} = \frac{\sum (C_i \times S_i)}{\sum C_i}$$

where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.

- iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	6	B	6	6 x 6 =36
2	Course 2	6	B+	7	6 X 7 =42
3	Course 3	6	B	6	6X 6 = 36
4	Course 4	6	O	10	6 X 10 =60
	Total	24			36+42+36+60=174

Thus, $\text{SGPA} = 174/24 = 7.25$

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	7.25	7.25	7	6.25

$$\text{CGPA} = \frac{(24 \times 7.25 + 24 \times 7.25 + 24 \times 7 + 24 \times 6.25)}{96}$$

$$666/96 = 6.94$$

* Department of Business Finance & Economics shall offer one skill course per semester from the list of skill courses approved for the Department.

In view of the course content, the Department of Business Finance & Economics has distributed the lecture as under per paper

- 6 (six lectures only per week) – For Theory Paper
- 2 (two lectures) - For Skill course

The Duration of the lecture shall be forty five minutes.

Course Evaluation (Evaluation of the Students)

All courses (Core/ Elective) involve an evaluation system of students that has the following two components:-

- (i) **Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
- (ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.
- (iii) Every Student should pass CCA & ESE separately in each Semester. No marks shall be set-off from each other.

Continuous Comprehensive Assessment (CCA): This would have the following components:

- a. **Quizzes:** Two Quizzes shall be arranged for each paper during the semester. The maximum marks for each Quiz will be 5 for each quiz per paper.
- b. **Term Test:** One term test shall be arranged for each paper during the semester. The maximum marks for term test for will be 10 for each paper
- c. **Seminar:** Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 5. The seminar shall be completed prior to term test for all the papers.
- d. **Classroom Attendance** – Each student will have to attend a minimum of 75% Lectures. A student having less than 75% attendance will not be allowed to appear in the End-Semester Examination (ESE). Attendance shall have 5 marks and will be awarded by following the system proposed below:

Those having greater than 75% attendance (for those participating in Co-curricular activities, 25% will be added to per cent attendance) will be awarded CCA marks as follows:-

75% to 80%	=	1 marks
80% to 85%	=	2 marks
85 to 90%	=	3 marks
90% to 95%	=	4 marks
> 95%	=	5 marks

Each student’s cumulative attendance shall be displayed in the Department Notice Board every month.

- e. CCA is based on open evaluation system without any bias to any student
- f. Any grievance received in the Department from student shall be placed before the **Grievance Redressal Committee** with adjudicated comments

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective Department shall declare the result as “Satisfactory” or “Non-Satisfactory”; each student need to get a minimum of three “Satisfactory” declaration for the course completion

For the ESE:

ESE paper shall be divided into three parts that is Part A, Part B and Part C.

Part A

Ten short questions (Definitions, illustrations, functions, short explanations, etc; up to 25 words) for two marks each; two questions from each Unit; no choice in this Part.
10 X 2 = 20 marks

20 marks

Part B

Ten Questions (Two Questions from each Unit) (up to 250 words); with internal choice i.e. students need To answer one question from each Unit. Each question will carry four marks.
5 X 4 = 20 marks

20 marks

Part C

Five questions of long/explanatory answer (up to 500 words) type, one drawn
From each Unit; students need to answer any three; ten marks each;
3 X 10 = 30

30 marks

70 marks

Qualifying for Next semester

1. A student acquiring minimum of 40% in total of the Continuous Comprehensive Assessment (CCA) is eligible to join next semester. The candidates who fail in CCA shall not be promoted to next semester.
2. A student who does not pass the examination (CCA + ESE) in any course(s) (or due to some reason as he/she has not been able to appear in the ESE, other conditions being fulfilled, and so is considered 'Fail'), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case may be
3. A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time, i.e. three additional chances for each paper; the student is ineligible for the Postgraduate degree in the subject.
4. Students failed in CCA: Any student declared "Not Eligible" by the department based on CCA in Semester I, II, III or IV and accordingly did not appear in ESE; can be readmitted as an additional student in that semester in the following year only. Such student need to deposit the annual university fee as prescribed for that academic year.
5. The consolidated mark-sheet of the M.Com. (BFE) will be issued and the degree will be awarded only after completing all the requirements i.e. satisfactorily passing the Skill Papers, CCA, and ESE. For grace-marks and revaluation, the rules and regulations declared by the University from time to time will be applicable.

Improvement Option:

Every student shall have the opportunity to improve Credit through University Examination only. Improvement opportunity for each paper is only with two additional chances; improvement examination fee shall be on additive basis; the Credit obtained in improvement examination shall be final.

Commencement of next Semester:

The Theory Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation.

Skill Courses

Electives would be discipline centric and only students from concerned departments can register.

M. Com.

Semesterization with Choice Base Credit System (CBCS) mode is applicable only for regular students. The annual system will be applicable for private students.

Semester I

Core course 1	BF&E-101	Economic Environment of India
Core course 2	BF&E -102	Micro Economics I
Core course 3	BF&E -103	Principles of Financial Management
Core course 4	BF&E -104	International Trade and Foreign Exchange
Skill Course I		E Commerce

Semester II

Core course 5	BF&E -201	Micro Economics II
Core course 6	BF&E -202	Indian Financial System
Core course 7	BF&E -203	Economic theory of Distribution
Core course 8	BF&E -204	Business Budget & Budgetary Control
Skill Course II		Personality Development & Communication Skills

Semester III

Core course 9	BF&E -301	Development of Financial Institution
Core course 10	BF&E -302	Quantitative Technique
Discipline Specific Elective 1	Elective Paper (Both two papers of Group A) 1. ECONOMY OF RAJASTHAN 2. RURAL ECONOMY OF INDIA	
OR		
Discipline Specific Elective 2	Elective Paper (Both two papers of Group B) 1. PUBLIC FINANCE 2. WORKING CAPITAL MANAGEMENT	
Skill Course III		Micro Finance

Semester IV

Core course 11	BF&E -401	Policies of Government of India
Core course 12	BF&E -402	Research Methodology
Discipline Specific Elective 3	Elective Paper : Group A (The papers will be from the same group as chosen in Semester III) 3. MODERN BANKING 4. COOPERATIVE MOVEMENT IN RAJASTHAN AND INDIA	
OR		
Discipline Specific Elective 4	Elective Paper : Group B (The papers will be from the same group as chosen in Semester III) 3. INDUSTRIAL AND LABOUR ECONOMICS 4. ECONOMICS OF INDUSTRIAL RELATIONS	
Skill Course IV		Investing in Stock Market

GROUP A: RURAL DEVELOPMENT & COOPERATION

1. ECONOMY OF RAJASTHAN
2. RURAL ECONOMY OF INDIA
3. MODERN BANKING
4. COOPERATIVE MOVEMENT IN RAJASTHAN AND INDIA

GROUP B: FINANCE AND LABOUR ECONOMICS

1. PUBLIC FINANCE
2. WORKING CAPITAL MANAGEMENT
3. INDUSTRIAL AND LABOUR ECONOMICS
4. ECONOMICS OF INDUSTRIAL RELATIONS

M.COM. (BUSINESS FINANCE & ECONMICS)

SESSION 2019-20

SEMESTER I

BF&E-101: ECONOMIC ENVIORNMENT OF INDIA

UNIT1: Economic Environment and non-economic environment: Characteristics, concept and components.

Economic Trends and Concept (Overview): Investment, Income and Saving. Economic Planning: Objectives, Types and Techniques of Economic Planning, Justification of Economic Planning, Critical Appraisal of current and Last five year Plans.

UNIT 2 : Problems relating to Poverty, Regional Imbalance, Parallel Economy and Inequalities of income.

UNIT 3 : Industrial Development and Industrial Policy, Industrial Sickness, Economic Reforms: Liberalization, Economic Reforms in India and Recent trend.

Small scale, Cottage and village Industries: Meaning, Role, Problems, Steps taken by Government, Suggestions, Latest changes in Small scale Industry Policy.

UNIT 4 : Business Cycle: Meaning, Phases and Theories. Industrial Relations: Meaning and Characteristics, Objectives of Sound Industrial Relations.

Technology and Environment Changes: Concept, Importance, benefits, impact of technology, Forms of technology transfer, Technology and Society, Technology and Economy.

UNIT 5: Infrastructure: Energy, Power, Coal, Oil and Gas, Atomic, Non-Conventional Energy Sources, Transport System, Communication.

Agriculture: Role, nature, cropping pattern and challenges.

Population: Rate of population growth, Causes of increase in population, Population and economic development, Government policy.

SUGGESTED READINGS

- Dave, Rathore, Mathur: Economic Environment, Vide Vision, Publishing House, Jaipur
Biswanath Ghosh: Economic Environment of Business, Vikas Publication, New Delhi.
Ashwani Mahajan: Indian Economy, S.Chand, New Delhi
H.L.Ahuja: Macro Economic Analysis, S.Chand, New Delhi
H.L.Ahuja: Macro Economic theory & Policy, S.Chand, New Delhi
H.G.Mannur: Indian Economy, S.Chand, New Delhi
M.C.Vaish: Macro Economic Theory & Practice, S.Chand, New Delhi
Sundaram & Black : The International Business Environment, prentice Hall, New Delhi
Agarwal, A.N. : Indian Economy, Vikas publishing House, Delhi
Khan, Farooq A. : Business and Society, S.Chand, Delhi
Dutt, R. and Sundharam, K.P.M. : Indian Economy, S.Chand, Delhi
Misra. S.K. and Puri, V.K. : Indian Economy, Himalaya Publishing House, New Delhi
Hedge, Ian : Environmental Economics, Macmillan, Hampshire
Dutt Ruddar : Economic Reforms in India - A critique, S. Chand, New Delhi
Gupta, Swami and Vaishnav : Economic and Business Environment, RBD, Jaipur
Pant evam Pant: Aarthik Vicharon ka Itihas, LNAE, Publisher, Agra
T.T.Sethi: Aarthik Vishleshan Ke Siddhanth, LNAE, Publisher, Agra
L.N.Koli: Bhartiya Aarthik Samsyaen, LNAE, Publisher, Agra
M.L.Sethi: Macro Economics, LNAE, Publisher, Agra
H.S.Agarwal: Indian Economy, LNAE, Publisher, Agra
R.C.Agarwal : Public Economics, LNAE, Publisher, Agra
R.C.Agarwal: Economics of development & planning (Theory & Practice), LNAE, Publisher, Agra
U.C.Kulshreshtha: Economic Development & Planning, LNAE, Publisher, Agra
S.Dodia: Environmental Studies, LNAE, Publisher, Agra
N.Kumar : Environmental Economics, LNAE, Publisher, Agra

BF&E-102 : Micro Economics – 1

Unit 1: Business Economics: Meaning, Nature and Scope, Responsibilities of a Business Economist, Micro and Macro Economic Analysis, National Income and Economic Welfare.

Unit 2: Cardinal approach and ordinal approach: Utility, Law of Diminishing Marginal Utility, Law of Equi-Marginal Utility, Indifference curve analysis: Meaning, Characteristics, Superiority of Indifference curve analysis over utility analysis

Unit 3: Demand Analysis : Meaning, Definition, Determinants, Demand Schedule, Extension and Contraction, Increase or Decrease in Demand
Law of Demand : Meaning, Assumptions, Causes of application of Law of Demand, Exception of Law of Demand.

Unit 4: Elasticity of Demand: Types, measurement, determinants and importance of Elasticity of demand
Law of Supply: Meaning and Determinants of supply. Supply curve, Elasticity of supply, Degree of Price elasticity of supply.

Unit 5: Cost and Output Analysis: Concept, Types of cost, Short run and long run cost curve, Economies and diseconomies of Scale.
Production Function: Law of Returns, Return to Scale
ISO-Product-Curve, Ridge lines

BOOKS RECOMMENDED

S.K.Agarwal: Micro Economics: Indian Economic Development, S.Chand, New Delhi

Amit Ahuja: Managerial Economics: S.Chand, New Delhi

Amit Kumar Upadhyay: Principles of Economics, S.Chand, New Delhi

D.N.Dwivedi: Essential of Business Economics, S.Chand, New Delhi

D.N.Dwivedi: Managerial Economics, S.Chand, New Delhi

Stonier and Hague : A Text Book of Economic Theory

Dewett : Modern Economic Theory, S.Chand, New Delhi (Hindi & English)

Mithani, D.M. : Principles of Economics, Himalaya Publishing House, New Delhi

Agarwal and Ararwal: Vyavsayik Arthshastra, RBD, Jaipur

Mathur B.L. & Dave R.K.: Business Economics, (Hindi & English)

Vide vision publisher, Jaipur.

Ojha B.L.: Business Economics, RBD Publication, Jaipur.

C.M. Chaudhary: Business Economics, Jaipur

Agarwal M.D & Som Deo: Business Economics, RBD, Jaipur

M.L.Seth: Principles of Economics, LNAE, Publisher, Agra

R.Sharma : Managerial Economics, LNAE, Publisher, Agra

BF&E-103 : PRINCIPLES OF FINANCIAL MANAGEMENT

- Unit 1: Financial Management: Meaning, nature and scope of Financial Management, Financial goal: Profit vs. wealth maximization, Financial Function: Investment, Financing and dividend decisions, Financial Planning: Meaning, Definition, Types, process, estimating Financial requirement, Factors affecting Financial planning, Sound financial plan.
- Unit 2: Capital Budgeting: Meaning, definition, importance, process, Investment evaluation criteria: Payback period, Accounting rate of return, Net present value, Profitability index and Internal rate of return, Comparison between NPV and IRR
- Unit 3: Capital Structure: Meaning and Definition, Point of indifference, Factor affecting Capital structure, optimum capital structure, Trading on equity, Capital Gearing,
Theories of capital structure: Net Income, Net Operating Income, Modigliani-Miller, Traditional Theory.
- Unit 4: Cost of Capital : Meaning, Definition, Significance. Calculation of cost of Debenture, Preference share capital, Equity share capital, cost of depreciation fund and retained earnings, Combined cost of capital (weighted).
Operating and Financial Leverage: Concept and impact, Measurement of operating, Financial and combined leverage. Financial break-even point.
- Unit 5: Dividend: Meaning and Forms, Sound dividend policy, Factors affecting Dividend policy, Dividend decisions, Walter's model and Gordon's model.

SUGGESTED READINGS

V.K.Bhalla: Financial Management, S.Chand, New Delhi

I.M.Pandey: Essential of Financial Management, S.Chand, New Delhi

Girish P.Jakhotiya: Strategic Financial Management, S.Chand, New Delhi
Bhavesh Patel: Fundamental of Financial Management, S.Chand, New Delhi
Agarwal, Agarwal, Kothari: Financial Management,(Hindi & English) RBD Publication, Jaipur.
Khan M.Y and Jain P.K.: Financial Management. TataMcGraw hill, New Delhi
Pandey I.M: Financial Management. Vikas Publishing house, New Delhi
Prasanna Chandra: Financial Management - Theory and Practice. TataMcGraw hill, New Delhi
Bierman, H. And Smidt, S.: The Capital Budgeting Decisions. Harcourt collage publisher, Singapore.
Van Horne, J.C.: Financial Management and Policy. Prentice hall, New Delhi
Kuchhal, S.C.: Financial Planning – An Analytical Approach. Chaitanya Publishing House,Michgun.
Ravi M. Kishore: Financial Management. Taxman Publisher, New Delhi
Sharma R.: Financial Management, LNAE, Publisher, Agra
Sharma R.: Corporation Finance, LNAE, Publisher, Agra

BF&E-104 : INTERNATIONAL TRADE AND FOREIGN EXCHANGE

- Unit 1: International Trade: Meaning, Nature, Need, Advantages and Disadvantages, Remedial measures of International trade; Classical and Ohlin view
- Unit 2: Term of Trade: Balance of Trade and Balance of Payment – Concept, Causes of Disequilibrium and measures for correction. Trends in World Trade and Problems of developing countries.
- Unit 3: Free Trade Policy: Protection, Advantages and Role in underdeveloped countries, Protection trade devices, Tariffs, effects of Tariffs, Import Quotas: Type, effect of Quotas, Quotas Vs. Tariffs, Trends in International trade, Planning of International trade operations.
- Unit 4: Foreign Exchange: Meaning, Definition, Problems and Importance. Foreign exchange Rate: Meaning, Definition, Types – Fixed and Flexible. Theories of exchange rate determination: Mint Par theory and Purchasing Power Parity theory. Fluctuations in exchange rate: Causes, limits and effects.
Foreign exchange control: Meaning, Objectives and methods, Foreign Exchange Control in India.

Unit 5: International Payment: Meaning, Characteristics, necessity and Methods. Documentary Credit, Export and Import Finance, Export Import Policy, Export Promotion and Import Substitution, Export Credit Guarantee Corporation (ECGC).

SUGGESTED READINGS

K.D. Swami : International Trade
Singhal : International Trade
M.C. Vaish : Macro Economics
Daniels & Radebaugh : International Business
Cheruvilam : International Business
Mittani D.M.: Money, Banking, International trade and Public Finance
R.Sharma.: International Trade & Finance, LNAE, Publications, Agra
Mathur B.L. and Dave R.K.: International Trade and Finance (Hindi & English), Vide Vision Publication House, Jaipur
Saini, H.C. : India's Foreign Trade, Its Nature and Financing
Choudhary, B.K. : Foreign Trade and Its Financing, Himalaya Pub. House, Agra
Mathur B.L. & Dave R.K. : International Trade & Finance, (Hindi & English), Vide Vision Publisher, Jaipur.
Singhal : Antarashtriya Arthshastra, Sahitya Bhawan, Agra
Agarwal, Singh, & Gupta: International Trade & Finance, RBD, Jaipur.
Ojha B.L. & Hai M.A.: International Trade & Finance, RBD, Jaipur
Eleseworth, P.T. : International Economy, New York
Saini, H.C.: India's Foreign Trade, Its Nature and Financing
Habaler, G.: Theory of International Trade, William Hedge & Co. Uk.
Mittani D.M.: Money, Banking , International Trade & Public Finance, Himaliya Publishing, Delhi
Seth, M.L.: Money Banking and International Trade, Education Pub., Agra

M.COM. PREVIOUS SEMESTER I

SKILL PAPER I : E-COMMERCE

- Unit 1: Internet: Meaning, concept, costs of E-commerce, E-market: Basics; Types, Advantages, as a seller and buyer; E-business issues, E-market place. Need for e-commerce. Business Model: Shop, membership, Market portal model, Online marketing and advertisement.
- Unit 2: Business to consumer E-commerce: Concept B2C, Advantage order online catalog, ordering system. Current opportunities and challenges of E-commerce, Post sales service. Web-site Design: Role, Design Model, Principles, push and pull technology, e-mail.
- Unit 3: Electronic Payment System: Special features, Types, Development checks & bank transfer, Electronic Data Inter change, Credit card, ATM, Bank, e-cash, Electronic purse, debit card, Benefit of using-e-payment, Risk, Digital Signature.

- Unit 4: Business to Business E-commerce: B2B Concept, Benefit of B2B, Electronic Data Interchange: Overview of EDI standard, Paperless trading, E-business models, components of EDI , cost of EDI.
- Unit 5: Workflow management issues in e-business, Mass communication & product differentiation, organization restructuring, knowledge management issues, Role of e-commerce infrastructure, concept & role of multimedia, media elements.
Security issues in E-commerce: Risks, Keys, one-way functions, Hackers.

SUGGESTED READINGS

- Chaffey, Mayer, Johnston, Ellis-Chadwick: Internet Marketing, Prentice Hall. Hagel, J and Singer M.: Net Worth, McKinsey.
- Hanson, W.: Principles of Internet Marketing, International Thomson Publishing
- Reedy, Schullo, Zimmerman, K.: Electronic Marketing,
- Dryden.Siebel, D.: Futurize your Enterprise,
J.Wiley. eSterne, J.: World Wide Web Marketing,
John Wiley & Sons. Straus, J. and Frost R.: Marketing on the Internet, Prentice Hall.
- Sharma & Gupta: E-Commerce, RBD, Jaipur
- Soni Gupta & Jain: E-Commerce, RBD, Jaipur
- Bhargava: E-Commerce, RBD, Jaipur
- Agarwal, Bhargava & Jain: E-Banking and Security Transaction, RBD, Jaipur
- Vivek Jain: Internet Technology and Application, LNAE Publication, Agra
- WhiteLey: E-Commerce: Strategy, Technology & Application, McGraw Hill Education, New Delhi
- Bansal Sandeep, Sanjeev, Rama: E-Commrce, Kalyani Book, Delhi
- Bhardwaj & Puneet: Fundamental of E-Commerce, Kalyani Book, Delhi
- Dhull & Bhardwaj: E-Commerce, Kalyani Book, Delhi
- Manjot Kaur: E-Commerce & Application, Kalyani Book, Delhi

M.COM. (BUSINESS FINANCE & ECONMICS)

SESSION 2019-20

SEMESTER II

BF&E-201 : MICRO ECONOMICS – II

- Unit 1: Market: Meaning, Definition, Characteristic, Classification and Different Forms of Market. Time Element in Price Determination, Market price and Normal price: Characteristic and determination.
- Unit 2: Revenue Analysis: Types and Inter-Relationship among Total Revenue, Average Revenue and Marginal Revenue.
National Income Analysis: Meaning and Definition, Concept, Methods of estimating, Importance and difficulties in estimating of National Income.
- Unit 3: Perfect Competition: Meaning and Characteristics, Price and output determination under Perfect competition, Firm and Industry equilibrium
Monopoly: Meaning, Definition and Classification, Short run and Long run Equilibrium under different cost conditions.
- Unit 4: Discriminating Monopoly: Meaning, Condition, Forms, price and output determination under Discriminating Monopoly, Justification of Price Discrimination.
Monopolistic Competition: Meaning, Definition and Features, Short run and Long run Equilibrium.
- Unit 5: Oligopoly: Meaning, Definition and Features, Price and output determination: Price Leadership, Independent pricing, Price war, Price Rigidity, Perfect collusion,
Price Strategies: Cost plus pricing, Multiple product pricing, Pricing in maturity period.

BOOKS RECOMMENDED

Amit Ahuja: Business Economics, S.Chand, New Delhi

Amit Ahuja: Managerial Economics, S.Chand, New Delhi

Amit Kumar Upadhyay: Principles of Economics, Vikas Publications, New Delhi

D.N.Dwivedi: Essential of Business Economics, Vikas Publications, New Delhi
D.N.Dwivedi: Managerial Economics, Vikas Publications, New Delhi
Stonier and Hague : A Text Book of Economic Theory
Singh, V.P. : Economic (Hindi & English)
Dewett, K.K. : Modern Economic Theory, S.Chand, New Delhi
Jhijan M.L.: Managerial Economics (Hindi & English)
Mithani, D.M. : Principles of Economics, Himalaya Publishing House, New Delhi
Agarwal and Ararwal: Vyavsayik Arthshastra, RBD, Jaipur
Mathur B.L. & Dave R.K.: Business Economics, (Hindi & English) Vide vision publisher, Jaipur.
Ojha B.L.: Business Economics, RBD Publication, Jaipur.
C.M. Chaudhary: Business Economics, Jaipur
Agarwal M.D & Som Deo: Business Economics, RBDS, Jaipur
Seth M.L. : Principles of Economics, S.Chand, New Delhi
Ahuja H.L. : Advanced Economic Theory, S.Chand, New Delhi
Sinha V.C. : Business Economics, S.Chand, New Delhi

BF&E-202 : INDIAN FINANCIAL SYSTEM

- Unit 1: Indian Financial System: Meaning, Structure. Financial Market: Characteristic, Importance, Classification. Market Types: Financial, Foreign Exchange and Insurance Market. Indian Money Market: Evolution, Objective, Importance, Players, Investments, Suggestion for improving money market, Policy development in Primary Market. Capital Market: Meaning, Importance, Recent trends, New Issue Market: Meaning, Functions, Instruments and its Mechanism, Problems and Remedial measures.
- Unit 2: Stock Exchange: Definition, Features, Merit and demerit, Function, listing, Public issues. Securities contract and regulation Act: Objectives, Main provisions. Investor Protection: Complaints of investors, Redressal of Investor complaints, Removal of Grievance.
- Unit 3: SEBI: Objectives, Organisation, Power of SEBI, Registration, insider dealing, online Real Time trading, Mobile Trading, Role and achievement of SEBI, Criticism of SEBI, Guideline of SEBI: General guidelines, new issue market, secondary market underwriting, Bonus issue.
- Unit 4: Depository Custodian: Meaning, definition, Organisational Structure, Objectives, function and Role. Derivative Market: Concept, Benefits, Need and Importance. Credit rating: Objectives, function, Advantages,

disadvantages, Rating process, Types, Credit rating Agencies in India.

Unit 5: Mutual fund: Meaning, regulation and operation, Types/Classification, Risk in Mutual fund, future of MF, Factoring: Meaning and Definition, function, services. Forfeiting: Meaning, drawback, factor affecting Forfeiting growth in India. Merchant Banker, Mutual fund, Guidelines of SEBI regarding Mutual Fund.

Efficient Market Hypothesis: Meaning, Ransom Walk Theory, form of efficient Market, Corporate Governance: Meaning, definition, Government mechanism, Mandatory and non-mandatory Recommendation

BOOKS RECOMMENDED

- Sapna Nibsaiya: Indian Financial System, S.Chand, New Delhi
H.R.Machiraju: Indian Financial System, S.Chand, New Delhi
C.Rama Gopal : Management of Financial Services, S.Chand, New Delhi
Punithavathy Pandian: Financial Services & Market, S.Chand, New Delhi
Punithavathy Pandian: Security Analysis & Portfolio Management, S.Chand, New Delhi
Gurley,J. and Saw, E.S. : Money in a Theory of Finance, Washington, Brooking Institution
Gold Smith, R.W. : Financial Institution, Random House
Khan, M.Y. : Indian Financial Theory and Practice, Vikas Publishing House, Delhi
Khan, M.Y. Financial Services, Vikas Publishing House, Delhi
Bhalla V.K.: Financial Market, S chand, Delhi
Mehta Jogendra: Mutual Fund & Stock Exchange, Aadi Publication, Jaipur
Mathur B.L. & Dave R.K.: Financial Market Operations, (Hindi & English), Vide Vision Publisher, Jaipur
Mishra V.K.: Financial Market Operations, (Hindi & English), RBD, Jaipur
Saraswat & Choudhary: Financial Market Operations, (Hindi & English), RBD, Jaipur
Garden, & Natarajan: Financial Market & Institution: Himalaya Publishing, Delhi
Agarwal, Garden, & Natarajan: Indian Financial Market & Services: Himalaya Publishing, Delhi
Gurusamy S: Financial Market & Institutions: Himalaya Publishing, Delhi
Sachdeva S.: Indian Financial System, LNAE Publication, Agra
Gupta, Agarwal, Gupta: Financial Market Operations, Kalyani Books, Delhi
Gupta, Gupta, Gupta: Financial Market & Financial Services, Kalyani Book, Delhi

BF&E-203 : ECONOMIC THEORY OF DISTRIBUTION

Unit 1: Factor Pricing: Meaning and Definition, Need, Problems, Importance, Theory of Distribution: Classical, Modern and Marginal Productivity Theory: Meaning, assumption, criticism, factor pricing under Perfect-competition, Imperfect Competition.

Unit 2: Rent: Concept, Economic Rent, Scarcity Rent, Quasi Rent, Factor affecting Rent. Theories of Rent: Ricardian theory, Modern theory, Rent

element in wages-interest-profit, Relationship of Rent and price.

- Unit 3: Wages: Meaning, Nominal and Real wage, Factors affecting Real wage, Theory of wages: Classical, Modern (Demand & Supply), Wage under perfect competition & imperfect competition. Trade Union: Concept, Functions, Objectives, Problems and role of Trade Unions in India.
- Unit 4: Interest: Meaning, Definition, Gross and Net interest, components of interest, causes of variation in interest rate, economic progress and rate of interest, negative rate of interest, justification of interest under Capitalist Economy, Real and Monetary. Theories of Interest: Classical, Fisher's time preference, Neo-Classical, Lovable Fund, Keynes Liquidity Preference and Modern Theory.
- Unit 5: Profit: Meaning, Concept of Gross and Net Profit. Theories of Profit: Dynamic, Risk bearing (Hawley's), Innovation, Uncertainty Bearing (Knight), Demand & Supply of Profit Theory.

SUGGESTED READINGS :

- Amit Ahuja: Business Economics, S.Chand, New Delhi
Amit Ahuja: Managerial Economics, S.Chand, New Delhi
Amit Kumar Upadhyay: Principles of Economics, Vikas Publications, New Delhi
D.N.Dwivedi: Essential of Business Economics, Vikas Publications, New Delhi
D.N.Dwivedi: Principles of Economics, Vikas Publications, New Delhi
Mathur B.L. Rathore M.S. and Dave R.K. : Business Economics (H & E), Vide Vision Publisher, Jaipur
Seth M.L. : Principles of Economics, S.Chand, New Delhi
Ahuja H.L. : Advanced Economic Theory, S.Chand, New Delhi
Dewett K.K. : Modern Economic Theory, S.Chand, New Delhi
Sinha V.C. : Business Economics.
Stonier and Hague : A Text Book of Economic Theory
Dewett, K.K. : Modern Economic Theory, S. Chand, New Delhi
Mithani, D.M. : Principles of Economics, Himalaya
Agarwal and Ararwal: Vyavsayik Arthshastra, RBD, Jaipur
Ojha & Ojha : Business Economics, RBD Publication, Jaipur.
C.M. Chaudhary: Business Economics, Jaipur
Agarwal M.D & Som Deo: Business Economics, RBDS, Jaipur

BF&E-204 : Business Budget & Budgetary Control

- Unit 1: Business Budget: Meaning, Nature, Characteristic Objective, Advantage, Disadvantage, Principles and Limitation of Budget. Budget Terminology, Preparation of budget, Budget coordination, Essential of effective budget. Budget Committee, Budget Manual.
- Unit 2: Types of Budget : Need, Importance, Fixed and Flexible Budget: Methods of

Preparing Budget, Production Budget, Cost of Production, Direct Material Budget, Direct Labour Budget, Overhead Budget, Performance Budget, Zero Based Budget, Master Budget. Cash Budget and Preparation of Cash Budget.

- Unit 3: Business Forecasting: Meaning, Theories, Importance, Limitations, Characteristic, Objectives, assumption, Theories of Business Forecasting, Tools of Business Forecasting, Essentials of Business Forecasting. Business Product Decisions: Meaning, Area, Use of Alternative Production Facilities, Determination of Profitable Level of Production, Determination of Product Mix on the basis of key factors
- Unit 4: Budgeting Control : Meaning, Definition, Characteristics, Object, Advantage and Disadvantage, Principles, Limitations of Budgeting Control. Project Planning : Meaning, Features, Stages, Advantages, essential of good Project Planning. Types of Project, Appraisal of Project,
- Unit 5: Analysis of Risk and Uncertainty: Introduction, Description of the basic risk concept, Measurement of Risk, Risk evaluation approaches, Types of risk. Value analysis: Meaning, Definition, Characteristics, Phases, Limitation, Objective and Importance.

Recommended Books:

Project Planning & Budgetary Control: Agarwal & Saraswat, RBD, Jaipur
Business Budgeting : M.D.Agarwal & Vijaesh, R.B.D, Jaipur
Business Budgeting : M.R.Agarwal , R.B.D, Jaipur
Management Accounting : S.P.Gupta, Sahitya Bhawan Publications, Agra
Nand Dhameja: Public Budgeting, S.Chand, New Delhi
Corporate Finance, Ross, Westerfield, McGraw Hill
Investment Analysis and Management, Charles P.Jones, John Wiley & Sons.
Modern Financial Management, Ross, Westerfield, Jaffe, Jordan, McGraw Hill
Practical Budgeting Decision : Harold & Seymour
Theory of Practice of Management Accounting ; N.K.Kulshrestha
Bhavesh Patel: Project Management, Vikas Publication, New Delhi

SKILL PAPER II : PERSONALITY DEVELOPMENT AND COMMUNICATION SKILL

- Unit 1: Introduction to Communication: Meaning and Definition - Process - Functions - Objectives - Importance - Essentials of good communication - Communication barriers - Overcoming communication barriers - Cross cultural Communication.
- Unit 2: Written Communication Need and functions of business letters -

Planning & layout of business letter - Essentials of effective correspondence – Advantages & limitations of written communication. Oral Communication Meaning, nature and scope - Principles of effective oral communication - Techniques of effective speech - The art of listening - Principles of good listening - Advantages and limitations of oral communication.

Unit 3: Personality Development: The concept personality - Dimensions of personality - Term personality development - Significance.

Unit 4: The concept of success and failure: What is success? - Hurdles in achieving success - Overcoming hurdles - Factors responsible for success – What is failure - Causes of failure - Do's and Don'ts regarding success and failure.

Unit 5: Attitude: Concept - Significance - Factors affecting attitudes - Positive attitude - Advantages - Negative attitude - Disadvantages - Ways to develop positive attitude - Difference between personalities having positive and negative attitude.

Interpersonal Relationships: Interpersonal relationships - Teaming - Developing positive personality - Analysis of strengths and weaknesses.

Other Aspects of Personality Development : Body language - Assertiveness - Problem-solving - Conflict and Stress Management – Decision making skills - Positive and creative thinking - Leadership and qualities of a successful leader - Character-building - Team-work - Lateral thinking - Time management - Work ethics - Management of change - Good manners and etiquettes.

SUGGESTED READINGS

Business Communication - K. K. Sinha - Galgotia Publishing Company, New Delhi.

Media and Communication Management - C. S. Rayudu - Himalaya Publishing House, Bombay.

Essentials of Business Communication - Rajendra Pal and J. S. Korlhalli – Sultan Chand & Sons, New Delhi.

Business Communication - Dr. S.V. Kadvekar, Prin. Dr. C. N. Rawal and Prof. Ravindra Kothavade - Diamond Publications, Pune.

Communicate to Win - Richard Denny - Kogan Page India Private Limited, New Delhi.

You Can Win - Shiv Khera - Macmillan India Limited

Group Discussion and Public Speaking - K. Sankaran and Mahendra Kumar - M.I.Publications, Agra

Organisational Behaviour - S. P. Robbins - Prentice-Hall of India Pvt. Ltd., New Delhi

Basic Managerial Skills For All - Prentice-Hall of India Pvt. Ltd., New Delhi

S.Sachdeva : Communication for Management, LNAE Publication, Agra

S.Sachdeva : Communication Skill, LNAE Publication, Agra

Gupta, Varinder, Bodh Raj: Business Communication, Kalyani Books, Delhi

Varinder, Sania, Bawa: Personality Development & Business Communication, Kalyani Books, Delhi

Roa & Das: Communication Skill, Himalaya Publishing House, Delhi

M.COM. (BUSINESS FINANCE & ECONMICS)

SESSION 2020-21

SEMESTER III

BF&E-301 : DEVELOPMENT OF FINANCIAL INSTITUTIONS

- Unit 1: International and National Economic Institution : Organisation, Management, Function, Objectives, Working and achievement of: World Trade Organisation (WTO),
- Unit 2: International Development Association (IDA), International Monetary Fund (IMF), International Bank of Reconstruction & Development (IBRD),
- Unit 3: International Financial Corporation (IFC), UNCTAD, Industrial Development Bank of India (IDBI), Industrial Credit and Investment Corporation of India Bank (ICICI),
- Unit 4: Industrial Reconstruction Bank of India (IRBI), State Financial Institution (SFI), Unit Trust of India (UTI), Life Insurance Corporation

of India (LIC).

Unit 5: Concept of General Agreement of Trade & Services (GATT), Trade Related Intellectual Property Rights (TRIPS), Trade Policy Review Mechanism (TRIMS)

SUGGESTED READINGS:

- Mathur B.L. & Dave R.K.: Economic Environment (H&E), Vide Vision Publication, Jaipur
C.Ram Goyal: Management of Financial Services, Vikas Publication, New Delhi
H.R.Machiraja: Introduction to Project Finance, Vikas Publication, New Delhi
Sapna Nibsaiya: Indian Financial System, Vikas Publication, New Delhi
M.B.Rao, Manjula: WTO & International Trade, Vikas Publication, New Delhi
Fabozzi: Foundation of Financial Market & Institutions, , Pearson, Delhi
Mishikin: Financial Market & Institutions, Pearson, Delhi
Sharma: Management of Financial Institutions, PHI, Delhi (Hindi & English)
Dewett, K.K. : Modern Economic Theory, S. Chand, Delhi
Mithani, D.M. : Principles of Economics, Himalaya Publishing House, New Delhi
Sundaram & Black : The International Business Environment, prentice Hall, New Delhi
Agarwal, A.N. : Indian Economy, Vikas publishing House, Delhi
Khan, Farooq A. : Business and Society, S.Chand, Delhi
Dutt, R. and Sundharam, K.P.M. : Indian Economy, S.Chand, Delhi
Misra. S.K. and Puri, V.K. : Indian Economy, Himalaya Publishing House, New Delhi
Hedge, Ian : Environmental Economics, Macmillan. Hampshire
Dutt Ruddar : Economic Reforms in India - A critique S. Chand, New Delhi
Gupta, Swami and Vaishnav : Economic and Business Environment, RBD, Jaipur
S.Sachdeva: Management of Financial Institutions & Services, LNAE Publication, Agra
Gupta & Gupta: Management of Financial Institution, Kalyani Books, Delhi
Gupta, Shashi & Gupta Neeti: Financial Institutions & Market, Kalyani Books, Delhi
Desai, Vasant: Development banking and Financial Intermediaries, Himalaya Publishing House, Delhi
Srivastava & Nigam: Management of Indian Financial Institutions, Himalaya Publishing House, Delhi
Varshney, P.N. : Indian Financial System, Sultan Chand & Sons, New Delhi.
Khan, M.Y.: Indian Financial System, Tata McGraah Hill, Delhi.
Mittani D.M.: Money, Banking & International Trade, Himaliya Publishing, Delhi
J.K. Tandon and T.N. Mathur, Banking and Finance, Shivam Book House, Jaipur (Hindi & English Version)
Vashitha, Swami, Gupta: Banking and Finance, RBD, Jaipur
Mathur B.L. & Dave R.K.: Money and Banking System, (Hindi & English), Vide Vision, Jaipur
Sundharam & Vaishney: Banking Theory Law & Practice, Sultan Chand & Sons, Delhi

BF&E-302 : QUANTITATIVE TECHNIQUES

Unit 1: Statistics: Meaning, Definition, Objective, Limitation, Functions,

- Importance, Distrust. Statistical Errors: Sources, Kinds, Measurement.
- Unit 2: Measurement of Central tendency: Meaning, Definition, Characteristic, Median, Mode, Arithmetic Mean, Harmonic Mean and Geometric Mean
- Unit 3: Measures of Dispersion: Meaning, Definition, Characteristics, Methods: Range, Inter-Quartile range, Percentile Range, Quartile deviation, Mean Deviation, Standard deviation, Skewness.
- Unit 4: Index Number: Meaning, Definition, Characteristics, Kinds, Importance, Limitation, Base: Fixed base, Chain base method, Index Number for more than one commodity, Weighted Index Method, Fishers Index Number, Consumer price Index Number, Test of adequacy.
- Unit 5: Correlation: Definition, Importance, Types, Degree of correlation, Methods: Karl Pearson, Rank, Concurrent. Regression Analysis. Interpolation and Extrapolation: Meaning, Definition, Difference, Need, Assumption, Binomial, Newton and Lagrange's Methods. Chi square test.

SUGGESTED READINGS:

- C.Satya Devi: Quantitative technique, S.Chand, New Delhi
 D.S.Hira: operational Research, S.Chand, New Delhi
 P.N.Arora: Managerial Statistics, S.Chand, New Delhi
 Padmalochan Hazarika: Business Statistics, S.Chand, New Delhi
 S.P.Singh: Sankhyayiki Sidhant Avam Vyavhar, S.Chand, New Delhi
 C.R.Kothari: Quantitative Techniques, Vikas Publication, New Delhi
 J.K.Sharma: Business Statistics, Vikas Publication, New Delhi
 Elhance, D.N. : Fundamental of Statistics, Kalyani Publishers, Meerut
 Nagar, K.N. : Sankhyiki Ke Mool Tatva
 Gupta, S.C. and Indra Gupta : Business Statistics
 Sancheti and Kapur : Statistics
 Gupta, S.P. : Statistics Methods
 Rajpurohit, Maheshwari and Sharma: Business Statistics, RBD, Jaipur

SKILL PAPER III : MICRO FINANCE

- Unit 1: Micro Finance: Meaning, Definition, Salient feature, Benefits, target group, Microfinance and poverty: Role in poverty alleviation in rural area. Micro Finance and Women Empowerment.
- Unit 2: Microfinance as a tool for development. Evolution and character of microfinance in India. Microfinance delivery methodologies. Microfinance in India: Present and Future. Some Innovative and Creative Microfinance Models. Monitoring and Evaluation Findings. Emerging issues.
- Unit 3: Microfinance debates and challenges: Interest rates, Use of Loans, Reach versus Depth of Impact, Gender. Benefits and Limitations. Microfinance Standards and Principles. Scale of Microfinance Operations, Micro finance and financial institutions, Microfinance and Social Interventions, criticisms of microfinance

Unit 4: Rural Credit institution. Micro Finance Institutions: Object, Functions and achievements. Credit requirement for farm, non-farm, livelihood poor person. Need for saving, credit and insurance.

Unit 5: Role of Financial intermediation, Problems and Remedial measures. Joint liabilities group (JLG), Micro Finance and Self help Group (SHGs), Collective action for empowerment and uplifting poverty. Role of federation of SHG.

SUGGESTED READINGS:

H.L.Bhatia: Public Finance: Vikas Publishing House, New Delhi

M.C.Vaish: Macro Economics Theory, Vikas Publishing House, New Delhi

A.Sharmila: Business Policy, Vikas Publishing House, New Delhi

Bimal Jaiswal: Banking Operation Management, Vikas Publishing House, New Delhi

Singh & Bani: Behavioural Finance, Vikas Publishing House, New Delhi

N.K.Sengupta: Government & Business, Vikas Publishing House, New Delhi

Armendaviz & Morduch: Economics of Micro Finance, PHI, Delhi

Kennedy: Applied Computational Economics & Finance, PHI, Delhi

Kaushik & Rengarajen: Micro Finance & Women's Empowerment, Serials Publication

Ratan Kumar: Cooperative & Microfinance, Serial Publication

M.COM. (BUSINESS FINANCE & ECONMICS)

SESSION 2020-21

SEMESTER IV

BF&E-401 : POLICIES OF GOVERNMENT OF INDIA

- Unit 1: Economic Policy
Monetary Policy
Population Policy
- Unit 2: Fiscal Policy and Deficit financing
Employment Policy
Wage Policy
- Unit 3: EXIM (Export-Import) Policy
Commercial Policy
Foreign Investment Policy
- Unit 4: Industrial Policy
Small Scale Industrial Policy
Price Policy
- Unit 5: Tariff Policy
Agriculture Policy
Disinvestment Policy
Education Policy

SUGGESTED READINGS:

- Mathur B.L. & Dave R.K.: Economic Environment, Vide Vision Publications, Jaipur
- N.K.Sengupta: Government & Business, Vikas Publications, New Delhi
- Gopal, Suman, Anisha: Indian Economy: Performance & Policies, Vikas Publications, New Delhi
- Sundaram & Black : The International Business Environment, prentice Hall, New Delhi
- Agarwal, A.N. : Indian Economy, Vikas publishing House, Delhi
- Khan, Farooq A. : Business and Society, S.Chand, Delhi
- Dutt, R. and Sundharam, K.P.M. : Indian Economy, S.Chand, Delhi
- Misra. S.K. and Puri, V.K. : Indian Economy, Himalaya Publishing House, New Delhi
- Hedge, Ian : Environmental Economics, Macmillan. Hampshire
- Dutt Ruddar : Economic Reforms in India - A Critique, S. Chand, New Delhi
- Gupta, Swami and Vaishnaw : Economic and Business Environment, RBD, Jaipur
- Memoria & Rao: Business Planning & Policies, Himalaya Publication House, Delhi

Gupta N.A.: Business Policy, Himalaya Publication House, Delhi

H.G.Mannur: Indian Economy, S.Chand, New Delhi

M.C.Vaish: Macro Economic Theory & Practice, S.Chand, New Delhi

T.T.Sethi: Aarthik Vishleshan Ke Siddhanth, LNAE, Publisher, Agra

M.L.Sethi: Macro Economics, LNAE, Publisher, Agra

U.C.Kulshreshtha: Economic Development & Planning, LNAE, Publisher, Agra

BF&E-402 : RESEARCH METHODOLOGY

Unit 1: Research : Meaning, objectives, features of good research study, Types, Research approach, Significance, scientific method and Non-scientific method, Research Methodology. Research Process. Role of research methods in Business/Industry. Research Problem, Selection of the Problem, limitations of research; Problems encountered by researchers in India.

Unit 2: Research Design : Meaning, Need, Formation of the Problem, Criteria of good decision, different research design: Basic Principles of Experimental Design Hypothesis: Basic Concept of Testing of Hypothesis, Procedure, Test of hypothesis, Parametric Tests, Limitation of the test of Hypothesis; How to prepare a synopsis. Sampling; Need, types and techniques, sampling errors.

Unit 3: Data collection: Meaning, Collection process, Types and editing, advantages and disadvantages, Primary and secondary data: Meaning, Sources, Advantage and Disadvantages, Limitation. Role of Statistical tools in data analysis.

Unit 4: Business Forecasting: Meaning, Techniques, Importance. Report: Significance of Report Writing, Different steps, Layout, Types, Mechanics of writing a Report, Bibliography.

Unit 5: Computer Research: Role, Computer technology, System, Characteristics, Computer applications.

SUGGESTED READINGS

Vijay & Shende: Research Methodology, S.Chand, New Delhi

Chawla & Sodha: Research Methodology, S.Chand, New Delhi

Goode and Hall : Research Methodology

Tondon, B.C. : Research Methodology in Social Science

Kothari, C.R. : Research Methodology

Nichamisand Nichamis : Research Methodology in Social Science

P.C. Tripathi : Research Methodology in Social Science

Paudin V. Young : Research Methodology

Mukherjee, R.N. : Research (Hindi)

Shukla and Trivadi : Research Methodology

Leving and Rubin : Statistics for Management

SKILL PAPER IV : INVESTING IN STOCK MARKET

- Unit 1: Type of investment – Equity Shares, Initial Public Offer (IPO). Bonds. Indian Securities Market: the market participants, trading of securities. Security market indices, sources of financial information. Role of Stock Exchange, Stock exchanges in India: Bombay Stock Exchange (BSE), National Stock Exchange (NSE), Multi Commodity Exchange (MCX). Buying and selling of stocks: using brokerage and analysis recommendation. Use of limit order and market order.
- Unit 2: Online trading of stocks. Understanding stock quotations, types and placing or order, Risk: its valuation and mitigation, Analysis of the company: financial characteristics.
- Unit 3: Comparative analysis of companies. Stock valuations: using ratios like Price Earning ratio. Price Revenue ratio. Use of historic prices, simple moving average, basic and advanced interactive charts. Examining the shareholding patter of company. Pitfalls to avoid while investing: high price stocks, low price stocks, stop loss, excess averaging.
- Unit 4: Background of Mutual Funds: Advantages of investing in Mutual Funds. Motives of mutual fund investments, Net Asset Value. Types of Mutual funds: Open ended, close ended, equity, debs, hybrid, money market, Load vs. no load funds, Factors affecting choice of mutual funds. CRISIL Mutual fund Ranking and its Usage.
- Unit 5: Future, Options, trading in futures and options. Understanding stock market quotes on futures and options. Types of orders, Put and Call options: How Put and Call options work. Commodities, Derivatives of commodities, trading of commodity derivatives on MCX. Currency derivatives and its trading.

SUGGESTED READINGS:

Gitman and Joehnk. Fundamentals of Investing. Pearson, New Delhi
Madura. Jeff. Personal final. Pearson, New Delhi

Chandra. Prasanna. Investment Analysis and Portfolio Management. Tata McGraw Hill, New Delhi

Damodaran, Aswath, Investment Valuation: Tool and Techniques for Determining the Value of Any Asset, Wiley Publication, New Delhi

M.COM. (BUSINESS FINANCE & ECONOMICS)

Group A : Elective Paper - I

ECONOMY OF RAJASTHAN

- Unit 1: Basic Characteristics of economy of Rajasthan. Regional imbalance, need for regional economic planning, Regional Development Programmes, Position of Rajasthan in India, Salient features of Rajasthan Economy, causes of low literacy in Rajasthan. Panchayat Raj : Concept, background, importance, set up, progress and problems. Rural Development Programmes in Rajasthan.
- Unit 2: Natural Resources of Rajasthan : Mines and Minerals, Land and water, Forest and Wild Life; Live stock, New Mineral Policy; Mineral Based Industries in Rajasthan, Human Resources of Rajasthan , Energy Resources in Rajasthan, Unemployment, Poverty. Main causes of high population growth in Rajasthan, Government measures towards control of population.
- Unit 3: Agricultural, Agriculture based industries in Rajasthan, Animal Husbandry, White Revolution : Dairy Development Programme; Irrigation in Rajasthan and Indira Gandhi Canal Project, Co-operative Movement in Rajasthan. Land Reforms in Rajasthan.
- Unit 4: Economic Planning in Rajasthan, Various Five Year Plan, Progress and Pit falls, Constraints in economic development of Rajasthan, Special emphasis in Plan periods. Economic Planning Mechanism in Rajasthan.
- Unit 5: Industries, Small Scale, Cottage and Village Industries; Handicrafts Industries in Rajasthan; Industrial Policy; Transport-Communication-Tourism Development in Rajasthan, Main feature of tourism in Rajasthan; Role of RFC, RICCO and RAJSICO in Industrial Development, Economic Reforms and Liberalization in Rajasthan, Major development project of Rajasthan, Public-Private partnership model.

BOOKS RECOMMENDED

- B.L.Mathur: Cooperative Development, Jaipur
B.L.Ojha: *Rajasthan Ki Arthvyavastha*
Laxmi Narayan Nathuramka: *Rajasthan Ki Arthvyavastha*
Nanavati, M.B. and Anjaria, J.J. : Indian Rural Problems,
Vora & Co. Agarwal, A.N. : Indian Agriculture
Desai, Vasant : A Study of Rural Economic, Himalaya Publishing House, Delhi
Mathur B.L.: Cooperative Development, RBSA, Jaipur
H.R. Swami & B.P.Gupta: Rural Development & Cooperation, RBD, Jaipur

Group A : Elective Paper - II
RURAL ECONOMY OF INDIA

- Unit 1: Concept of Rural Economy, Nature and Problems of Rural Economy; Rural Backwardness, Significance of Rural Development, Social, Economic and Political Development, Recent development in rural area.
- Unit 2: Rural Development Strategies - Nature and problems of Rural Economy, Concept of Rural Economy, Rural Versus Urban Development, Nature and Causes of imbalance between rural areas and urban areas during planning period; Panchayat Raj System and 73rd Amendment; Employment Guarantee schemes- Swarnajayanti Gram Swarajgar Yojana (SGSY), Rural Employment Guarantee Scheme, Pradhan Mantri Gram Sadak Yojana (PMGSY), Sampura Gramin Rojgar Yojana (SGRY), Jawahar Gram Samridhi Yojana (JGSY), Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)
- Unit 3: Indian Agriculture: Agriculture Development: Characteristics, Importance of Indian Agriculture, Problems, Suggestion, Irrigation, Land Reform, Modern Technology and Agriculture Policy; Crop Insurance.
- Unit 4: Rural Finance, Unorganized Sector-Rural Indebtedness. Organized Sector : Role of Rural Credit Institutions. Cooperative and Commercial Banks, Role of Regional Rural Banks, NABARD, Rural Insurance.
- Unit 5: Rural Energy Problems, Energy Development & Utilization; Rural Renewable Sources of Energy; Rural Industry-Rural-Industrialisation-KVIC, Government Policy for Rural Industrial Development, Programmes related to Tribal Welfare, Drought area development, Desert, forest conservation, Woman and Child Development.

BOOKS RECOMMENDED

- B.L.Ojha: *Rajasthan Ki Arthvyavastha*, RBD, Jaipur
Laxmi Narayan Nathuramka: *Rajasthan Ki Arthvyavastha*
Nanavati, M.B. and Anjaria, J.J. : Indian Rural Problems,
Vora & Co. Agarwal, A.N. : Indian Agriculture
Desai, Vasant : A Study of Rural Economic, Himalaya Publishing House, Delhi

Mathur B.L.: Cooperative Development, RBSA, Jaipur
Garg Basu: Rural Marketing, Kalyani Books, Delhi
Desai, Vasant: Rural development of India, Himalaya Publishing House, Delhi
Satya Sundaram: Rural Development, Himalaya Publishing House, Delhi
Venkata Reddy K: Agriculture and Rural Development, Himalaya Publishing House, Delhi

Group A : Elective Paper - III

MODERN BANKING

- Unit 1: Money : Meaning, Definition, Function, importance, classification of money, money supply in India, Monetary Standards-India monetary system, An overview of Inflation & Deflation: Causes and Remedial action
- Unit 2: Fisher's quantity theory of money the Cambridge equation. The Keynesian approach, saving and Investment. Business cycle: Nature, Phases of a Business Cycle, the problems of Business Cycle.
- Unit 3: Commercial Bank : Meaning & Definition of Banks, functions and importance, Types, Organisation. Credit creation by banks, Rural Banking, Co-operative Banks in India
- Unit 4: Innovative Trends & recent trends in Indian Banking: E-banking, Internet banking, Electronic payment system: NEFT,ECS,RTGS. Mobile banking, Retail banking, Debit & credit card. Negotiable Instruments- Cheques, Bill of Exchange and Promissory notes.
- Unit 5: SBI: Establishment & objectives, Organisation & Management, Functions, progress, RBI: Establishment, objectives, Function, Organisation & Management

Suggested Books:

Vasant Desai: Indian Banking Nature and Problems, Himalaya Publishing House, Delhi
Natarajan S, Parameshwaran R: Indian Banking, S.Chand & Company
Averbach, Robert D: Money, Banking and Financial Markets Macmillan, London.
Varshney, P.N. : Indian Financial System, Sultan Chand & Sons, New Delhi.
Khan, M.Y.: Indian Financial System, Tata McGraw Hill, Delhi.
Mittani D.M.: Money, Banking & International Trade, Himaliya Publishing, Delhi
Bhole L.M.: Financial Market and Institution, Tata McGraw Hill, Delhi
J.K. Tandon and T.N. Mathur, Banking and Finance, Shivam Book House, Jaipur (Hindi & English Version)
Vashitha, Swami, Gupta: Banking and Finance, RBD, Jaipur
Agarwal & Singh: Internet Banking Technology, Raj Publishing house, Jaipur
Mathur B.L. & Dave R.K.: Money and Banking System, (Hindi & English), Vide Vision, Jaipur

Ojha.B.L.: Money and Financial System, (Hindi & English), Ajmera book Company, Ajmer
Trivedi, dashora, Nagar and Jain: Money and Banking System, (Hindi & English), RBD, Jaipur
Mathur & Kateva: Banking & Finance, Wide Vision, Jaipur
Bhat Anil K: Indian Banking System, Shivam Book, Jaipur.
Sundharam & Vaishney: Banking Thory Law & Practice, Sultan Chand & Sons, Delhi

Group A : Elective Paper - IV

COOPERATIVE MOVEMENT IN INDIA

- Unit 1: Concept of Co-operation, Principles of Co-operation, Co-operation v/s Capitalism and Socialism. Evolution of Cooperative Movement in India, Cooperative movement before and after independence.
- Unit 2: Organisation and function of non-credit cooperative society: Marketing Cooperative, consumer cooperative, Industrial cooperative, Housing Cooperative, Producer Cooperative, Government control over Cooperative: Legal and Administrative,
- Unit 3: Need of Bureaucratic manager in Cooperative Organisation, merit and demerit, Role, Function, Power, Duties of General Body, Board of Director, Secretary of the Society.
- Unit 4: Cooperative movement in Rajasthan : Meaning, Definition, Evolution before and after Independence. Cooperatives during plan, cooperative principles, Importance. Study of Rajasthan Cooperative Societies Act 1965 and amended uptodate. Shodha Ram Committee, Mirdha Committee, Shivraman Committee.
- Unit 5: Cooperative Institutions in Rajasthan; Cooperative Credit: Short-Medium-Long term Loan, Credit Societies
Role of the State Government in the growth of Cooperative movement, Problems, Drawbacks and suggestion for its progress

SUGGESTED READINGS:

H.R. Swami & B.P.Gupta: Rural Development & Cooperation, RBD, Jaipur
B.P.Gupta, H.R.Swami : *Grameen Vikas evam Sahakarita*
B.P.Gupta, RBD, Jaipur : *Sahakarita ke Siddanth evam Vyavhar*
Nair K.M.: Cooperative Management & Administration, Kalyani Books, Delhi
Kamat G.S.: New Dimensions of Co-operative Movement, Himalaya Publishing House, New Delhi
Sharada V: The Theory of Co-operation, Himalaya Publishing House, New Delhi
Singh L.P.: Co-operative Marketing in India & aborad, Himalaya Publishing House, New Delhi

Group B : Elective Paper - I

PUBLIC FINANCE

- Unit 1: Public Finance - Meaning, Nature and Scope, Principles, importance of Public finance. Principle of Maximum Social Advantage. Difference between public Finance and Private Finance. Public Finance and Economic Development.
- Unit 2: Public Expenditure : Meaning, classification, Objective, importance and Principles. Effects of Public Expenditure - production, consumption, saving, Investment and distribution. Trends and causes of rising public expenditure in India.
- Unit 3: Public Revenue: Meaning, Significance & Sources, Functional and economic classification. Public Borrowing :Meaning, Nature, types, techniques of principles of public borrowing. Sources of Public debt and redemption of Public debt. Role and effects of Public debt in economic Development Trends and causes of rise in public debt.
- Unit 4: Taxation :Taxation-Types, Principle and Cansos. Impact and Effects, Incidence of Taxes, Shiting of tax, Problem of tax evasion and black money, Taxable Capacity. Indian Tax System. Non tax revenues.
- Unit 5: Fiscal Policy - Meaning, objective and tools, Fiscal Deficit, Fiscal policy in India, Finance Commission, Financial relationship between Centre and State, Major criterion for transfer of funds, Current Issue: Goods and Service Tax (GST): Concept and implications.

BOOKS RECOMMENDED

- H.L.Bhatia: Public Finance, Vikas Publishing House, New Delhi
- H.L.Bhatia: Lok Vitt, Vikas Publishing House, New Delhi
- Hajela.T.N. Rajasva (H) Dalton, H. : Public Finance
- Hicks, U.K. : Public Finance
- Musgrave, R.A. : The Economics of Public Finance
- Prof. J.K. Mehta : Public Finance
- B.N. Gupta : Government Budgeting
- D.T. Lakadwala : Union State Finance Relation
- Dr.T.T.Sethi: Lokvitt evam Antarrashtriya Vyapar, LNAE Publishers, Agra
- M.L.Seth: Money, Banking, International Trade & Public Finance, LNAE Publishers, Agra
- R.C.Agarwal: Public Finance, LNAE Publishers, Agra
- Chowdhary & Chakraborty: Public Finance & Fiscal Policy, Kalyani Book, Delhi
- D.M.Mithani: Public Finance, Himalaya Publishing House, Delhi
- D.M.Mithani: Modern Public Finance, Himalaya Publishing House, Delhi

Group B : Elective Paper - II
WORKING CAPITAL MANAGEMENT

- Unit 1: Working Capital: Concept, kinds, Importance, Advantages, Disadvantages, Sources: Long term-Medium term-Short term, Methods of estimating, Accounting Ratio related to Working Capital.
- Unit 2: Financing of working Capital: Tandon & Chore Committee, recommendation, Factoring Services: Meaning, Mechanism, Function, Benefit, Limitations. Management of Cash: Meaning, Need, Factors determining, Objectives, Functions, Models, Advantages, Disadvantages
- Unit 3: Management of Receivables: Meaning, Objectives, Factors determining, Functions, Ageing Schedule
- Unit 4: Management of Inventory Control: Meaning, Objective, Need of hold inventory, factor determining levels in inventory, Risk and Cost association with inventory
- Unit 5: Techniques of inventory control: ABC Analysis, Maximum-Minimum-Re-order-Danger Level, Economic Order Quantity.

SUGGESTED READINGS

- V.K.Bhalla: Working Capital Management, S.Chand, New Delhi
- H.R.Machiraju: Introduction to Project Finance, S.Chand, New Delhi
- Bhavesh Patel : Fundamental of Financial Management, S.Chand, New Delhi
- Agarwal, Agarwal, Kothari: Financial Management,(Hindi & English) RBD Publication, Jaipur.
- Khan M.Y and Jain P.K.: Financial Management. TataMcGraw hill, New Delhi
- Pandey I.M: Financial Management. Vikas Publishing house, New Delhi
- Prasanna Chandra: Financial Management - Theory and Practice. TataMcGraw hill, New Delhi
- Agarwal & Mishra: Financial Management.
- Bierman, H. And Smidt, S.: The Capital Budgeting Decisions. Harcourt collage publisher, Singapore.
- Fama, E.F. and Miller, M.H.: The Theory of Finance.
- Hunt, P., Williams, C.M. and Donaldson, G.: Basic Business Finance.
- Van Horne, J.C.: Financial Management and Policy. Prentice hall, New Delhi
- Kuchhal, S.C.: Financial Planning – An Analytical Approach. Chaitanya Publishing House,Mich
- Malodia, G.L.: Financial Management. Jodhpur
- Ravi M. Kishore: Financial Management. Taxman Publisher, New Delhi
- S.N. Maheshwari: Financial Management. New Delhi
- Periasamy.P: Working Capital Management, Himalaya Publishng House, Delhi
- Sharma D.: Working Capital Management, Himalaya Publishng House, Delhi

Group B : Elective Paper - III
INDUSTRIAL AND LABOUR ECONOMICS

- Unit 1: Industrialization: Meaning, Strategies and Pattern of Industrial Growth, Industrial Productivity, Determinants of industrial growth. Impact and advantages of industrialization. Dangers of heavy industrialization, changes in Indian Economy in recent years.
- Unit 2: Industrial Policy : Industrial (Dev. and Regulation) Act, 1951. Licensing Policy, Policy towards multinationals, Industrial Location: Theories, Factors influencing location, Tariff Policy. Rationalisation: Object, Importance, Merits.
- Unit 3: Issues of Indian Industry: Growth and Changes in Structure, Public Sector: Shortcoming, New Economic Policy, Pricing Policy, Industrial Sickness: Causes, Remedial Action. Private Sector: Growth, Characteristics, Contribution, Defects, Liberalisation and Private Sector.
- Unit 4: Labour Economics : Meaning and scope, Labour and Labour welfare : Concept, Principles, Labour welfare in Indian Industries: Internal and external welfare facilities. Factories Act 1948: Different definition; Workers: Rights, Obligation, Occupier and his duties.
- Unit 5: Theory of Wages : Living wage, minimum wage, need based wage, Deduction from wages, claims for wrongful deductions. The Payment of wage Act, 1936 and Minimum Wages Act, 1948: Object, Scope of the act, Fixation and revision of minimum wages, Advisory and Central Advisory Board, Safeguard on payment of Minimum Wages.

BOOKS RECOMMENDED

- S.C.Srivastava: Industrial Relations & Labour Law, Vikas Publishing House, New Delhi
 Pylee & George: Industrial relations & Personnel Management, Vikas Publishing House, New Delhi
 R.S.Davar: Personnel Management & Industrial Relations, Vikas Publishing House, New Delhi
 Kuchhal, S.C. : Industrial Organisation
 Agarwal, A.N. : Indian Economy
 Datta and Sundaram : Industrial Economics
 Mishra and Puri : Economic Planning
 Dhar, P.N. and Lydel : The Role of Small Enterprises in Indian Economic Development
 Bagchi, A. and Banerjee : Change and Choice in Indian Industry
 S.C. Kuchhal : Industrial Economy of India, 1983
 Gupta, K.R. : Organisation and Management of Public Enterprises
 D.K.Kulshreshtha: Industrial Law, LNAE Publications, Agra
 D.K.Kulshreshtha: Labour Legislation, LNAE Publications, Agra
 Amandeep Kaur: Industrial Relations, Kalyani Books, Delhi
 Ghosh, Biswanath: Industrial Relations of Developing Economy, Himalaya Publishing House, Delhi
 Kubendran, Kodesswari: Industrial Relations & Labour Laws, Himalaya Publishing House, Delhi
 Mamoria, Mamoria & Gankar: Dynamics of Industrial Relations, Himalaya Publishing House, Delhi
 Sharma A.M.: Industrial Relations & Labour Laws, Himalaya Publishing House, Delhi
 N.Kumar: Industrial Economics, LNAE Publications, Agra
 R.Sharma: Human Resources Development, LNAE Publications, Agra

N.Kumar: Labour Economics, LNAE Publications, Agra
R.Sharma: Industrial Relations, LNAE Publications, Agra
D.K.Kulshreshtha: Industrial Law, LNAE Publications, Agra
D.K.Kulshreshtha: Labour Legislation, LNAE Publications, Agra
Sahni N.K., Amandeep & Agarwal: Industrial Relations, Kalyani Book, Delhi
Bhogilwal T.N.: Industrial relation and Labour Welfare, Sahitya Bhawan Publication, Agra

Group B : Elective Paper - IV

ECONOMICS OF INDUSTRIAL RELATIONS

- Unit 1: Industrial Relations : Definition, Importance, Determining Factor, Causes and suggestions of Poor Industrial Relations. collective bargaining : concept, need, practice and progress, strikes and lockout: Right to strike and workout, Worker's Participation in management: Meaning, object, Forms, Merit and Demerit. Social Security: Definition, Need, Significance, Working of the various Social Security measures.
- Unit 2: Industrial Discipline: Meaning, Objectives, Principles, Types, Act of Misconduct, causes of indiscipline, Measure, Kinds of Punishment, Procedure for taking disciplinary action. Grievances: Definition, Causes, Features of grievance procedure.
- Unit 3: Personnel Management: Definition, Nature, Objective, Scope, Principles and functions, Organisation of personnel department, role of a personnel officer; line and Staff function; Recruitment, induction; promotion and transfer, development and training.
- Unit 4: Wage and Salary Administration: Meaning, Classification, Principles, Wage variation, Methods of Payment, wage incentives essential of a good incentive plan. Non-wage incentives: Meaning, Role, Fringe Benefits: Meaning, Features, Kinds, Growth factors of Fringe Benefits.
- Unit 5: Human Relation: Need, Objectives, Scope, Themes, causes of slow Human Relation in Industry, Suggestions to improve Human Relation, Philosophy of Human Relation.

BOOKS RECOMMENDED

Agarwal, R.D. : Dynamics of Labour Relation in India
Agnihotry, V. : Industrial Relation in India
Gadgil, D.R. : Industrial Relation in India
Davar, R.S. : Personnel Management and Industrial Relation Chatterjee, R.N. : Management of Personnel in India Sharma, D.C. and R.C. : Industrial Relations and Personnel Management
Ghosh, Biswanath: Industrial Relations of Developing Economy, Himalaya Publishing House, Delhi
Kubendran, Kodesswari: Industrial Relations & Labour Laws, Himalaya Publishing House, Delhi
Mamoria, Mamoria & Gankar: Dynamics of Industrial Relations, Himalaya Publishing House, Delhi
Sharma A.M.: Industrial Relations & Labour Laws, Himalaya Publishing House, Delhi
N.Kumar: Industrial Economics, LNAE Publications, Agra
R.Sharma: Human Resources Development, LNAE Publications, Agra
N.Kumar: Labour Economics, LNAE Publications, Agra
R.Sharma: Industrial Relations, LNAE Publications, Agra
D.K.Kulshreshtha: Industrial Law, LNAE Publications, Agra
D.K.Kulshreshtha: Labour Legislation, LNAE Publications, Agra

Sahni N.K., Amandeep & Agarwal: Industrial Relations, Kalyani Book, Delhi
Bhogilwal T.N.: Industrial relation and Labour Welfare, Sahitya Bhawan Publication, Agra

SYLLABUS

*As per Choice Based Credit System (CBCS)
Applicable for Regular Students*

DEPARTMENT OF BUSINESS ADMINISTRATION

M.Com. (Previous) Bus. Adm. Examination, 2019 - 20

M.Com. (Final) Bus. Adm. Examination, 2020 - 21



JAI NARAIN VYAS UNIVERSITY

JODHPUR

MASTER OF COMMERCE (M.COM.) – BUSINESS ADMINISTRATION

As per Choice Based Credit System (CBCS)

Applicable for the Regular Students

ACADEMIC SESSION 2019 – 21

DEPARTMENT OF BUSINESS ADMINISTRATION
FACULTY OF COMMERCE & MANAGEMENT STUDIES,
JAI NARAIN VYAS UNIVERSITY, JODHPUR

The 'Department of Business Administration' came into existence on 3rd February 1990 with the objective of imparting quality business education as well as to enable the student fraternity to broaden their base and sharpen their understanding with a view to mould them as future business leaders' administrators and executives. Initially the department commenced its activities within the 'Faculty of Commerce' but started functioning independently from February 1990. Since then the Department of Business Administration has grown both academically and professionally. We have had a long journey of two decades taking the department to greater heights over the years.

The Department of Business Administration focuses on integrated, interdisciplinary themes of fundamental importance to every aspect of decision making. The department and its expert faculty educate future business leaders. The department is dedicated to instilling the critical thinking necessary to succeed in business. A rich learning environment is enhanced by experiential learning opportunities.

VISION

To be recognized as knowledge hub of business education and research creating socially responsible citizens.

MISSION

To develop future business leaders and professionals from a cross-functional, cross-cultural perspective with the consciousness, knowledge, and practical skills to assume responsible positions in organizations, and develop them into well-rounded managers to be successful in dynamic, ever changing business environment.

OBJECTIVES

-
- *To offer academic and research programmes in business and allied disciplines.*
 - *To offer educational programmes at different levels in the field of business education.*
 - *To provide opportunity to students to acquire skills for improving employability and entrepreneurial abilities.*
 - *To undertake consultancy, research and extension activities with a focus on sustainable development.*

COURSES FOR STUDIES

The department offers following programmes of teaching:

- Bachelor of Commerce (B.Com.) – In combination with other department of the faculty.
- Bachelor of Commerce – B.Com. (Honours) Business Administration

- Bachelor of Business Administration (BBA) – In combination with other department of the faculty.
- Master of Commerce (M.Com.) – Business Administration
- Master of Human Resource Management (MHRM)
- Master of Marketing Management (MMM)
- Post Graduate Diploma in Human Resource Management (PGDHRM)
- Post Graduate Diploma in Marketing Management (PGDMM)
- Post Graduate Diploma in Entrepreneurship (PGDE)

RESEARCH PROGRAM

The department provides facilities for full time M.Phil / Ph.D. / D.Lit. programmes in Business Administration. The research programs in the department promote innovation; focus on activities that can make a difference to problems that matter to industry & society. These research program continue to attract researchers of excellent caliber.

TEACHING FACULTY

The Department of Business Administration is headed by Dr. Umaid Raj Tater with rich teaching experience of over 20 years. The department is supported by eight Assistant Professors. Our teaching faculties are widely acknowledged as leaders in research in varied business streams. They actively contribute in professional organizations and serve on influential editorial boards. The faculty members have authored various books, produce academic papers, and written an array of articles for general business publications. The research and consultancy are translated into a classroom experience that is theoretically grounded, evidence-based, practical and forward looking. The teaching team comprises of:

1. Dr. U.R. Tater, Assistant Professor and Head
M.Com., Ph.D.
2. Dr. M.L. Vasita, Assistant Professor (joined UOR on lien)
M.Com., Ph.D., PGDLL, M.B.A., SFDP-IIMA
3. Dr. Asha Rathi, Assistant Professor
M.Com., Ph.D., PGDM&SM
4. Dr. Ashish Mathur, Assistant Professor
M.B.A., Ph.D.
5. Dr. Manish Vadera, Assistant Professor
M.B.A., Ph.D., LL.B.
6. Dr. Ramesh Kumar Chouhan, Assistant Professor
M.Com., M.T.A., Ph.D.
7. Dr. Ashok Kumar, Assistant Professor
M.Com., M.Phil., Ph.D.
8. Dr. Vandana Yadav, Assistant Professor
M.B.A., Ph.D.

NEW INITIATIVES AND FUTURE VISION

Department plans to organize Management Development Programmes, Quality improvement in Business Education, Faculty Development Programmes, Quality improvement in teaching, Student-industry Partnership activities.

At the department, changes are occurring in the form of revised course curriculum, increased industry interaction; focus on business research, leadership applications, student-alumni interaction and career building.

Apart from the other post-graduate and research courses M.Com is the most exalted two year full time post-graduate programme in business administration. The course provides an extreme and rigorous base for teaching, research and allied business administration. The programme is well received in the industry and for years had been serving the needs of managerial cadre in Indian Inc.

The course serves the needs of academics and prepares students for research and teaching. The Alumni of this course are well placed in business, academics and administration in the country as well as abroad.

In the year 2016, this course has been changed from annualized to Choice Based Credit System (CBCS) dividing the whole course into 4 semesters. During the semesterization of the course, the overall structure has been improved to provide an insight of research in business administration and interdisciplinary areas.

As per the new structure, there are 4 papers in each semester. In the second year, there are 2 compulsory papers in each semester. As per the area of interest, the students are required to choose one optional group in the beginning of 2nd year. The group shall consist of 4 papers to be studied in 3rd and 4th semester. The structure for the groups has been designed with intent to provide advanced level specialization in the respective field.

Admission:

The minimum qualification for admission to M.Com. Course is B.Com. (10+2+3) degree. The details of eligibility conditions and admission procedure are given in the admission form. The admission will be done on the basis of merit calculated by the aggregate marks obtained at the B.Com. level including the marks awarded under the category (a) and (b) mentioned in the admission form [i.e. (a) benefit to the candidates who are resident of Rajasthan, and (b) benefit for candidates of J.N. Vyas University, Jodhpur]. Reservation of Scheduled Caste / Scheduled Tribes / Disabled / OBC / SBC and wards of University employees will be as per University rules.

Medium of Instruction:

The language medium of instructions and examination in each course shall be English and Hindi.

Name of the Program: Master of Commerce (M.Com.) in Business Administration

Agency conducting the course: Department of Business Administration, Faculty of Commerce and Management Studies, Jai Narain Vyas University, Jodhpur

Program Structure:

The M.Com. Program is divided into two parts as under. Each Part will consist of two semesters.

		Semester	Semester
Part – I	First Year	Semester I	Semester II
Part – II	Second Year	Semester III	Semester IV

- There will be 6 lecture periods of 45 minutes each of teaching per week for each paper.
- Duration of End Semester Examination of each paper shall be 3 hours.
- Each paper will be of 100 marks out of which 70 marks shall be allocated for End Semester Examination (ESE) and 30 marks for Continuous Comprehensive Assessment (CCA).

The Schedule of papers prescribed for various semesters shall be as follows:

TYPE OF COURSE	COURSE CODE	TITLE OF THE COURSE	LECTURE / WEEK	NO. OF CREDITS	CCA	ESE	TOTAL
SEMESTER I							
Core course 1	Bus.Adm.-101	Representative Management Thinkers	6	6	30	70	100
Core course 2	Bus.Adm.-102	Marketing Management	6	6	30	70	100
Core course 3	Bus.Adm.-103	Human Resource Management	6	6	30	70	100
Core course 4	Bus.Adm.-104	Financial Management	6	6	30	70	100
Skill Course I	E-Marketing		2				
Total				24	120	280	400
SEMESTER II							
Core course 5	Bus.Adm.-201	Strategic Management	6	6	30	70	100
Core course 6	Bus.Adm.-202	Organization Behaviour	6	6	30	70	100
Core course 7	Bus.Adm.-203	Entrepreneurship and Small Business	6	6	30	70	100
Core course 8	Bus.Adm.-204	Production & Operations Management	6	6	30	70	100
Skill course II	Consumer Rights and Education		2				
Total				24	120	280	400
SEMESTER III							
Core course 9	Bus.Adm.-301	Fundamentals of Management Research	6	6	30	70	100
Core course 10	Bus.Adm.-302	International Business	6	6	30	70	100
Discipline Specific Elective 1	Bus.Adm.-303M / 303H / 303F	Elective Paper I (Both two papers of any one chosen group)	6	6	30	70	100
Discipline Specific Elective 2	Bus.Adm.-304M / 304H / 304F	Elective Paper II (Both two papers of any one chosen group)	6	6	30	70	100
Skill course III	E-Commerce		2				
Total				24	120	280	400
SEMESTER IV							
Core course 11	Bus.Adm.-401	Labour and Industrial Laws	6	6	30	70	100
Core course 12	Bus.Adm.-402	Corporate Governance, Ethics and Social Responsibility	6	6	30	70	100

Discipline Specific Elective 3	Bus.Adm.- 403M / 403H / 403F	Elective Paper III (Both two papers of any one chosen group. The papers will be from the same group as chosen in Semester III)	6	6	30	70	100
Discipline Specific Elective 4	Bus.Adm.- 404M / 404H / 404F	Elective Paper IV (Both two papers of any one chosen group. The papers will be from the same group as chosen in Semester III)	6	6	30	70	100
Skill course IV	Social Ethics		2				
Total				24	120	280	400

CCA – Continuous Comprehensive Assessment
ESE – End Semester Examination (University Examination)

Note:

- The elective group in the Semester IV will remain the same as the one selected in Semester III.
- Once a group has been selected, no change in selected group will be allowed later.

LIST OF OPTIONAL GROUPS:

The Department will announce in the beginning of the respective semester, the list of elective groups which will be offered during the semester depending upon the availability of faculty members and demand of electives.

GROUP A : **MARKETING AREA**
Paper I : Consumer Behaviour and Marketing Research
Paper II : Logistics & Supply Chain Management
Paper III : Retail Marketing
Paper IV : Service Marketing and Customer Relationship Management

GROUP B : **HUMAN AREA**
Paper I : Organization Development & Change Management
Paper II : Labour-Management Relations
Paper III : Performance Management
Paper IV : Strategic Human Resource Management

GROUP C : **FINANCE AREA**
Paper I : Financial Market and Institutions
Paper II : Security Analysis and Portfolio Management
Paper III : Management of Financial Services
Paper IV : Corporate Tax Planning

Teaching Methods:

A combination of different teaching methods such as Lectures; Case Discussions; Seminars; Presentations, Individual and Group Exercises and Assignments etc will be used.

Teaching Faculties:

Faculty will be drawn from within the Jai Narain Vyas University of Jodhpur and outside subject to availability considering nature of the subject and availability of resources as the case may be. In addition, an attempt will be made to draw Professionals from Business, Industry to share their experience with Participants.

Key Guidelines:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed elective and skill courses. A student needs to select **elective group** offered by the Department of Business Administration as part of core programme during third and fourth semester. The elective group in the Semester IV will remain the same as the one selected in Semester III. Once a group has been selected, no change in selected group will be allowed later. Each student has to complete **four skill courses:** two within the Department of Business Administration (Semester I and III) and two from other Department within JNV University or the Universities approved by JNV University (Semester II and IV).
3. **Course:** Usually referred to, as 'papers' is a component of a programme.
4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.
5. **Credit Point:** It is the product of grade point and number of credits for a course.
6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one period of teaching (lecture or tutorial) or two periods of practical work/field work per week.
7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
10. **Programme:** An educational programme leading to award of the Postgraduate Degree in the Core subject in which he/she is admitted.
11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.
12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to November/December and even semester from December/January to May.
Odd semester University examination shall be during second/third week of December and even semester University examination shall be during second/third week of May.
13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a statement of grades obtained shall be issued to all the registered students after every semester. This statement will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester.

Assessment:

Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Accordingly:

- a. All internal assessments shall be open assessment system only and that are based on quizzes, term test and seminar.
- b. Attendance shall carry the prescribed marks in all papers.
- c. In each semester two out of four theoretical components of the University examinations shall be undertaken by external examiners from outside JNV University, who may be appointed by the competent authorities.

Grievances and Redressal Mechanism:

- a) The students will have the right to make an appeal against any component of evaluation. Such appeal has to be made to the Head, Department of Business Administration in writing the reason(s) for the complaint / appeal.
- b) The appeal will be assessed by the Head and he/she shall place before the **Grievance Redressal Committee (GRC)**, Chaired by the Head, Department of Business Administration comprising of the senior most Professor from Department of Business Administration and one teaching staff nominated by the Head and if need be Course Teacher(s) be called for suitable explanation; GRC shall meet at least once in a semester and prior to CCA finalization.
- c) The Committee will consider the case and may give a personal hearing to the appellant before deciding the case. The decision of the Committee will be final.

Table 1: Grades and Grade Points

S.No.	Letter Grade	Meaning	Grade Point
1	'O'	Outstanding	10
2	'A+'	Excellent	9
3	'A'	Very Good	8
4	'B+'	Good	7
5	'B'	Above Average	6
6	'C'	Average	5
7	'P'	Pass	4
8	'F'	Fail	0
9	'AB'	Absent	0

- i. A student obtaining Grade F in a paper shall be considered failed and will be required to reappear in the University End Semester examination.
- ii. For noncredit courses (Skill Courses) 'Satisfactory' or "Unsatisfactory' shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA

Grade Point assignment:

- = and > 95 % marks Grade Point 10.0
- 90 to less than 95 % marks Grade Point 9.5
- 85 to less than 90 % marks Grade Point 9.0
- 80 to less than 85 % marks Grade Point 8.5
- 75 to less than 80 % marks Grade Point 8.0
- 70 to less than 75 % marks Grade Point 7.5
- 65 to less than 70 % marks Grade Point 7.0
- 60 to less than 65 % marks Grade Point 6.5

- 55 to less than 60 % marks Grade Point 6.0
- 50 to less than 55 % marks Grade Point 5.5
- 45 to less than 50 % marks Grade Point 5.0
- 40 to less than 45 % marks Grade Point 4.5
- 35 to less than 40 % marks Grade Point 4.0

Computation of SGPA and CGPA:

- i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student,
i.e.

$$\text{SGPA (Si)} = \frac{\sum (Ci \times Gi)}{\sum Ci}$$

Where Ci is the number of credits of the ith course and Gi is the grade point scored by the student in the ith course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme,
i.e.

$$\text{CGPA} = \frac{\sum (Ci \times Si)}{\sum Ci}$$

where Si is the SGPA of the ith semester and Ci is the total number of credits in that semester.

- iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration for SGPA

S.No.	Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
1	Course 1	6	B	6	6 x 6 =36
2	Course 2	6	B+	7	6 X 7 =42
3	Course 3	6	B	6	6X 6 = 36
4	Course 4	6	O	10	6 X 10 =60
	Total	24			36+42+36+60=174

Thus, $\text{SGPA} = 174/24 = 7.25$

Illustration for CGPA

	Semester- I	Semester-II	Semester-III	Semester-IV
Credit	24	24	24	24
SGPA	7.25	7.25	7	6.25

$$\text{CGPA} = \frac{(24 \times 7.25 + 24 \times 7.25 + 24 \times 7 + 24 \times 6.25)}{96}$$

$$666/98 = 6.94$$

*** Department of Business Administration shall offer one skill course per semester from the list of skill courses approved for the Department.**

In view of the course content, the Department of Business Administration has distributed the lecture as under per paper

- 6 (six lectures only per week) – For Theory Paper
- 2 (two lectures) - For Skill course

The Duration of the lecture shall be forty five minutes.

Course Evaluation (Evaluation of the Students):

All courses (Core/ Elective) involve an evaluation system of students that has the following two components:-

- (i) **Continuous Comprehensive Assessment (CCA)** accounting for 30% of the final grade that a student gets in a course; and
- (ii) **End-Semester Examination (ESE)** accounting for the remaining 70% of the final grade that the student gets in a course.

Continuous Comprehensive Assessment (CCA): This would have the following components:

- a. **Quizzes:** Two quizzes shall be arranged for each paper during the semester. The maximum marks for each quiz will be 5 for each quiz per paper.
- b. **Term Test:** One term test shall be arranged for each paper during the semester. The maximum marks for term test will be 10 for each paper.
- c. **Seminar:** Each student shall prepare and deliver a seminar per theory paper; maximum marks shall be 5. The seminar shall be completed prior to term test for all the papers.
- d. **Classroom Attendance** – Each student will have to attend a minimum of 75% Lectures. A student having less than 75% attendance (on the basis of cumulative attendance of all the course papers and individual course basis) will not be allowed to appear in the End-Semester Examination (ESE). Attendance shall have 5 marks and will be awarded by following the system proposed below:

Those having greater than 75% attendance (condonation of shortage of attendance shall be governed in accordance with the provisions in the Act and Statute of the University vide Ordinance 78 to 80 as amended from time to time) will be awarded CCA marks as follows:-

75% to 80%	=	1 marks
80% to 85%	=	2 marks
85 to 90%	=	3 marks
90% to 95%	=	4 marks
> 95%	=	5 marks

Each student's cumulative attendance shall be displayed in the Department Notice Board every month.

- e. CCA is based on open evaluation system without any bias to any student
- f. Any grievance received in the Department from student shall be placed before the **Grievance Redressal Committee** with adjudicated comments

Skill Course Evaluation: Based on his/her performance and hands on practice, the respective Department shall declare the result as "Satisfactory" or "Non-Satisfactory"; each student need to get a minimum of three "Satisfactory" declaration for the course completion.

For the ESE:

ESE paper shall be divided into three parts that is **Part A, Part B** and **Part C**.

Part A

Ten short questions (Definitions, illustrations, functions, short explanations, etc; up to 25 words) for two marks each $10 \times 2 = 20$ marks; two questions from each Unit; no choice in this part.

20 marks

Part B

Five short answer (up to 250 words) type questions for four marks each. $5 \times 4 = 20$ marks; one question from each Unit with internal choice

20 marks

Part C

Five questions of long/explanatory answer (up to 500 words) type, one drawn from each Unit; student needs to answer any three; ten marks each; $3 \times 10 = 30$ marks

30 marks

70 marks

Qualifying for Next semester:

1. A student acquiring minimum of 40% in total of the Continuous Comprehensive Assessment (CCA) will be eligible to join next semester. The candidates who fail in CCA shall not be promoted to next semester.
2. A student who does not pass the examination (CCA + ESE) in any course(s) (or due to some reason as he/she has not been able to appear in the ESE, other conditions being fulfilled, and so is considered 'Fail'), shall be permitted to appear in such failed course(s) in the subsequent ESE to be held in the following October / November or April / May, or when the course is offered next, as the case maybe.
3. A student who fails in one or more papers in a semester shall get three more chances to complete the same; if he/she fails to complete the same within the prescribed time, i.e. three additional chances for each paper; the student is ineligible for the Postgraduate degree in the subject.
4. Students failed in CCA: Any student declared "Not Eligible" by the department based on CCA in Semester I, II, III or IV and accordingly did not appear in ESE; can be readmitted as an additional student in that semester in the following year only. Such student need to deposit the annual university fee as prescribed for that academic year.
5. The consolidated mark-sheet of the M.Com. (Business Administration) will be issued and the degree will be awarded only after completing all the requirements i.e. satisfactorily passing the Skill Papers, CCA and ESE. For grace-marks and revaluation, the rules and regulations declared by the University from time to time will be applicable.

Improvement Option:

Every student shall have the opportunity to improve Credit thorough University Examination only. Improvement opportunity for each paper is only with two additional chances; the credit obtained in improvement examination shall be final. There shall be no improvement opportunity in practical examinations.

Commencement of next Semester:

The Theory Classes of even semesters shall begin from the next day of ESE; whereas odd semester classes shall commence after summer vacation.

M.COM. (BUSINESS ADMINISTRATION)

SESSION 2019 – 20

SEMESTER-I

Bus.Adm.-101 - REPRESENTATIVE MANAGEMENT THINKERS

Unit-I: Early Thinkers: Charles Babbage, Robert Owen, Fredrick W Taylor, Henry Fayol, Elton Mayo, Chestard I Barnard, Mary P Follet.

Unit-II: Behavioral Thinkers: Abraham H Maslow, Fredrick Herzberg, Douglas McGregor, Victor H Vroom, David McClelland, James S Adams.

Unit-III: Leadership Theorists: Rensis Likert, Robert R Blake & Jane S Mouton, Robert Tannenbaun, Fred Feidler, Paul Hersey & Kenneth H. Blanchard.

Unit-IV: Modern Thinkers: Peter F Drucker, Michael Porter, Garry Hamel, Tom Peters, Coimbatore K Prahalad.

Unit-V: Indian Epics and Management: Bhagwad Gita, Ramayana, Swami Vivekananda, Chanakaya, Mahatama Gandhi.

SUGGESTED READINGS

- Mathur Navin: Management Gurus – Ideas and Insights, National Publishing House, Jaipur.
- Singh RN: Management Thoughts and Thinkers, Sultan Chand and Sons, New Delhi.
- George CS: The History of Management Thought, Prentice Hall, New Delhi.
- Drucker, Peter F: Management: Tasks, Responsibilities and Practices, Harper and Row, New York.
- Khanna S: Vedic Management, Taxman Publications (P) Ltd.
- Saneev, Rinku and Khanna, Parul: Ethics and Values in Business Management, Ane Books Pvt. Ltd.
- Bhagwad Gita as viewed by Swami Vivekananda: Vedanta Press & Bookshop.
- Rajgopalachari, C.: Ramayan, Bhartiya Vidya Bhawan.

Bus.Adm.-102 - MARKETING MANAGEMENT

Unit-I: Introduction: Concept, Nature, Scope and Importance of Marketing; Marketing concept and its evolution; Marketing mix.

Market Analysis and Selection: Marketing environment – macro and micro components and their impact on marketing decisions; Market segmentation and positioning; Buyer behavior; Consumer versus organizational buyers; Consumer Decision Making Process.

Unit-II: Product Decisions: Concept of a product; Classification of products; Major product decisions; Product line and product mix; Branding; Packaging and labeling; Product life-cycle – strategic implications; New Product Development and Consumer Adoption Process.

Pricing Decisions: Factors affecting price determination; Pricing policies and strategies; Discounts and rebates.

Unit-III: Distribution Channels and Physical Distribution Decisions: Nature, functions, and types of distribution channels; Distribution channel intermediaries; Channel Management Decision; Retailing and Wholesaling.

Unit-IV: Promotion Decisions: Communication process; promotion mix – advertising, personal selling, sales promotion, publicity and public relations; Determining advertising budget; Copy designing and its testing; Media selection; Advertising effectiveness; Sales Promotion – tools and techniques.

Unit-V: Issues and Developments in Marketing: Social, Ethical and Legal Aspects of Marketing; Services Marketing; Green Marketing; Sustainable Marketing; Relationship Marketing; and other development in marketing.

SUGGESTED READINGS

- Agarwal, P.K.: Marketing Management: An Indian Perspective, Pragati Prakashan, Meerut.
- Kotler, Philip and Gary Armstrong: Principles of Marketing, Prentice Hall, New Delhi.
- Kotler, Philip: Marketing Management – Analysis, Planning, Implementation and Control, Prentice Hall, New Delhi.
- Majumdar, Ramanuj: Product Management in India, Prentice Hall, New Delhi.
- Ramaswamy, V.S. and Namakumari, S: Marketing Management, MacMillan India, New Delhi.
- Srinivasan, R: Case Studies in Marketing: The Indian Context, Prentice Hall, New Delhi.
- Stanton, William J., and Charles Futrell: Fundamentals of Marketing, McGraw Hill Publishing Co., New York.
- Sontakki, C.N., Marketing Management: In the Indian Background, Kalyani Publishers, New Delhi.
- Verma V. Harsh & Duggal Ekta: Marketing, Oxford University Press, New Delhi.

Bus.Adm.-103 - HUMAN RESOURCE MANAGEMENT

Unit-I: Human Resource Management- Meaning & Definition, Importance, Role of HR Manager- Strategic HRM, Human Resource Planning- Meaning & Definition, Objectives, Process, Forecasting. Job Analysis- Job Description & Job Specification. Recruitment-Meaning & Definition, Sources of Recruitment, Process, Employer Branding. Selection - Meaning & Definition, Process. Induction.

Unit-II: Training & Development- Meaning & Definition, Objectives and Needs, Process & Methods of Training, Evaluation of Training Programme, Performance Management- Concept & Definition, Methods, Rating Errors ,Competency Management.

Unit-III: Compensation Management-Concept, Job Evaluation, Incentives &Benefits, Types of Compensation Plans, Career Planning-Succession Planning-Talent Management High Potential Employees.

Unit-IV: Productivity Management- Concept- TQM- Kaizen- Quality Circles, Industrial Relations- Grievance, Collective Bargaining. Retirement/Separation - Superannuation - Voluntary Retirement Schemes, Resignation, Discharge-Dismissal-Suspension-Layoff. Exit Interview

Unit-V: Ethical Issues in HRM: Nature and Need, HR Ethical Issues. Challenges of HRM. International Human Resource Management. Domestic HRM and IHRM Compares, Managing International HR Activities.

SUGGESTED READINGS

- Gomez-Mejia, Luis R., D.B. Balkin and R.L. Cardy: Managing Human Resources, Prentice Hall, New Jersey.
- DÇenzo, David A. & Stephen P. Robbins: Human Resource Management, John Wiley and Sons, New Delhi.
- Ian, Beardwell and Len Holden: Human Resource Management, MacMillan, Delhi.
- Dessler, Garry: Human Resource Management, Prentice Hall of India, New Delhi.
- Saiyadain Mirza S.: Human Resource Management, Dhanpat Rai and Co. Pvt. Ltd., New Delhi
- Chhabra, T.N.: Human Resource Management, Dhanpat Rai and Co. Pvt. Ltd., New Delhi
- Dwivedi, R.S.: Managing Human Resources: Personnel Management in Indian Enterprises, Galgotia Publishing Company, New Delhi
- Harzing, A.W. and Joris Van Ruysseveldt: International Human Resource Management: An Integrated Approach, Sage Publication, London
- Dowling, Peter J., D.E. Welch and R.S. Schuller: International Human Resource Management: Managing People in a Multiple Context, South Western College Publishing Cincinnati.
- Sharma and Surana: Sevivargiya Prabandh evam Audyogik Sambandh (Hindi)

Bus.Adm.-104 - FINANCIAL MANAGEMENT

Unit-I: Meaning, Importance and Objectives of Financial Management, Conflicts in profit versus value maximization principle, Role of Chief Financial Officer. Time value of money: compounding and discounting techniques-Concepts of Annuity and perpetuity.

Unit-II: Financing Decisions: Cost of Capital, Capital Structure decisions-Capital structure patterns, designing optimum capital structure, Constraints, Various capital structure theories.

Unit-III: Investment decisions: Capital budgeting-concept, theory, Techniques of Decision making: Non-discounted and Discounted Cash flow Approaches. , Business Risk and Financial Risk — operating leverage, financial leverage and Combined Leverage.

Unit-IV: Dividend Policy: concept, theories sand determinants, Different sources of finance: Asset Based financing-Lease Hire Purchase and Project Financing, Capital Restructuring

Unit-V: Management of working capital: Working capital policies, Inventory management Receivables management, Management of cash and marketable securities, financing of working capital.

SUGGESTED READINGS

- Bierman, H. : Financial Policy Decisions, Macmillan
- Bierman, H. and Smidt, S. : The Capital Budgeting Decisions, Macmillan
- Fama, E.F. and Miller, M.H. : The Theory of Finance, Holt, Rinchart and Winston
- Hunt, P., Williams, C.M. and Donaldson, G.: Basis Business Finance
- Van Horne, J.C. : Financial Management and Policy, Prentice Hall
- Kuchhal, S.C. : Financial Planning An Analytical Approach, Chaitanya Publishing House
- Ramchandran, H. : Financial Planning and Control, S.Chand and Co.

- Lawrence, D. Sohail and Charles W. Haley : Introduction to Financial Management, Tata McGraw Hill
- Agarwal and Agarwal : Financial Management (Hindi), Ramesh Book Depot., Jaipur
- Malodia, G.L. : Financial Management (Hindi and English), Jodhpur Publishing House, Jodhpur
- Khan and Jain : Financial Management, Tata McGraw Hill Co.
- Ravi M. Cishore : Financial Management, Taxmann's Publications
- S.N. Maheshwari : Financial Management, Sultan Chand and Co.

SKILL COURSE I - E-MARKETING

Unit-I: E-Marketing: Introduction, Strengths & Applications, Communication modes,

Unit-II: Integrated Marketing Communication & the Internet, Consumer Segmentation.

Unit-III: The Online Marketing Mix: Marketing Segmentation, Customer Segmentation, Targeting, Positioning, E-Price, E-Promotion; The Online Consumer.

Unit-IV: Business Drivers in Business World: Social Media, Online Branding, Web Business Model, E-Commerce.

Unit-V: Online Tools for Marketing: Engagement Marketing through Content Management, Online Campaign Management, Consumer Segmentation, Targeting, and Positioning using online tools.

SUGGESTED READINGS

- Chaffey, Mayer, Johnston, Ellis-Chadwick: Internet Marketing, Prentice Hall.
- Hagel, J and Singer M.: Net Worth, McKinsey.
- Hanson, W.: Principles of Internet Marketing, International Thomson Publishing
- Reedy, Schullo, Zimmerman, K.: Electronic Marketing, Dryden.
- Siebel, D.: Futurize your Enterprise, J.Wiley.
- eSterne, J.: World Wide Web Marketing, John Wiley & Sons.
- Straus, J. and Frost R.: Marketing on the Internet, Prentice Hall.

SESSION 2019 – 20

SEMESTER II

Bus.Adm.-201 - STRATEGIC MANAGEMENT

Unit-I: Strategic Management: Evolution, Understanding Strategy, Levels of strategy, strategic decision making, issues in strategic decision making, various schools of thoughts on formation of strategy, introduction to strategic management, strategic management process.

Unit-II: Establishing Strategic Intent: Understanding strategic intent, concept of stretch, leverage and fit, vision, mission, business definition, goals and objectives, role of objectives, characteristics of objectives, issues in objective setting, formulation of objective.

Unit-III: Strategy Formulation: Concept of environment, environmental sectors, scanning of the environment, environmental appraisal, organizational appraisal, corporate level & business level strategies.

Unit-IV: Strategic Analysis & Choice: Process of strategic choice, strategic analysis, subjective factors in strategic choice, contingency strategies. Strategy Implementation: Nature of strategy implementation, barrier to strategy implementation, interrelationship of formulation and implementation, project implementation, procedural implementation, and behavioral implementation

Unit-V: Functional and Operational Implementation: Financial, Marketing, Operations / Production, Personnel plans and policies, information, integration of functional plans and policies. Strategic evaluation and control; Techniques of strategic evaluation and control.

SUGGESTED READINGS

- Azar Kazmi: Business Policy and Strategic Management, Tata McGraw Hill, New Delhi.
- Jain PC: Strategic Management (Hindi).
- Bhattacharry, SK and N. Venkataramin: Managing Business Enterprises: Strategies, Structures and Systems, Vikas Publishing House, New Delhi.
- Budhiraja, S.B. and Athreya, M.B.: Cases in Strategic Management, Tata McGraw Hill, New Delhi.
- Coulter, Mary K.: Strategic Management in Action, Pearson Education, Delhi.
- David, Fred R.: Strategies Management, Pearson Education, Delhi.
- Glueck, William F. and Lawrence R. Jauch: Business Policy and Strategic Management, McGraw Hill, International Edition.
- H.Igor, Ansoff: Implanting Strategic Management, Prentice Hall, New Jersey.
- Michael, E. Portor: Implanting Strategic Management, Prentice Hall, New Delhi.
- Mintzberg, Henry and James, Brian Quinn: The Strategy Process, Pearson Education, Delhi.
- Newman, William H. and James, P. Logan: Strategy, Policy and Central Management, South Western Publishing Co., Cincinnati, Ohio.
- Sharma, R.A.: Strategic Management in Indian Companies, Deep and Deep Publications, New Delhi.
- Peters, T.J. and R.H. Waterman, Jr. in Search of Excellence, Harper and Row, New York.
- Ramaswamy, V.S. and S. Namakumari, Strategic Planning: Formulation of Corporate Strategy, Text and Cases. The Indian Context, Macmillian India, Delhi.

Bus.Adm.-202 - ORGANIZATION BEHAVIOUR

Unit-I: Manager and Organizational Behavior: Managerial Roles and Skills, Environmental Forces: Meaning, Characteristics, key elements and Evolution of Organizational Behavior (OB); Research on Organizational Behavior; Biological Foundations of Behavior; Biological foundation Inherited and Learned Characteristics of Behavior.

Unit-II: Individual Dimension of OB: Motives and Behavior; Personality and Behavior: Perception and Behavior; Learning and Behavior; Theories of Motivation; Expectancy Theory; Equity Theory;

Reinforcement Theory; Goal Theory; Job Stress: Meaning and Sources; Stress moderators; Consequences and Management of Stress.

Unit-III: Groups and Leadership: Meaning and Classification of Group; Reasons for group formation; Conditions imposed on the Group; Group Member Resource; Group Structure; Group Cohesiveness, Committees: Nature and functions; Advantage and Disadvantage; Guidelines for effectivity. Leadership: Meaning and Roles in Organization; Major approaches; Leadership styles; Distinction between Manager and leader; Theories: Ohio and Michigan studies; Fiedler's Contingency Model; Hersey and Blanchard's model; Path- Goal Theory.

Unit-IV: Power, Politics and Conflict: Power; Meaning, Sources and Bases; How Power influences Behavior; Impression management; Defensive Behavior; Rational versus Political Behavior; Acquiring and exercising Political Power, Conflict: Meaning, Nature, Sources and Types; Effect of Inter-Group conflict handling and Resolution; Preventing and stimulating conflict.

Unit-V: Organizational Culture: Introduction; Elements of Culture; Identifying Organizational Culture; Functions of Organizational Culture; Diagnosing Organizational Culture; Approaches to Describing Organizational Culture; Managing Organizational Culture; Organizational Culture and Ethics. Organizational Change: Forces for Change; Planned Change; Resistance to Change; Approaches to Managing Organizational Change; Creating a Culture for Change; Organizational Change in Indian Businesses.

SUGGESTED READINGS

- Agarwal, P.K. & Mathur Ashish: Organizational Behaviour, Pragati Prakashan, Meerut.
- Luthans, Fred: Organizational Behaviour.
- Davis Keith: Human Behaviour at Work.
- Stogdill, R.M.: Hand Book at Leadership.
- Hersey, Paul and Blanchard, K.H.: Management of Organizational Behaviour.
- Korman, Abraham, K: Organizational Behaviour.
- Bennis and Thomas(ed): Management of Change and Conflicts.
- Drucker, Peter, P: The Effective Executive.
- Dr. M.L. Dashora: Sangathan Sidhant and Vyavhar (Hindi).
- Dr. P.C. Jain: Sangathanatmak Vyavhar (Hindi).
- K. Aswathappa : Organization Behaviour.
- K. Aswathappa and G. Sudarsana Reddy: Management and Organization Behaviour.
- G.S. Sudha: Management concept and Organization Behaviour.

Bus.Adm.-203 - ENTREPRENEURSHIP AND SMALL BUSINESS

Unit-I: Concept of Entrepreneurship; Functions of an Entrepreneur; Quality of a successful Entrepreneur; Emergence of Entrepreneurial Class; Theories of Entrepreneurship.

Unit-II: Environmental factors affecting Entrepreneurial Development; Entrepreneurial Development Programmes and their Critical Evaluation; Government Policies and their Effect; Role of Government and other Institutions.

Unit-III: Role of SMEs in Indian Economy; Problems of SMEs in India; Institutional support; Various Issues related to Production, Marketing and Finance of SMEs.

Human Resource Management of SMEs – Recruitment, Training and Wage Administration; Sickness

Unit-IV: Turnaround – Meaning, Causes, Prevention and Remedies, Role of BIFR; Technological Up-gradation.

Unit-V: Creativity – Nature, Constituents, Types; Techniques of Creative thinking – Focus Groups, Brainstorming, Attitude Analysis; Synectics; Innovation – Types and Phases. Knowledge Management and its Role in Innovation.

SUGGESTED READINGS

- Vasant Desai: Dynamics of Entrepreneurial Development and Management, HPH
- Zimmerver & Scarborough: Essential of Entrepreneurship and Small Business Management, PHI
- S. S. Khanka: Entrepreneurship and Small Business Management, S. Chand & Sons
- Nandan: Fundamentals of Entrepreneurship Management, PHI
- M. B. Shukla: Entrepreneurship and Small Business Management, Kitab Mahal

Bus.Adm.-204 - PRODUCTION AND OPERATIONS MANAGEMENT

Unit-I: Nature and Scope of Production Management, Facility Location; Manufacturing Systems & its types; Layout Planning and Analysis, Material Handling-Principals-Equipment's, Line Balancing-Problems, Work Environment & Industrial Safety; Computer aided Manufacturing (CAM), Artificial Intelligence & expert systems.

Unit-II: Operations decisions – Production Planning and Control – In Mass Production in Batch/Job Order Manufacturing. Capacity Planning-Models, Process Planning- Aggregate Planning-Scheduling, Concepts-Work Study, Method Study, Work Measurement, Work Sampling.

Unit-III: Material Management-an Overview, production control, storage and retrieval System. Inventory Control, JIT approach. Network Techniques - Simulation.

Unit-IV: Concept of total Quality (TQ). International Quality Certification and other standards and their applicability in design manufacturing .Humanistic and Marketing Aspects of TQ. Introduction and meaning of six sigma concept.

Unit-V: ERP and Business process engineering, Maintenance Management, Networking Techniques PERT & CPM.

SUGGESTED READINGS

- Buffa, A.E.S.: Modern Production Management
- Chase, R.B., Aquilano N. Jr: Production and Operation Management
- Laufer A.C.: Operations Management
- O.P. Khanna: Industrial Engineering Management
- S.K. Hajra & Choudhary & Nihar Roy: Production Management
- Hicks, P.E.: Introduction to Industrial Engineering & Management Science
- S.K. Dutta: Materials Management
- Lamer & Donald: Purchasing and Materials Management
- Dean S. Ammer: Material Management

SKILL COURSE II – CONSUMER RIGHTS AND EDUCATION

UNIT I: Consumer Rights: Definition, Consumer Rights: Types; Concept of Consumer: a) Consumer in India. b) Consumer of goods and services. c) Professional services - Medical, legal, educational and welfare services. Consumer movement and consumer protection in India, historical perspectives, the post independence scenario. Emergence of consumer protection in India, U.S.A. and Britain. Consumerism: Concept of consumerism, consumer justice and consumer sovereignty, and development of public policy and consumer justice.

UNIT II: Consumer behaviour in Indian marketing system. Countervailing influence: Responsibility of manufacturers, producers organizations. Consumer groups and tools of consumer organizations: Consumer action groups, consumer resistance, consumer boycotts, lobbying, consumer guidance.

UNIT III: Development of consumer protection movement in international sphere, International Convention on Consumer Justice, role of Consumer International (CI), International Activities for Consumers Protection, IOCU, FAO, ILO, WIPO, WHO, UNCTAD, UN guidelines for Consumer Protection. Emergence of new Consumer Movements: Green Consumerism, Cyber Consumerism.

UNIT IV: Consumer education: Consumer awareness of rights and duties, lack of awareness, particularly in rural areas and amongst the farmers, lack of access to information. Role of media in consumer protection, social effect of advertisement, remedies for false and deceptive advertisement, code for commercial advertisements.

UNIT V: Historical and Sociological Background of Consumer Law in India: Rights of Consumer under the Consumer Protection Act 1986, nature and characteristics. Definitions: complainant, consumer dispute, defect, deficiency in service, service, unfair trade practices, restrictive trade practices. Consumer Protection Councils, role, objects, and composition. Structure, composition, power and functions of District Forum, State Commission and National Commission. Law of compensation, approach of Consumer Forum while awarding compensation.

SUGGESTED READINGS

- Gordon Barrier, The Development of Consumer Law and Policy (1984)
- Joel R. Ivans, Consumerism in the United States and Inter- industry Analysis
- Ram Krishana Bajaj, Consumer view-point
- Wilson M. Herman, Business Economic Problems
- M.M. Prasad, Top Consumer Behaviour (Top Publication, Delhi).
- Robert N. May, Consumer Movement-Guardians of Market Place (1980).
- Foo Gaik Sim, 10 CU on Record, A Documentary History of the International Organisation of Consumer Unions 1969-90.
- United Nations Guidelines on Consumer Protection, 9th April 1985.
- J.N. Barowalia, Commentary on the Consumer Protection Act, 1986 (1996), Universal Publishing Co, Pvt. Ltd.
- Dr. Gurjeet Singh, Law of Consumer Protection in India (1996)

SESSION 2020 – 21

SEMESTER III

Bus.Adm.-301 - FUNDAMENTALS OF MANAGEMENT RESEARCH

Unit-I: Research: Meaning, Types, Research and the Managerial Process, Management Research and the Social Science, Fundamental/ Applied Approaches: Historical / Experimental / Exploratory Methodology.

Unit-II: Research Problem: Selection and Identification. Hypotheses: Meaning and Formulation. Research Design: Meaning, Types, Essentials.

Unit-III: Data: Types, Methods of Collection, Observation Method, Interview Method, Schedule / Questionnaire. Scientific Method: Meaning, Characteristics, Steps of Scientific Method, Problem of use of Scientific Method in Social Research.

Unit-IV: Sampling: Different Types, Determination of Sample Size, Selection of Sample. Case Study: Meaning, assumptions procedure, merits and limitation.

Unit-V: Research Report: General Principles and Practice. Layout of Research Report, Types of Reports, Mechanics of writing Research Report. Computer and Research.

SUGGESTED READINGS

- Rogert Bennett : Management Research, ILO Publication
- Rummel, J.F. and Ballaine, W.C. : Research Methodology in Business, Harper and Row, New York
- Kerlinger. F.N. : Foundations of Behavioural Research
- Hughes, J. : The Philosophy of Social Research, Longman, London
- Blalock, H.M.: An Introduction to Social Research, Prentice Hall, New Jersey
- Bailey, K.D. : Methods of Social Research, Free Press, New York
- Kothari, C.R. : Research Methodology : Methods and Techniques Wiley
- Eastern Ltd., New Delhi.
- Trivedi, R.N. and Shukla, D.P. : Research Methodology (Hindi Edition) College Book

Depot, Jaipur

- Satpal Runela : Sarvekeshan Anusandhan Aur Sankhiki, Vikas Publishing, New Delhi
- Campbell : Form and Style in Thesis Writing (William Gileo)
- Sharma C.L.: Samajik Anushandhan Evam Surveykshan, Rajasthan Hindi Granth Acadamy, Jaipur
- Nahar and Khanna: Samajik Anushandhan Evam Surveykshan, Jain Book Depot, Jodhpur

Bus.Adm.-302 - INTERNATIONAL BUSINESS

Unit-I: Introduction: International Business - Importance, nature and scope; Globalization; Drivers of Globalization. Basic Entry Decisions; Modes of entry into international business, selecting an Entry Strategy; IT and international business, India's involvement in International Business

Unit-II: International Business Environment: Political, Legal, Economic, and Cultural environment and associated risks; Framework for analyzing international business environment.

International Trade: Reasons for international trade; Theories of international trade; Foreign trade multiplier; World trading environment – Pattern and structure of world trade in goods and services; Government intervention in International Trade: Arguments for Government intervention.

Unit-III: Instruments of Commercial Policy: Tariffs, quotas and other measures and their effects. World Trade and Protectionism: GATT, The Uruguay Round, WTO, Evaluation of WTO, Important Agreements of WTO – Agriculture Agreements; SPS, TBT, GATS, TRIPS; WTO and Developing Countries, WTO and India.

Unit-IV: Balance of Payment Account: Components of BOP: Current Account, Capital Account, Official Reserve Account; Disequilibrium in BOP; Correction of Disequilibrium.

International Economic Institutions and Financial Environment: IMF, World Bank, UNCTAD, International commodity trading and agreements - India's involvement and consequences; International Financial Environment: International Monetary System; Exchange rate mechanism and arrangement; Types of Exchange rate systems in the world; International money and capital markets.

Unit-V: Movements in foreign exchange and interest rates. Foreign Direct Investment: Types of FDI; Theories of FDI, Cost and Benefit of FDI to Host and Home Countries, Government Policy Instruments and FDI, Trends in FDI.

SUGGESTED READINGS

- Daniels, John D., Radebaugh, Lee H., Sullivan, Daniel P. and Salwan, P., International Business: Environment and Operations.
- Griffin, Ricky W. and Pustay, Michael W, International Business: A Managerial Perspective , Prentice Hall.
- Hill, Charles, W.L., International Business, McGraw Hill Company, New York.
- Cherunilam, F., International Business Text and Cases, PHI.

- Bhasin, N., Foreign Direct Investment in India: Policies, Conditions and Procedures, New Century Publications.
- Ball, Donald, Wendall H. McCulloch, Miachel Geringer, Michael S. Minor and Jeanne M. McNett, International Business: The Challenge of Global Competition, McGraw Hill Co.

SKILL COURSE III - E-COMMERCE

Unit-I: Introduction to E-Commerce: Meaning and concept; Electronic commerce versus traditional commerce; Channels of ecommerce; Business applications of e-commerce; Need for e-commerce, e-commerce as an electronic trading system- special features.

Unit-II: Introduction to Internet: URLs, HTTP, HTML etc. E-commerce models; Supply chain management, product and service digitalization, remote servicing, procurement; Online marketing and advertising; E-commerce resources and infrastructure, resources and planning for infrastructure.

Unit-III: Business to Consumer E-Commerce: Cataloguing, order planning and order generation, cost estimation and pricing, order receipt and accounting, order-selection and prioritization, order scheduling, order fulfilling and delivery, order billing and payment management; Post sales services.

Electronic Payment Systems: Special features required in payment systems for ecommerce; Types of e-payment systems; E-cash and currency servers, e-cheques, credit cards, smart cards, electronic purses and debit cards.

Unit-IV: Security Issues in E-Commerce: Security risks of e-commerce, exposure of resources, types of threats, sources of threats, security tools and risk-management approach, ecommerce security and a rational security policy for e-commerce; Corporate Digital Library; I.T Act 2000.

Unit-V: Multi-Media and E-Commerce: Concept and role of multimedia; Multi-media technologies; Digital video and digitalization of product and customer communication; Desktop video conferencing and marketing; Broadband networks and related concepts; ISDN, ATM, Cell relay.

SUGGESTED READINGS

- Agarwala, K.N., and Deeksha Ararwala: Business on the Net: Bridge to the Online Storefront: Macmillan, New Delhi.
- Janal,D.S: On-line Marketing Hand Book, Van Nostrand Reinhold, New York.
- Kosivr,David: Undestanding Electronic Commerce, Microsoft Press, WaShington.
- Minoli and Minol: Web Commerce Technology Handbook, Tata McGraw Hill, New Delhi. Schneider,Gary P: Electronic Commerce, Course Technology, Delhi.
- Parag Diwan and Sunil Sharma, E-Commerce - A Managers Guide to E-Business; Excel Books, New Delhi.

SESSION 2020 – 21

SEMESTER IV

Bus.Adm.-401 - LABOUR AND INDUSTRIAL LAWS

Unit-I: Emergence and objectives of labour laws and their socio-economic environment. Evaluation of labour legislations in India. Need and principles of labour legislation.

Unit-II: Factories Act 1948: Provisions regarding health, welfare and security. Industrial Disputes Act, 1947: Provisions regarding Strikes, Lockouts, Retrenchment and Layoff.

Unit-III: Payment of Wages Act, 1936, Minimum Wages Act, 1948, Trade Union Act, 1926

Unit-IV: Workers Compensation Act, 1923, Employee's State Insurance Act, 1948, Employees Provident Fund and miscellaneous provisions Act, 1952.

Unit-V: Contract Labour Act (Abolition & Regulation Act), 1970, Maternity Benefit Act, 1961, Payment of Gratuity Act 1972.

SUGGESTED READINGS

- Misra, S.N.: Labour and Industrial Laws, Central Law Publications, Allahabad.
- Malik, P.N.: Industrial Law (Volume 1 and 2), Eastern Book Depot, New Delhi.
- Garg, A: Labour Laws: One Should Know, New Delhi, NABHI Publications.
- Raza, M.A. and Anderson, A.J.: Labour Relations and the Law, Prentice Hall Inc., London.
- Saini, D.S.: Cases on Labour Law: Minimum Conditions of Employment, Oxford, New Delhi.
- Srivastava, S.C.: Industrial Relations and Labour Laws, New Delhi, Vikas Publishing House.
- Monga, M.I.: Industrial Relations and Labour Laws in India, Deep and Deep Publications Pvt. Ltd., Delhi.

Bus.Adm.-402 - CORPORATE GOVERNANCE, ETHICS AND SOCIAL RESPONSIBILITY

Unit-I: Business Ethics: The concept of ethics; 'ethics' and related connotations; business values and ethics; concept of business ethics; various approaches to business ethics; ethical theories; ethical governance; social responsibility—an extension of business ethics; the concept of corporate ethics; benefits of adopting ethics in business; ethics programme; code of ethics; ethics committee.

Unit-II: Conceptual Framework of Corporate Governance: Evolution of corporate governance; developments in India; regulatory framework of corporate governance in India; SEBI guidelines and clause 49; reforms in the Companies Act; secretarial audit; class action; NCLT; insider trading; rating agencies; green governance/e-governance; shareholders' activism; corporate governance in PSUs and banks; legislative framework of corporate governance—an international perspective (United Kingdom, USA, Australia, China, Russia, South Africa).

Unit-III: Major Corporate Failures – Bank of credit and commerce international (UK), Maxwell communication corporation and Mirror group newspapers (UK), Enron (USA), World.com (USA), Andersen worldwide (USA), Vivendi (France), News of the world (UK); Satyam computer services ltd (India); Sahara (India); Kingfisher ltd (India); common governance problems noticed in various corporate failures; policy actions including major codes and standards.

Unit-IV: Whistle blowing and Corporate Governance – The Concept of Whistle-Blowing; Types of Whistle-blowers; Whistle-blower Policy; the Whistle-Blower Legislation across Countries; developments in India.

Unit-V: Corporate Social Responsibility (CSR) – Meaning; corporate philanthropy; CSR-an overlapping concept; corporate sustainability reporting; CSR through triple bottom line; CSR and business ethics; CSR and corporate governance; environmental aspect of CSR; CSR models; drivers of CSR; global reporting initiatives; major codes on CSR; initiatives in India.

SUGGESTED READINGS

- Mallin, Christine A., *Corporate Governance (Indian Edition)*, Oxford University Press, New Delhi.
- Blowfield, Michael, and Alan Murray, *Corporate Responsibility*, Oxford University Press.
- Francesco Perrini, Stefano, and Antonio Tencati, *Developing Corporate Social Responsibility - A European Perspective*, Edward Elgar.
- Sharma, J.P., *Corporate Governance, Business Ethics & CSR*, Ane Books Pvt Ltd, New Delhi.
- Sharma, J.P., *Corporate Governance and Social Responsibility of Business*, Ane Books Pvt. Ltd, New Delhi.

SKILL COURSE IV – SOCIAL ETHICS

UNIT-I: Definition of Ethics - Objectives of ethics - Subject matter of ethics - Culture and ethical relativism - Differences between ethics and theology.

UNIT-II: Moral judgments - Normative judgments - Types of normative judgments - Characteristics of normal judgments.

UNIT-III: Business ethics - Purposes of firm - the rights and objects of management in relation to business ethics.

UNIT-IV: Relationship of the firm to the employees - hiring and firing - fair wages - working conditions and work satisfaction.

UNIT-V: Business ethics and social responsibilities of the firm - relationship of the firms with customers, competitors, stockholders, dealers and suppliers.

SUGGESTED READINGS

- Thomas M. Garrett - Business Ethics - The times of India Press Bombay.
- Peter Pratley - The essence of Business Ethics - prentice Hall of India (P) Ltd., New Delhi.

- Chackraborty S.K. - Ethics in Management - Vedantic Perspectives - Oxford University Press, Delhi.
- Ananta K. Giri - Values, Ethics and Business - Rawat Publications, New Delhi.

OPTIONAL GROUP A: MARKETING AREA

Bus.Adm.-303M - CONSUMER BEHAVIOUR AND MARKETING RESEARCH

Unit-I: Consumer Behaviour: Nature, Decision Process. Application of Consumer Behaviour in Marketing. Models of Consumer and Industrial Buying Behaviour: Concept of economic man, passive man, cognitive man and emotional man; Models of Consumer Decision Making; Industrial Buying Behaviour and models.

Unit-II: Reference Group Influence: Family Buying Influences. Family Life-Cycle and buying roles. Social and Sub-Cultural Influences. Models of Consumer Behaviour.

Unit-III: Cross Cultural Consumer and Industrial Buying Behaviour: Globalization of Consumer Markets and Marketing Implications; Impact of Information Technology on Consumer Behaviour.

Unit-IV: Marketing Research: Definition, Nature, Scope, Significance, Types, Organization, Scientific Method, Basic Marketing Methods: The Survey, Observational and Experimental Methods. The Research Design: Types and Sources of Data. Hypothesis Testing, Pre-Testing Pilot Study, Sampling, Questionnaire, Schedules, Place of Marketing Research in India.

Unit-V: Collection of Data, Interpretation of Data, Presentation of Results and Research Report, Motivational Research, Advertising Research, Product Research. Market Research Applications: Product Research; Advertising Research; Sales and Market Research; International Marketing Research; Marketing Research in India.

SUGGESTED READINGS

- Beri, G.C.: Marketing Research, Tata McGraw Hill, New Delhi.
- Boyd, H.W., Ralph Westfall and S.F. Starsh: Marketing Research: Text and Cases, Richard D. Irwin, Boston.
- Churchill, Gilbert A.: Basic Marketing Research, Dryden Press, Boston.
- Naresh K. Malhotra: Marketing Research: An Applied Orientation. Pearson Education, Asia.
- Aaker, Kumar and Day: Marketing Research, John Wiley and Sons.
- Richard I. Levin: Statistics for Management: Prentice Hall, New Delhi.
- Assael, H.: Consumer Behavior and Marketing, South Western Publishing Co., Ohio.
- Berkman and Gilson: Consumer Behavior: Concepts and Strategies, Kent Publishing Co.
- Bennett, P.D. and H.H. Kassarijion: Consumer Behavior, Prentice Hall of India, New Delhi.
- Block and Roering: Essentials of Consumer Behavior, Dryden Press, Chicago.
- Hawkins, Best and Coney: Consumer Behavior, Tata McGraw Hill, New Delhi.
- Howard JA, Sheth JN: The Theory of Buyer Behavior, John Wiley, New York.
- Laudon, D.L.: Consumer Behavior, Tata McGraw Hill, New Delhi.
- Schiffan, Leon G. and Lealie Lazar Kanuk: Consumer Behavior, Prentice Hall, New Delhi.

Bus.Adm.-304M - LOGISTICS AND SUPPLY CHAIN MANAGEMENT

Unit-I: Introduction: Concept of supply chain management (SCM) and trade logistics; Scope of logistics; Logistic activities – an Overview; Contribution of logistics at macro and micro levels; Process of integrated SCM.

Unit-II: Supply chain metrics (KPIs), performance measurement and continuous improvement; Product development Process and SCM; Strategic role of purchasing in the supply chain.

Unit-III: Managing Relationship: Role of Relationship marketing in SCM; Managing relationships with suppliers and customers; Captive buyers and suppliers; Strategic partnerships.

Unit-IV: Focus Areas of Logistics and Supply Chain management: Transportation-Importance of effective transportation system; Service choices and their characteristics; inter-modal services, World sea borne trade; International shipping- characteristics and structure; Development in sea transportation-Unitization, containerisation, inter and multimodal transport. Carriage of Goods by sea -Role and types of cargo intermediaries; Air transport: Set up for air transport and freight rates.

Unit-V: Warehousing and inventory management: Reasons for warehousing; Warehousing location strategies; Inventory management principles and approaches; Inventory categories -EOQ, LT, ICC; Material management systems and techniques – JIT purchasing, manufacturing and inbound logistics; Packing and marking.

SUGGESTED READINGS

- Ballau, R.H., Business Logistics Management, Prentice Hall, Englewood Cliffs.
- Christopher, M., Logistics and Supply Chain Management, Prentice Hall.
- Murphy, Paul R. and Donald F. Wood, Contemporary Logistics, Prentice Hall.
- Shapiro, R., Logistics Strategy: Cases and Concepts, West Publishing, St. Paul.
- Coughlan, A., Anderson, E. and Louis W. Stern, Marketing Channels, Prentice Hall.
- Handfield and Nicholas, Jr., Introduction to Supply Chain Management, Prentice Hall.
- Jhon J Coyle, C. Jhonand Langley, Brian J Gibs, Logistics approach to Supply Chain Management, Cengage Learning.

Bus.Adm.-403M - RETAIL MARKETING

Unit-I: Retailing - Definition, Functions, Importance, Types of Retailing, Organized & Unorganized, Store and Non-store; Retailing in India - Current Scenario, Retailing from International Perspectives; Consumer Buying Decision Process, Influencing Factors, Consumer Shopping Behaviour.

Unit-II: Retail Planning - Purpose, Method, Structure and Monitoring the Plan; Retail Marketing mix - Strategies; Retail Brand Management - Positioning, Personality, Merchandise Management, Meaning, Methods, Assortment and Inventory; Purchase Negotiation, Supply Channel and Relationship, SCM Principles and Retail Logistics.

Unit-III: Retail Location Decisions – Trading Area Analysis, Types of Locations; Site Evaluation; Store Design - Layout and Space Management; Visual Merchandising and Displays; Retail Pricing - Approaches, Influencing Factors.

Unit-IV: Retail Promotion - Setting Objectives, Role of Advertising, Sales Promotion, Personal Selling, Public Relations and Relationship Marketing in Retailing; Human Resource Issues and Considerations, Customer Service Management.

Unit-V: Impact of Information Technology in Retailing, Integrated Systems and Networking, EDI, Bar Coding, RFID, Customer Database Management. Electronic Retailing - Role of Web, Online Retailing, Factors to be considered in having a Online Store, Limitations of Web and Future Trends, Consumerism and Ethics in Retailing, Social and Green issues. Retail Audit.

SUGGESTED READINGS

- Michael Levy, Barton Weitz : Retail Management, McGraw Hill
- Chetan Bajaj, Rajnish Arya, Nidhi Varma Srivatava : Retail Management, Oxford Publishing
- Tapan K. Panda, Sunil Sahadev : Sales and Distribution Management, Oxford Publishing
- Suja Nair : Retail Management, Himalaya Publishing House
- Swapna Pradhan : Retailing Management, Tata McGraw Hill
- S.L. Gupta : Retail Management, Wisdom Publications
- Philip Kotler : Marketing Management, Prentice Hall
- Cox, Roger and Paul Brittain : Retail Management, Prentice Hall

Bus.Adm.-404M - SERVICE MARKETING AND CUSTOMER RELATIONSHIP MANAGEMENT

Unit-I: Importance of Services Sector: Nature and types of services; Difference between services and goods marketing; Services marketing triangle.

Environment for Services Marketing: Macro and micro environments; Understanding service customers – models of service consumer behaviour; Customer expectations and perception; Service quality and GAP model.

Unit-II: Market Segmentation and Selection: Service market segmentation; Targeting and positioning.

Services Marketing Mix: Need for expanded marketing mix; Planning for service offer; Pricing, Promotion and Distribution of Services; Management of People, process and physical evidence; Matching of demand for and supply of services.

Unit-III: Service Marketing Applications: Marketing of financial, hospitality, hospital, tourism and educational services; International marketing of services and GATS.

Unit-IV: Relationship Marketing: Meaning, nature, and scope; Types of relational exchanges; Reasons for relationship marketing – firm and customer perspectives.

Relationship Development Process: Attributes and determinants of relational exchanges;
Networking – nature, role and mechanism.

Unit-V: Developing and Managing Relationships: Customer selection; Relationship strategies;
Implementing CRM; Mistakes in implementing CRM; Role of information technology in
relationship building – e-CRM.

SUGGESTED READINGS

- Christopher H. Lovelock: Service Marketing, Prentice Hall, New Jersey.
- Gosney, John W. and Thomas P. Boehm: Customer Relationship Management Essentials, Prentice Hall, New Delhi.
- Payne, Adrian: The Essence of Services Marketing, Prentice Hall, New Delhi.
- Seth, Jagdish N.et. Al.: Customer Relationship Management, Tata McGraw Hill Publishing Co., New Delhi.
- Shankar Ravi: Service Marketing – The Indian Experience, South Asia Publication, New Delhi.
- Stone, Merlin and Neil Woodrock: Relationship Marketing, Kogan Page, London.
- Zeithami, V.A. and M.J. Bitner: Services Marketing, McGraw Hill, Inc., New York.

OPTIONAL GROUP B: HUMAN AREA

Bus.Adm.-303H - ORGANIZATION DEVELOPMENT AND CHANGE

MANAGEMENT

Unit-I: Introduction to Organizational Development: Definition, Nature and Characteristics of Organization Development, Managing the Organization Development Process, Theories of Planned Change, Goals, Values and Assumptions of OD, Role and Competencies of the OD practitioner.

Unit-II: The Diagnostic Process and Introduction to OD Interventions: Diagnosis at the Organization, Group and Individual Level, Data Collection Process, Diagnostic Methods, Challenges in Diagnosis, Diagnostic Information Feedback: Characteristics of Effective Feedback, Survey Feedback. Characteristics of Effective Interventions, Designing Interventions, the Intervention Process. Human Process and HRM Intervention: Sensitivity Training, Process Consultation, Third-Party Interventions, Team Building, Organization Confrontation Meeting, Intergroup Relations Interventions, Large Group Interventions: Grid OD; Role Playing, Employee Empowerment

Unit-III: Techno Structural Strategic Interventions: Restructuring Organizations, Job Enrichment, Socio technical Systems, TQM and Quality Circles, Culture Change, Self Designing Organizations, Learning Organizations. Challenges and Future for the Organization, Future trends in OD, Ethical Issues in Organizational Development.

Unit-IV: Organizational diagnosis, Evolutionary Change, Transformational Change, Turnaround Change. Human processual, techno structural, human resource and strategic interventions.

Understanding Change: nature of change, forces of change, perspective on change: contingency perspective population ecology perspective – institutional perspective resource-dependence perspective.

Unit-V: Types of Change: continuous change discontinuous change participative change directive change. Implementing change: assemble a change management team, establish a new direction for change. Prepare the organization for change, setup change teams to implement change, align structure, systems and resources to support change, identify and to remove road blocks to change, absorb change into the culture of the organization.

SUGGESTED READINGS

- French, W.L. Bell, Jr., C.H. and Zawacki, R.A.: Organisation Development, Universal Book Stall, New Delhi.
- Huse, E.F. and Cummings, T.G.: Organization Development and Change, West Publishing Co., Minnesota.
- Cummings, T.G. and Worley, C.G.: Organization Development and Change, USA; South Western College Publishing.
- Beer, M. and Nitin, N: Breaking the Code of Change, USA: Harvard Business School Press.
- Pettigrew. A. and Whipp, R.: Change Management for Competitive Success, New Delhi: Infinity Books.
- Schein, E.H. and Beckard, R: Addison Wesley Series on Organization Development, USA: Addison Wesley Publishing Co.

Bus.Adm.-304H - LABOUR-MANAGEMENT RELATIONS

Unit I: Industrial Relations : concept and Parties, Rise and Growth, Industrial Relations and Human Relations, Changing pattern of Industrial settlement, State action

Unit II: Trade Unions: Problems and remedies, Recent Trends in Trade Union Movement in India, Employers, Organizations and their role

Unit III: Collective Bargaining: Concept, Need, Process-Collective Bargaining in India: Progress, Prerequisites for success, Wage Boards

Unit IV: Worker's Participation in Management Concept, Need, Objectives of Participation- Indian Scene : Forms, Progress, Barriers, Remedial Measures

UnitV: International Labour Organization: Objectives, Principles, Functions, Organization, impact of ILO on Indian Labour, Labour Productivity : Concept, Causes of low Productivity. Measures for improving productivity

SUGGESTED READINGS

- Myres, C.A. : Industrial Relations in India
- Pigors and Myres : Reading in Personnel Administration
- Agrwal, R.D. : Dynamics of Labour Relations
- Punekar, S. : Industrial Peace in India
- Vaid, K.N. : Labour Management Relation in India

- Shrivastava G.L. : Collective Bargaining and Labour Management Relations in India
- Agnihotri, V. : Industrial Relations
- Sharma, Surana and Srivastava: Prabandh evam Audhyogic Sambandh, Hindi
- Tanc Zivan : Participation in Management

Bus.Adm.-403H - PERFORMANCE MANAGEMENT

Unit-I: Performance Management: Philosophy, Conceptual framework, Different approaches to Performance Management, Significance of Performance Management in the fast changing environment.

Unit-II: Performance Management System and its linkages with other systems: Reward driven integration, development driven integration, goal setting and monitoring.

Unit-III: Designing Performance Management Systems: Challenges and obstacles to Performance Management, building performance oriented culture, designing, implementing a performance management strategy; factors influencing the use of performance management (external and internal)

Unit-IV: Tools and approaches to Performance Measures: Measures of performance by behaviour, by result and by process, 360 feedbacks, balanced scorecard – concept and application, challenges in implementation.

Unit-V: Performance Management Initiatives: Causes on Performance Management System; benchmarking best practices.

SUGGESTED READINGS

- Andrew E. Schwartz (1999): Performance Management, Barron's Educational Series.
- Bacal, R. (1999): Performance Management, McGraw Hill Inc.
- Chadha, P (2003): Performance Management, Macmillan India Ltd.
- Daniel A.C. (2003): Performance Management: Changing Behaviour that drives organization effectiveness, Atlanta Performance Management Publications.
- Holpp, Lawrence (1999): Managing Teams, Mc Graw Hill Companies Inc.
- Joseph H. Boycott and Henry P.C. (1997): Maximum Performance Management, Vanity Book International, New Delhi.
- Kaplan, R.S. and Norton D.P. (1996): Balanced Score Card: Translating strategy into action, Harvard Business School Press, Boston.
- Kermally S. (1997): Managing Performance, Butterworth – Heinemann, Oxford.
- Ossey Bass / Pfeiffer, A. Wiley Company, Zigon J. (1999): Performance Management Series, Zigon Performance Group.

Bus.Adm.-404H - STRATEGIC HUMAN RESOURCE MANAGEMENT

Unit-I: Understanding Strategic HRM: Traditional v/s Strategic HR, Typology of HR activities, “best fit” approach v/s “best practice” approach, HR strategy and the role of national context,

sectoral context, and organizational context on HR strategy and practices, investment perspective of human resources.

Unit-II: Aligning HR systems with business strategy: Sustained competitive advantage how HR adds value to the firm, HR as scarce resource, non-substitutable resource, linking HRM practices to organizational outcomes, assessing and reducing costs, behavioral impact of HR practices, marginal utility models.

Unit-III: Auditing HR practices and department, linking strategy to HRM practices, corporate HR philosophy and companywide HR standards, HRM leading strategy formulation, alternative HR systems, universalistic contingency, configurational, congruence and integrated HR systems.

Unit-IV: HR strategy in workforce utilization: Efficient utilization of human resource, cross training and flexible work assignment, work teams, non unionization, strategies for employee shortages, strategies for employee surpluses. Strategies for performance and development: typology of performance types, marginal performers, under achievers, stars, solid citizens, managing employee, ability recruitment and selection strategy, typology, incentive alignment, psychological contracting.

Unit-V: Evaluating HR Function: Overview of evaluation, scope, strategic impact, level of analysis, criteria level of constituents, ethical dimensions, approaches to evaluation, audit approach, analytical approach, quantitative and qualitative measures, outcome and process criteria, balanced scorecard perspective, bench marking, accounting for HRM – purpose of measuring cost and benefits of HRM, approaches to HRM performances, employee wastage and turnover rates, cost of absenteeism, measuring human resource cost.

SUGGESTED READINGS

- Boxall. P. and Purcell. J. (2003): Strategy and Human Resource Management, Great Britain: Palgrave Macmillan.
- Sparrow, P. and Marchington, M. (1998): Human Resource Management, The new Agenda Great Britain: Ptman Publishing.
- Mello., A. (2002): Strategic Human Resource Management, USA: South Western.
- Walker, J.W. (1997): Human Resource Strategy, Intel Edn., USA, McGraw Hill.
- Porter, M. (1985): Competitive Advantage, Free Press.
- Thompsonm A.A., Stickland, A.J. (1999): Strategic Management: Concepts and Cases, 11th edn., Irwin.

OPTIONAL GROUP C: FINANCE AREA

Bus.Adm.-303F - FINANCIAL MARKET AND INSTITUTIONS

Unit-I: Nature of Financial Markets: Financial markets: Concept, nature, functions, role and scope; Securities traded in financial markets; Financial markets in India: Indian money markets-

Meaning, need, call money market, treasury bill market, commercial bill market, markets for commercial paper & certificate of deposits; Capital market: Recent developments in Indian capital markets; Markets for derivatives; Futures and options, uses and pricing of derivatives.

Unit-II: Exchange Rates & Currency Markets: Exchange rates: Devaluation and depreciation, risk hedging and futures in exchange rates, international financial flows, financial system and economic development, criteria to evaluate assets; Risk and financial assets, types of risk, return on assets, level of interest rates, long period and short period rates, spread between lending and deposit rates, administered interest rates, appropriate interest rate policy, Euro-dollar and Euro-currency markets.

Unit-III: Financial Institutions and Credit Policies: Meaning, functions, role of financial institutions; Impact of credit crisis on financial institutions; Reserve Bank of India- Functions and role; Aims and objectives of the monetary policy of RBI, effectiveness of monetary policy; Credit creation and its control;

Unit-IV: Profitability and efficiency of banks; Nature, types, functions of commercial and regional rural banks. Development and Investment Banking: Development banks: Role and functions; Investment banking and merchant banking;

Unit-V: Financial sector reforms in India, lending operation of World Bank and its affiliates: Working of IDA, IFC and ADB, Development Banks and India; Types of Non-banking financial institutions-Role, growth and impact on India's economic development; Investment Trust Companies; Mutual funds, Critical appraisal of UTI in the Indian financial system.

SUGGESTED READINGS

- Bhole, L. M., Financial Institutions and Markets, Tata McGraw Hill Company Ltd., New Delhi
- Bhole, L. M. (4000), Indian Financial System, Chugh Publications, Allahabad.
- Edminster, R. O, Financial Institutions, Markets and Management, McGraw Hill, New York.
- Goldsmith, R. W., Financial Structure and Development, Yale, London.
- Hanson, J. A. and S. Kathuria (Eds.), India, A Financial Sector for The Twenty-first Century, Oxford University Press, New Delhi.
- Johnson, H. J. (1993), Financial Institutions and Markets, McGraw Hill, New York.
- Khan, M. Y. (1996), Indian Financial System, Tata McGraw Hill, New Delhi.

Bus.Adm.-304F - SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT

Unit-I: Investment: Concepts of investment, objective of investment, Factor affecting investment decision, Investment, Speculation and Gambling, Form of Security Financial and Non-Financial, Financial Market- Primary and Secondary Market Stock Exchange: - Meaning, Function, Significance, Trading and Settlement procedures at stock exchange, NSE, BSE, OTCEI, Online Trading, Listing of Security, Regulation of Stock Exchange.

Unit-II: Risk and Return:- Concept , type of risk, calculation of risk and return, calculation of Expected return, Coefficient of Variation , Risk aversion and risk premium, Risk and Return Relationship.

Unit-III: Fundamental Analysis: - Concept, Objectives, Approaches to Fundamental Analysis, Economy Analysis, Industry Analysis, Company Analysis, Valuation of Security, Technical Analysis: - Concept, Assumptions, Significance, Theory of Technical of Technical Analysis:- Bar chart, Line chart, Point and Figure chart, Candlestick chart, Confidence index RSA,RSI, Moving average analysis.

Unit-IV: Portfolio management – Concept, Phases of Portfolio management, Diversification: Concept, type- Simple and Markowitz diversification, Portfolio Analysis: - Concept, Modern Portfolio theory, Markowitz risk return optimization (HM Model), Single Index Model, Sharp Index Model, Corner Portfolio, Selection of Optimal Portfolio Capital Market Theory- CAPM, CML, SML & APT, Beta Estimation Efficient Market Theory: - Random Walk Theory, The efficient Market Hypothesis.

Unit-V: Process of portfolio management – International Diversification, Portfolio performance evaluation – Sharp & Treynor & Jensen’s measure, Portfolio revision – Active and passive strategies & formula plans in portfolio revision.

SUGGESTED READINGS

- V.A. Avadhani, Security Analysis and Portfolio Management, Himalaya Publishing House, New Delhi.
- Punithavathy Pandian, Security Analysis and Portfolio Management, Vikas Publishing House, New Delhi.
- Reilly, Investment Analysis and Portfolio Management, Thompson publication .
- Fisher and Jordon, Security Analysis and Portfolio Management, New Parkshan, Delhi.

Bus.Adm.-403F – MANAGEMENT OF FINANCIAL SERVICES

Unit-I: Indian financial system: an overview of Indian financial institutions, an overview of the different activities performed by a bank. Objectives and Functions of Different Financial Institutions in India like IFCI, ICICI, IDBI, UTI, and LIC Reforms in financial sector.

Unit-II: Financial Services: Meaning, Nature and Types of Financial Services Fund based 19 and Fee based, Mutual Fund: Concepts and emerging role. Risk in financial services and changing perception of intermediaries regarding financial services.

Unit-III: Types of Leasing: Concept, Classification, Accounting, Legal and Tax Aspects of Leasing; Financial Evaluation of leasing. Factoring: Meaning, Characteristics and Types of Factoring arrangements, Factoring in India, Factoring vs. Forfeiting.

Unit-IV: Credit Rating: Meaning and Types; Benefits of Credit rating to investors and companies. Credit Rating Agencies; Objectives and Functions. Credit Cards: Concept and Significance.

Unit-V: Venture Capital: Meaning, Modes of Financing. Merchant banking: nature and scope, regulation, overview of current Indian merchant banking scene-structure of merchant banking industry, Role and Functions of Merchant Bankers.

SUGGESTED READINGS

- Khan M.Y., Financial Services, 4th ed., McGraw Hill, New Delhi, 2007.
- Prasanna Chandra, Project Preparation Appraisal and Implementation, 5th ed., Tata McGraw Hill, 2002.
- Dietrich J.K. Financial Services and Financial Institutions: Value Creation in Theory and Practice, Prentice Hall, New Jersey, 1996.
- Clifford Gray, Project Management, Richard D. Irwin, 2005 (latest Edition).
- Bhalla, V K. Management of Financial Services. Anmol, New Delhi, 2008.
- Bhalla, V K And Dilbag, Singh. International Financial Centres. New Delhi, Anmol, 1997.
- Ennew. C, Trevor Watkins & Mike Wright: Marketing of Financial Services. Heinemann Professional Pub.,2010.
- Gordan.E and K.Natrajan Emerging Scenario of Financial Services.Himalaya Publishing House, 1997
- Meidan, Arthur Brennet, M. Option Pricing: Theory & Applications. Toronto, Lexington Books

Bus.Adm.-404F - CORPORATE TAX PLANNING

Unit-I: Structure of Direct and Indirect Taxes in India. Meaning of tax planning and management, tax evasion and tax avoidance; Nature and scope of tax planning and management in the corporate sector; Justification of corporate tax planning and management. Taking advantages of available reliefs, rebates and tax free sources of income.

Unit-II: Definition of various kinds of companies - Meaning of company under IT Act. Residential status of companies and implications for Tax Planning. Assessment of companies including carry forward and set off of losses.

Unit-III: Tax Planning with reference to setting up of a new business. Tax Planning with reference to location of business. Tax Planning with reference to nature of business. Tax Planning with reference to form of organization.

Unit-IV: Tax Planning with reference to Financial Management Decisions. Tax Planning with reference to Managerial Decisions. Tax Planning in respect to Employee's Remuneration.

Unit-V: Tax Planning and Adoption of Method of Accounting. Tax planning regarding Capital Gains. Tax Planning in respect of Amalgamation or Demerger.

SUGGESTED READINGS

- V.K. Singhania : Direct Taxes : Planning and Management
- Girish Ahuja : Direct Taxes : Law and Practice
- Bhagwati Prasad : Law and Practice of Income Tax in India
- R.N. Lakhota : Corporate Tax Planning

Syllabus & Examination Scheme

**BACHELOR OF ENGINEERING
CIVIL ENGINEERING**

(Semester Scheme)

FOUR YEAR INTEGRATED COURSE

B.E. Second Examination	2020-21
B.E. Third Examination,	2021-22
B.E. Fourth Examination,	2022-23



JAI NARAIN VYAS UNIVERSITY

JODHPUR

Contents

LIST OF TEACHING STAFF	3-4
TEACHING AND EXAMINATION SCHEME	
ACADEMIC RULES	5
SECOND B.E.: III SEMESTER	10
1SECOND B.E.: IV SEMESTER	11
THIRD B.E.: V SEMESTER	12
THIRD B.E.: VI SEMESTER	13
FINAL B.E. : VII SEMESTER	14
FINAL B.E. : VIII SEMESTER	15
List of Electives	16
DETAILED SYLLABUS	
SECOND B.E. : III SEMESTER	18
SECOND B.E. : IV SEMESTER	22
THIRD B.E. : V SEMESTER	25
THIRD B.E. :VI SEMESTER	28
FINAL B.E. VII SEMESTER	30
FINAL B.E. VIII SEMESTER	36
Electives (CBCS Scheme)	39-39

**LIST OF MEMBERS OF TEACHING STAFF
CIVIL ENGINEERING DEPARTMENT**

Professor & Head

- | | |
|---------------------|---|
| 1. Dr. Sunil Sharma | B.E.(Civil) Hons., M.E. (Civil) Hons.
Ph.D (Civil Engineering) |
|---------------------|---|

Professors

- | | |
|---------------------------|--|
| 1. Dr. Shrikant. Ojha | B.E. , M.E. , Ph.D, L.L.B. |
| 2. Dr. Suresh Kumar Singh | B.E., M.E. (Hons), PGDM (Fin Mgt) ,Ph.D |
| 3. Dr. Ravi Saxena | B.E., M.E., Ph.D |
| 4. Dr. A.N. Modi | B.E., M.E., Ph.D |

Associate Professor

- | | |
|------------------------|------------|
| 1. Shri Kamal Bhandari | B.E., M.E. |
|------------------------|------------|

Assistant Professor

- | | |
|----------------|------------------|
| 1 Sanu Meena | B. Tech, M. Tech |
| 2. Umesh Kumar | B. Tech, M. Tech |

Bachelor of Engineering

Four Year Integrated Course

Academic Rules

1. Admission :

A candidate for admission to the four year degree programme for B.E. (Building & Construction Technology, Civil Engineering, Chemical Engineering, Computer Science & Engineering, Electrical Engineering, Electronics & Communication Engineering, Electronics & Computer Engineering, Electronics & Electrical Engineering, Information Technology, Mechanical Engineering, Mining Engineering, Production & Industrial Engineering must have passed (10+2) Senior Secondary (with English, Physics, Chemistry & Mathematics) of a board situated in state of Rajasthan or other examinations recognized as equivalent or higher thereto and selected through RPET or otherwise as per the procedure laid down by the University/State Govt. time to time.

2. Duration of course :

The course of study shall extend over a period of four years (eight semesters as an integrated course). A student shall follow the prescribed course as given in the teaching and examination scheme of the course to which he/she is admitted.

3. Examination Rule :

(a) There shall be a theory examination (Main Examination) at the end of each Semester in Building & Construction Technology, Civil Engineering, Chemical Engineering, Computer Science & Engineering, Electrical Engineering, Electronics & Communication Engineering, Electronics & Electrical Engineering, Electronics & Computer Engineering, Information Technology, Mechanical Engineering, Mining Engineering, Production & Industrial Engineering viz.,

At the end of First Semester : First B.E., First Semester Examination

At the end of Second Semester : First B.E., Second Semester Examination

At the end of Third Semester : Second B.E., Third Semester Examination

At the end of Fourth Semester : Second B.E., Fourth Semester Examination

At the end of Fifth Semester : Third B.E., Fifth Semester Examination

At the end of Sixth Semester : Third B.E., Sixth Semester Examination

At the end of Seventh Semester : Final B.E., Seventh Semester Examination

At the end of Eighth Semester : Final B.E., Eighth Semester Examination

(b) Practicals and Sessionals examinations of odd and even semester of First B.E., Second B.E., Third B.E. & Fourth B.E. will be held at the end of each semester of the year.

(c) A candidate will be given marksheets at the end of semester examination of I, II, III & IV year of the respective semester/year to indicate performance of the candidate as per the scheme of teaching and examination after the declaration of result.

4. Attendance Required:

The attendance requirement in the Faculty of Engineering & Architecture shall be, "In compliance of the decision of the Hon'ble High Court all students are required to fulfil the 75% attendance rule in each subject and there must be 75% attendance of the student before he/she could be permitted to appear in the examination".

(a) Condonation of shortage of attendance:

The shortage of attendance up to the limits specified below may be condoned on valid reasons:

(i) Upto 6% in each subject plus 5 attendances in all aggregate of subject/papers may be condoned by the Vice-Chancellor on the recommendation of the Dean/Director/Principal for undergraduate students and on the recommendation of the Head of the Department for the Post-graduate students.

(ii) The N.C.C./N.S.S. Cadets sent out to parades and camps and such students who are deputed by the University to take part in games, athletics or cultural activities may for- purposes of attendance be treated as present for the days of these absence in connection with the aforesaid activities and that period shall be added to their subject wise attendance.

5. BE First Year Examination:

(a) A candidate who has attended a regular course of study in the Faculty of Engineering & Architecture for the first semester of first B.E. shall be eligible for appearing at the second semester examination of first B.E. for the B.E. degree which shall be common to all branches.

(b) Every candidate appearing for the first semester of first B.E. examination shall be required to show a competent knowledge of the subjects as per examination and teaching scheme.

- (c) A candidate who has attended a regular course of study for the second semester of first B.E. and has appeared in the first semester examination shall be eligible for appearing at the second semester examination of first B.E. for the B.E. degree, which shall be common to all branches.
- (d) Every candidate appearing for the second semester of first B.E. examination shall be required to show a competent knowledge of the subjects as per examination and teaching scheme.

6. BE Second Year Examination:

- (a) The course of study for the Second B.E. Examination shall be separate for all branches of study.
A candidate who after passing I & II semester of I B.E. examination and has attended regular course of study in a particular branch of Engineering for the Third Semester second B.E. shall be eligible for appearing at the third semester examination of Second B.E. in that branch of study.
- (b) Every candidate appearing for the third semester of second B.E. examination shall be required to show a competent knowledge of the subject as per examination and teaching scheme.
- (c) A Candidate who has attended a regular course of study for the Fourth semester examination of second B.E. and has also appeared in the third semester examination of examination of second B.E. shall be eligible for appearing at the fourth semester examination of second B.E. in that branch of study.
- (d) Every candidate appearing for the fourth semester of second B.E. examination shall be required to show a competent knowledge of the subjects as per examination and teaching scheme.

7. BE Third Year Examination:

- (a) A candidate who after passing III & IV semester of second B.E. examination and has attended a regular courses of study in a particular branch of Engineering for the fifth semester examination of third B.E. in that branch of study.
- (b) Every candidate appearing for the fifth semester of third B.E. examination shall be required to show a competent knowledge of the subjects as per examination and teaching scheme.
- (c) A candidate who has attended a regular courses of study for the eighth semester examination of final B.E. and also has appeared in V semester examination of the third B.E. shall be eligible for appearing at the eighth semester examination of final B.E. in that branch of study.
- (d) Every candidate appearing for the eighth semester of final B.E. examination shall be required to show a competent knowledge of the subjects as per examination and teaching scheme.

8. BE Final Year Examination:

- (a) A candidate who after passing V and VI semester of third B.E. examination and has attended a regular courses of study in particular branch of Engineering for the seventh semester of final B.E. shall be eligible of appearing at the seventh semester examination of final B.E. in that branch of study.
- (b) Every candidate appearing for the seventh semester of final B.E. examination shall be required to show a competent knowledge o the subjects as per examination and teaching scheme.
- (c) A candidate who has attended regular course of study for the eighth semester of final B.E. and has also appeared in the seventh semester examination of final B.E. Shall be eligible for appearing at study.
- (d) Every candidate appearing for the eighth semester of final B.E. examination shall be required to show a competent knowledge of the subjects as per examination and teaching scheme.

9. Training after BE Second year and BE Third year:

Every candidate is required to undergo practical training in a workshop, factory, mines or engineering works/design office approved by the Dean of the Faculty for a period as mentioned below:

- (a) Building & Construction Technology after II and III Year 45+45=90 days
- (b) Civil Engineering after II and III Year 45+45=90 days
- (c) Chemical Engineering after II and III Year 45+45=90 days
- (d) Computer Science & Engineering after II and III Year 45+45=90 days
- (e) Electrical Engineering-after II and III Year 45+45=90 days
- (f) Electronics & Comm. Engineering after II and III Year 45+45=90 days
- (g) Electronics & Electrical Engineering after II and III Year 45+45=90 days
- (h) Electronics & Computer Engineering after II and III Year 45+45=90 days
- (i) Information Technology after II and III Year 45+45=90 days
- (j) Mechanical Engineering after II and III Year 45+45=90 days
- (k) Mining Engineering after II and III Year 45+45=90 days
- (l) Production & Industrial Engineering after II and III Year 45+45=90 days

10. Criteria to Pass and Allowed To Keep Term (ATKT)

- (i) The candidate has to pass individually in all subjects of each semester from I to VIII semesters, as mentioned in the specification of corresponding teaching and examination scheme.
- (ii) For a candidate to pass in each semester he/she must obtain
For I and II semester examinations, if a candidate fails in not more than 3 units (excluding HUMANITIES & ENGLISH) in a semester examination, and for III to VII semester examinations, if a candidate fails in not more than 3 units in a semester examination, he/she shall be allowed to keep term (ATKT) in the next higher semester, subject to the provisions of clause 5(c),6(c),7(c), and 8(c). He/ She

shall appear in the units (s) along with regular candidates whenever examination that semester is held and pass in the unit (s) in which he/she has failed. For the purpose of the clause, each written paper and each practical and sessional shall be counted as a separate unit. For I B.E. examination, candidates failing in HUMANITIES & ENGLISH shall be awarded and additional ATKT.

NOTE: A candidate who is unable to appear at the semester examination in some/all written papers, Practical and sessionals due to any reason what so ever, shall be considered as having failed in those paper(s), Practical(s) and Sessional(s).

11. Ex-student:

- (i) For I and II semester examinations, if a candidate fails in more than 3 units (excluding HUMANITIES & ENGLISH) in a semester examination, and for III to VII semester examinations, if a candidate fails in more than 3 units in a semester examination, he/she shall be declared failed. Such candidate shall appear in that semester examination as Ex-student in all papers.
- (ii) The candidates, who are permitted to appear as ex-students shall be required to pay a fee of Rs. 500/- for doing each practical and sessional during the semester.
- (iii) A candidate who has passed all practicals and sessionals semester shall appear in the semester examination as Ex-student in all written papers. His practical and sessional marks of the semester shall be carried over.

12. Change of Branch in Second Year:

A candidate, promoted to II year BE, may be permitted to change his/her branch of study, from GAS course to GAS Course and from SFS Course to SFS Course only, Strictly on the base of merit secured in BE I year examination (First and Second Semester Examination taken together) depending upon the vacancies available in a particular branch of study which shall be determined as follows.

“The maximum strength of branch should not increase by more than 10 percent of the sanctioned strength and the minimum strength of a branch should not be decreased to less than 90 percent of the sanctioned strength.”

The sanctioned strength of a branch shall be reckoned to be the intake capacity of that branch, approved by AICTE.

13. Result Computation (Award of Grade and Grade Point Average)

(a) On the basis of percentage of obtained marks the process of result computation will be as follows, and followings will be awarded:

For every subject: Grade and Score Point

For every semester: Semester Grade Point Average (SGPA) up to precision of two digits after decimal.

For every semester: Cumulative Grade Point Average (CGPA) up to current semester, up to precision of two digits after decimal.

Step 1: For each subject the percentage of obtained marks will be converted into Grade as per Table I.

Table I: Percentage of Obtained Marks to Grade Conversion		
Percentage of Obtained Marks in Theory Subjects	Percentage of Obtained Marks in Practical Subjects	Grade
85≤per	85≤per	O
70≤per<85	70≤per<85	A+
60≤per<70	60≤per<70	A
55≤per<60	55≤per<60	B+
50≤per<55	50≤per<55	B
45≤per<50	NA	C
35≤per<45	NA	P
per<35	per<50	F
Absent	Absent	AB

Step 2: For each subject convert the Grade to Score Point as per Table II.

Table II : Grade to Score Point	
Grade	Score Points
O	10
A+	9
A	8
B+	7
B	6
C	5
P	4

F	0
AB	0

Step 3: Semester Grade Point Average (SGPA) of kth semester is

$$SGPA = \frac{\sum_{i=1}^n P_i * C_i}{\sum_{i=1}^n C_i}$$

Where P_i is Score Points in ith subject, C_i is Credits of ith subject, and n is total number of subjects in current kth semester

Step 4: Cumulative Grade Point Average (CGPA) of kth semester is

$$CGPA = \frac{\sum_{j=1}^m S_j * C_j}{\sum_{j=1}^m C_j}$$

Where S_j is SGPA of jth semester, C_j is total Credits in jth semester, and m is total number of semesters upto current kth semester.

- (b) For determining merit position of the candidates at the final year level the SGPA obtained by them in III semester to VIII semester shall only be considered, termed as MGPA (Merit Grade Point Average). MGPA shall be calculated as below:

$$MGPA = \frac{\sum_{i=3}^8 S_i * C_i}{\sum_{i=3}^8 C_i}$$

Where S_i is SGPA of ith semester, C_i is total Credits in ith semester.

- (c) In case a candidate passes any subject in 2nd attempt or later one, the grade awarded shall not be higher than B+ in that subject.
 (d) Awarded SGPA and CGPA shall be recalculated if a candidate passes a subject or all subjects of any semester in 2nd or later attempt.
 (e) To calculate SGPA and CGPA, obtained marks for all subjects shall be considered irrespective of whether it is F grade (Failed or Absent) or any other grade.

14. Requirement of additional degree:

- (a) An engineering graduate of the Jai Narain Vyas University, Jodhpur who wish to qualify for an additional degree of Engineering of the University will be considered by a committee consisting of the Dean and the Head of the Department concerned.
 (b) He/She will be admitted in Second B.E. class of that branch. The written papers and practicals and sessionals which he/she has to appear at the various examinations in that branch will be decided by the above committee.
 (c) He /She will be awarded Grades and Grade Points on the basis of percentage of marks obtained by applying result computation method mentioned in section 13.
 (d) He/She has to undergo training after Second BE and Third BE as per Section 9.
 (e) He/She will not be awarded any position in the class.
 (f) Mention will be made in the certificate that he/she has qualified for the additional degree.

15. Medium of Instruction and Examination

The medium of Instructions and Examination in all Engineering Examinations of Theory/Practical and Sessional shall continue to be English as hitherto.

16. Make up Examination for VIII Semester:

- (a) There shall be a Make up Examination for the VIII Semester only for those candidates, who are eligible for **ATKT in VIII semester**, at a suitable interval of time after declaration of the result of the VIII Semester Examination. Candidates, who fail or are unable to appear at this examination, shall appear in the immediate corresponding ensuring Semester Examination.
 (b) Candidates who have failed in the Final B.E. Examination but have passed in seminar, project, practical training and tour, and obtained SGPA 5.00 or above in corresponding semester, shall be exempted from re-examination in project, practical training and tour and shall be required to pass the examination in rest of the subjects only.
 (c) A candidate who passes in a limited number of Theory papers/Practical and Sessional /Project in VIII Semester Examination shall be awarded division with a mention of "Pass in more than on attempt" on the marksheet with asterisks on the respective Theory papers/ Practical and Sessional /Project.

17. On changing Teaching and Examination Scheme or contents of the offered subjects:

- (a) In case a candidate fails in any semester, and appears as ex-student, he will be given two attempts to pass through OLD SCHEME. Otherwise he will be transferred to NEW SCHEME offered by the department currently.
- (b) If a candidate joins any semester as regular student, in all cases he/she has to study as per the currently offered scheme.
- (c) In case a candidate fails in some of the subjects in a semester (ATKT), he will be given only two chances to pass through OLD SCHEME. Otherwise he will be transferred to NEW SCHEME offered by the department currently.

18. **For lateral entry candidates admitted to Second B.E. (all branches):**

- (a) The diploma passed candidates admitted in the Second B.E. (all branches) shall be required to undergo a regular course of study in Special Mathematics III and IV semesters of II B.E. along with other theory units of the semester examinations. For a candidate to pass in Special Mathematics examination the combined marks obtained in III & IV Semester shall be counted. Candidate failing in special mathematics shall be awarded one additional ATKT.
- (b) The B Sc Passed candidates admitted to Second BE (all branches) will have to clear deficiencies of engineering subjects (theory and practical of B.E. 1st year) as mentioned below :-

Theory Papers

CE 102 A : CIVIL ENGINEERING
 SE 104 A: ENGINEERING MECHANICS
 EE 105 A: BASIC ELECTRICAL ENGINEERING
 CSE 151 A : INTRODUCTION OF COMPUTING
 ME 154 A : ELEMENTS OF MECHANICAL ENGINEERING
 ECE 155 A : BASIC ELECTRONICS

Practicals and Sessionals

CE 121B: ENGG. GRAPHICS
 SE 123 B : ENGINEERING MECHANICS LAB
 CE 124 B: CIVIL ENGINEERING LAB
 ME 125 B: WORKSHOP PRACTICE – I
 EE 126 B: BASIC ELECTRICAL LAB
 ME 171 B : MACHINE DRAWING
 ME 173 B : MECHANICAL LAB
 ME 175 B : WOTKSHOP PRACTICE - II
 ECE 176 B : BASIC ELECTRONICS LAB
 CSE 177 B : COMPUTER LAB

B.E. II Year (Civil) 2020-21
SEMESTER III EXAMINATION SCHEME 2021

Deptt Code	Subject Code	Subject	L	T	Pr	Contact Hours	Credit	Exam Hours	Marks		
									Theory	Pract & Sess	Total
A: Theory Papers											
CE	201 A	Fluid Mechanics – I	2	-	-	2	2	3	100	-	100
CE	202 A	Surveying	2	-	-	2	2	3	100	-	100
CE	203 A	Construction Technology-I	3	-	-	3	3	3	100	-	100
SE	204 A	Strength of Materials	2	-	-	2	2	3	100	-	100
SE	205 A	Transportation Engineering-I	2	-	-	2	2	3	100	-	100
MA	207 A	Mathematics	2	-	-	2	2	3	100	-	100
Total (A)			13	-	-	13	13	-	600	-	600
B: Practicals and Sessionals											
CE	201 B	Fluid Mechanics – I	-	1	3	4	2.5	-	-	100	100
CE	202 B	Surveying	-	1	3	4	2.5	-	-	100	100
CE	203 B	Construction Technology-I	-	-	3	3	1.5	-	-	100	100
SE	204 B	Strength of Materials	-	2	2	4	3	-	-	100	100
G	206B	Geology	-	2	1	3	2.5	-	-	100	100
Total (B)			-	6	12	18	12	-	-	500	500
Grand Total (A+B)			13	6	12	31	25	-	600	500	1100

To pass, a candidate must obtain:

- (a) At least P Grade in each written paper.
- (b) At least B Grade in each practical & sessional.
- (c) At least 5.00 SGPA in a semester.

B.E. II Year (Civil), 2020-21
SEMESTER IV EXAMINATION SCHEME 2021

Deptt Code	Subject Code	Subject	L	T	Pr	Contact Hours	Credit	Exam Hours	Marks			
									Theory	Pract & Sess	Total	
A: Theory Papers												
CE	251 A	Fluid Mechanics-II	2	-	-	2	2	3	100	-	100	
CE	252 A	Topographical Surveying	2	-	-	2	2	3	100	-	100	
CE	253 A	Construction Technology-II	2	-	-	2	2	3	100	-	100	
SE	254 A	Mechanics of Solids	2	-	-	2	2	3	100	-	100	
SE	255 A	Transportation Engineering-II	2	-	-	2	2	3	100	-	100	
	-	OPEN ELECTIVE-I	3	-	-	3	3	3	100	-	100	
Total (A)			13	-	-	13	13	-	600	-	600	
B: Practicals and Sessionals												
CE	251 B	Fluid Mechanics-II	-	1	2	3	2	-	-	100	100	
CE	252 B	Topographical Surveying	-	1	2	3	2	-	-	100	100	
CE	253 B	Construction Technology-II	-	-	4	4	2	-	-	100	100	
SE	254 B	Mechanics of Solids	-	2	2	4	3	-	-	100	100	
SE	255B	Transportation Engineering-II		2	2	4	3	-	-	100	100	
Total (B)			-	-	12	18	12	-	-	500	500	
Grand Total (A+B)			13	6	12	31	25	-	600	500	1100	
CE	200 E	Co-curricular Activities	-	-	-	-	0	-	-	-	100	

List of Open Electives I: Enclosed with examination scheme of VIII Semester

To pass, a candidate must obtain:

- (a) At least P Grade in each written paper.
- (b) At least B Grade in each practical & sessional.
- (c) At least 5.00 SGPA in a semester.

B.E. III Year (Civil), 2021-22
SEMESTER V EXAMINATION SCHEME 2022

Deptt. Code	Subject Code	Subject	L	T	Pr	Contact Hours	Credit	Exam Hours	Marks		
									Theory	Pract & Sess	Total
A: Written Papers											
CE	301 A	Geotechnical Engineering-I	2	-	-	2	2	3	100	-	100
CE	302 A	Pipe Flow Hydraulics	2	-	-	2	2	3	100	-	100
SE	303 A	Theory of Structures-I	2	-	-	2	2	3	100	-	100
SE	304 A	Structural Design- I (RCC)	2	-	-	2	2	3	100	-	100
SE	305 A	Structural Design-II (Steel)	2	-	-	2	2	3	100	-	100
		OPEN ELECTIVE-II	3	-	-	3	3	3	100	-	100
Total (A)			13	-	-	13	13	-	600	-	600
B: Practicals and Sessionals											
CE	301 B	Geotechnical Engineering-I	-	1	3	4	2.5	-	-	100	100
CE	302 B	Pipe Flow Hydraulics	-	1	3	4	2.5	-	-	100	100
SE	303 B	Theory of Structures-I	-	2	-	2	2	-	-	100	100
SE	304 B	Structural Design- I (RCC)	-	1	3	4	2.5	-	-	100	100
SE	305B	Structural Design-II (Steel)	-	1	3	4	2.5	-	-	100	100
Total (B)			-	6	12	18	12	-	-	500	500
Grand Total (A+B)			13	6	12	31	25	-	600	500	1100

List of Open Electives II: Enclosed with examination scheme of VIII Semester

To pass, a candidate must obtain:

- (a) At least P Grade in each written paper.
- (b) At least B Grade in each practical & sessional.
- (c) At least 5.00 SGPA in a semester.

B.E. III Year (Civil), 2021-22
SEMESTER VI EXAMINATION SCHEME 2022

Deptt. Code	Subject Code	Subject	L	T	Pr	Contact Hours	Credit	Exam Hours	Marks			
									Theory	Pract & Sess	Total	
A: Theory Papers												
CE	351 A	Geotechnical Engineering-II	2	-	-	2	2	3	100	-	100	
CE	352 A	Open Channel Hydraulics	2	-	-	2	2	3	100	-	100	
CE	353 A	Advanced Surveying	2	-	-	2	2	3	100	-	100	
SE	354 A	Structural Design III (RCC)	2	-	-	2	2	3	100	-	100	
SE	355 A	Structural Design IV (Steel)	2	-	-	2	2	3	100	-	100	
		OPEN ELECTIVE-III	3	-	-	3	3	3	100	-	100	
Total (A)			13	-	-	13	13	-	600	-	600	
B: Practicals and Sessionals												
CE	351 B	Geotechnical Engineering-II	-	2	2	4	3	-	-	100	100	
CE	352 B	Open Channel Hydraulics	-	-	3	3	1.5	-	-	100	100	
CE	353 B	Advanced Surveying	-	2	3	5	3.5	-	-	100	100	
SE	354 B	Structural Design III (RCC)	-	1	2	3	2	-	-	100	100	
SE	355B	Structural Design IV (Steel)	-	1	2	3	2	-	-	100	100	
Total (B)			-	6	12	18	12	-	-	500	500	
Grand Total (A+B)			13	6	12	31	25	-	600	400	1100	
CE	300 E	Co-curricular Activities	-	-	-	-	-	-	-	-	100	

List of Open Electives III: Enclosed with examination scheme of VIII Semester

To pass, a candidate must obtain:

- (a) At least P Grade in each written paper.
- (b) At least B Grade in each practical & sessional.
- (c) At least 5.00 SGPA in a semester.

B.E. Final Year (Civil), 2022-23
SEMESTER VII EXAMINATION SCHEME 2023

Deptt Code	Subject Code	Subject	L	T	Pr	Contact Hours	Credit	Exam Hours	Marks		
									Theory	Pract & Sess	Total
A: Theory Papers											
CE	401 A	Environmental Engineering-I	2	-	-	2	2	3	100	-	100
CE	402 A	Hydrology & Dams	2	-	-	2	2	3	100	-	100
CE	403 A	Engineering Economics & Management	2	-	-	2	2	3	100	-	100
SE	404 A	Structural Design V (RCC)	2	-	-	2	2	3	100	-	100
SE	405 A	Structural Design VI (Steel)	2	-	-	2	2	3	100	-	100
CE		Elective – I	2	-	-	2	2	3	100	-	100
Total (A)			12	-	-	12	12	-	600	-	600
B: Practicals and Sessionals											
CE	401 B	Environmental Engineering-I	-	1	3	4	2.5	-	-	100	100
CE	402 B	Hydrology & Dams	-	1	3	4	2.5	-	-	100	100
SE	404 B	Structural Design V (RCC)	-	2	2	4	3	-	-	100	100
SE	405 B	Structural Design VI (Steel)	-	2	2	4	3	-	-	100	100
SE	435 B	Estimating and Costing	-	1	2	3	2	-	-	100	100
Total (B)			-	7	12	19	13	-	-	500	500
Grand Total (A+B)			12	7	12	31	25	-	600	500	1100

To pass, a candidate must obtain:

- (a) At least P Grade in each written paper.
- (b) At least B Grade in each practical & sessional.
- (c) At least 5.00 SGPA in a semester.

B.E. Final Year (Civil), 2022-23
SEMESTER VIII EXAMINATION SCHEME 2023

Deptt Code	Subject Code	Subject	L	T	Pr	Contact Hours	Credit	Exam Hours	Marks		
									Theory	Pract & Sess	Total
A: Theory Papers											
CE	451 A	Environmental Engineering-II	3	-	-	3	3	3	100	-	100
CE	452 A	Water Resources Engineering	3	-	-	3	3	3	100	-	100
CE	453 A	Town Planning	2	-	-	2	2	3	100	-	100
SE	454 A	Structural Design VII (RCC)	3	-	-	3	3	3	100	-	100
SE	455 A	Structural Design VIII (Steel & General)	3	-	-	3	3	3	100	-	100
SE		Elective –II	2	-	-	2	2	3	100	-	100
Total (A)			16	-	-	16	16	-	600	-	600
B: Practicals and Sessionals											
CE	451 B	Environmental Engineering-II	-	-	3	3	1.5	-	-	100	100
CE	452 B	Water Resources Engineering	-	-	3	3	1.5	-	-	100	100
CE	454 B	Structural Design VII (RCC)	-	1	2	3	2	-	-	100	100
CE	455 B	Structural Design VIII (Steel) & ESA Lab	-	1	2	3	2	-	-	100	100
CE/SE		*Project	-	2	-	2	2	-	-	100	100
Total (B)			-	4	10	14	9	-	-	500	500
Total (A+B)			16	4	10	30	25	-	600	500	1100
C: Others											
CE	475 C	**Practical Training	-	-	-	-	13	-	-	100	100
Total (C)			-	-	-	-	13	-	-	100	100
Grand Total (A+B+C)			16	4	10	30	38	-	600	600	1200
CE	400 E	Co-curricular Activities	-	-	-	-	0	-	-	-	100

*Project: The Head of the departments of Civil Engineering & Structural Engineering will together decide the number and topics to be offered for project work and examination, for each session, subject to maximum of 12 such topics which will be allotted to the students on the basis of choice-cum merit. The working load of 2 periods per week will be considered for the teachers supervising the project work.
** Practical Training: Students will take practical training as per the course requirement during II Year and III Year.

To pass, a candidate must obtain:

- (a) At least P Grade in each written paper.
- (b) At least B Grade in each practical & sessional.
- (c) At least 5.00 SGPA in a semester.

List of Electives

Any one of the following for CE: Elective I – VII Semester Civil Engineering

CE	411	A	Foundation Engineering
CE	412	A	Rural Water Supply and Sanitation Engineering
CE	413	A	Desert Technology
CE	414	A	Hydraulic Machines
CE	415	A	Dams
CE	416	A	Water Resources and Management
CE	417	A	Ground Water Hydrology

Any one of the following for SE: Elective II- VIII Semester Civil Engineering

SE	461	A	Finite Element Method*
SE	462	A	Prestressed Concrete
SE	463	A	Dynamics of Structures
SE	464	A	Industrial Building Structures
SE	465	A	High Rise Structures
SE	466	A	Composite Structures
SE	467	A	Introduction to Earthquake Engineering

***If any student has opted ME 392A Open Elective-II: Finite Elements Method in Sixth Semester from the list of electives offered by the other departments, in that case he is not eligible to opt SE 461 A: Finite Element Method paper.**

List of Open Electives available for Civil Engineering Students offered by other departments:

Name of subject	Semester
BCT 291 A Open Elective-I: Sustainable Architecture ChE 291 A Open Elective-I : Renewable Energy Sources CSE 291A Open Elective-I :Object Oriented Programming Through C++ CSE 292A Open Elective-I :Object Oriented Programming Through JAVA EC 291 A Open Elective-I: Logic System Design Ma-291 A Open Elective-I :Mathematical Statistics For Engineers ME- 291A Open Elective-I:Renewable Energy Sources ME-292A Open Elective-I: Automobile Engineering MI 291A Open Elective-I: Tunneling For Engineering Projects PI 291A Open Elective-I: Manufacturing Science	Fourth Semester
ChE 341 A Open Elective-II : Petroleum Refining Technology CSE 341A Open Elective-II :Data Structures and Algorithms EC 341 A Open Elective-II: Microprocessors & Microcontrollers EE 341 A Open Elective-II : Optimization Techniques EE 342 A Open Elective-II : Artificial Intelligence EE 341 A Open Elective-II : Industrial Applications of Electrical Drives Ma 341 A Open Elective-II :Mathematical Theory of Operations Research ME 342A Open Elective-II: Systems Design And Analysis MI 341A Open Elective-II: Application of GIS & Remote Sensing in Engineering	Fifth Semester
BCT 391 A Open Elective-III: Climate Responsive Architecture ChE 391 A Open Elective-III : Nanotechnology CSE 391A Open Elective-III; Web Technology CSE 392A Open Elective-III: Data Base Management System CSE 393A Open Elective-III: Information Protection & Computer Security EC 391 A Open Elective-III: Electronic Instrumentation EE 391 A Open Elective-III: Soft Computing Techniques EE 392 A Open Elective-III: Energy Conservation Ma 391 A Open Elective-III: Advanced Numerical Analysis ME 391A Open Elective-III: Design Planning And Control Of Production System ME 392A Open Elective-III: Finite Elements Method MI 391A Open Elective-III: Project Environment Clearance PI 391A Open Elective-III: Quality Management	Sixth Semester
Note: Students are allowed to opt only one subject from the combination given below: (a) EE 292 A Open Elective-I/ EE 391 A Open Elective –III	
BCT: Building Construction Technology, CE: Civil Engineering, ChE: Chemical Engineering, CSE: Computer Science, EC: Electronics & Communication, EE: Electrical Engineering, ME:Mechanical Engineering, MI: Mining Engineering, PI: Production & Industrial Engineering, SE: Structural Engineering, Ma: Mathematics	

B.E. II Civil Engineering - III Semester
CE 201 A: FLUID MECHANICS - I

2L, 1T, 3P

3 HOURS, MM 100

Introduction: Fluid, its physical properties. Ideal and Real fluids. Newtonian and Non-Newtonian fluids.

Principles of fluid statics: Pressure at a point, Absolute, gauge and vacuum pressures. Pressure measurements by manometers, Pressure gauges and Transducers. Total pressure and centre of pressure on plane and curved immersed surfaces.

Buoyancy, Floatation, Equilibrium of floating bodies, Metacentre and determination of metacentric height.

Kinematics of flow: Concepts of fluid flow – steady and unsteady flows, uniform and non-uniform flows, laminar and turbulent flows. Rotational and irrotational flows, Vorticity. Condition for two dimensional irrotational flows. Streaklines, streamlines and pathlines. Stream tubes, stream function. Continuity equation in Cartesian co-ordinates. Stream function and Velocity potential for two dimensional flow, Laplace equation. Flownet and its characteristics.

Equation of motion, energy and momentum applications: General hydrodynamic equations for total accelerations, Euler's equation of motion in Cartesian co-ordinates, integration of Euler's equation of motion to obtain Bernoulli's equation. Energy equation and its applications, Pitot tube, Fluid masses subjected to uniform accelerations. Free and forced vortex flows. Momentum equation and its applications, Navier Stoke's equation

CE 202 A: SURVEYING

2L, 1T, 3P

3 HOURS. MM 100

Plane Table Surveying: Principle, advantages and disadvantages of plane table surveying. Plane table equipments including Indian pattern tangent clinometer and telescopic alidade, Adjustments, setting up of the plane table, leveling, orientation and centering, Different methods of plane table surveying, radiation, traversing, intersection and resection. Two & three point problems and their solutions.

Theodolite Surveying : Introduction : Measurement of horizontal and vertical angles, other uses of theodolite. Errors in the measured values of horizontal and vertical angles and the procedures adopted in the field to eliminate/minimize the errors.

Permanent adjustments of standard vernier theodolite. Elementary idea of the micro-optic theodolites.

Theodolite Traversing: Various methods of theodolite traversing. Traverse computation, Gales Traverse Table, Systems of co-ordinates, Adjustment of traverse by Bowditch and Transit rules. Area of a closed traverse by Double Meridian Distance Method. Omitted measurements and their calculations.

Tacheometric Surveying: Theory of stadia tacheometer. Fixed hair stadia tacheometer and stadia rods. Instrumental constants, methods of observation with a fixed hair stadia tacheometer, horizontal and inclined sights, vertical and normal staff holdings. Reduction tables. Elementary treatment of self reducing tacheometers. Tangential tacheometry, substance methods of tacheometry. Errors and precision in tacheometric surveying.

Contours and contouring: Methods of representation of relief on a map. Definition of contours. Choice of contour: Contour interval, Characteristics of contours, Contour interval for various purposes, Contour gradients, Uses of contour maps. Direct and indirect methods of contouring. Interpolation of contours. Volume of reservoir from contour map.

CE 203: Construction Technology-I

3L, 3P

3 HOURS. MM :100

Selection of site of site of a building, planning , Orientation of buildings. Building bye laws- general concept. Functional requirements of building. Planning for residential buildings. Parts of the building.

Foundation: Function of foundation , requirement of foundation . Settlements of foundation Failure of foundation.

Shallow & Deep Foundation: Wall foundation, isolated footing, raft foundation & Grillage foundation (description only). Pile foundation ((description only): various types of pile , pile driving machinery, pile caps.

Design Loads: Dead load, live load, wind load, seismic load, snow load and other loads as per BIS.

Concrete: Fundamental of concrete, various concrete mixtures.

Mortars: Lime and Cement mortar. Masonries: Stone, Brick., and hollow block masonry

Damp Proofing: Causes and effects of dampness, Parts of building likely to be affected , various methods of damp proofing of buildings including basement and roof.

Shoring, underpinning and scaffolding

Mechanised construction: Fundamentals of mechanization. Plants & tools for earth work, transportation, movement , handling, concrete mixers & pumps.

Centreline of residential building and layout in field.

Origin of Earth.. Internal Structure of the Earth.

Various types of Rocks and their formation (Description only) : Igneous, Sedimentary and Metamorphic rocks

SE 204 A: Strength of Materials

2L,2T, 2P

3 HOURS, MM 100

Compound Stress: Stresses on inclined plane, Principle planes, principle stresses and strains, Mohr's Circle diagram.

Strain Energy, Resilience, proof resilience, strain energy for gradual, sudden and impact loading, strain energy due to shear.

Theories of Failures – Maximum Principal Stress theory, Maximum Principal Strain theory, maximum shear stress theory, maximum strain energy theory and maximum shear strain energy theory.

Theory of Springs – Closed coil and open coil helical spring for axial pull, axial couple/Torque, carriage or leaf spring. Spring in series and parallel.

Thin Cylindrical and Spherical Shells Longitudinal and hoop stresses for internal pressure, change in volume. Thin cylinder/Tube externally reinforced by external windings.

Columns and Struts-Elastic Instability, criteria for stability of equilibrium, Euler's Theory for long columns for different end conditions, limitations of Euler's theory. Rankine's formula, Indian Standard formula, Built – up columns.

Bending moment and shearing force diagrams under static loads, concentrated, uniformly distributed and uniformly varying loads on cantilever, simply supported and overhanging beams.

Theory of simple bending, distribution of normal stress due to bending, section modulus.

Shear stress distribution in rectangular, circular, I, Tee and L – section.

Torsion : Shear stress in solid and hollow circular shafts, angle of twist, power transmitted by shaft under pure torsion. Combined bending and torsion.

Shear centre and its location. Introduction to unsymmetrical bending.

SE 205 A : TRANSPORTATION ENGINEERING- I

2L, 2T

3 HOURS. MM 100

General: Introduction: Principal modes of transportation , comparison and coordination History of Development of Road in India.

Highway Engineering: Highway Planning and Finance, Principle of highway planning, factors affecting, preparation of Master Plan, Highway Financing - Various Methods.

Traffic Engineering: Vehicular and Driver's characteristics, Reaction Time, PIEV theory, volume, speed and O and D studies . Traffic control methods, channelization , Road Intersection- Types, Traffic sign, signals and markings, Design of signal timings for two way intersection.

Geometric Design: Factors affecting and controlling highway alignment, preliminary and location survey, Factors governing Geometric design, Vehicle Dimension and Design speed, Highway capacity, lane width camber side slopes. Formation width, Widening on curves, Superelevation on curves.

Sight Distance: Stopping and overtaking, Gradients, grade compensation on curves, vertical curves.

Highway Material: Properties and tests on stone aggregates, bitumen and tar. Design characteristics of Bituminous concrete Mix - Marshal Method of mix design.

Pavment Design: Factors affecting design of Highway, Flexible and Rigid pavements, Introduction to Boussinesqu's and Burmister's formula, concept of Equivalent single wheel load, C.B.R. method of flexible pavement design. Construction and Maintenance:

Construction features of W.B.M., Bituminous and concrete Roads, specification for 20mm thick Premix Bituminous carpet and 50 mm thick grouted Bitumen Macadam.

Highway Maintenance: Brief Introduction of failure pattern and maintenance techniques for WBM, bitumen and concrete Roads.

Highway Drainage: Types of CD works.

Ma 207 A : Engineering Mathematics

2L

3 HOURS. MM 100

Differential Equation : Simultaneous differential equation. Total differential equations..

Partial differential equations of first order. Charpit's method

Complex Analysis : Analytic functions, Complex integration

Cauchy's Integral theorem, cauchy's integral formula and its application, cauchy's residue theorem and its application to evaluate the integral of the type

$\int_0^{2\pi} f(\sin \theta, \cos \theta)d\theta$ and $\int_{-\infty}^{+\infty} f(x) dx$

Probability & Statistics: Theory of probability and its application. Binominal probability distribution, poisson probability distribution, normal probability distribution, correlation and regression analysis of two variable system.

G206 B : Engineering Geology

2T,1P

3 HOURS. MM: 100

Earth Science and its branches. Introduction to engineering geology. Origin of Earth.. Internal Structure of the Earth. Standard geological time scale.

The theory of Plate tectonics,. Applications of the Plate tectonic theory.

Importance of weathering and erosion in Civil Engineering Geological work of river, glaciers and wind,

Structural Geology : Bedding plane, Dip and Strike, Folds, Fault and unconformity, terminology classification and identification in the field and map.

Earthquakes definition, Geological causes, measurement (Magnitude and intensity), Sismic zone of India. Aseismic designs. Volcanoes – their products and distribution.

Mineralogy: Definition and physical properties of minerals. Classification of minerals

Rocks : Igneous, Sedimentary and Metamorphic rocks, their classification, texture and structure; Engineering properties of rocks and rocks as engineering materials.

B.E. II Year Civil -IV Semester

CE 251 A : FLUID MECHANICS II (C)

2L, 1T, 2P

3 HOURS. MM 100

Flow through pipes: Reynold's experiment, Minor losses – loss of head due to sudden enlargement, sudden contraction, bend, entry and exit, loss of head due to friction – Darcy's Weisbach equation,. Hydraulic gradient and total energy lines. Pipes in series and parallel. Equivalent pipeline, Bye pass, Flow through branched and uniformly tapped pipes. Flow measurement through pipes.

Transmission of power through pipes, Water hammer in pipes due to gradual and sudden closure of valve. Allevi's equation, Hydram.

Dimensional analysis and similitude: Dimensions and units of measurement. Principle of dimensional homogeneity. Buckingham's pi theorem. Dimensional analysis of typical flow problems. Hydraulic experimentation for determination of omitted and superfluous variables. Geometric, Kinematic and dynamic similarity. Important dimensional-less numbers and significance. Planning and operation of undistorted models of typical flow problems. Merits, demerits and planning of distorted models.

Flow through opening - Orifices, mouthpieces, nozzles, sluice gates, flow under varying head. Orifice discharging free, Jet, Vena contracta, co-efficient of contraction, velocity and discharge.

Notches and Weirs – rectangular, triangular and trapezoidal notches and weirs. Proportional weirs, Ogee profile, Flow under varying head.

CE 252 A: TOPOGRAPHICAL SURVEY

2L, 1T, 2P

3 HOURS. MM 100

Curves and curve ranging : Necessity of curves. Classification of curves-simple, compound, Reverse and vertical curves.

Element of Simple circular curves, methods of setting out a simple circular curve, obstacles in setting out of simple circular curves, Elementary treatment of Compound and Reverse curves.

Transition curves: Change of curvature, super elevation, Requirements of an ideal transition curve, super elevation. Modifications to the ideal transition curve. Methods of setting out a transition curve.

Vertical curves: Consideration of change of gradient and sight distance. Setting out of a vertical curve. Hydrographic Surveying: Tide producing forces. Equilibrium theory, tide gauges. Establishment of mean sea level. Sounding : Equipments used in sounding. Methods of sounding for various depths of water.

Location of soundings: Various methods of locating the sounding, three point problem and its solution by mechanical, graphical and analytical methods.

Introduction to Barometric leveling.

Tunnel Surveying. Necessity of tunneling, surface surveys and setting out.

Correlation of surface and underground surveys. Transfer of levels underground. Transfer of surface alignment to underground by Coplanning and Weisbach Triangle Methods.

Electronic Surveying: Principles, working of Geodimeter. Tellurometer and distomat Radar system. Accuracy of different electronic distance measuring methods.

CE 253 A: CONSTRUCTION TECHNOLOGY – II

2L, 4P

3 HOURS. MM 100

Staircase: Requirements of goods staircase . Layout of staircases. Types of staircases. Planning and design of various types of staircase. Ramps, lifts & escalators (Design requirements and consideration only).

Floors: Various types, suitability for various purposes, construction details, floor finishes, composite floors, precast beam floors etc.

Roof & Roof covering: Sloping roofs, flat roofs, roof covering (AC Sheets, GI corrugated sheets, sheet materials, glass covering, stone roofing, RCC roofing etc)

,Doors & windows: Locations, size, materials, frames & fittings.

Type of doors: Battened & legged & braced, framed and panelled, glazed doors, flush doors, metal doors, composite doors

Types of windows :Sliding , pivoted, double hung, casement etc, metal windows, composite windows.

Plastering & pointing: Materials & tools, design consideration foe plastering, defects in plastering.

Painting: Type of paints and process of painting. Distempering & white washing.

Wall cladding.

Joints: Expansion & construction joints in buildings.

Ventilation & Air conditioning: Purpose of ventilation . Methods of ventilation, systems of ventilation. Rate of ventilation. Systems of air conditioning.

Thermal Insulation: Insulation of roofs, insulation by air spaces & cavities. Economics of insulation.

Water Supply and Drainage: House connection alignment, laying and joining of service pipes and fittings. House Drainage, sanitary fitting, traps, soil pipe waste pipe, vent pipe, anti-syphonage pipe, inspection chamber, intercepting trap and soak pit.

Acoustics and Sound Insulation : General principles, sound absorbing materials, insulation of walls and floors. Acoustical correction, optimum time of reverberation

Fire Protection: Behaviors of different materials. Methods of fire proofing of walls, structural steel & wood.

SE 254 A : Mechanics of Solids

2L, 2T, 2P

3 HOURS. MM 100

Slope and Deflection of Statically Determinate Beams – Moment-curvature relation, Governing differential equation, double integration method, singularity function for beams, Macaulay's method, moment area method, conjugate beam method, relation between maximum stress and maximum deflection. Deflection due to shear. Deflection of composite beams. Method of consistent deformation.

Fixed and Continuous Beams. Use of three moment theorem for solving statically indeterminate beams, drawing SFD, BMD and deflected shape for simple static loading.

Column analogy method for fixed beams.

Force Method Method of strain energy: basic concept, strain energy in linear elastic system, castigliano's energy theorems, derivation application of Castigliano's energy theorem, Maxwell's reciprocal theorem, Willot – Mohr diagram.

Analysis of statically indeterminate beams and frames: Law of reciprocal deflection, theorem of least mode analysis of statically indeterminate beams and frames by minimum strain energy.

Analysis of statically indeterminate trusses: Degree of indeterminacy, application's of castigliano's theorem, Maxwell's method, stresses due to lack of fit, combined stresses, Externally Indeterminate trusses. Trussed Beam.

SE 255 A : Transportation Engineering II

2L, 2T, 2P

3 HOURS. MM 100

General : History of Development of Rail and Air Transportation in India.

Railway Engineering : Railway Track Assembly :- Permanent way, Gauge, Problem of having different gauges, track modulus, Rail joints, stresses in rails, creep and wear of rails.

Sleeper : Functions and requirements of an ideal sleeper, various types and their comparison, Rail to sleeper fixtures.

Ballast: Function and requirement of ballast, Materials used for ballast, Renewal of ballast and maintenance of track.

Railway Track –alignment – Basic principles and factors affecting geometric design of railway track, gradients, speed, Cant deficiency and negative cant curves, grade compensation on curves, Point and crossing, Turnouts, Symmetrical split, Switches double turnout, Diamond crossing, crossovers, single slip and double slip, Gauntlet track-Scissors crossover, Gathering lines. Railway Station and yards – Station site selection,

facilities required by passengers. Platforms: goods and passengers Yards : Goods and passengers yards, Marshalling yards, Station yards.

Airport Engineering : Airport Planning :- Regional planning, site selection, imaginary surfaces and zoning laws, Aircraft characteristics and controls their importance in airport planning and design. Runway orientation and design – Factors affecting; Wind rose diagram, cross wind component, Basic runway length, Runway length calculation, correction for elevation and temperature as per ICAO, Runway and Taxiway width, gradients; Minimum turning radius. Airport Layout and control :- Terminal Building, Apron, Hangers, Aircraft parking systems. Layout plans of an airport with single and multiple runway, Wind direction and Landing direction indicators. Airport lighting system, Airport drainage system (brief introduction)

Ma 261A: Special Mathematics-I

(For Diploma Passed Candidates - common for all branches)

3L,IT

3 Hrs. MM : 100

Differential Calculus :Asymptotes, curvature, envelops evolutes, and curve tracing

Integral Calculus : Rectification . Volumes and surfaces of solids of revolution, differentiations under sign of integration

Differential Equations : Differential equations with constant coefficients and variable coefficients.

Mechanics: Friction , common catenary, kinematics of uniplanar motion, simple harmonic motion

Vector calculus: Gradient , divergence, curl, green's theorem , stoke's theorem, gauss divergence theorem (Verification only).

III B.E. Civil Engineering – V Semester

CE 301 A :Geotechnical Engineering I

2L,1T,3P

3 HOURS. MM 100

Soil and rock, Soil mass constituents. Definition of water content, Specific gravity, Void ratio, Porosity, degree of saturation, air voids, density index etc. Phase relationship.

Determination of water content. Specific gravity, particle size distribution, consistency limits, void ratio and density index, Classification of soil for Engineering use. Group index, Unified and I.S. Soil classifications, field identification tests. Soil structure, basis clay minerals. Flocculated and dispersed clays.

Bearing capacity of soil. Terzaghi's analysis of bearing capacity of shallow foundations, skempton's and hansen's formula, local and general shear failure. Bearing capacity determination by plate load test, standard penetration test and dutch cone test. Presumptive bearing capacity.

Soil water, Permeability of soil and its determination, Field pumping out test. Factors affecting permeability. Permeability of stratified soil deposits.

Seepage and seepage pressure. Quick sand phenomena. Effective and total pressures. Change in effective stresses due to water flow conditions. State water Table and steady flow condition. Laplace equation for seepage. Flow net and its uses, its construction by graphical and electrical analogy methods. Piping; uplift pressure, Principle of drainage by Electro-osmosis.

Principle of soil compaction. Laboratory compaction, standard and modified proctor compaction tests, Jodhpur Minicompactor test, Proctor needle. Determination of field density. Field compaction and its control.

Vertical pressure distribution in soil. Boussinesq's, equation. Vertical stress due to circular, rectangular and strip loaded areas, Newmarks chart and approximate methods, pressure bulb and its significance in foundation exploration. Contact pressure distribution.

Settlement of foundation : Immediate, consolidation and differential, minimum depth of foundation. Proportioning of footings.

CE 302 A : Pipe Flow Hydraulics

2L,1T, 3P

3 HOURS. MM 100

Laminar Flow: Simple solution of Navier Stokes equations, Hagen-Poiseuille's equation, Plane Poiseuille flow and Couette flow, Effect of Viscosity on Fluid flow:, Shear stress distribution, Equation of motion for laminar flows, Stoke's law, Measurement of viscosity, Flow through parallel plates, Laminar flow through pipes, cavitations.

Turbulent Flow: Nature of turbulence, Reynold's momentum exchange concept and Prandtl's mixing length theory, Turbulent flow in pipes, equation for velocity, distribution and friction coefficient, velocity distribution in smooth pipes, rough pipes. Nikuradse's curves, Moody's diagram.

Introduction to boundary layer theory, Development of boundary layer over a thin flat plate, Laminar and turbulent boundary layers, boundary layer thickness and boundary shear (by momentum integral equation), boundary layer separations and control. The Prandtl boundary layer equation. Solution for laminar boundary layer. Smooth and rough flat surfaces.

Flow round a body – Drag, Skin friction drag, Pressure drag and friction drag on two dimensional bodies submerged bodies. Wave drag, lift induced drag, Flow past sphere and cylinder.

SE 303 A: Theory of Structures

2L,2T

3 HOURS. MM 100

Fundamental approaches/methods. Statically Determinate structures v/s statically indeterminate structures, conditions of geometry force/flexibility method, displacement/stiffness method/displacement method.

The slope-deflection method, Derivation of slope-deflection method fundamental assumptions, application of slope deflection method for solving statically indeterminate beams and portal frames (with and without inclined members) and drawing SFD, BMD and deflected shape.

The moment distribution method: Basic concept, stiffness and carry over factors, Distribution factors. Application of moment distribution method for solving statically indeterminate beams and portal frame (with and without inclined members) and draw SFD, BMD and deflected shape

Analysis of statically indeterminate beams and frames: Law of reciprocal deflection, theorem of least mode analysis of statically indeterminate beams and frames by minimum strain energy

Analysis of statically indeterminate trusses: Degree of indeterminacy, applications of Castigliano's theorem, Maxwell's method, stresses due to lack of fit, combined stresses. Externally Indeterminate trusses. Trussed Beam.

Rolling loads on beams and statically determinate trusses, shear force and bending moments due to concentrated loads, uniformly distributed loads-longer and shorter than the span, equivalent distributed load.

Influence lines for shear force, bending moments, stress and deflection for simply supported beams and statically determine trusses, Muller-Bresleau principle.

SE 304 A : Structural Engineering Design-I (RCC)

2L,1T, 3P

3 HOURS. MM 100

Ingredient of cement concrete-cement, fine and coarse aggregates, water, chemical and mineral admixtures. Processes of concreting. Specification and tests for fresh and hardened concrete. Stress-strain curve, modulus of elasticity, creep and shrinkage of concrete. Types of cement and concrete. Properties and types of reinforcement-codal provisions

Basic design concepts. Limit state design method, use of IS 456(latest version) provisions. Behavior, analysis and design of flexural,Members: Singly and doubly reinforced rectangular and 'T' section

Design of one way, two way slab panels, flat slabs (direct design method)
Design of form work for beam, slabs and columns

Note : Use of IS 456-2000 is permitted in exams.

SE 305 A : Structural Engineering Design-II (Steel)

2L,1T, 3P

3 HOURS. MM 100

Introduction to design – working stress method and limit state method. Factor of safety and permissible stresses, partial safety factor for loads and material, types of structural steel and section classification. Various loads on structures, floors and roofs.

Types of connections-Bolted and welded joints, ordinary black bolts, turned bolts, high strength bolts. Axially and eccentrically loaded joints, Design of brackets, Prying forces.

Design of axially and eccentrically loaded tension members by LSD. Mode of failure, Lug angles.

Design of compression members by LSD, Axially and eccentrically loaded columns, Design of lacings and battens for built – up columns, Design of slab and gusseted base plate.

Design of Beams by limit state design. Simple and plated beams, web buckling and web crippling, laterally supported and unsupported curtailment of plates.

Note:

(i). All design to conform to IS:800 - 2007

(ii). The use of IS: 875, IS: 800-2007 and structural hand book no. 01(latest version) shall be allowed in the examination.

B.E. III Year Civil -VI Semester

CE 351 A : GEOTECHNICAL ENGINEERING-II

2L,2T,2P

3 HOURS. MM 100

Mohr circle of stress, shear strength of soil, its strength of sand and clays. Sensitivity and thixotropy, skempton's pore pressure coefficient. Stress path (introduction).

Active, passive and at rest earth pressures, rank and coulomb's earth pressure theories, rebhann's and culmann's construction for cohesionless soil back fill. Uniformly distributed surcharge. Bell's equation for cohesive back fill. Stability of retaining wall, earth pressure on sheet piling and bulkheads.

Stability of slopes. Causes of slope failures. Stability analysis by Swedish and friction circle method for total and effective stresses, Taylor's method. Stability under sudden drawdown condition, Remedial measures.

One-dimensional consolidation of soil, Consolidation test. Terzaghi's one-dementional consolidation theory and its use in predicting rate of settlement. Total and differential settlements. Over consolidated and normally consolidated soils.

Site investigation. Depth of exploration. Distributed and undisturbed samples. Types of samples. Brief description of procedures of boring and sampling. Depth, number and extent of bore holes for various structures.

Soil stabilisation, Mechanical stabilisation with lime, cement, bitumen, hygroscopic and water proofing chemicals. Electrochemicals and thermal stabilisation.

Deep Foundation: Types, functional classification of piles. Pile load capacity by dynamic and static formula. Pile load test, group effect, well foundation in detail.

Foundation in black cotton soil. CBR Test and its application. Sub grade modules and its determination.

CE 352 A: Open Channel Hydraulics

2L, 3P

3 HOURS. MM 100

Flow through open channels: Uniform steady flow in open prismatic channels, Discharge formulae of Chezy's, Manning's, Bazin's and Kutter's. Most economical section, Conveyance of a channel section, Specific energy and discharge curves. Alternate depth and critical depth. Critical state of flow. Hump and channel contraction, Broad crested weir, Parshall flume.

Dynamic equation of gradually varied flow in prismatic channels, Classification and analysis of surface curves, Computation of surface curve by step method.

Rapidly varied flow, Hydraulic jump in prismatic channels, Specific force curve, Conjugate depths, Hydraulic jump elements and energy loss, Location of the jump, surges and waves.

Hydraulic turbines: Impact of free jet on curved vanes, Velocity vector diagrams. Types of hydraulic turbines, determination of vane angles, main dimensions and efficiencies. Study of Pelton, Francis and Kaplan turbines, Bulb turbines.

Governing of hydraulic turbines, Surge tank, Unit quantities, Specific speed, Characteristic curves and their uses. Problem of cavitation in turbines, Selection of turbines. Centrifugal Pumps: Energy recuperation devices – volute casing, vortex chamber and diffuser ring. Pump efficiencies. Effects of variation of discharge and speed of the pump, Specific speed. Characteristics curves. Pumps in series and parallel. Multistage pumps and compressors.

CE 353A : Advanced Surveying

2L, 2T, 3P

3 HOURS. MM 100

Triangulation: Principles, objectives and classification. Triangulation layouts and figures. Station markers and signals Satellite stations. Strength of figure. Computation and adjustments in

triangulation. Weight of observation, Least squares method, most probable values. Base line measurement. Adjustment of quadrilateral and polygon with central station.

Trigonometrical Levelling: Curvature and atmospheric refraction, single and reciprocal observations, Eye and object (axis-signal) correction.

Trilateration: Brief introduction.

Photogrammetry: Introduction, limitation. Types of photographs, Aerial Photogrammetry, Photocoordinate system, Geometry and scale of vertical photographs. Ground coordinates from vertical photograph, Relief displacement. Flight planning, Planimetric mapping, photomaps and mosaics. Stereoscopy, Parallax, difference in elevation.

Introduction to photo interpretation and remote sensing.

SE 354 A : Structural Engineering Design-III (RCC)

2L,1T,2P

3 HOURS. MM 100

High performance concrete : Role of microstructure. Mix design for compression and flexure using chemical and mineral admistures and various types of cement ; durability aspects-deterioration, exposure condition, cement content. Water-cement ratio, cover to rebar, consideration for fire, acceptance criteria, non-destructive testing technique.

Analysis and design of compression members : Axially loaded columns. Axial load and uni-axial bending

Design of isolated and combined footing.

Design of retaining walls-cantilever and counterfort types design of staircases (excluding spiral type)

Note : use of IS 456-2000 is permitted in exam.

SE 355 A : Structural Engineering Design-IV (Steel)

2L,1T, 2P

3 HOURS. MM 100

Design of grillage foundation for individual column and two columns beam columns connection-framed, unstiffened and stiffened seated connections

Design of Gantry girder, impact effect

Design of riveted and welded plate girders under dead and superimposed loads-flanges area and moment of inertia method.

Splicing of web and flanges. Intermediate stiffeners-vertical horizontal and bearing stiffeners. Curtailment flange of plates.

Roof trusses : type of trusses, economical spacing of trusses, design loads, design of purlins, struts, ties and joints including shoe joint

Note : 1. All design to conform to IS : 800 – 2007, IS: 875(latest version)

2. The use of I.S. 800, I.S. 875(latest version) and structural hand book no. 01 (latest version) shall be allowed in the examination.

B.E. Final Civil Engineering -VII Semester

CE 401 A: Environmental Engineering- I

2L,1T, 3P

3Hrs, MM:100

Sources of water supply, quantity of water per capita variation in seasonal and hourly consumption. Forecast of pollution. Standards of purity for public water supplies Flow Diagram. Lakes and rivers intakes. Raw water pumping. Aeration, simple sedimentation and chemical precipitation. Quiescent and continuous flow types of tanks. Design of coagulation. Filtration – slow sand filters, Rapid sand filters. Disinfection – uses of excess lime, ozone, ultraviolet rays, chlorine and chloramines for disinfection, water softening.

Different types of pipes used in water supply practice, joints in pipes, valves, distribution of water, Design of distribution system. Alignment, laying and jointing of pipes, Service reservoir and fittings service connection, detection and prevention of wastage of water, Metering, Rural Water Supply.

CE 402 A : HYDROLOGY & DAMS

2L, 1T, 3P

3 HOURS, MM:100

Hydrology : Descriptive hydrology, hydrological cycle, hydrologic budget.

Precipitation: Precipitation, measurement and related data analyses, Hydrologic abstractions, Water losses, Evaporation and its estimation, transpiration, evapotranspiration, measurement of evapotranspiration, infiltration.

Quantitative hydrology: Rainfall Runoff relationships, estimation quantity of runoff, flood estimation.

Hydrograph : Storm hydrograph, factors affecting flood hydrograph, analysis : PMP, unit and synthetic hydrographs, its application, storage routing.

Floods and their management, PMF; Streams and their gauging; Routing of floods; Capacity of Reservoirs. Regression and Correlation analysis.

Ground water : Forms of subsurface water, Aquifer properties and well irrigation: source of ground water, types of wells, steady flow into a well, Unsteady flow in a confined aquifer, well loss, specific capacity,

Ground water budget, construction, yield, maintenance and development of wells.

River Engineering – River morphology; River training, embankments and Dikes, guide banks, groynes, Levees, spurs, Pitched island, cut off, bed pitching , butter panelling, design of launching apron, Revetment for bank protection, Classification rivers on alluvial plains – degrading, aggrading and meandering.

Sediment transport – Origin and formation of sediments, stream erosion and deposition, definition of regime of flow, plane bed, ripple and dune regime, transition regime, anti-dune regime, introduction to bed loads, saltation, suspended load and wash load.

Reservoir planning : Reservoir, economic considerations, environmental effects, yield, capacity of reservoir, mass curve for inflow and demand. Reservoir sedimentation, site selection and flood routing through reservoirs.

Dams : Basic principles for design and construction features of dams and spillways, forces on gravity dam, stability analysis, causes of failure, stress analysis, elementary profile, design of gravity dams, foundation treatment. Structural joints, keys and water seals, galleries, outlets.

Earth dams : Types, methods of construction, design and stability analysis. Estimation and control of seepage, slope protection. Introduction and brief description of Arch, Buttress dams, rockfill dams, coffer dams.

Hydro-Power : General features and components of hydropower station.

CE 403 A : Engineering Economics and Management

2L

3Hrs, MM:100

Principle and explanation of economic terms: Land, labour, capital, rent, wages, interest, production. Law of return, scale of industry, Location of industry, internal and external

economics, Price determination under perfect competition and monopoly conditions, Derivation of revenue and cost curves, Index number.

Taxation – Principle of incidence

Contracts – various types and conditions.

Business organisation – Sole proprietorship, partnership and joint stock companies, Different kinds of shares and debentures, co-partnership and profit sharing, Nationalisation of industries, State enterprise, monopoly.

Industrial Relations – Trade Unions and their functions. Strikes and lockouts, Prevention and settlement of disputes, Unemployment and its solution.

Management – Scientific management and relations.

Rationalisation, qualities of good manager, office organisation, works organisation, organisation and management of stores.

Accounts – Double entry system, cash book, journal and ledger, profit and loss account, valuation of business assets for balance sheet, trial balance, bad debts and depreciation.

Financial Analysis : Determination of liquidity ratios, leverage ratios, activity ratios, profitability ratios.

SE 404 : Structural Engineering Design-V (RCC)

2L,2T,2P

3 HOURS. MM 100

Design of continuous beams on non-yielding supports

Design of rectangular portal frame (one storey one bay) with different support conditions

Analysis of beams curved in plan : Ring beams uniformly loaded and supported on-equispaced columns : Arcate beams fixed at the ends and uniformly loaded

Analysis and design of a R.C. spherical dome for uniformly distributed load with or without a central load.

Design of overhead tanks : Rectangular, circular and intze type (membrane analysis only) Design of staging. Design of circular raft foundation

Note: Following references can be used in exam:

1. The use of IS 456 - 2000
2. The use of SP 16 design aids to IS 456 and Reinforced concrete designer's handbook (latest version) by Reynolds and steedman shall be allowed in the examination

SE 405 : Structural Engineering Design-VI (Steel)

2L,2T,2P

3 HOURS. MM 100

Types of bridges: Through type and deck type bridges, plate girder and truss girder bridges, different type of truss bridges : Limiting spans and economical span

Standard loading for railways and highway bridges : Tractive effort, braking forces and wind forces. Principles of design of through and deck type bridges.

Design of plate girder bridges :Lateral bracings, cross frames and bearing

Design of railway bridge: Design of stringers or rail bearers, cross girders and main girders, design of lateral bracing, sway and portal bracings. Design of Roller and rockers bearing

Introduction of light gauge sections : Description only, different shapes, stiffened and unstiffened, post buckling strength. Use of high tensile bolts in joints of bridge trusses (description only)

Influence lines for Pratt, Warren, Baltimore, Pettit and 'k' type trusses, influence lines for cantilever and three pines arch bridges

Note 1. The need of IS – 800 – 2007, IS – 875 and ISI hand book no. 01 shall be allowed in the examination.

2. Use of railway bridges rules and code of practice of steel bridges (Railway board) I.R.C. codes I and II, IS: 1915 and ISI Structural hand book no. 01 shall be allowed in the examination

CE 411 A Elective I: Foundation Engineering

2L

3Hrs, MM:100

Shallow foundations; Failure modes. Effects of foundation shape, eccentricity and inclination of load. Terzaghi and Meyerhof's approaches. Bearing capacity computations, I.S. method.

Influence of water table. Influence of adjacent footings, bearing capacity of a footing on stratified deposits. Settlement of footings on sands and clays, permissible total and differential settlement of structures Foundation of swelling soils. Combined footing and strap footing, mat footing.

Deep foundations : Type of piles. Allowable load. Pile load test. Pile group bearing capacity and settlement. Group action in piles.

Well foundations: various shapes, depth of well foundation, forces acting, well curb, cutting edge, steining, bottom plug, well sinking, construction.

Plate load test and Penetration tests and their applications in the design of shallow and deep foundations.

Machine foundations, Introduction to dynamic loads on soil foundation Natural frequency of foundation soil system, Barken's method, bulb of pressure concept, Design criteria for reciprocating and impact type machines.

CE 412A Elective I: Rural Water Supply & Sanitation

2L

3Hrs, MM:100

Rural Water Supply: Importance of village community in India, conditions of Indian villages with special regard to economic, social and health aspects. Quality of water needed for village community, Sources of water for village water supplies. Types of wells of sanitary aspects in well construction. Disinfections of wells. Different types of pumps used for village wells. Operation and maintenance of pumps, water borne diseases. Quantity of water Human and Cattle population and their water requirement Rate of water supply standards of potable water. Rain water storage.

Treatment of water – Disinfection, desalination, defluoridation, Distribution of water. Communicable diseases : Disease and immunity, communicable disease sources, mode of transfer. Control of communicable diseases.

Fly and Mosquito control. Life cycle of flies and mosquitoes. Various methods of fly and mosquito control.

Milk and food sanitation. Essentials of dairy farm and cattle shed sanitation. Tests for milk and dairy products. Food epidemics, food poisoning Botulism. Rural sanitation, village latrines, Aqua privies, storm water and sully problems, animal waste, methods of composting. Biogas collection and disposal of refuse.

Septic tank, percolation pits, sub surface disposal. Composting, Digestion for methane and manure recovery.

CE 413A Elective I: Desert Technology

2L

3Hrs, MM:100

Desert: Definition, characteristics of desert area, world deserts Desertification and its control.

Types of sand dunes and their characteristics.

Water supply, sanitation and housing problems in desert areas, and their remedy.

Water harvesting. Dry land agriculture and soil conservation.
Problems of constructing roads, their maintenance and remedial measures in desert areas.
Mineral resources in desert areas.
Medicinal plants and food plants of desert areas.
Solar, wind and Geothermal energy; Bio gas plants.
Soil salinity and alkalinity
Animal wealth of desert areas

CE 414 A Elective I: Hydraulic Machines

2L

3Hrs, MM:100

Impact of jets : Impact of jets on plane and curved stationary and moving vanes; Velocity vector diagrams.

Hydraulic Turbines : Types of hydraulic turbines, determinations of vane angles, main dimensions and efficiencies; Study of Pelton wheel, Francis turbine, Caplan turbine and Bulb turbine.

Governing of hydraulic turbines: Surge tanks, unit quantities, specific speed, characteristic curves and their uses. Problem of cavitations in turbines selection of turbines.

Centrifugal Pumps: Energy recuperation devices – volute casing, vortex chamber and diffuser ring; Pump efficiencies; Effects of variation of discharge and speed of the pump; Specific speed. Characteristic curves; Pumps in series and parallel; Multistage pumps.
Submersible pump: Elementary study.

CE 415 A Elective I: Dams

2L

3Hrs, MM:100

General: Various types of dams; Site selection for dams and reservoirs; Cofferdams; Reservoir sedimentation; Trap efficiency and determination of useful life; Salient features of important dams in Rajasthan and India.

Geology of dam site: Site investigation and their interpretations; Suitability of site for dam foundation; Treatment of foundation; Grouting.

Gravity dams: Forces acting – uplift pressure, wave pressure and seismic forces, load combinations; Determination and distribution of shear, normal and principal stresses; Stability analysis with and without seismic forces; Practical profile of a gravity dam; Zones of a gravity dam; Design of first four blocks of a high gravity dam; Single step design method; Free-board determination; Control of shrinkage and cracking of concrete in gravity dams; Transverse and longitudinal joints, galleries, and stress concentration in gravity dams.

Embankment dams: Safety criteria and design requirements; Zoning of dam section; General requirement for materials and compaction; Construction pore pressure and its determination; Seepage through body of the dam – phreatic line for different cases, quantity of seepage and its control; Control of seepage through foundation; Design of filter, relief well, and impervious blanket; Stability analysis of homogeneous and composite earth dams under steady seepage and sudden draw-down cases by slip arc method and sliding wedge method; Conduits through earth dams; protection of upstream and downstream slopes; Rockfill Dam – problems of design, different types of membranes, settlement, and construction methods.

Arch and buttress dams: Arch dam – general considerations, different types, constructional features, basic design criteria and design of constant radius & centre and variable radius & centre arch dams by thin cylinder theory; Buttress dams – component parts, different types, constructional features, basic design criteria and design of deck and buttress.

CE 416 A Elective I: Water Resources Planning and Management

2L

3Hrs, MM:100

Water Resources and their space-time distribution in global, national and state wise perspective, integral approach to water resources planning and development. Hydrological appraisal of water resources. Data collection, processing and frequency analysis. Assessment of water needs and planning objectives. Study of alternatives and selection of optimal project size. Multiple objective, Planning, Environmental considerations in water resources projects planning.

Legislative aspects. Water laws and policy. Machinery for interstate and international disputes, case study.

Mathematics of finance – interest, present value, annuity, cost comparison and comparison of alternative proposals. Benefits and their determination; tangible and intangibles, Benefit cost analysis, Selection of a project, preparation of feasibility report. Problems of Project financing.

CE 417A Elective I: Ground Water Hydrology

2L

3Hrs, MM:100

General Introduction: Importance of study; Ground water in hydrologic cycle; Soil properties favorable for ground water; Vertical distribution of ground water; Geological formation; Different type of aquifers; Aquifer parameters.

Ground water movement: Darcy's law, and its range of validity; Streamline; Velocity potential; Stream function; Continuity equation for ground water flow; Laplace equation; General hydrodynamic equation for two dimensional ground water flow; Inhomogeneity; Anisotropy; Boundary conditions; Flownet.

Well hydraulics: Differential equation governing ground water flow; Dupuit-Forchheimer assumptions; Steady unidirectional flow; Steady and unsteady radial flow to a fully penetrating well in confined and unconfined aquifers; Test pumping analysis with steady and unsteady flows; Introduction to flowing wells and stream depletion; Method of image for wells near stream and impermeable boundaries; Collector wells; Partially penetrating wells; Interference of wells; Well loss; Specific capacity and efficiency of wells; Design, construction, development and maintenance of wells.

Ground water modeling: Necessity and objectives; Sand tank models; Hele-Shaw models; Thermal analog models; Electrical analog models; Introduction to Finite difference models; Introduction to mathematical modeling of a ground water basin.

Ground water management: Ground water budget; Consumptive use; Ground water quality - standards and measures of quality, sources of pollution and their preventive measures; Artificial recharge of ground water - requirements and importance, water spreading and well methods of recharge, and recharge mounds; Saline water intrusion-sources, depth and shape of fresh-saline water interface, upconing, interface in island, and control measures against intrusion.

SE 435 B: Estimating & Costing

1T,2P

3Hrs, MM:100

Introduction to the subject: Definition of estimating and costing, Need for estimating and costing, Procedure of estimating or method of estimating, Data required to prepare an estimate, Types of estimates, Complete estimate, Rules and methods of measurements, Methods of taking out quantities, specifications, Basic units, Conversion factors, Conversion of rates etc.

Measurement of Materials & Works: Units of measurements, Rules for measurement, Measurement of plinth and carpet area of buildings, Calculation of reinforcement, Estimating data for roof slopes, Road gradients etc., Quick methods for estimating material and labour requirement in different types of buildings,

Detailed Estimates: Detail estimates of buildings, R.C.C. works, earth work calculations for roads and estimating of culverts, Services for building such as water supply, drainage and electrification, irrigation works.

Analysis of Rates: Elements of builder cost, working out unit rates, working costs of tools and plant, output of tools and plant, Labour output constants for building work, Cement constants, Material constants, Current schedule of rates.

Valuation: Purposes, depreciation, sinking fund, scrap value, year's purchase, gross and net income, dual rate interest, methods of valuation, rent fixation of buildings, fixation of rent, mortgage lease, Formulae useful in valuation of property.

B.E. Final Year -VIII Semester

CE 451A: Environmental Engineering II

3L,3P

3Hrs, MM:100

Systems of drainage, Surface drainage, Under drainage, Separate, Combined and Partially combined system. House drainage – conservancy and water carriage systems, Stoneware pipes, junctions, Intercepting traps, grease traps, Gulleys water closets urinals baths and lavatory basins soil, waste and antisiphonage pipes. Alignment and gradient of drains. Inspection chambers. Testing of drains. Ventilation of drains.

Layout of sewerage systems, Design of sewers Quantity of sewage per capita, Estimating storm water by time of concentration method. Forms, cross section and inclination of sewers appurtenances, Manholes, Flushing of sewers. Ventilation of sewers. Principles of sewage treatment. Aerobic and anaerobic processes. Sewage screening, grit separation, sewage pumping, Disposal of sewage by dilution and land sedimentation with chemical precipitation. Septic tank, Imhoff tank, contact beds, percolating filters. Activated sludge process. Nature of sewage sludge. Sludge treatment, sludge gas rural sanitation. Collection and disposal of refuse.

CE 452 A : Water Resources Engineering

3L, 3P

3Hrs, MM:100

Irrigation Practices : Irrigation and its importance, assessment of water requirements for crops, factors affecting water-requirement of crops, consumptive use of water, determination of irrigation water requirement, command area, delta, duty, base period, relation between delta, duty and base period, Kor depth and Kor period. factors affecting duty and methods of improvement, methods of irrigation, canal and well irrigation comparison.

Canal irrigation : Canal alignment, design principles of irrigation, curves in canals, canal losses, estimation of design discharge of a canal, design by Kennedy and Lacey's theories, Tractive force concepts in canal design, construction and maintenance, canal outlets, lining of canals.

Canal Head Works : Selection of site, components parts, Weirs and Barrages, Bligh's and Khosla theory, Computation of uplift pressure and exit gradient.

Canal Regulation Structures : Canal fall, types, Sarda fall, Glacis fall, Design of Distributary head regulator, Cross regulator, control of sediment entry into an offtaking canal, canal escapes.

Cross-drainage structures : Needs, types of cross drainage (CD) structures, selection of suitable CD structures, design of cross-drainage structures, waterway and headway of the stream, head loss through cross-drainage structures, energy dissipation.

Canal outlets, ejectors and extractors, tail escape, fish ladder.

Spillways, gates and outlet works, types of spillways, dynamic force on overflow spillways, energy dissipation below spillways, wing wall.

Introduction and brief description of various types of crest gates, sluice ways, intake and trashrack.

Water-logging – Definition, adverse effects of water-logging, causes of water-logging, anti-water logging measures, Drainage system design.

CE 453 A : Town Planning

2L

3Hrs, MM:100

- (i) Brief history of birth and growth of town.
- (ii) Definition and scope of town planning. Concept of Town Planning. Physical Planning and Social Planning.
- (iii) Principles governing selection of site and town layout. Basic elements of city plan.
- (iv) Transportation and communication. Traffic problems and remedies. Segregation and channelisation of traffic, urban roads, functions, layouts parking, problems and solutions.
- (v) Open space provision and standards.

- (vi) Land use Pattern and Zoning, Industrial Concept of zones and interrelationship. Neighbourhood planning, garden city concept, satellite town.
- (vii) New trends in Town planning – Housing schemes, Future of towns, aesthetics of towns, landscape.
- (viii) Development of existing cities. Master Plan, Slum clearance and building bye laws.
- (ix) Town planning in ancient and modern India.

SE 454 A : Structural Engineering Design VII (RCC)

3L, 3P

3Hrs, MM:100

Design of a rectangular slab with the concept of yield line theory

Introduction to I.R.C. codes for bridges. Design of slab culvert and T beam bridges

Application of courbon's theory. Use of Piegaud's coefficients

Design of bearings . Design of sub-structures elements Prestressed concrete – Advantages, methods of Prestressing, Analysis of rectangular and I section. Design of a simple beam of rectangular section (excluding end block)

Note : Following references can be used in exam

1. The use of IS 456 (latest version)
2. The use of SP 16(latest version)
3. The use IRC section, I,II & III (latest version) and Reinforced concrete designer's handbook by Renynold and Steedman shall be allowed in the examination

SE 455 A : Structural Engineering Design VIII – (Steel and General)

3L,3P

3Hrs, MM:100

Design of rectangular and circular overhead steel storage tanks: Design of staging.

Design of steel and masonry. Chimney, stacks excluding their foundation.

Space structures : Analysis of statically determinate simple space frames. Fundamentals of the plastic theory for steel structures, plastic analysis, design of continuous beams. Portal frames, gable frames.

Note 1. The need of IS :800 - 2007 IS : 875 and ISI hand book no. 01(latest version) shall be allowed in the examination.

SE 461 A : Elective II- Finite Element Methods

2L

3Hrs, MM:100

Introduction to finite element method. Basic concept of finite element (F.E.) analysis of structures. Finite element analysis of an elastic continuum : Displacement approach, Direct formulation energy integral, Co and Cil continuity, convergence criteria

Elements : Types and properties. Conforming and non conforming

Shape function L General families for one and two dimensional elements, pascal triangle, serendity and langrangian family. Sper, sub and Iso parametric elements plane stress and plane strain problems, constant strain triangle. Steps in finite element analysis of an elastic continuum Natural coordinates and numerical integration (one and two dimensional cases)

SE 462 A : Elective II- Prestressed Concrete

2L

3Hrs, MM: 100

Prestressing systems and devices. Analysis and design of element for flexure, losses in pressure strength in flexure, shear and Torsional Behaviour, Transmission and Ancchorage zone, composite sections subjected to flexure, statically indeterminate structures.

SE 463 A : Elective II - Dynamics of Structures

2L

3Hrs, MM:100

Source of vibration, types of vibration, degree of freedom, spring action and damping : viscous and coulomb's damping. Single Degree of freedom system : undamped and damped and free and forced vibration (harmonic) Systems, subject to Transient Forces, Introduction of multi degree freedom system.: Response to unit impulse and arbitrary loading by Duhamel's integral for SDOF system (Ramp and Pulse loading). Vibration measuring instruments. Vibration isolation, Response to ground motion and transmissibility. Introduction to multi degree of freedom system. Use of Codal provisions for earthquake resistant design IS : 13827, IS : 13828, IS : 13920, IS : 13935.

Note: Use of IS : 1893 (latest version) shall be allowed in exams.

SE 464 A : Elective II: Industrial Building Structures

2L

3Hrs, MM: 100

Simple industrial building and steel mill buildings. Analysis and design of major components – roof trusses, gantry girder, side rails, eaves girder, sagrods, gable rafter, gable wind girder, vertical side bracing, Analysis and design of industrial bents, columns and bracket connections

Note: 1. All design to conforms to IS: 800 - 2007 and IS: 875

2. The use of IS 800, IS 800 IS-875 and ISI structural hand book no. 01(latest version) shall be allowed in the examination.

SE 465 A : ELECTIVE-II – HIGH RISE STRUCTURES

2 L

3 Hrs., MM : 100

Basic concepts of structural systems.

Effect of creep, shrinkage, fire.

Analysis : Approximate methods for gravity and lateral loads – Portal, Cantilever, Substitute frame.

Design of Frame (Skeletal), shear wall (planer) structures.

SE 466 A : ELECTIVE- II-COMPOSITE STRUCTURES

2L

3 Hrs. MM 100

Introduction to composite structural members, mechanics of composite action. Shear connectors-types and design considerations. Composite Beams, Floors and columns-design consideration. Structural joints for different elements.

SE 467A: ELECTIVE- II: Introduction to Earthquake Engineering

2L

3 Hrs., MM 100

Earthquakes, causes of earthquakes and their characteristics. Elastic rebound theory, plate tectonic theory. Movement of Indian plate. Past earthquake : India, World. Intensity and magnitude : Scales – Richter, Modified Mercalli, MSK. Response spectra. Tsunami, Types of Seismic waves, Epicentre, Hypocentre, focus, Iso-seismals. Consequences of Earthquake, Seismic zoning map of India. Seismic instruments. Strong ground motion characteristics : Near and far field problems. Selection of design earthquake. Methods of analysis for seismic loading. Factors affecting performance of structures under earthquakes. Base isolation, Ductile detailing.

Syllabus of Open Electives available for Civil Engineering Students offered by other departments:

LIST OF OPEN ELECTIVES-I

BCT 291 A Open Elective-I: Sustainable Architecture

3L

3 Hrs, MM 100

Concepts of sustainability : Energy and Global environment, Energy use and Climate change – Its impact, Types of Energy systems, Concept of Sustainability - Principles of conservation -synergy with nature, Bioregionalism - community basis shelter technology within bioregional patterns and scales, Ethical- environmental degradation.

Sustainable planning & Design: Sustainable Development -Sustainable approach to site planning and design - site inventories- relationships between site factors - development impacts from one area of the site on the other areas - phasing of development - limits of change - Design facility within social and environmental thresholds

Sustainable Building Materials and Construction : Properties, Uses and Examples of -Primary, secondary and Tertiary Sustainable Materials, Principles to improve the energy efficiency - siting and vernacular design, shade, ventilation, earth shelter, thermal inertia and air lock entrances. Techniques of sustainable construction - technologies, methods of effectiveness, and design synthesis – alternative materials and construction methods: solar water heating panels; photovoltaic electricity generation; use of local materials and on site growth of food, fuel and building materials.

Recycling and Reuse : Pre building, Building, Post building stages - Architectural Reuse, Waste prevention, Construction and Demolition recycling- Conservation of natural and building resources- Energy and material savings – types of wastes - Elimination of waste and minimize pollution- various Decomposing methods – Innovative reuse of various wastes Case Studies and Rating systems : Sustainable Development Case Studies: illustrated examples of the planning, development, and construction. Green architecture and various international rating systems for sustainability- EAM (UK), CASBEE (Japan), LEED (US), Green Star (Australia), etc. – Indian systems – TERI GRIHA rating, LEED India rating, IGBC

ChE 291 A Open Elective-I : Renewable Energy Sources

3L

3 Hrs, MM:100

Sources of energy: Energy sources and their availability, renewable energy sources.

Energy from Biomass: Introduction, Biomass as a source of energy, Biomass conversion technologies, Biogas generation, classification of biogas plants, Biomass gasification.

Solar Energy: Sun and solar energy, solar radiation and its measurement, solar energy collectors, solar energy storage, Photovoltaic systems, Application of solar energy.

Wind Energy: Wind as an Energy source, Basic principles of wind energy conversion, Types of Wind machines, Components of wind energy conversion system, Performance of wind machines, application of wind energy.

Geothermal Energy: Introduction, Origin and distribution of geothermal energy, types of geothermal resources, Hybrid geothermal power plant, Application of geothermal energy.

Hydrogen energy: Introduction, Hydrogen production, Hydrogen storage, Hydrogen transportation.

Energy from the Oceans: Introduction, Ocean Thermal Electric Conversion (OTEC), Energy from Tides, Ocean Waves.

CSE 291A Open Elective-I :Object Oriented Programming Through C++

3L

3 Hrs, MM:100

A review of C. Concepts of object oriented programming using C++. Data types: elementary and derived data types, literals.

Operators and expressions: operators, association and precedence rules of operators, expressions using unary, binary and ternary operators.

Statements: declarations as statements, selection statements, iteration statements, goto statement, break statement, continue statement, return statement, try-catch block.

Functions: void functions, functions with return value, call by value and call by reference parameter passing, default parameters, recursive functions, inline functions.

Classes: classes, objects, friend functions, classes within a class, local classes, global classes, constructors, destructors.

Derived classes: single and multiple derivation of classes, multilevel and hybrid derivation of classes, constructors, destructors.

Polymorphism: function and operator overloading, virtual functions.

Streams: input and output of built-in data types, manipulators.

File streams: opening a file, accessing a file, closing a file.

Exceptions: catching exceptions, rethrowing the exception, standard exceptions.

Templates: defining a template, template instantiation, function templates, class templates.

Elementary case study of a object oriented database in C++.

CSE 292A Open Elective-I :Object Oriented Programming Through JAVA

3L

3 Hrs, MM:100

Overview of object oriented concepts in JAVA.

Introduction – Java & internet, java applets and its applications, Java features like – security, portability, byte code, java virtual Machine, object oriented, robust, multi threading, architectural neutral, distributed & dynamic.

Data types and control structures, operators, arrays, Java methods and classes.

Inheritance of procedures and data, Packages and interface, exception handling, multi-threaded programming – thread priorities, synchronization, messaging, creating and controlling of threads. IO and applets.

String handling and various string functions.

Java utilities like java.lang, java.util and their uses, java.io, basics of networking using Java.

Java applets and their use, event handling, AWT and working with windows.

Introductory study of Java Beans, Servelets and JDBC.

EC 291 A Open Elective-I: Logic System Design

3L

3 Hrs, MM:100

Number Systems & Codes: Binary, Octal and Hexadecimal number systems. Different numerical and alpha-numeric codes.

Basic Logic Circuits and Combinational logic: Positive and negative logic of OR, AND, NOT, NOR, NAND, Exclusive OR and Exclusive NOR gates. Boolean algebra, Boolean functions and expressions. Simplification and minimization techniques, K-map and tabular methods. Design of minimal combinational systems and realization.

Arithmetic circuits: Design and realization of Digital comparator, half and full adders, parallel and serial binary adders, half and full subtractors.

Miscellaneous sub systems: Encoders, decoders and code converters. Parity generator and parity checking circuits. Multiplexers and demultiplexers.

Sequential logic: Storage devices and sequential sub systems. Introduction to synchronous and asynchronous sequential systems. Mealy and moore circuits.

Synchronous sequential systems: Introductory examples, memory elements and their excitation functions. Synthesis of synchronous sequential circuits. Analysis and design of synchronous sequential circuits.

Asynchronous sequential circuits: Fundamental mode circuits. Analysis procedure. Circuits with latches. Design of pulse mode asynchronous sequential circuits. Problems in asynchronous circuits - races and hazards.

Ma-291 A Open Elective-I :Mathematical Statistics for Engineers

3L

3 Hrs., M M :100

Theory of probability : Theoretical probability distribution (Binomial, Poisson and Normal).

Correlation and Regression Analysis : Karl-Pearson's coefficient , Spearman's coefficient, Regression analysis of two variables system.

Sampling Theory : Test of significance, Large sample tests for mean and proportions. χ^2 (chi-square) , t and F Test of significance for Small sample.

Theory of attributes: association and independence of attributes, coefficient of association.

Index Number: Various types of index numbers, construction of index number of prices, fixed base and chain base methods

ME- 291A Open Elective-I: Renewable Energy Sources

3L

3 Hrs, MM:100

Principal types of fossil fuel fired power plants and their effects on livestock and environment; Concepts of NCES, Criteria for assessing the potential of NCES, Limitations of RES.

Solar Energy - Solar radiation data, solar energy conversion into heat, Analysis of Flat plate and Concentrating collectors, Testing procedures, Paraboloid Dish, Central Receiver; concept of collector tracking, energy storage systems; Solar thermal systems for residential water heating, Solar Pond, industrial process heating and power generation. Photo voltaic: p-n junctions, I-V characteristics of solar cells, Calculation of energy for photovoltaic power generation; Battery Characteristics, DC Power Conditioning Converters, AC Power Conditioning -Inverters.

Wind Energy: Energy available from wind, General formula, Lift and drag. Basis of Wind energy conversion, Effect of density, Frequency variances, Angle of attack, Wind speed, Determination of torque coefficient, Principle of Operation of wind turbines, types of wind turbines and characteristics, Generators for Wind Turbines, Control strategies.

Biomass and Biofuels: Conversion routes- combustion, pyrolysis of biomass to produce solid, liquid and gaseous fuels; Constructional details of gasifier; Aerobic and anaerobic digestion, Biofuels and their production; biofuels, Biomass systems for thermal applications and power generation.

Geothermal Energy: Definition and classification of resources, typical geothermal gradient; Dry, flash and binary steam systems; Utilization for electricity generation and direct heating, Wellhead power generating units. Basic features: Atmospheric exhaust and condensing, Exhaust types of conventional steam turbines.

An overview of other renewable devices- Fuel cells: principle, types, applications; Ocean thermal energy conversion (OTEC), Thermoelectric, MHD, Wave energy, Tidal energy, etc.

Economic Viability: Calculation of the cost of energy supply from renewables, Payback period, Carbon footprints; Comparison with conventional fossil fuel driven systems in terms of costs and emissions; Calculation of carbon dioxide reduction and incremental costs for renewable options.

ME 292 A Open Elective-I: Automobile Engineering

3L

3Hrs, MM:100

Power Unit: Automobile engine types, classification; Engine parts: cylinder head, block and crank case, piston and rings; Carburation, fuel injection, valve operation; Fuel combustion, mechanical power and engine performance characteristics; Engine cooling and thermal stresses in parts.

Chassis and Suspension: Load on frame, general considerations for strength and stiffness, engine mounting; Dampers, leaf and coil springs, various arrangements of suspension systems.

Transmission System: Clutches, flywheels, torque convertors; Gear-box: simple, synchromesh and overdrive; Type of universal joints, propeller shaft, differential; Rolling, air, gradient resistances and propulsive power calculation.

Steering: Steering geometry, Ackermann and Davis steering mechanisms; Telescopic steering; Steering shaft, gear-box, linkages, steering angles, front and rear axles; Vehicle longitudinal, static and dynamic balancing and electronic stability; Power steering: types and mechanism; Effect of caster, camber, toe-in and toe-out on tyre wear.

Brakes and Tyres: Servo-action, brake components; Bendix and Gerling system lock-head, hydraulic, vacuum, air and power brakes, and retarders; Pneumatic and tubeless tyres;

Features of a Modern passenger Car: Introduction to ABS, Front and side air bags, EBD, Climatizer, ESP, night-vision dashboard system; sun-roofing, collision warning system, Hybrid cars.

MI 291A Open Elective-I: Tunneling for Engineering Projects

3L

3 Hrs, MM:100

Tunneling: Introduction about tunnels, functions, advantages and disadvantages of tunnels compared to open cuts, Criteria for selection of size and shape of tunnels, consideration in tunneling, geological investigation, tunnel alignment, tunnel shafts, pilot tunnels. Advantages of twin tunnels and pilot tunnels, portals and adits.

Conventional Method of Tunneling: Drilling, Blasting, Loading and Transport of Muck, Supports, Ventilation, Drainage, and Equipments. Drivage work in varying ground conditions using conventional methods
Fast Tunneling: Dill jumbos, trackless mucking and transportation units. Tunnel boring machine
Tunneling in Soft Ground: General characteristics of soft ground, shield methods, needle beam method and NATM method of tunneling in practice.
Tunneling (rock bolting and guniting), Safety measures, Ventilation in tunneling, Lighting, Drainage.

PI 291A Open Elective-I: Manufacturing Science

3L

3 Hrs, MM:100

History and introduction to science of basic manufacturing processes and its classification.

Primary manufacturing processes: Introduction to liquid state forming process (casting), solid state forming process (drawing, extrusion, rolling, forging and other sheet metal working) and power state forming process (powder metallurgy).

Secondary manufacturing processes: Introduction to material removal processes

Conventional Machining processes (basic machining operations performed of lathe, shaper, milling, drilling and grinding machine).

Introduction to basic metal joining processes (welding, brazing, soldering and mechanical fastening).

Non conventional machining processes (Basic introduction, classification, need for their development, characteristics and their industrial applications).

LIST OF OPEN ELECTIVES-II

EE 341 A Open Elective-II : Optimization Techniques

3L

3 Hrs, MM:100

Introduction to Optimization : Historical Development, Engineering application of optimization, Statement & Classification of optimization problems, Classical optimization techniques for single & multiple variable functions. Linear Programming : Introduction, application, standard form, Basic Solutions, Simplex method, Revised Simplex method, Duality, Transportation problem, Carmarkar's method. Nonlinear programming : Unconstrained Optimization, Introduction, Fibonacci method, Golden section search, Gradient method, Newton's method, Quasi Newton method. Dynamic Programming : Introduction, Multistage decision process, Concept of optimization & principle of optimality, Computational procedure in dynamic programming. Advanced topics in optimization : Introduction, Separable programming, Multi objective optimization, Calculus of variation.

Books :

1. Engineering Optimization – S. S. Rao, New Age International Publishers.
2. An introduction to optimization – Er. K. P. Chong, S. H. Zak (Wiley Slident Edition)
3. Operations Research : An international – H. A. Taha (PHI)
4. Introduction to operation research – Hiller F.K. & Lieberman (TMH)

ChE 341 A Open Elective-II: Petroleum Refining Technology

3L,

3 Hrs, MM 100

Origin occurrence of petroleum, Formation and Evaluation of Crude Oil. Testing of Petroleum Products. Petroleum refining processes, general processing, topping and vacuum distillations. Thermal cracking in vapor, liquid and mixed phase. Overview of Refinery Products

Catalytic cracking - Houdry fixed bed, fluidized bed, T.C.C. Houdry flow etc. Catalytic reforming - conversion of petroleum gases into motor fuel with special reference to alkylation, polymerization, hydrogenation and dehydrogenation.

Treatment Techniques: Removal of Sulphur Compounds in all Petroleum Fractions to improve performance, Destruction of Sulphur Compounds and Catalytic Desulphurization, Solvent Treatment Processes, Dewaxing, Clay Treatment and Hydrofining.

Production of aviation gasoline, motor fuel, kerosene, diesel oil, tractor fuel and jet fuel, hydrodesulfurisation, Lubricating oil manufacture, Petroleum waxes and asphalts. Octane number, Cetane number, Diesel index, their determination and importance Storage of petroleum products: tanks, bullets, special types of spheres etc. Transportation of petroleum products: road, rail, sea and pipeline; Importance of pipeline transportation.

CSE 341A Open Elective-II :Data Structures and Algorithms

3L

3 Hrs, MM 100

Introduction to data structure, String storage representation and manipulation. Markov algorithm and primitive data structures.

Concepts of non primitive data structures. Linear data structure. Array, stack, queue, their applications and implementations using sequential storage representation and linked representation.

Linear linked list, double linked list, circular linear linked list and generalized lists and applications.

Concept of non-linear data structures, Tree, graph, set and their representation, Binary Tree, Threaded tree, different techniques of tree traversal, breadth first search, depth first search, application of tree and graph such that Polish notation, concepts of heap.

Sorting, searching algorithms and comparative study of different sorting and searching techniques such that selection sort, heap sort, bubble sort, quick sort, merge sort and radix sort. Linear search and binary search, hashing. External sorting.

Time and space complexity of the algorithms – Big-O, θ , Ω , and small-o, Asymptotic complexity, Upper and Lower bound time and space trade offs.

EC 341 A Open Elective-II: Microprocessors And Microcontrollers

3L,

3 Hrs, MM 100

Microprocessor Architecture: Architecture of 8-bit 8085 Microprocessor; instruction set and addressing modes. Assembly language programming of Intel's 8085 Microprocessor. Introduction to assemblers.

Microprocessor interfacing: Interfacing of address, data and control buses, Memory and I/O devices, Interrupt and DMA for 8085 microprocessor.

Introduction to Microcontrollers: Architecture and instruction set of MCS-51 series of microcontrollers. Applications of Microcontrollers.

16 and 32-bit Microprocessors: CPU architecture, addressing modes and features of 16 and 32 bit microprocessors – 8086. Salient features of 80286, 80386, 80486 and Pentium series microprocessors.

Bus standards: Introduction to Multibus , VME, RS-232-C, IEEE 488, PCI, USB, RS 422 and 485.

EE 341 Open Elective-II: Industrial Application Of Electrical Drives

3L

3 Hrs, MM:100

Operating-Characteristics : Individual, group and collective drives, steady state individual and joint characteristics of electric motors and driven industrial units under different conditions of operation.

Transient Characteristics : Causes of transient conditions starting, braking, reversing, speed transition and sudden system changes. Forces and torques on the drives referred to a common reference shaft. General equation of motion, Accelerating and deaccelerating times. Starting and braking time and means of reducing.

Drives Control : Parameters characterizing speed control methods of electric drives, speed control of Industrial d.c. and a.c. motors under constant and varying torque and h.p. conditions.

Families of speed torque characteristics : Idea of manual and automatic control gears, Master-controller.

Motor Ratings : Continuous-short time and intermittent ratings, overload capacity. Effect of altitude, Motor heating and cooling curves. Equivalent current, power and torque. Selection motor for various duty cycles. Permissible frequency of starting, features of load diagram construction. Load equalisation and use of fly wheels. Types of motor enclosures.

Illumination : Units of light, Point , linear and surfact sources. Laws of illumination. Candle power distribution, MSCP and reduction factor, Indoor lighting system and their classification. Contrast, glare, shadow and colour. Mounting height and spacing. General and local lighting Total lumen and point by point methods of calculations. Outdoor lighting distributor and protector fittings. Isolux diagram. Flood, gas, discharge and arc-lamp-working, characteristics and applications.

Electric Heating and Welding : Principles of electric heating. Direct and indirect resistance heating, lead baths and salt baths. Resistance oven convection and radiation ovens. Arc resistance and induction furnance, elements of operation, performance and power supply arrangements. temperature regulation of ovens and furnances. Induction, high frequency and dielectric heating and their uses. Elementary study of different kinds of electric welding operation, Power supply for welding. Elements of Electric Traction : Electric traction versus others System of electric traction for tramways, trolley buses, motor coach trains and locomotive hauled trains. Idea about suitability of electric motor for traction. Conductor rail and pantograph. meaning for multiple-unit operation.

Economics : Methods for economic selection of Industrial drives, loss factor and cost of losses, Effect of load factor. Power factor and factory diversity factor. Methods of power factor improvement and its economic limit. Economic calculations for illumination schemes Economic value of good lighting.

Ma 341 A Open Elective-II :Mathematical Theory of Operations Research

3L

3 Hrs., MM : 100

Linear programming problems-Simplex Method, two phase method, Duality of LPP.

Theory of games: Competitive strategies, minimax and maximin criteria, two person zero-sum games with and without saddle point, dominance .

Inventories: Single item deterministic inventory models with finite and infinite rates of replenishment, economic lot-size model with known demand

Replacement problems: Replacement of item that deteriorate, replacement of items that fail completely, group replacement policy, individual replacement policy

Queing theory-Queues with Poisson input and exponential service time, the queue length, waiting time and busy period in steady state case, model with service in phase, multiserver queueing models.

ME 342A Open Elective-III: Systems Design and Analysis

3L

3 Hrs, MM:100

System Fundamental Concept: System definition, systems approach, Classification- General Systems, Discrete Systems, Controlled systems.

Procedure for Engineering a system: Defining system objective, formulation of objective criteria, Development of system alternatives.

Systems Optimization: Formulation of system, Design problem and application of search methods, Linear programming and dynamic programming for optimum solutions.

System Schedule: Time models, resource allocation, Time cost trade-off, system cost economic flow graph.

MI 341A Open Elective-II: Application of GIS & Remote Sensing in Engineering

3L

3 Hrs, MM:100

Remote Sensing: Introduction to Remote Sensing, Terminology in Remote Sensing, Types of Remote sensing, advantage and disadvantage of remote sensing data, Electromagnetic radiation atmospheric. Windows remote sensing platforms and sensors systems, path-row referencing system, remote sensing data product, procedure for obtaining satellite data. Hardware and software related to remote sensing.

Different types of platforms, sensors and their characteristics, Orbital parameters of a satellite, Multi concept in remote sensing.

Image Interpretation and analysis: Elements of visual image interpretation, Digital image pre-processing, radiometric correction, geometric correction, resolution of remote sensing data, image enhancement, contrast enhancement, spatial filtering band rationing image classification supervised and unsupervised classification, remote sensing applications in forestry, geology, hydrogeology, Land use and land cover mapping.

Principles of interpretation of aerial and satellite images, equipments and aids required for interpretation, ground truth – collection and verification, advantage of multirate and multiband images. Digital image Processing concept.

Geographic Information System (GIS): Fundamental of GIS: Basis concept including definition and history of GIS, Essential Elements of GIS, Uses and users of GIS, General GIS Applications, Geodesy, Grids, Datum's and projection systems, GIS Data structure, Data Formats, GIS layers and Digitization overview of GPS and its application, Hardware and software related to GIS.

Raster and vector Based GIS: Raster based GIS, Definition of Raster Based GIS, Spatial Referencing Definition and Representation of Raster Data. Vector based GIS, Definition and concept of vector based GIS, Data structure, Data Capture and Basic operations of spatial analysis, advantages and disadvantage in raster and vector based GIS, Introduction to network in GIS, GIS Project Planning Management and Implementation.

Application of GIS :in Map revision, Land use, Agriculture, Forestry, Archaeology, Municipal, Geology, water resources, soil Erosion, Land suitability analysis, change detection, Use of GIS in Mining.

EE 342 A Open Elective-II : Artificial Intelligence

3L

3 Hrs, MM: 100

Artificial Intelligence: Introduction to AI Knowledge-based Expert Systems and I: Introduction. Importance and Definition of AI, ES, ES, building tools and shells.

Knowledge-Representation: Concept of knowledge, Representation of knowledge using logic, semantic networks, frames and production systems.

Control Strategies: Concept of heuristic search and back-tracking forward and backward chaining, study of the following search, techniques Depth-first search, Breadth-first search, Generate and Test.

Hill Climbing Best-first search Learning; Concept of learning and knowledge acquisition study of the following learning techniques: Rote learning, Induction, Explanation-based learning.

Neural Networks: Introduction: Evolution, Biological Neurons and Synapses, Characteristics of Artificial Neural Networks (ANN) Types of Activation Functions.

Perceptrons: Perceptron representation: Concept of Linear separability, Limitations of Perceptrons, Single layer and multi layer Perceptrons. Perception learning algorithms.

Basic Concept of Learning in ANN: Supervised learning, Back propagation, Unsupervised learning, Self-Organisation, Kchonen's Network, Hopfield Network: configuration Hardware Implementation, Learning, Stability.

Art Networks: Network configuration, Characteristics, Learning.

Implimentation: Applications

Conclusion: Recent trends and Future Applications.

LIST OF OPEN ELECTIVES-III

BCT 391 A Open Elective-III: Climate Responsive Architecture

3L,

3 Hrs, MM 100

Understanding Climate and its impact on architectural design, fundamentals of climatology and environmental studies.

Introduction – Elements of Climate, measurement and representation of climatic data. Classification of climate, major climatic zones of India.

Thermal Comfort: Effect of climatic elements on Thermal comfort; indices for Thermal comfort Thermal performance of building elements: Thermal and physical properties of building materials and their effect on indoor environments.

Natural ventilation: Functions, effects of openings and external features on internal air circulation. Design considerations for achieving natural ventilation.

Sun path diagram, use of solar charts, types of shading devices

Day light factor: components, design considerations for indoor spaces

Micro Climate: factors and effects

Construction techniques for improving thermal performance of walls and roofs. Passive cooling techniques: traditional and contemporary

Design considerations for buildings and settlements in tropical climates with special reference to hot-dry, warm-humid and composite climates; Mahoney Tables.

Exercises:

Design of shading devices.

Layout of Residence for hot - dry, warm-humid and composite climates.

ChE 391 A Open Elective-III: Nanotechnology

3L,

3 Hrs, MM 100

Introduction to Nanotechnology: Introduction to nanotechnology and materials, Nanomaterials, Introduction to nano sizes and properties comparison with the bulk materials, different shapes and sizes and morphology.

Fabrication of Nanomaterials: Wet Chemical Synthesis Methods, Colloidal Nanoparticles Production, Sol Gel Methods, Microwave and Atomization, Gas phase Production Methods : Chemical Vapour Depositions.

Kinetics at Nanoscale: Nucleation and growth of particles, Issues of Aggregation of Particles, Layers of surface Charges, Zeta Potential and pH.

Carbon Nanomaterials: Synthesis of carbon buckyballs, List of stable carbon allotropes extended fullerenes, metallofullerenes solid C60, bucky onions nanotubes.

Nanomaterials characterization: Instrumentation Fractionation principles of Particle size measurements, Particle size and its distribution, XRD, Zeta potential Microscopies SEM, TEM, Atomic Forced Microscopy, Scanning and Tunneling Microscopy

Applications in Chemical Engineering: Self-assembly and molecular manufacturing : Surfactant based system Colloidal system applications, ZnO,TiO₂, Silver Nanoparticles Functional materials Applications, Production Techniques of Nanotubes, Carbon arc, bulk synthesis, commercial processes of synthesis of nanomaterials, Nanoclay, Commercial case study of nano synthesis - applications in chemical engineering.

CSE 391A Open Elective-III; Web Technology

3L

3 Hrs, MM:100

Understanding Microsoft .NET Framework and ASP.NET, Creating components in Visual C#. CLR, Framework Class Library, Undocumented Types.

Programming the .NET Framework, Common Types, Math, Strings, Collections, Regular Expressions. Core Types, Serialization, Remoting, Graphics, Rich Client Applications, Globalization, Configuration, Advanced Component Services.

Multithreading, Thread Synchronization, Inter-thread Communication and Monitor. Delegates & Events. Validating User Input.

Creating a Connection to the Database, Displaying a DataSet, List-Bound Control, Paging and Selection, DataGrid Control, Accessing Data with DataReaders and SqlDataReader. Overview of Stored Procedures.

Managing State, State management, Application and Session Variables, Cookies and Cookieless Sessions. Configuring, Optimizing. Using the Cache object.

Reading and Writing XML Data, Overview of XML Architecture, DataSet Object, XML Web Server Control, Reading, Transforming, and Displaying XML, Nested Data. Creating an XML Web Service.

Securing a Microsoft ASP.NET Web Application, Web Application Security Overview, Windows-Based Authentication, Forms-Based Authentication, Passport Authentication, Registering New Users, Permitting Users to Sign Out.

AJAX.NET Architecture, Working with AJAX Pro and Controls, Accordion, Calendar, CascadingDropDown, CollapsiblePanel, Filtered TextBox, Numeric Up Down, Modal Popup, Popup Control. Page_Load Event and Click Event Procedure, Adding server controls to an ASP.NET Web Form basics, handling text and numbers.

CSE 392A Open Elective-III : Database Management Systems

3L

3 Hrs, MM:100

Purpose of data base system, data abstraction, data models, data independence, data definition language, data manipulation language, data base manager, data base administrator, data base users, overall system structure.

E-R Models, entities and entity sets, relationships and relationship sets, attributes, mapping constraints, keys, E-R diagrams, reducing E-R diagrams to tables, generation, aggregation, design of an E-R data base scheme

Basic concept of object oriented model, New database applications, object structure, class hierarchy, multiple inheritance, object identity, object containment, physical organization, object oriented queries, scheme modification.

File and system structure, overall system structure, file organization, logical and physical file organization, sequential, random, hierarchical, inverted, multilist, Indexing and hashing, B-tree index files

Introduction to distributed database. Introduction to SQL Query and SQL joins.

CSE 393A Open Elective-III - Information Protection and Network Security

3L

3 Hrs, MM 100

Introduction to Cryptography: Simple substitution ciphers, divisibility and greatest common divisions, prime numbers and unique factorization, cryptography before computer age.

Discrete Logarithms and Diffie-Hellman: Public Key cryptography, groups, discrete logarithm problem and its hardness, Diffie-Hellman key exchange, Chinese remainder theorem.

Integer Factorization and RSA: Euler's formula, RSA Public Key Crypto System, implementation and security issues, primality testing.

Digital signature, Hash functions, modern symmetric crypto systems: DES and AES.

Computer Security overview.

Common attacks and Defense Mechanisms; Evesdropping, cryptoanalysis, password pilfering, Identity spoofing, Buffer-overflow, Repudiation, intrusion & IDS system Traffic analysis, DOS attacks, Malicious software.

Basic Security models and Security resources.

Network Perimeter Security. Packet Filters, Circuit Gateways, Application Gateways, Trusted Systems, Firewall Configurations.

EC 391 A Open Elective-III: Electronic Instrumentation

3L

3 Hrs, MM:100

Transducers: Construction, characteristics and circuits for common types of resistive, capacitive, inductive, magneto-structive; piezo-electric. Photo-electric and thermo-electric transducers for measurement of process physical variables. Various sensing elements and transducers for measurement of Force, Pressure, Humidity, Moisture, strain, Velocity, Acceleration and pH. Inductive and Capacitive proximity switches. Physical and electrical loading of and by the transducer Systems.

Signal Conditioning: Analog and digital signal conditioning for instrumentation. Objectives of DAS, components of analog DAS and digital Data acquisition system, digital data recording system, multi channel DAS, modern digital acquisition system.

Electronic Displays: Principle of LED numeric, matrix and alpha-numeric displays, flat panel CRT, LCD, electro-luminiscent and electrophoretic and touch screen displays.

EE 391 A Open Elective –III :Soft Computing Techniques

3L

3 Hrs, MM:100

Soft Computing : Introduction of soft computing, soft computing vs. hard computing, various types of soft computing techniques, applications of soft computing.

Artificial Intelligence : Introduction, Various types of production systems, characteristics of production systems, breadth first search, depth first search techniques, other Search Techniques like hill Climbing, Best first Search, A* algorithm, AO* Algorithms and various types of control strategies. Knowledge representation issues, Propositional and predicate logic, monotonic and non monotonic reasoning, forward Reasoning, backward reasoning, Weak & Strong Slot & filler structures, NLP.

Neural Network : Structure and Function of a single neuron: Biological neuron, artificial neuron, definition of ANN, Taxonomy of neural net, Difference between ANN and human brain, characteristics and applications of ANN, single layer network, Perceptron training algorithm.

Fuzzy rule base system : fuzzy propositions, formation, decomposition & aggregation of fuzzy rules, fuzzy reasoning, fuzzy inference systems, fuzzy decision making & Applications of fuzzy logic.

EE 392 A Open Elective –III: Energy Conservation

3L

3 Hrs, MM:100

Elements of Energy Conservation and Management : General energy problem, Sector wise Energy consumption, demand supply gap, Scope for energy conservation and its benefits, Energy conservation Principle Maximum energy efficiency, Maximum cost effectiveness. Mandatory provisions of EC act Features of EC act Standards and labeling, designated consumers, Energy Conservation Building Codes (ECBC). Energy management concept and objectives Initializing Planning, Leading, Controlling, Promoting, Monitoring and Reporting, energy management programmes.

Energy Conservation Approaches In Industries : energy saving opportunities in electric motors Benefits of Power factor improvement and its techniques Shunt capacitor, Synchronous Condenser etc., Effects of harmonics on Motors, and remedies leading to energy conservation Energy conservation by VSD Methods and techniques of energy conservation in ventilation and air conditioners compressors pumps, fans and blowers Area Sealing, Insulating the Heating / cooling fluid pipes, automatic door closing Air curtain, Thermostat / Control Energy conservation in electric furnaces, ovens and boilers lighting techniques Natural, CFL, LED lighting sources and fittings

Energy Conservation in Power Generation, Transmission and Distribution : Performance improvement of existing power plant: cogeneration, small hydro, DG Set. Demand side management Load response programmes Types of tariff and restructuring of electric tariff Technical measures to optimize T and D losses.

Ma 391 A Open Elective-III: Advanced Numerical Analysis

3L

3 Hrs., MM : 100

Solution of Algebraic and Transcendental Equations: Newton-Raphson method for real multiple roots, for complex roots and for system of non-linear equations; Synthetic Division, Birge-Vieta Method.

Solution of simultaneous Linear Equations and Eigen Value Problems: Direct methods: Gauss-elimination, Gauss-Jordan, Iterative Methods: Jacobi iteration, Gauss-seidel iteration and Successive Relaxation method. Eigen value Problems: power method

Curve fitting and Function Approximation: Chebyshev approximations, Chebyshev Expansion, Chebyshev Polynomials. Economization of Power Series.

Numerical Solution of Partial Differential Equations: Finite difference Approximation to partial derivatives. Solution of Laplace and poisson equations, Solution of one and two dimensional heat and wave equation by the method of separation of variables.

ME 391A Open Elective-III: Design Planning and Control of Production System

3L

3 Hrs, MM:100

Production Planning: Planning horizon, product exploring, Make and buy decisions, operations planning, demand forecasting, conversion of forecast into production goal.

Scheduling: Operation sequencing and balancing, Scheduling for mass production and job order production, MRP, ERP.

Inventory System: Cost factors relevant to operations and inventory control, EOQ with shortages and uniform production, quantity discount.

Project Planning and Control: Network control, control cost consideration and optimization, Resource allocation and levelling, Aggregate production planning, decision rules.

Supply Chain Management: Strategic framework of Supply chain – meaning, scope and performance of supply chain, supply chain drivers and obstacles. Role of e-business in a supply chain.

ME 392A Open Elective-II: Finite Elements Method

3L

3 Hrs, MM: 100

Introduction: Basic concept of Finite element method; Rayleigh-Ritz and weighted residual method of variational approximation, Numerical Solution of equilibrium problem by Gaussian elimination.

Finite Element Analysis of One-dimensional Problem; Basic Concepts, derivation of elements equations, connectivity of elements, imposition of boundary conditions, Solution of equations, Application in One dimensional problem of Solid mechanics and heat transfer.

Finite Element Analysis of Two Dimensional Problem: Single variable problems: finite element discretization, interpolation, function, numerical integration and modeling considerations for triangular, rectangular, Quadrilateral, Isoparametric and Plane frame elements, Evaluation of equation and their solutions, Application in Two Dimensional Problem of Solid mechanics, Heat Transfer and Eigen value problems.

MI 391A Open Elective-III: Project Environment Clearance

3L

3 Hrs, MM:100

Brief introduction of Environment Protection Act 1986 and other relevant legal provisions applicable to get environment clearance in India.

Impact of major engineering projects on various components of the environment: Socio-Economy, Land, Water, Air, Noise and others.

Preparation of Environment management plan: Public hearing, collecting baseline data, Environment impact assessment and predication, Environment management plan, environment monitoring and management.

PI 391A Open Elective-III: Quality Management

3L

3 Hrs, MM: 100

Introduction: History of Quality, Objectives , importance and need of quality, Contributions of Quality Gurus- Juran, Deming, Crosby, Feigenbaum, Ishikawa, Taguchi etc., Impact of Quality on business performance.

Process and Statistical Quality Control: Quality System; Quality control techniques; Process capability; Control Charts- Theory of control charts, control limits and specification limits, Control charts for variables-X R Charts, Control Charts for attributes p, np, c and u charts.

Acceptance Sampling : Fundamental concepts of acceptance sampling; OC Curves; Single , Double and multiple sampling;

Quality Management: Introduction to Quality management; quality control and quality assurance; Quality control tools; cost of quality and cost of poor quality.

ISO 9000: ISO 9000 series; terminologies; need for ISO 9000 certification; basic procedure and work instructions; steps in ISO 9000 registration; Internal and third party audit for registration; Clauses of ISO 9000-2000 .

List of Open Electives (for other departments students offered by Civil & Structural Engg Department)	
Name of subject	Semester
CE 291A Open Elective-I :Energy Efficient Building Design SE 291A Open Elective-I: Computer oriented Numerical Analysis	Fourth Semester
CE 341A Open Elective-II: Non Urban Public Hygiene & Drinking Water SE 341A Open Elective-II :Structural Dynamics	Fifth Semester
CE 391A Open Elective-III: Ecosystem & Biodiversity SE 391A Open Elective-III :Finite Element Method	Sixth Semester

LIST OF OPEN ELECTIVES-I (IV Sem)

CE 291A Open Elective-I :Energy Efficient Building Design

3L

3 Hrs, MM:100

Environment and man, external environment and built environment, Built-environment – integrated approach.

Climate: elements of climate, classification of climate, Micro-climate, site climate.

Comfort: desirable conditions, thermal comfort factors, comfort indices, effective and corrected effective temp. Tropical summer index.

Thermal Design: heat loss from a building under steady state condition, heat gains due to solar radiation, steady state and cyclic conditions, Means of thermal control – mechanical, structural control, air infiltration into buildings by natural means, shape of buildings,-thermal cube, fabric heat loss, ventilation loss and volume.

Light & Lighting: illumination requirement, day-lighting, artificial lighting, energy conservation.

Noise Control: Sources of noise, means of control, control requirements, behaviour of sound in rooms, vibration & vibration control.

Building Services: Mechanical & electrical services in building, lifts, escalators.

SE 291A Open Elective-I: Computer Oriented Numerical Analysis

3L,

3 Hrs, MM 100

Error Analysis:- Approximations and errors, Round off errors.

Roots of Equations:- Bisection method, Newton – Raphson method.

Curve Fitting:- Linear Regression, Least Square Ft, Co-relation.

Interpolation:- Linear & Quadratic, Newton's & Lagrange's polynomials.

Numerical Differentiation:- Forward / Backward / Centered F.D. method.

Numerical Integration:- Trapezoidal rule, Simpson's rule.

Solution of simultaneous Linear algebraic equations.

LIST OF OPEN ELECTIVES-II (V Sem)

CE 341A Open Elective-II: Non Urban Public Hygiene & Drinking Water

3L,

3 Hrs, MM 100

Communicable disease: Disease and immunity, communicable disease sources, mode of transfer. Control of communicable disease.

Fly and mosquito control: Life cycle of flies and mosquitoes. Various methods of fly and mosquitoes control.

Milk and food sanitation: Essential of dairy farm and cattle shed sanitation. Tests for milk and dairy products. Food epidemic, food poisoning. Botulism. Rural sanitation, village latrines, aqua privies, storm water and sullage problems, animal waste, methods of composting. Biogas collection and disposal of refuse, solid waste management through vermicomposting.

Septic tank (only salient features), percolation pits, sub surface disposal.

Rural water supply: Importance of village community in India, conditions of Indian villages with special regards to economic, social and health aspects. Quality of water needed for village community, sources of water for village water supplied, domestic roof water harvesting. Types of wells of sanitary aspects in well construction. Disinfections of wells. Different types of pumps used for village wells. Operation and maintenance of pumps, water borne diseases. Quality of water, human and cattle population and their water requirement. Rate of water supply. Standards of potable water. Rain water storage.

Treatment of water: Disinfection, desalination, Defluoridation, distribution of water.

SE 341A Open Elective-II :Structural Dynamics

3L

3 Hrs, MM: 100

Vibrations of single degree of freedom system, sources of vibration, Types of vibration, Degree of freedom, spring action and damping, equation of motion of single degree of freedom system, undamped system of single degree of freedom, combination of stiffnesses, damped system of single degree of freedom, dry friction, damping forced vibration of damped system, introduction to multi degree freedom system.

LIST OF OPEN ELECTIVES-III (VI Sem)

CE 391A Open Elective-III: Ecosystem & Biodiversity

3L,

3 Hrs, MM 100

Concept of an ecosystem, structure & function of ecosystem, Bio-Geo chemical cycles (Hydrological, carbon, oxygen, nitrogen, phosphorus & sulphur cycle), energy flow in ecosystem, food chain

Major ecosystems (Description only) : Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystem, Riverine and stream ecosystem, Marine ecosystem, Estuarine ecosystem.

Biodiversity : Definition and its importance. Biodiversity at global, national & local level. Hot spots of biodiversity, Threats to biodiversity & causes of biodiversity loss. Conservation of biodiversity.

Value of biodiversity: Consumptive use, productive use, social value, ethical value, aesthetic value& optional value.

Bio-geographical classification of India. India as mega- diversity nation

SE 391A Open Elective-III :Finite Element Method

3L

3 Hrs,MM: 100

Introduction to Finite Element Method, Basic Concept of Finite Element Method, Analysis of continuum:- Structural, thermal, Potential etc., Finite Element Analysis of an elastic continuum:- Displacement approach, Direct Formulation, Energy Integral, Co and C1 continuity, Convergence criteria.

Elements:- Types and Properties. Conforming and Non conforming.

Shape Functions:- Langrangian and Serendity family for one and two dimensional cases.

Pascal triangle, Super / Sub and Iso parametric elements.

Steps in Finite Element Analysis of an elastic continuum.

B.E. II Year (Electronics & Electrical Engineering), 2016-17

SEMESTER III EXAMINATION SCHEME

Branch Code	Subject Code	Subject	Lectures	Tutorials	Practicals	Contact Hours	Credits	Exam Hours	Marks		
									Theory	Pract & Sess	Total
A: Written Papers											
MA	201 A	Advanced Engineering Mathematics (EC/ECC/EEE) - I	2	-	-	2	2	3	100	-	100
EC	202 A	Network Theory (EC/ECC/EEE)	2	1	-	3	3	3	100	-	100
EEE	203 A	Electronics Devices & Circuits (EEE)	2	1	-	3	3	3	100	-	100
EEE	204 A	Direct Current Machines (EEE)	3	1	-	4	4	3	100	-	100
EC	205 A	Digital Electronics (EC/ECC/EEE) – I	3	1	-	4	4	3	100	-	100
EEE	210 A	Measurement & Instruments (EEE)	2	1	-	3	3	3	100	-	100
Total (A)			14	5	-	19	19	-	600	-	600
B: Practicals and Sessionals											
EEE	211 B	Network Laboratory (EEE)	-	-	2	2	1	-	-	100	100
EEE	212 B	Electronic Devices & Circuits Lab (EEE)	-	-	2	2	1	-	-	100	100
EEE	213 B	D.C. Machines Lab (EEE)	-	-	2	2	1	-	-	100	100
EEE	214 B	Digital Electronics Lab (EEE) - I	-	-	2	2	1	-	-	100	100
EEE	215 B	Measurement Lab (EEE)	-	-	2	2	1	-	-	100	100
EEE	216 B	Computer Programming Lab (EEE) – I	-	-	2	2	1	-	-	100	100
Total (B)			-	-	12	12	6	-	-	600	600
Grand Total (A+B)			14	5	12	31	25	-	600	600	1200

B.E. II Year (Electronics & Electrical Engineering), 2016-17

SEMESTER IV EXAMINATION SCHEME

Branch Code	Subject Code	Subject	Lectures	Tutorials	Practicals	Contact Hours	Credits	Exam Hours	Marks		
									Theory	Pract & Sess	Total
A: Written Papers											
MA	251 A	Advanced Engineering Mathematics (EC/ECC/EEE) - II	2	-	-	2	2	3	100	-	100
EC	254 A	Electronics Circuits (EC/EEE) – II	3	1	-	4	4	3	100	-	100
EC	255 A	Digital Electronics (EC/ECC/EEE) - II	2	1	-	3	3	3	100	-	100
EC	257 A	Industrial Electronics (EC/EEE)	3	1	-	4	4	3	100	-	100
EEE	256 A	Electrical Circuit Theory (EEE)	3	1	-	4	4	3	100	-	100
		OPEN ELECTIVE – I*	3	-	-	3	3	3	100	-	100
Total (A)			16	4		20	20	-	600	-	600
B: Practicals and Sessionals											
EEE	261 B	Electronics Circuits Lab (EEE)	-	-	2	2	1	-	-	100	100
EEE	262 B	Industrial Electronics Lab (EEE)	-	-	2	2	1	-	-	100	100
EEE	263 B	Digital Electronics Lab (EEE) – II	-	-	2	2	1	-	-	100	100
EEE	265 B	Electrical Circuits Lab (EEE)	-	-	2	2	1	-	-	100	100
EEE	266 B	Computer Programming Lab (EEE) – II	-	-	2	2	1	-	-	100	100
Total (B)					10	10	5	-	-	500	500
Grand Total (A+B)			16	4	10	30	25	-	600	500	1100
EC	200 E	Co-curricular Activities	-	-	-	-	0	-	-	-	100

*Select Choice based electives offered by other than Electronics & Communication Engineering Department in IVth semester:

B.E. III Year (Electronics & Electrical Engineering), 2017-18

SEMESTER V EXAMINATION SCHEME

Branch Code	Subject Code	Subject	Lectures	Tutorials	Practicals	Contact Hours	Credits	Exam Hours	Marks		
									Theory	Pract & Sess	Total
A: Written Papers											
EEE	301 A	Control Systems (EEE)	2	1	-	3	3	3	100	-	100
EEE	302 A	Alternating Current Machines – I (EEE)	3	1	-	4	4	3	100	-	100
EEE	303 A	Electrical Power Transmission & Distribution (EEE)	3	1	-	4	4	3	100	-	100
EC	309 A	Computer Organisation (EC/ECC/EEE)	2	1	-	3	3	3	100	-	100
EEE	310 A	Analog & Digital Communication Engineering (EEE)	2	1	-	3	3	3	100	-	100
		Open Elective – II*	3	-	-	3	3	3	100	-	100
Total (A)			15	5		20	20	-	600	-	600
B: Practicals and Sessionals											
EEE	316 B	Control Systems Lab (EEE)	-	-	2	2	1	-	-	100	100
EEE	317 B	A.C. Machines Lab (EEE) - I	-	-	2	2	1	-	-	100	100
EEE	318 B	Power Systems Lab (EEE)	-	-	2	2	1	-	-	100	100
EEE	321 B	Electronics Workshop (EEE)	-	-	2	2	1				
EEE	322 B	Analog & Digital Communications Lab (EEE)	-	-	2	2	1	-	-	100	100
Total (B)			-	-	10	10	5	-	-	500	500
Grand Total (A+B)			15	5	10	30	25	-	600	500	1100

*Select Choice based electives offered by other than Electronics & Communication Engineering Department in Vth semester:

B.E. III Year (Electronics & Electrical Engineering), 2017-18

SEMESTER VI EXAMINATION SCHEME

Branch Code	Subject Code	Subject	Lectures	Tutorials	Practicals	Contact Hours	Credits	Exam Hours	Marks		
									Theory	Pract & Sess	Total
A: Written Papers											
EEE	351 A	Alternating Current Machine (EEE) – II	3	1	-	4	4	3	100	-	100
EEE	352 A	Modern Control Systems (EEE)	2	1	-	3	3	3	100	-	100
EEE	353 A	Electrical Power Switch gear & Protection (EEE)	3	1	-	4	4	3	100	-	100
EC	358 A	Microprocessor & Microcomputers (EC/ECC/EEE)	3	1	-	4	4	3	100	-	100
EC	371 A	Radiation & Wave Propagation (ECC/EEE)	2	1	-	3	3	3	100	-	100
		OPEN ELECTIVE – III*	3	-	-	3	3	3	100	-	100
Total (A)			16	5		21	21	-	600	-	600
B: Practicals and Sessionals											
EEE	367 B	A.C. Machines Lab (EEE) – II	-	-	2	2	1	-	-	100	100
EEE	368 B	Modern Control Systems Lab (EEE)	-	-	2	2	1	-	-	100	100
EEE	370 B	Microprocessor Lab (EEE)	-	-	2	2	1	-	-	100	100
EEE	372 B	Radiation & Wave Propagation Lab (EEE)	-	-	2	2	1	-	-	100	100
Total (B)			-	-	8	8	4	-	-	400	400
Grand Total (A+B)			16	5	8	29	25	-	600	400	1000
EC	300 E	Co-curricular Activities	-	-	-	-	0	-	-	-	100

*Select Choice based electives offered by other than Electronics & Communication Engineering Department in VIth semester:

B.E. IV Year (Electronics & Electrical Engineering), 2018-19

SEMESTER VII EXAMINATION SCHEME

Branch Code	Subject Code	Subject	Lectures	Tutorials	Practicals	Contact Hours	Credits	Exam Hours	Marks		
									Theory	Pract & Sess	Total
A: Written Papers											
EEE	401 A	Power Electronics (EEE)	3	1	-	4	4	3	100	-	100
EEE	402 A	Control System Design (EEE)	3	1	-	4	4	3	100	-	100
EC	403 A	Advance Communication Systems (EC/ECC/EEE)	3	1	-	4	4	3	100	-	100
EC	404 A	Advance Computer Technology (EC/EEE)	3	1	-	4	4	3	100	-	100
EC	408 A	Engineering Management & Economics (EC/ECC/EEE)	2	-	-	2	2	3	100	-	100
		Core Elective – I	3	1	-	4	4	3	100		100
Total (A)			17	5	-	22	22	-	600	-	600
B: Practicals and Sessionals											
EEE	421 B	Power Electronics Lab (EEE)	-	-	2	2	1	-	-	100	100
EEE	422 B	Control System Design Lab (EEE)	-	-	2	2	1	-	-	100	100
EEE	423 B	Advance Communication Systems Lab (EEE)	-	-	2	2	1	-	-	100	100
EEE	426 B	Project (EEE) (Phase – I)*	-	-	2	2	-	-	-	-	-
Total (B)			-	-	8	8	3	-	-	300	300
Grand Total (A+B)			17	5	8	30	25	-	600	300	900

* EEE 426 B: A combined exam of Phase I & II shall be conducted at the end of VIII Semester.

B.E. IV Year (Electronics & Electrical Engineering), 2018-19

SEMESTER VIII EXAMINATION SCHEME

Branch Code	Subject Code	Subject	Lectures	Tutorials	Practicals	Contact Hours	Credits	Exam Hours	Marks		
									Theory	Pract & Sess	Total
A: Written Papers											
EC	451 A	Digital Signal Processing (EC/EEE)	2	1	-	3	3	3	100	-	100
EEE	453 A	Power System Operation & Control (EEE)	2	1	-	3	3	3	100	-	100
EEE	454 A	Electrical Machine Design (EEE)	3	1	-	4	4	3	100	-	100
EC	458 A	Computer Communication & Data Networks (EC/ECC/EEE)	3	1	-	4	4	3	100	-	100
EC	459 A	Microwave Engineering (EC/EEE)	3	1	-	4	4	3	100	-	100
EEE		Core Elective - II	2	1	-	3	3	3	100	-	100
Total (A)			15	6		21	21	-	600	-	600
B: Practicals and Sessionals											
EEE	471 B	Digital Signal Processing Lab (EEE)	-	-	2	2	1	-	-	100	100
EEE	473 B	Advance Power System Lab (EEE)	-	-	2	2	1	-	-	100	100
EEE	474 B	Electrical Machine Design Lab (EEE)	-	-	2	2	1	-	-	100	100
EEE	426 B	Project (EC) (Phase – II)*	-	-	2	2	1	-	-	200	200
Total (B)			-	-	8	8	4	-	-	500	500
Total (A+B)			15	6	8	29	25	-	600	500	1100
C: Others											
EEE	476 C	Practical Training II (EC)	-	-	-	-	13	-	-	100	100
Total (C)			-	-	-	-	13	-	-	100	100
Grand Total (A+B+C)			15	6	8	29	38	-	600	600	1200
EC	400 E	Co-curricular Activities	-	-	-	-	0	-	-	-	100

*Project (Phase II) is continuation of Project (Phase I) & combined examination shall be conducted.

List of Core Electives	
EEE 456 A	Telematics (EEE)
EEE 457 A	Mobile Communication Engineering (EEE)
EEE 458 A	Medical Electronics (EEE)
EEE 459 A	High Voltage Engineering (EEE)
EEE 460 A	Electric Traction Engineering (EEE)

List of Open Electives	
Name of subject	Semester
BCT 291 A Open Elective-I: Sustainable Architecture CE 291A Open Elective-I :Energy Efficient Building Design ChE 291 A Open Elective-I : Renewable Energy Sources CSE 291A Open Elective-I :Object Oriented Programming Through C++ CSE 292A Open Elective-I :Object Oriented Programming Through JAVA EE 291 A Open Elective-I : Industrial Applications of Electrical Drives Ma 291 A Open Elective-I :Mathematical Statistics For Engineers ME 291 A Open Elective-I:Renewable Energy Sources ME 292A Open Elective-I: Automobile Engineering MI 291A Open Elective-I: Tunneling For Engineering Projects PI 291A Open Elective-I: Manufacturing Science SE 291A Open Elective-I: Computer Oriented Numerical Analysis	Fourth Semester
BCT 341 A Open Elective-II: Traditional Indian Architecture CE 341A Open Elective-II: Non Urban Public Hygiene & Drinking Water ChE 341 A Open Elective-II : Petroleum Refining Technology CSE 341A Open Elective-II :Data Structures and Algorithms EE 341 A Open Elective-II : Optimization Techniques EE 342 A Open Elective-II : Artificial Intelligence Ma 341 A Open Elective-II :Mathematical Theory of Operations Research ME 342A Open Elective-II: Finite Elements Method MI 341A Open Elective-II: Application of GIS & Remote Sensing in Engineering SE 341A Open Elective-II :Structural Dynamics	Fifth Semester
BCT 391 A Open Elective-III: Climate Responsive Architecture CE 391A Open Elective-III: Ecosystem & Biodiversity ChE 391 A Open Elective-III : Nanotechnology CSE 391A Open Elective-III : WEB TECHNOLOGIES CSE 392A Open Elective - III : DATABASE MANAGEMENT SYSTEMS EC 391 A Open Elective-III: Electronic Instrumentation EE 391 A Open Elective-III: Soft Computing Techniques EE 392 A Open Elective-III: Energy Conservation Ma 391 A Open Elective-III: Advanced Numerical Analysis ME 391A Open Elective-III: Design Planning And Control Of Production System ME 392A Open Elective-III: Systems Design And Analysis MI 391A Open Elective-III: Project Environment Clearance PI 391A Open Elective-III: Quality Management SE 391A Open Elective-III :Finite Element Method	Sixth Semester
BCT: Building Construction Technology, CE: Civil Engineering, ChE: Chemical Engineering, CSE: Computer Science and Engineering, EC: Electronics & Communication, EE: Electrical Engineering, ME: Mechanical Engineering, MI: Mining Engineering, PI: Production & Industrial Engineering, SE: Structural Engineering, Ma: Mathematics	

CORE ELECTIVES

EEE 456 Telematics (EEE)

3L, 1T

3 Hours, 100 Marks

Digital Telephony : Principle of working of SPC digital telephone exchanges. Digital switching, space, time. TS, ST, STS, TST switch blocks. Termination of subscriber lines Signalling systems with digital exchanges. Principle of common channel signalling. Synchronization aspect for digital telephony. Store Program Control for call processing. Integrated Digital Networks: Data Communication terminology. Introduction to Circuits, message and packet switching concept. Basic aspects of multiplexing, signaling and synchronization in integrated digital networks. Overview of ISDN and BISDN. Concepts of basic rate and primary rate ISDN. Access and facilities provisions. Elements of fast packet switching, frame relay, ATM, SONET and SDH. Introduction to photonic switching.

EEE 457 Mobile Communication Engineering (EEE)

3L, 1T

3 Hours, 100 Marks

Basic technical concepts: Concept of mobile telecommunications. Mobile radio network issues, cell size coding, modulation and diversity Base station subsystems. Access methods. Location strategies for personal communications services. Cell design principles. Radio Paging System: Types of radio paging system. On site and wide area paging digital codes like POCSAG, elements of radio paging system engineering. Microcellular radio communication: Fixed and dynamic channel assignment. Cellular systems and power control basic features and system architecture in cordless telephones. Marine and aircraft communication. Overview of mobile terrestrial communication by satellite. Cellular Radio System: Allocation of spectrum and channels, Concepts of hexagon cells, mobile identification system and registration of mobile, call procedure and measurement of signal strength, GSM and CDMA radio system architecture, roaming, digital speech and channel coding. Efficient use of radio spectrum, multi operator working, cells and frequency reuse.

EEE 458 Medical Electronics (EEE)

3L, 1T

3 Hours, 100 Marks

Introduction to Physiology : Physiological system of the human body. Nerve physiology. Function of nerves and myoneural junction. Cardiac muscle and its contractions. Blood flow system. Arterial pressure Mechanism of respiration, Function of Spinal cord. Generation, Propagation and distribution of action potentials. Recording of Bio- Electric Events : Kinds of electrodes, amplifiers and display units for recording bioelectric potentials. Principles of ECG, EEG, and EMG. Electrophysiological signals from a micro electrode and salt bridge, Use of field effect – devices as electrometers. Principle of driven shield. Use of photon – coupled amplifiers. Artifacts. Bio – Medical Measurement : Electronic methods of measuring blood pressure, blood flow, blood pH, skin and systemic body temperature and pulse rate. Electronic Medical Instrument : Electronic pace makers. Implantable power sources. Defibrillators. Micro power transmitter for telemetering bio – signal. Surgical and therapeutic diathermy units. Physiological stimulators Basic diagnostic X – ray units. Introduction to patient monitoring and intensive care units.

EEE 459 High Voltage Engineering (EEE)

3L, 1T

3 Hours, 100 Marks

Breakdown in gases : Mechanisms of breakdown in gases, various related ionization process. Townsend's theory and streamer theories. Paschen's law, Breakdown in Non – uniform fields. Effect of wave shape of impressed voltages on the breakdown of sphere gap and rod gap. Breakdown in Liquids and Solids: Mechanisms of breakdown in liquids suspended particle, suspended water cavitations and bubble and electronic breakdown theories. Mechanisms of breakdown in solids, intrinsic electromechanical, erosion, surface, thermal and streamer, relation between electronic strength of solids and time intrinsic breakdown strength. Impulse Generator: Specification of an impulse voltage, wave, standard impulse, reasons for adopting the particular shape, Analysis and control of simple circuit of impulse generator. Multistage impulse generator (Marx Circuit) circuit working, earthing and tripping, Techniques to observe wave front on CRO. Generation of High Voltage: Methods of generation of power frequency high voltage cascade transformers and resonance and methods, generation of high voltage d.c. voltage stabilization. Tesla coil. Measurement of High Voltage: Potential dividers – resistive capacity and mixed dividers of high voltage. Sphere gap, construction, mounting effect of nearby earthed objects humidity and atmospheric conditions. Effect of irradiation and polarity. Electrostatic voltmeter. Principle and classification, constructional details of an absolute electrostatic voltmeter Oscilloscopes and their application in high voltage measurement. High Voltage Testing: Measurement of insulation resistance of cables. Wet and dry flashover test of insulators in simulated polluted conditions. Testing of transformers and rotating machines, measurement of breakdown strength of oil. Basic technique of nondestructive testing of insulators measurement of loss angle and partial discharge measurement techniques.

EEE 460A Electric Traction Engineering (EEE)

3L, 1T

3 Hours, 100 Marks

Train movement and performance : Speed – time curve, its analysis and construction. Schedule speed and factors affecting it. Train resistance and its components. Tractive effort calculations. Average acceleration and speed, energy output and consumption. Power Transmission and Weight Transference: Methods of transmission of power from motor to wheels, Idea about riding qualities of an electric locomotive, Grouping of motors and weight transference. Adhesive weight, Factors affecting slip. Traction Motors: Performance of (i) d.c. motors (ii) a.c. single phase series motors at low frequencies and at commercial frequency and (iii) polyphase induction motors, under traction service conditions, Specific problems and methods of overcoming them, Special features of construction. Effect of differences in driving wheel diameters and speed time – curves on division of load. Traction motor rating speed factor. Track and overhead equipment. Power supply of traction : overhead and conductor rail systems. Third rail construction. Bonding of conductor and track – rails. Overhead construction for trolley. Buses and railways, cantenary construction. Temperature effects, current collectors. Outlines of feeding and distributing systems for d.c. low frequency a.c. and commercial frequency a.c. traction Voltage drop control, Electrolytic and inductive coordination. Power leading curves Positions of Sub-stations and load sharing. Breaking of Electrified Railways : Mechanical versus electric breaking, Rheostatic breaking, regenerative breaking, methods and energy saving in the process, magnetic track brakes. Tractional Control: Study cycle, Methods of traction motor control, series - parallel and other types of controllers, Use of inter locks, Runback prevents Multiple unit control. Master controllers, Reversers, Dead man's handle, use of metadyne and magnavolt diesel – electric and Gas turbo – electric traction: Generator and motor rating and characteristics of diesel – electric loco – motives, Speed acceleration and braking introduction to gas turbo – electric and straight electric traction. Train lighting

and Signalling: Dynamo for train light, Lighting systems of Indian Railway, Introduction to electric signaling methods manual and automatic. Systems of Electric Traction : Comparison between various systems, expected trends, Position of single phase commercial frequency Traction. Linear induction motor, possibility for traction purpose.

SYLLABUS OF OPEN ELECTIVES-I

BCT 291 A Open Elective-I: Sustainable Architecture

3L

3 Hrs, MM 100

Concepts of sustainability : Energy and Global environment, Energy use and Climate change – Its impact, Types of Energy systems, Concept of Sustainability - Principles of conservation -synergy with nature, Bioregionalism - community basis shelter technology within bioregional patterns and scales, Ethical-environmental degradation.

Sustainable planning & Design: Sustainable Development -Sustainable approach to site planning and design - site inventories- relationships between site factors - development impacts from one area of the site on the other areas - phasing of development - limits of change - Design facility within social and environmental thresholds

Sustainable Building Materials and Construction : Properties, Uses and Examples of -Primary, secondary and Tertiary Sustainable Materials, Principles to improve the energy efficiency - siting and vernacular design, shade, ventilation, earth shelter, thermal inertia and air lock entrances. Techniques of sustainable construction - technologies, methods of effectiveness, and design synthesis – alternative materials and construction methods: solar water heating panels; photovoltaic electricity generation; use of local materials and on site growth of food, fuel and building materials.

Recycling and Reuse : Pre building, Building, Post building stages - Architectural Reuse, Waste prevention, Construction and Demolition recycling- Conservation of natural and building resources- Energy and material savings – types of wastes - Elimination of waste and minimize pollution- various Decomposing methods – Innovative reuse of various wastes Case Studies and Rating systems : Sustainable Development Case Studies: illustrated examples of the planning, development, and construction. Green architecture and various international rating systems for sustainability- EAM (UK), CASBEE (Japan), LEED (US), Green Star (Australia), etc. – Indian systems – TERI GRIHA rating, LEED India rating, IGBC

CE 291A Open Elective-I: Energy Efficient Building Design

3L

3 Hrs, MM 100

Environment and man, external environment and built environment, Built-environment – integrated approach.

Climate: elements of climate, classification of climate, Micro-climate, site climate.

Comfort: desirable conditions, thermal comfort factors, comfort indices, effective and corrected effective temp. Tropical summer index.

Thermal Design: heat loss from a building under steady state condition, heat gains due to solar radiation, steady state and cyclic conditions, Means of thermal control – mechanical, structural control, air infiltration into buildings by natural means, shape of buildings,-thermal cube, fabric heat loss, ventilation loss and volume.

Light & Lighting: illumination requirement, day-lighting, artificial lighting, energy conservation.

Noise Control: Sources of noise, means of control, control requirements, behaviour of sound in rooms, vibration & vibration control.

Building Services: Mechanical & electrical services in building, lifts, escalators.

ChE 291 A Open Elective-I: Renewable Energy Sources

3L

3 Hrs, MM 100

Sources of energy: Energy sources and their availability, renewable energy sources.

Energy from Biomass: Introduction, Biomass as a source of energy, Biomass conversion technologies, Biogas generation, classification of biogas plants, Biomass gasification.

Solar Energy: Sun and solar energy, solar radiation and its measurement, solar energy collectors, solar energy storage, Photovoltaic systems, Application of solar energy.

Wind Energy: Wind as an Energy source, Basic principles of wind energy conversion, Types of Wind machines, Components of wind energy conversion system, Performance of wind machines, application of wind energy.

Geothermal Energy: Introduction, Origin and distribution of geothermal energy, types of geothermal resources, Hybrid geothermal power plant, Application of geothermal energy.

Hydrogen energy: Introduction, Hydrogen production, Hydrogen storage, Hydrogen transportation.

Energy from the Oceans: Introduction, Ocean Thermal Electric Conversion (OTEC), Energy from Tides, Ocean Waves.

CSE 291A Open Elective-I: Object Oriented Programming Through C++ (Open)

3L

3 Hrs, MM 100

A review of C. Concepts of object oriented programming using C++. Data types: elementary and derived data types, literals.

Operators and expressions: operators, association and precedence rules of operators, expressions using unary, binary and ternary operators.

Statements: declarations as statements, selection statements, iteration statements, goto statement, break statement, continue statement, return statement, try-catch block.

Functions: void functions, functions with return value, call by value and call by reference parameter passing, default parameters, recursive functions, inline functions.

Classes: classes, objects, friend functions, classes within a class, local classes, global classes, constructors, destructors.

Derived classes: single and multiple derivation of classes, multilevel and hybrid derivation of classes, constructors, destructors.

Polymorphism: function and operator overloading, virtual functions.

Streams: input and output of built-in data types, manipulators.

File streams: opening a file, accessing a file, closing a file.

Exceptions: catching exceptions, rethrowing the exception, standard exceptions.

Templates: defining a template, template instantiation, function templates, class templates.

Elementary case study of a object oriented database in C++.

CSE 292A Open Elective-I: Object Oriented Programming Through JAVA (Open)

3L

3 Hrs, MM 100

Overview of object oriented concepts in JAVA.

Introduction – Java & internet, java applets and its applications, Java features like – security, portability, byte code, java virtual Machine, object oriented, robust, multi threading, architectural neutral, distributed & dynamic.

Data types and control structures, operators, arrays, Java methods and classes.

Inheritance of procedures and data, Packages and interface, exception handling, multi-threaded programming – thread priorities, synchronization, messaging, creating and controlling of threads. IO and applets.

String handling and various string functions.

Java utilities like java.lang, java.util and their uses, java.io, basics of networking using Java.

Java applets and their use, event handling, AWT and working with windows.

Introductory study of Java Beans, Servlets and JDBC.

EE 291 A Open Elective I: Industrial Application Of Electrical Drives

3L

3 Hrs, MM 100

Operating-Characteristics : Individual, group and collective drives, steady state individual and joint characteristics of electric motors and driven industrial units under different conditions of operation.

Transient Characteristics : Causes of transient conditions starting, braking, reversing, speed transition and sudden system changes. Forces and torques on the drives referred to a common reference shaft. General equation of motion, Accelerating and deaccelerating times. Starting and braking time and means of reducing.

Drives Control : Parameters characterizing speed control methods of electric drives, speed control of Industrial d.c. and a.c. motors under constant and varying torque and h.p. conditions.

Families of speed torque characteristics : Idea of manual and automatic control gears, Master-controller.

Motor Ratings : Continuous-short time and intermittent ratings, overload capacity. Effect of altitude, Motor heating and cooling curves. Equivalent current, power and torque. Selection motor for various duty cycles. Permissible frequency of starting, features of load diagram construction. Load equalisation and use of fly wheels. Types of motor enclosures.

Illumination : Units of light, Point , linear and surfact sources. Laws of illumination. Candle power distribution, MSCP and reduction factor, Indoor lighting system and their classification. Contrast, glare, shadow and colour. Mounting height and spacing. General and local lighting Total lumen and point by point methods of calculations. Outdoor lighting distributor and protector fittings. Isolux diagram. Flood, gas, discharge and arc-lamp-working, characteristics and applications.

Electric Heating and Welding : Principles of electric heating. Direct and indirect resistance heating, lead baths and salt baths. Resistance oven convection and radiation ovens. Arc resistance and induction furnance, elements of operation, performance and power supply arrangements. temperature regulation of ovens and furnances. Induction, high frequency and dielectric heating and their uses. Elementary study of different kinds of electric welding operation, Power supply for welding. Elements of Electrics Traction : Electric traction versus others System of electric traction for tramways, trolley buses, motor coach trains and locomotive hauled trains. Idea about suitability of electric motor for traction. Conductor rail and pantograph. meaning for multiple-unit operation.

Economics : Methods for economic selection of Industrial drives, loss factor and cost of losses, Effect of load factor. Power factor and factory diversity factor. Methods of power factor improvement and its economic limit. Economic calculations for illumination schemes Echnomic value of good lighting.

EE 292 A Open Elective I: Engineering Economics

3L

3 Hrs, MM 100

Introduction: Economics for Electrical Engineering, concept of physical efficiency and financial efficiency of electrical goods and services supply and demand, Elasticity. Necessities and luxuries, free competition, monopoly, law of diminishing returns.

Interest and Depreciation: Interest rates and equivalence, annuities and various factors, concept of depreciation in utilizing electrical energy, economic life of electrical machines, salvage value, various methods of depreciation calculations, equivalent capital recovery depreciation.

Economical choice of Electrical Apparatus: Motors, transformers, Economical choice between synchronous motors and Induction motor running them simultaneously.

Comparison of Alternatives: Basic economic study patterns, annual cost, capitalized cost, present worth, rate of return, Increment investment, pay back and benefit to cost ratio methods and their respective fields of applications.

Ma-291 A Open Elective-I :Mathematical Statistics for Engineers

3L

3 Hrs, MM 100

Theory of probability : Theoretical probability distribution (Binomial, Poisson and Normal).

Correlation and Regression Analysis : Karl-Pearson's coefficient , Spearman's coefficient, Regression analysis of two variables system.

Sampling Theory : Test of significance, Large sample tests for mean and proportions. χ^2 (chi-square) , t and F Test of significance for Small sample.

Theory of attributes: association and independence of attributes, coefficient of association.

Index Number: Various types of index numbers, construction of index number of prices, fixed base and chain base methods

ME- 291A Open Elective-I: Renewable Energy Sources

3L

3 Hrs, MM 100

Principal types of fossil fuel fired power plants and their effects on livestock and environment; Concepts of NCES, Criteria for assessing the potential of NCES, Limitations of RES.

Solar Energy - Solar radiation data, solar energy conversion into heat, Analysis of Flat plate and Concentrating collectors, Testing procedures, Paraboloid Dish, Central Receiver; concept of collector tracking, energy storage systems; Solar thermal systems for residential water heating, Solar Pond, industrial process heating and power generation. Photo voltaic: p-n junctions, I-V characteristics of solar cells, Calculation of energy for photovoltaic power generation; Battery Characteristics, DC Power Conditioning Converters, AC Power Conditioning -Inverters.

Wind Energy: Energy available from wind, General formula, Lift and drag. Basis of Wind energy conversion, Effect of density, Frequency variances, Angle of attack, Wind speed, Determination of torque coefficient, Principle of Operation of wind turbines, types of wind turbines and characteristics, Generators for Wind Turbines, Control strategies.

Biomass and Biofuels: Conversion routes- combustion, pyrolysis of biomass to produce solid, liquid and gaseous fuels; Constructional details of gasifier; Aerobic and anaerobic digestion, Biofuels and their production; biofuels, Biomass systems for thermal applications and power generation.

Geothermal Energy: Definition and classification of resources, typical geothermal gradient; Dry, flash and binary steam systems; Utilization for electricity generation and direct heating, Wellhead power generating units. Basic features: Atmospheric exhaust and condensing, Exhaust types of conventional steam turbines.

An overview of other renewable devices- Fuel cells: principle, types, applications; Ocean thermal energy conversion (OTEC), Thermoelectric, MHD, Wave energy, Tidal energy, etc.

Economic Viability: Calculation of the cost of energy supply from renewables, Payback period, Carbon footprints; Comparison with conventional fossil fuel driven systems in terms of costs and emissions; Calculation of carbon dioxide reduction and incremental costs for renewable options.

ME 292 A Open Elective-I: Automobile Engineering

3L

3Hrs, MM 100

Power Unit: Automobile engine types, classification; Engine parts: cylinder head, block and crank case, piston and rings; Carburation, fuel injection, valve operation; Fuel combustion, mechanical power and engine performance characteristics; Engine cooling and thermal stresses in parts,.Chassis and Suspension: Load on frame, general considerations for strength and stiffness, engine mounting; Dampers, leaf and coil springs, various arrangements of suspension systems.Transmission System: Clutches, flywheels, torque convertors; Gear-box: simple, synchromesh and overdrive; Type of universal joints, propeller shaft, differential; Rolling, air, gradient resistances and propulsive power calculation.Steering: Steering

geometry, Ackermann and Davis steering mechanisms; Telescopic steering; Steering shaft, gear-box, linkages, steering angles, front and rear axles; Vehicle longitudinal, static and dynamic balancing and electronic stability; Power steering: types and mechanism; Effect of caster, camber, toe-in and toe-out on tyre wear. Brakes and Tyres: Servo-action, brake components; Bendix and Gerling system lock-head, hydraulic, vacuum, air and power brakes, and retarders; Pneumatic and tubeless tyres; Features of a Modern passenger Car: Introduction to ABS, Front and side air bags, EBD, Climatizer, ESP, night-vision dashboard system; sun-roofing, collision warning system, Hybrid cars.

MI 291A Open Elective-I: Tunneling for Engineering Projects (MI)

3L

3 Hrs, MM 100

Tunneling: Introduction about tunnels, functions, advantages and disadvantages of tunnels compared to open cuts, Criteria for selection of size and shape of tunnels, consideration in tunneling, geological investigation, tunnel alignment, tunnel shafts, pilot tunnels. Advantages of twin tunnels and pilot tunnels, portals and adits.

Conventional Method of Tunneling: Drilling, Blasting, Loading and Transport of Muck, Supports, Ventilation, Drainage, and Equipments. Drivage work in varying ground conditions using conventional methods

Fast Tunneling: Dill jumbos, trackless mucking and transportation units. Tunnel boring machine

Tunneling in Soft Ground: General characteristics of soft ground, shield methods, needle beam method and NATM method of tunneling in practice.

Tunneling (rock bolting and guniting), Safety measures, Ventilation in tunneling, Lighting, Drainage.

PI 291A Open Elective-I: Manufacturing Science

3L

3 Hrs, MM 100

History and introduction to science of basic manufacturing processes and its classification.

Primary manufacturing processes: Introduction to liquid state forming process (casting), solid state forming process (drawing, extrusion, rolling, forging and other sheet metal working) and powder state forming process (powder metallurgy).

Secondary manufacturing processes: Introduction to material removal processes

Conventional Machining processes (basic machining operations performed of lathe, shaper, milling, drilling and grinding machine).

Introduction to basic metal joining processes (welding, brazing, soldering and mechanical fastening).

Non conventional machining processes (Basic introduction, classification, need for their development, characteristics and their industrial applications).

SYLLABUS OF OPEN ELECTIVES-II

BCT 341 A Open Elective-II: Traditional Indian Architecture

3L,

3 Hrs, MM 100

To provide theoretical knowledge base on the uniqueness of Indian traditional Architecture principles, the meaning of space, the manifestation of energy, the selection of site and how 62 integration of built form with site happens at metaphysical level based on articulation of celestial grid.

To introduce the principles of Vastu and relationship between building and site. To familiarize the students with the units of measurement in traditional architecture. To introduce concepts of orientation and cosmogram according to the Vasthu Purusha Mandala. To study the detailing and design of various building components and their material and method of construction.

Vastu - its definition and classification - Relationship to earth.. Features of good building site - good building shapes - macro, micro, enclosed and material spaces - relationship between built space, living organism and universe - impact of built space on human psyche.

Orientation of building, site, layout and settlement - positive and negative energies - importance of cardinal and ordinal directions - The celestial grid or mandala and its types. The Vaastu Pursha Mandala and its significance in creation of patterns, and lay-outs, Types of lay-outs. Simple design of residential buildings.

Building heights -Base and basement - wall and roof specifications - column and beam designs - Pitched roof and domical roofs - significance of pyramid.

Use of wood, stone, metal, brick and tile - marking technology, corbelling technology, jointing technology - foundations for heavy and light structures - Landscaping in and around buildings - Aesthetics in Indian Architecture.

CE 341A Open Elective-II: Non Urban Public Hygiene & Drinking Water

3L,

3 Hrs, MM 100

Communicable disease: Disease and immunity, communicable disease sources, mode of transfer. Control of communicable disease.

Fly and mosquito control: Life cycle of flies and mosquitoes. Various methods of fly and mosquitoes control.

Milk and food sanitation: Essential of dairy farm and cattle shed sanitation. Tests for milk and dairy products. Food epidemic, food poisoning. Botulism. Rural sanitation, village latrines, aqua privies, storm water and sullage problems, animal waste, methods of composting. Biogas collection and disposal of refuse, solid waste management through vermicomposting.

Septic tank (only salient features), percolation pits, sub surface disposal.

Rural water supply: Importance of village community in India, conditions of Indian villages with special regards to economic, social and health aspects. Quality of water needed for village community, sources of water for village water supplied, domestic roof water harvesting. Types of wells of sanitary aspects in well construction. Disinfections of wells. Different types of pumps used for village wells. Operation and maintenance of pumps, water borne diseases. Quality of water, human and cattle population and their water requirement. Rate of water supply. Standards of potable water. Rain water storage.

Treatment of water: Disinfection, desalination, Defluoridation, distribution of water.

ChE 341 A Open Elective-II: Petroleum Refining Technology

3L,

3 Hrs, MM 100

Origin occurrence of petroleum, Formation and Evaluation of Crude Oil. Testing of Petroleum Products. Petroleum refining processes, general processing, topping and vacuum distillations. Thermal cracking in vapor, liquid and mixed phase. Overview of Refinery Products

Catalytic cracking - Houdry fixed bed, fluidized bed, T.C.C. Houdry flow etc. Catalytic reforming - conversion of petroleum gases into motor fuel with special reference to alkylation, polymerization, hydrogenation and dehydrogenation.

Treatment Techniques: Removal of Sulphur Compounds in all Petroleum Fractions to improve performance, Destruction of Sulphur Compounds and Catalytic Desulphurization, Solvent Treatment Processes, Dewaxing, Clay Treatment and Hydrofining.

Production of aviation gasoline, motor fuel, kerosene, diesel oil, tractor fuel and jet fuel, hydrodesulfurisation, Lubricating oil manufacture, Petroleum waxes and asphalts.

Octane number, Cetane number, Diesel index, their determination and importance Storage of petroleum products: tanks, bullets, special types of spheres etc. Transportation of petroleum products: road, rail, sea and pipeline; Importance of pipeline transportation.

CSE 341A Open Elective III - Data Structures and Algorithms (Open)

3L

3 Hrs, 100 Marks

Introduction to data structure, String storage representation and manipulation. Markov algorithm and primitive data structures.

Concepts of non primitive data structures. Linear data structure. Array, stack, queue, their applications and implementations using sequential storage representation and linked representation.

Linear linked list, double linked list, circular linear linked list and generalized lists and applications.

Concept of non-linear data structures, Tree, graph, set and their representation, Binary Tree, Threaded tree, different techniques of tree traversal, breadth first search, depth first search, application of tree and graph such that Polish notation, concepts of heap.

Sorting, searching algorithms and comparative study of different sorting and searching techniques such that selection sort, heap sort, bubble sort, quick sort, merge sort and radix sort. Linear search and binary search, hashing. External sorting.

Time and space complexity of the algorithms – Big-O, θ , Ω , and small-o, Asymptotic complexity, Upper and Lower bound time and space trade offs.

EE 341 A Open Elective II: Optimization Techniques

3L

3 Hrs, MM 100

Introduction to Optimization : Historical Development, Engineering application of optimization, Statement & Classification of optimization problems, Classical optimization techniques for single & multiple variable functions.

Linear Programming : Introduction, application, standard form, Basic Solutions, Simplex method, Revised Simplex method, Duality, Transportation problem, Carnmarkar's method.

Nonlinear programming : Unconstrained Optimization, Introduction, Fibonacci method, Golden section search, Gradient method, Newton's method, Quasi Newton method.

Dynamic Programming : Introduction, Multistage decision process, Concept of optimization & principle of optimality, Computational procedure in dynamic programming.

Advanced topics in optimization : Introduction, Separable programming, Multi objective optimization, Calculus of variation.

Books :

Engineering Optimization – S. S. Rao, New Age International Publishers.
An introduction to optimization – Er. K. P. Chong, S. H. Zak (Wiley Slident Edition)
Operations Research : An international – H. A. Taha (PHI)
Introduction to operation research – Hiller F.K. & Lieberman (TMH)

Ma 341 A Open Elective-II :Mathematical Theory of Operations Research

3L

3 Hrs, MM 100

Linear programming problems-Simplex Method, two phase method, Duality of LPP.
Theory of games: Competitive strategies, minimax and maximin criteria, two person zero-sum games with and without saddle point, dominance .
Inventories: Single item deterministic inventory models with finite and infinite rates of replenishment, economic lot-size model with known demand
Replacement problems: Replacement of item that deteriorate, replacement of items that fail completely, group replacement policy, individual replacement policy
Queing theory-Ques with Poisson input and exponential service time, the queue length, waiting time and busy period in steady state case, model with service in phase, multiserver queueing models.

ME 341A Open Elective-II : Economics Analysis and Management of Operations

3L

3 Hrs, MM 100

Business Goals & Form of Business Organization, Introduction to Management- Elements of Management, Principle of Management.
Concept of Costing- Breakeven Analysis, Deprecation & Estimate.
Marketing- 5Ps of Marketing- Product, Price, Demand Forecasting, Promotion, Person and Place.
Concept of Advertising and It's Objective.
Financial Analysis-Statement and Financial Ratio.
Introduction to Privatization Liberalization, Globalization Ratio & Their Impact on Economy.

ME 342A Open Elective-II: Finite Elements Method

3L

3 Hrs, MM 100

Introduction: Basic concept of Finite element method; Rayleigh-Ritz and weighted residual method of variational approximation, Numerical Solution of equilibrium problem by Gaussian elimination.
Finite Element Analysis of One-dimensional Problem; Basic Concepts, derivation of elements equations, connectivity of elements, imposition of boundary conditions, Solution of equations, Application in One dimensional problem of Solid mechanics and heat transfer.
Finite Element Analysis of Two Dimensional Problem: Single variable problems: finite element discretization, interpolation, function, numerical integration and modeling considerations for triangular, rectangular, Quadrilateral, Isoparametric and Plane frame elements, Evaluation of equation and their solutions, Application in Two Dimensional Problem of Solid mechanics, Heat Transfer and Eigen value problems.

MI 341A Open Elective-II: Application of GIS & Remote Sensing in Engineering

3L

3 Hrs, MM 100

Remote Sensing: Introduction to Remote Sensing, Terminology in Remote Sensing, Types of Remote sensing, advantage and disadvantage of remote sensing data, Electromagnetic radiation atmospheric. Windows remote sensing platforms and sensors systems, path-row referencing system, remote sensing data product, procedure for obtaining satellite data. Hardware and software related to remote sensing.

Different types of platforms, sensors and their characteristics, Orbital parameters of a satellite, Multi concept in remote sensing.

Image Interpretation and analysis: Elements of visual image interpretation, Digital image pre-processing, radiometric correction, geometric correction, resolution of remote sensing data, image enhancement, contrast enhancement, spatial filtering band rationing image classification supervised and unsupervised classification, remote sensing applications in forestry, geology, hydrogeology, Land use and land cover mapping.

Principles of interpretation of aerial and satellite images, equipments and aids required for interpretation, ground truth – collection and verification, advantage of multirate and multiband images. Digital image Processing concept.

Geographic Information System (GIS): Fundamental of GIS: Basis concept including definition and history of GIS, Essential Elements of GIS, Uses and users of GIS, General GIS Applications, Geodesy, Grids, Datum's and projection systems, GIS Data structure, Data Formats, GIS layers and Digitization overview of GPS and its application, Hardware and software related to GIS.

Raster and vector Based GIS: Raster based GIS, Definition of Raster Based GIS, Spatial Referencing Definition and Representation of Raster Data. Vector based GIS, Definition and concept of vector based GIS, Data structure, Data Capture and Basic operations of spatial analysis, advantages and disadvantage in raster and vector based GIS, Introduction to network in GIS, GIS Project Planning Management and Implementation.

Application of GIS :in Map revision, Land use, Agriculture, Forestry, Archaeology, Municipal, Geology, water resources, soil Erosion, Land suitability analysis, change detection, Use of GIS in Mining.

PI 341A Open Elective-II: Principles of Management & Economics

3L

3 Hrs, MM 100

Introduction: Definition of management; Historical developments. Evolution of management; various schools of management theories; management functions; principles of management.

Types of organization: Organization and organization structures; Line, staff, function and committee type structures of organizations; flow of responsibility and authority in organization. Types of business organizations: sole proprietorship, partnership, private and public limited, co-operative societies, public sectors, joint sectors- their formation and dissolution.

Personnel management: Objectives of personnel management; functions of personnel management; nature of personnel management.

Economic analysis: Money time relationship; Law of supply and demand, Demand curves, demand elasticity, equilibrium concept, economies of scale.

Financial management: Assets and liabilities; balance sheet; profit and loss accounts, ratio analysis.

Operations management: Introduction to operations management; history, function and scope of operations management, areas of operations management; general model of managing operations; Introduction to production planning and control.

Introduction to marketing management; Budget and budgetary control; Purchasing process; Motivation; Leadership; Moral, job satisfaction.

SE 341A Open Elective-II :Structural Dynamics

3L

3 Hrs, MM 100

Vibrations of single degree of freedom system, sources of vibration, Types of vibration, Degree of freedom, spring action and damping, equation of motion of single degree of freedom system, undamped system of single degree of freedom, combination of stiffnesses, damped system of single degree of

freedom, dry friction, damping forced vibration of damped system, introduction to multi degree freedom system.

SYLLABUS OF OPEN ELECTIVES-III

BCT 391 A Open Elective-III: Climate Responsive Architecture

3L, 3 Hrs, MM 100

Understanding Climate and its impact on architectural design, fundamentals of climatology and environmental studies.

Introduction – Elements of Climate, measurement and representation of climatic data.

Classification of climate, major climatic zones of India.

Thermal Comfort: Effect of climatic elements on Thermal comfort; indices for Thermal comfort Thermal performance of building elements: Thermal and physical properties of building materials and their effect on indoor environments.

Natural ventilation: Functions, effects of openings and external features on internal air circulation. Design considerations for achieving natural ventilation.

Sun path diagram, use of solar charts, types of shading devices

Day light factor: components, design considerations for indoor spaces

Micro Climate: factors and effects

Construction techniques for improving thermal performance of walls and roofs.

Passive cooling techniques: traditional and contemporary

Design considerations for buildings and settlements in tropical climates with special reference to hot-dry, warm-humid and composite climates; Mahoney Tables.

Exercises:

Design of shading devices.

Layout of Residence for hot - dry, warm-humid and composite climates.

CE 391A Open Elective-III: Ecosystem & Biodiversity

3L, 3 Hrs, MM 100

Concept of an ecosystem, structure & function of ecosystem, Bio-Geo chemical cycles (Hydrological, carbon, oxygen, nitrogen, phosphorus & sulphur cycle), energy flow in ecosystem, food chain

Major ecosystems (Description only) : Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystem, Riverine and stream ecosystem, Marine ecosystem, Estuarine ecosystem.

Biodiversity : Definition and its importance. Biodiversity at global, national & local level. Hot spots of biodiversity, Threats to biodiversity & causes of biodiversity loss. Conservation of biodiversity.

Value of biodiversity: Consumptive use, productive use, social value, ethical value, aesthetic value& optional value.

Bio-geographical classification of India. India as mega- diversity nation

ChE 391 A Open Elective-III: Nanotechnology

3L, 3 Hrs, MM 100

Introduction to Nanotechnology: Introduction to nanotechnology and materials, Nanomaterials, Introduction to nano sizes and properties comparison with the bulk materials, different shapes and sizes and morphology.

Fabrication of Nanomaterials: Wet Chemical Synthesis Methods, Colloidal Nanoparticles Production, Sol Gel Methods, Microwave and Atomization, Gas phase Production Methods : Chemical Vapour Depositions.

Kinetics at Nanoscale: Nucleation and growth of particles, Issues of Aggregation of Particles, Layers of surface Charges, Zeta Potential and pH.

Carbon Nanomaterials: Synthesis of carbon buckyballs, List of stable carbon allotropes extended fullerenes, metallofullerenes solid C60, bucky onions nanotubes.

Nanomaterials characterization: Instrumentation Fractionation principles of Particle size measurements, Particle size and its distribution, XRD, Zeta potential Microscopies SEM, TEM, Atomic Forced Microscopy, Scanning and Tunneling Microscopy

Applications in Chemical Engineering: Self-assembly and molecular manufacturing : Surfactant based system Colloidal system applications, ZnO,TiO₂, Silver Nanoparticles Functional materials Applications, Production Techniques of Nanotubes, Carbon arc, bulk synthesis, commercial processes of synthesis of nanomaterials, Nanoclay, Commercial case study of nano synthesis - applications in chemical engineering.

CSE 391A Open Elective III – Web Technologies (Open)

3L,

3 Hrs, MM 100

Understanding Microsoft .NET Framework and ASP.NET, Creating components in Visual C#. CLR, Framework Class Library, Undocumented Types. Programming the .NET Framework, Common Types, Math, Strings, Collections, Regular Expressions. Core Types, Serialization, Remoting, Graphics, Rich Client Applications, Globalization, Configuration, Advanced Component Services. Multithreading, Thread Synchronization, Inter-thread Communication and Monitor. Delegates & Events. Validating User Input. Creating a Connection to the Database, Displaying a DataSet, List-Bound Control, Paging and Selection, DataGrid Control, Accessing Data with DataReaders and SqlDataReader. Overview of Stored Procedures. Managing State, State management, Application and Session Variables, Cookies and Cookieless Sessions. Configuring, Optimizing. Using the Cache object. Reading and Writing XML Data, Overview of XML Architecture, DataSet Object, XML Web Server Control, Reading, Transforming, and Displaying XML, Nested Data. Creating an XML Web Service. Securing a Microsoft ASP.NET Web Application, Web Application Security Overview, Windows-Based Authentication, Forms-Based Authentication, Passport Authentication, Registering New Users, Permitting Users to Sign Out. AJAX.NET Architecture, Working with AJAX Pro and Controls, Accordion, Calendar, CascadingDropDown, CollapsiblePanel, Filtered TextBox, Numeric Up Down, Modal Popup, Popup Control. Page_Load Event and Click Event Procedure, Adding server controls to an ASP.NET Web Form basics, handling text and numbers.

CSE 392A Open Elective III - Database Management Systems (Open)

3L

3 Hrs, MM 100

Purpose of data base system, data abstraction, data models, data independence, data definition language, data manipulation language, data base manager, data base administrator, data base users, overall system structure.

E-R Models, entities and entity sets, relationships and relationship sets, attributes, mapping constraints, keys, E-R diagrams, reducing E-R diagrams to tables, generation, aggregation, design of an E-R data base scheme

Basic concept of object oriented model, New database applications, object structure, class hierarchy, multiple inheritance, object identity, object containment, physical organization, object oriented queries, scheme modification.

File and system structure, overall system structure, file organization, logical and physical file organization, sequential, random, hierarchical, inverted, multilist, Indexing and hashing, B-tree index files Introduction to distributed database. Introduction to SQL Query and SQL joins.

EC 391 A Open Elective III: Electronic Instrumentation

3L

3 Hrs, MM 100

Transducers: Construction, characteristics and circuits for common types of resistive, capacitive, inductive, magneto-structive; piezo-electric. Photo-electric and thermo-electric transducers for measurement of process physical variables. Various sensing elements and transducers for measurement of Force, Pressure, Humidity, Moisture, strain, Velocity, Acceleration and pH. Inductive and Capacitive proximity switches. Physical and electrical loading of and by the transducer Systems. Signal Conditioning: Analog and digital signal conditioning for instrumentation. Objectives of DAS, components of analog DAS and digital Data acquisition system, digital data recording system, multi channel DAS, modern digital acquisition system. Electronic Displays: Principle of LED numeric, matrix and alpha-numeric displays, flat panel CRT, LCD, electro-luminiscent and electrophoretic and touch screen displays.

EE 391 A Open Elective III: Soft Computing Techniques

3L

3 Hrs, MM 100

Soft Computing : Introduction of soft computing, soft computing vs. hard computing, various types of soft computing techniques, applications of soft computing.

Artificial Intelligence : Introduction, Various types of production systems, characteristics of production systems, breadth first search, depth first search techniques, other Search Techniques like hill Climbing, Best first Search, A* algorithm, AO* Algorithms and various types of control strategies. Knowledge representation issues, Prepositional and predicate logic, monotonic and non monotonic reasoning, forward Reasoning, backward reasoning, Weak & Strong Slot & filler structures, NLP.

Neural Network : Structure and Function of a single neuron: Biological neuron, artificial neuron, definition of ANN, Taxonomy of neural net, Difference between ANN and human brain, characteristics and applications of ANN, single layer network, Perceptron training algorithm.

Fuzzy rule base system : fuzzy propositions, formation, decomposition & aggregation of fuzzy rules, fuzzy reasoning, fuzzy inference systems, fuzzy decision making & Applications of fuzzy logic.

EE 392 A Open Elective III: Energy Conservation

3L

3 Hrs, MM 100

Elements of Energy Conservation and Management : General energy problem, Sector wise Energy consumption, demand supply gap, Scope for energy conservation and its benefits, Energy conservation Principle Maximum energy efficiency, Maximum cost effectiveness. Mandatory provisions of EC act Features of EC act Standards and labeling, designated consumers, Energy Conservation Building Codes (ECBC). Energy management concept and objectives Initializing Planning, Leading, Controlling, Promoting, Monitoring and Reporting, energy management programmes. Energy Conservation Approaches In Industries : energy saving opportunities in electric motors Benefits of Power factor improvement and its techniques Shunt capacitor, Synchronous Condenser etc., Effects of harmonics on Motors, and remedies leading to energy conservation Energy conservation by VSD Methods and

techniques of energy conservation in ventilation and air conditioners compressors pumps, fans and blowers Area Sealing, Insulating the Heating / cooling fluid pipes, automatic door closing Air curtain, Thermostat / Control Energy conservation in electric furnaces, ovens and boilers lighting techniques Natural, CFL, LED lighting sources and fittings Energy Conservation in Power Generation, Transmission and Distribution : Performance improvement of existing power plant: cogeneration, small hydro, DG Set. Demand side management Load response programmes Types of tariff and restructuring of electric tariff Technical measures to optimize T and D losses.

Ma 391 A Open Elective-III: Advanced Numerical Analysis

3L

3 Hrs, MM 100

Solution of Algebraic and Transcendental Equations: Newton-Raphson method for real multiple roots, for complex roots and for system of non-linear equations; Synthetic Division, Birge-Vieta Method.

Solution of simultaneous Linear Equations and Eigen Value Problems: Direct methods: Gauss-elimination, Gauss-Jordan, Iterative Methods: Jacobi iteration, Gauss-seidel iteration and Successive Relaxation method. Eigen value Problems: power method

Curve fitting and Function Approximation: Chebyshev approximations, Chebyshev Expansion, Chebyshev Polynomials. Economization of Power Series.

Numerical Solution of Partial Differential Equations: Finite difference Approximation to partial derivatives. Solution of Laplace and poisson equations, Solution of one and two dimensional heat and wave equation by the method of separation of variables.

ME 391A Open Elective-III: Design Planning and Control of Production System

3L

3 Hrs, MM 100

Production Planning: Planning horizon, product exploring, Make and buy decisions, operations planning, demand forecasting, conversion of forecast into production goal.

Scheduling: Operation sequencing and balancing, Scheduling for mass production and job order production, MRP, ERP.

Inventory System: Cost factors relevant to operations and inventory control, EOQ with shortages and uniform production, quantity discount.

Project Planning and Control: Network control, control cost consideration and optimization, Resource allocation and levelling, Aggregate production planning, decision rules.

Supply Chain Management:: Strategic framework of Supply chain – meaning, scope and performance of supply chain, supply chain drivers and obstacles. Role of e-business in a supply chain.

ME 392A Open Elective-III: Systems Design and Analysis

3L

3 Hrs, MM 100

System Fundamental Concept: System definition, systems approach, Classification- General Systems, Discrete Systems, Controlled systems.

Procedure for Engineering a system: Defining system objective, formulation of objective criteria, Development of system alternatives.

Systems Optimization: Formulation of system, Design problem and application of search methods, Linear programming and dynamic programming for optimum solutions.

System Schedule: Time models, resource allocation, Time cost trade-off, system cost economic flow graph.

MI 391A Open Elective-III: Project Environment Clearance

3L

3 Hrs, MM 100

Brief introduction of Environment Protection Act 1986 and other relevant legal provisions applicable to get environment clearance in India.

Impact of major engineering projects on various components of the environment: Socio-Economy, Land, Water, Air, Noise and others.

Preparation of Environment management plan: Public hearing, collecting baseline data, Environment impact assessment and predication, Environment management plan, environment monitoring and management.

PI 391A Open Elective-III: Quality Management

3L

3 Hrs, MM 100

Introduction: History of Quality, Objectives , importance and need of quality, Contributions of Quality Gurus- Juran, Deming, Crosby, Feigenbaum, Ishikawa, Taguchi etc., Impact of Quality on business performance.

Process and Statistical Quality Control: Quality System; Quality control techniques; Process capability; Control Charts- Theory of control charts, control limits and specification limits, Control charts for variables- \bar{X} R Charts, Control Charts for attributes p, np, c and u charts.

Acceptance Sampling : Fundamental concepts of acceptance sampling; OC Curves; Single , Double and multiple sampling;

Quality Management: Introduction to Quality management; quality control and quality assurance; Quality control tools; cost of quality and cost of poor quality.

ISO 9000: ISO 9000 series; terminologies; need for ISO 9000 certification; basic procedure and work instructions; steps in ISO 9000 registration; Internal and third party audit for registration; Clauses of ISO 9000-2000 .

SE 391A Open Elective-III :Finite Element Method

3L

3 Hrs, MM 100

Introduction to Finite Element Method, Basic Concept of Finite Element Method, Analysis of continuum:- Structural, thermal, Potential etc., Finite Element Analysis of an elastic continuum:- Displacement approach, Direct Formulation, Energy Integral, Co and C1 continuity, Convergence criteria. Elements:- Types and Properties. Conforming and Non conforming.

Shape Functions:- Lagrangian and Serendity family for one and two dimensional cases.

Pascal triangle, Super / Sub and Iso parametric elements.

Steps in Finite Element Analysis of an elastic continuum.

B. E. II YEAR (ELECTRONICS & ELECTRICAL ENGINEERING)

III SEMESTER EXAMINATION

Ma 201 A (EC/ECC/EEE) - Advanced Engineering Mathematics I

2L

3 Hours, 100 Marks

Section A

Differential equations : Simultaneous differential equations, Total differential equations, Partial differential equations of first order, Charpit's method, Linear homogeneous partial differential equations with constant coefficients, Second order partial differential equations : Monge's method for the equation of type

$$Rr + Ss + Tt = V$$

Solution of Wave, Heat and Laplace equations using separation of variables method.

Section B

Complex Analysis : Analytic function, Harmonic function, Construction of an Analytic function, Complex integration: Cauchy's integral theorem, Cauchy's integral formula, Derivative of Cauchy's integral formula.

Taylor's and Laurent's series expansion of complex functions.

Cauchy's residue theorem and its application to evaluate the contour integrals of type $\int_0^{2\pi} f(x)dx$

and $\int_{-\infty}^{+\infty} f(x)dx$

Transformations: conformal and bilinear transformations.

Section C

Probability and Statistics: Theorems of probability and their application, Binomial, Poisson and Normal probability distribution. Correlation and Regression analysis of two parameters.

Note: Candidates are required to attempt FIVE questions in all, selecting at least one from each Section.

EC 202 A Network Theory (EC/ECC/EEE)

2L, IT

3 Hours, 100 Marks

Network Equations: Topology incidence, cut-set and tie-set matrices. Mesh and nodal analysis of networks with independent and dependent sources. Duality, Transient and steady state solutions of D.C. and A.C. networks.

Network Theorems: Superposition, Thevenin, Norton, Reciprocity. Maximum power transfer. Millman and Tellegen's Theorems and their applications to D.C. and A.C. circuits Resonance: Resonance in series and parallel- circuits. Q-Factor, bandwidth and selectivity. Non-sinusoidal Periodic Waveforms: Fourier series- trigonometric and exponential forms. Response of network to non-sinusoidal periodic

waveforms. Two Port Networks: Different two port parameters and their inter-relations and characteristic functions, interconnection of two port networks, Brune's test. Network configurations. Symmetrical and asymmetrical two port communication networks. Iterative, Image and characteristic impedances, Propagation, attenuation, phase and Image transfer constants. Balanced, unbalanced and reciprocal networks; T.L. lattice and bridged T network. Network Functions: Generalized concept of complex frequency, Impedance and admittance functions. Exponential excitation and system functions. Driving point and transfer functions. Pole zero configuration of system functions.

EEE 203 A Electronics Devices & Circuits (EEE)

2L, 1T

3Hours,100 Marks

Introduction to Solid State Devices: Space charge region and junction capacitance. Minority carrier injection, carrier storage and transient response. Impact ionization and avalanche break-down. Analytical theory of junction diodes. BJT, JFET, MOSFET, UJT, diffused transistors, avalanche transistors. Degenerate semi-conductors and theory of tunneling, Theory of tunnel diodes, zener diodes, varactor diodes, photo diodes, LEDs, photo-transistors, photo FETs and LASER. Introduction to Laser. Elementary theory of composite junction. Ohmic junctions and hetero junctions. Biasing: Biasing and stabilization techniques of BJT, JFET, MOSFET for use as amplifiers in various configurations. Small signal models for BJT, JFET and MOSFET in discrete and integrated form. Frequency dependence characterization and equivalent circuits. Miller effect. Untuned small signal BJT amplifiers: Analysis and design of Single stage and multistage. RC coupled and transformer coupled amplifiers. Frequency response, bandwidth, gain and factors affecting them. Various two transistor integrated circuit amplifier stages. Introduction of d.c. amplifiers, differential amplifiers, Cascode and Darlington circuits. Follower circuits and boot-strapping.

EEE 204 A Direct Current Machines (EEE)

3L, 1T

3 Hours,100 Marks

Armature Winding: Fundamental winding terms, classification of windings, simple lap and wave winding, chorded and multiplex winding, dummy coils and equalizing connections, calculations. Armature Reaction : Armature and field M.M.F.s, cross and demagnetizing effect of armature reaction and their calculations, effect of brush shift, effect of saturation compensating windings. Commutation : Meaning of commutation, action of commutator, types of commutation, effect of armature reaction, leakage flux, position of brushes, contact resistance, cause of bad commutation, methods of improving commutation. Generators : EMF equation, types of field excitations, characteristics and parallel running of shunt and compound generators. Motors : Back EMF, torque equation, characteristics of series, shunt and compound motors, starters and their designs, speed control by field, armature and voltage control, Ward Leonard Method. Efficiency and testing : Losses and efficiency, condition for maximum efficiency, Estimation of losses by Swinburne's and Hopkinson's tests, separations of losses, Retardation test. Cross – Field Machines : Constructional features, Rosenberg generator and amplidyne.

EC 205 A Digital Electronics- I (EC/ECC/EEE)

3L, IT

3 Hours,100 Marks

Device Characteristics: Steady state and transient switching characteristics of diodes, BJTs, FETs, UJTs. Wave shaping circuits. Integrating and differentiating circuits, effects of time constant, relation of tilt time to time constants. Clipper and clamper circuits using diodes and transistors. Saturated and unsaturated transistor switches. Speed-up capacitors. Inverter circuits. Performance of pulse transformer and lumped distributed parameter electromagnetic delay lines. Relaxation Oscillators: Theory, operation and performance of astable, monostable and bistable multivibrators. Different triggering circuits. Theory of Schmitt trigger. Comparison of performance of various circuits configurations of multivibrators and their fields of applications. Tunnel diode. UJT relaxation oscillator. Theory of astable and monostable blocking oscillators and their triggering methods. Sweep Circuits: Free running and triggered modes. Theory and common circuits of voltage and current time base generators. Sampling Gates: Theory, operation and applications of unidirectional and bi-directional sampling gates using diodes and transistors.

EEE 210 A: Measurement & Instruments (EEE)

2L,1T

3 Hours,100 marks

Principle of operation, constructional details, torque equation, scale shapes, uses and errors in moving coil, moving iron, electro dynamic and induction instruments for the measurement of voltage, current and power. Measurement of Resistance: Three and four terminal resistances, Kelvin's double bridge. Price's guard wire and loss of charge methods. Instrument Transformers: Theory and constructional details of current and potential transformers, Ratio and phase angle errors and methods of minimizing them. Classification and rating, absolute and comparison methods of testing, uses. Single-phase and polyphase induction type energy meters. Energy meter adjustment and testing. Magnetic Measurement: Determination of B-H curve and hysteresis loop of ring and bar specimens, Measurement and separation of iron loss, Epstein Lloyd Fisher Squares. Theory of Errors: Accuracy and precision systematic and random errors, limits of error, probable error and standard deviation Gaussian error curves, combination of errors.

B. E. II YEAR (ELECTRONICS & ELECTRICAL ENGINEERING)

IV SEMESTER EXAMINATION

Ma 251 A - ADVANCED ENGINEERING MATHEMATICS (EC/ECC/EEE) - II

2L

3 Hours, 100 Marks

Section A

Transforms: Laplace Transform, Inverse Laplace Transform, Properties of Laplace Transforms, Application of Laplace Transform to solve differential equation with constant coefficients. Z- Transforms. Infinite Fourier Transforms.

Section B

Numerical Analysis : Interpolation with equal intervals: Newton-Gregory interpolation formulae, Lagrange's interpolation formula for unequal intervals. Central difference interpolation formulae: Gauss' forward and backward formulae, Stirling's and Bessel's interpolation formulae. Numerical integration : Trapezoidal rule, Simpson's 1/3 and 3/8 rule. Numerical solution of algebraic and transcendental equations : Bisection, regula falsi and Newton-Raphson methods. Numerical solution of linear simultaneous equations : Gauss' elimination, Gauss-Jordon, Jacobi and Gauss-Siedal methods. Numerical solution of ordinary differential equations : Euler's, Runge-Kutta Fourth order and Milne's methods.

Section C

Special function : Series solution of Bessel and Legendre's differential equations. Generating function of Bessel and Legendre's Polynomials. Orthogonal Property of

Bessel and Legendre's function. Rodrigue's formula.

Note: Candidates are required to attempt FIVE questions in all, selecting at least one from each Section.

EC 254 A Electronic Circuits -II (EC/EEE)

3L, IT

3 Hours,100 Marks

Untuned large signal amplifiers: Methods of analysis of large signal FET, BJT and IC amplifiers. Analysis of distortion and cross modulation. Classification of power amplifiers. Analysis and design of single ended, parallel and push-pull Class A, AB and B power amplifiers. Complementary, symmetry and quasi-complementary circuits, Driver and out-put stages, with and without out-put transformers for power amplifiers. Output circuit efficiency calculations for various classes and configuration of amplifiers. Power out-put. Thermal considerations. Derating curves. Power Supply Circuit: Design factors and applications of various power supply filters and voltage multiplying rectifier circuits. Regulated Power Supplies: Regulator circuits using voltage regulating tubes, solid state devices and monolithic ICS. Adjustable constant voltage power supplies. Adjustable constant current power supplies. Higher output power supplies with solid state pre-regulations. Protection circuits for power supplies. Rating and specifications.

EC 255 A Digital Electronics - II (EC/ECC/EEE)

2L,1T

3 Hours,100 Marks

Counters and Registers: Binary and decade ripple counters. One bit counters. Up, down and up-down, synchronous counters. Programmable counters. Divide-by N counters. Storage registers, shift-right, shift-left and bi-directional shift registers. Serial input, serial output, parallel input, parallel output, parallel-in-serial out, serial in parallel out and Universal shift registers and synchronous parallel loading of shift registers. Static and dynamic MOS shift registers. Ring and Johnson counters
Arithmetic Circuits: Digital Comparators, half, and full adders; parallel and serial binary adders, half and full binary subtractors. BCD adders and subtractors. Binary multipliers and divider circuits
Miscellaneous Sub-systems: Encoders, decoders and code converters. Parity checking circuits. Multiplexers and demultiplexers. Digital to analog and analog to digital converters.
Semi-conductor memories: Random and sequential access memories. RAM, ROM, PROM, EPROM, EEPROM, EAPROM, EPLA, GALs. MOS and CMOS memories

EC 257 A Industrial Electronics (EC/EEE)

3L, 1T

3 Hours,100 Marks

Power electronics devices: Characteristics and operation of SCR, PUT, SUS, SBS, SCS, TRIAC, DIAC, IGBT, GTO, MCA and light activated thyristors. Ratings and rating extension by series/parallel operation. Electronic Power Control: Electronic methods of power control. SCR firing methods, Phase control techniques. Line commutation and different types of commutation. One, two and four quadrant converters. Bridge inverters, series and parallel inverters. Cyclo converters
Electrical Drives: Performance characteristics of series, shunt and compound d.c. motors. Motor starters. Characteristics of single and three phase induction motors, Universal motor, Amplidyne and selsyns.
AC and DC Motor Speed Control: Philosophy of speed control, open and closed control and single and three phase AC, DC and universal motors using thyristors. PWM inverter technique and introduction to variable frequency drive
Misc. Industrial Applications: Photo relays and their applications, X-ray tubes. Particle accelerators. Principle of Electron Microscope, Uninterruptible supplies. Switched mode power supplies
Programmable Logic Controllers (PLC): Advantages of PLC, CPU configurations, Digital and analog inputs and outputs, ladder circuits and process flow diagram. Console and operator panel.

EEE – 256 A Electricals Circuit theory (EEE)

3L, 1T

3 Hours,100 Marks

Time Domain Analysis : Transient and steady state solution of differential equations of RLC networks. Effect of initial conditions and time constants, damped and undamped oscillations.
Non- Sinusoidal Waveforms : Fourier series expansion of periodic functions, summery conditions, Exponential form of Fourier series
Equivalent voltage, current and power, analysis of simple circuits with non sinusoidal excitation, concept of power factor.
Fourier Integral and Continuous Spectra : Fourier integral and analysis of a recurring pulse, properties of the Fourier transform, Convolution, Analysis of circuits using Fourier Transform.
Polyphase Circuits : Analysis of three phase three wire and three phase four wire balanced and unbalanced circuits with symmetrical supply, Individual phase power factor and overall power factor, Blondel's theorem, Measurement of active and reactive power in three phase balanced and unbalanced systems.

Ma 261 A: Special Mathematics (all branches)
(For Diploma Passed Candidates - common for all branches)

3L,IT

3 Hours,100 Marks

Differential Calculus: Asymptotes, curvature, envelopes, evolutes, and curve tracing
Integral Calculus: Rectification . Volumes and surfaces of solids of revolution, differentiations under sign of integration
Differential Equations: Differential equations with constant coefficients and variable coefficients.
Mechanics: Friction , common catenary, kinematics of uniplanar motion, simple harmonic motion
Vector calculus: Gradient , divergence, curl, green's theorem , stoke's theorem, gauss divergence theorem (Verification only)

B. E. III YEAR (ELECTRONICS & ELECTRICAL ENGINEERING)

V SEMESTER EXAMINATION

EEE 301 A Control system (EEE)

2L, 1T

3 Hours, 100 Marks

Mathematical models: Representation of simple physical open – loop and closed up loop system: electrical analog block diagrams, block diagram reduction techniques; Signal flow diagram; Masson's gain formula. Control Systems components: Error detectors, potentiometers synchros; servo amplifiers d.c. and a.c. motors. Time Domain Analysis: Characteristics equations, response to step, ramp and parabolic inputs, Transient response specifications, effects of derivative and integral control, steady errors and error coefficients, generalized error series. Frequency domain analysis: Bode and polar plots, frequency domain specification, Correlation between transient response and frequency response. Stability Analysis : Routh Hurwitz and Nyquist criteria of stability gain and phase margins constant M and N circles; Nichols; charts and its applications. Root- Locus Techniques: Nature of Root – Locus diagrams, rules of construction, root – locus analysis of control systems.

EEE 302 A Alternating Current machine- I (EEE)

3L, 1T

3 Hours, 100 Marks

Transformers: Types of cross, windings and insulation, transformer oil cooling methods, bushes and accessories. Equivalent circuit, phasor diagrams, regulation; open circuit, polarity and back – to – back tests. Efficiency. Condition for maximum efficiency and all day efficiency. Separation of losses, standard connections for three – phase operation, magnetizing current and harmonics, tertiary winding, parallel operation. Scot connection. Autotransformer, off – load and on – load tap changers. Three phase induction motors: Constructional features, Torque production, slip equivalent circuit, phasor diagram, circle diagram, No- load and blocked rotor tests, Calculation of performance. Torque slip characteristics speed control, starting and braking. Induction generator, induction regulators single and three phase. Single Phase Induction Motors: Double revolving field theory, Methods of starting, equivalent circuit, calculation of performance.

EEE 303 A Electrical Power Transmission & Distribution (EEE)

3L, 1T

3 Hours, 100 Marks

Supply systems: Feeders distributors and service main. Systems of transmission. Elementary idea of high voltage d.c. Transmission. Effect of systems voltage on size of conductor, transmission voltage . Calculation for a.c. single phase and three phase feeders and distributors. Insulators : Pin shackle, suspension and strain insulators voltage distribution over an insulators string. Grading and methods of improving string efficiency pollution flashover Bushing and station insulators. Mechanical Features of overhead Lines: Different types of conductor materials with special reference to their mechanical properties. Line support, cross – arms and stays. Spacing and arrangements of conductors. Conductor vibration and its prevention, sag – tension calculations for various conditions. Sag templates Conductor and stringing. Parameters of Transmission Lines: Resistance, inductance and capacitance of overhead lines. Effect of earth, Lines transposition. Geometric mean radius and distance. Inductance and capacitance of double circuit lines on the same tower, skin and proximity effects. Bundled

conductors. Performance of Transmission Lines: Resistance inductance of short, medium and long lines. Generalized ABCD line Constants, Ferranti effect. Interference with communication circuits. Corona: Electric stress between parallel conductors. Disruptive critical voltage and visual critical calculation for three phase overhead line, corona power loss effect of corona. Underground Cables; Conductor, insulation, sheathing and armouring material. Types of cables Insulation resistance and capacitance calculation. Reduction of maximum stresses, causes of break down. Oil filled and gas filled cables. Thermal ratings of cables, Localization of cable faults by bridge and search coil methods.

EC 309 A Computer organization (EC/ECC/EEE)

2L, 1T

3 Hours, 100 Marks

Elements of Computer Organization Evolution of Computers : Generations of Computers, modeling of Computers at Gates, Registers and Processors level. CPU Architecture : Fixed and floating point arithmetic and ALU organization. Instruction format, types, sequencing and interpretation. Instruction fetch and execute cycles. Addressing techniques. Hardwired and Micro – programmed control. Secondary Memories : Magnetic memories core, tape, disk and floppy disc, introduction to magnetic bubble and CCD memories. I/O Devices : Principle and construction of Keyboard, Mouse, digitizer, joystick, optical scanner, Resistive membrane touch screen, Tele-typewriter, CRT Terminals, TFT monitors, Line Dot Matrix, Daisy Wheel, Ink Jet and Laser printers. Communication of I/O with CPU and memory : Speed mismatch of I/O v/s memory and CPU. Communication methods for I/O to CPU and Memory : Polling, interrupt, DMA and I/O channel.

EEE 310 A: Analog & Digital Communication Engineering(EEE)

2L,1T

3 Hours,100 Marks

Amplitude Modulation: Analysis of standard AM waves and signal power distribution. Methods of generating DSBSC, SSB and VSB – AM and their characteristics. Envelope and coherent demodulation methods for standard AM. DSBSC, SSB signals. Frequency Division Multiplexing. Angle modulation: Theory of frequency and phase modulations. Spectrum and BW of FM and PM signals. Direct and indirect methods of generating narrow – band and wide band FM. Discriminators and PLL demodulators for FM and PM. Pre-emphasis and de – emphasis. Idea of noise suppression properties of FM and PM systems. Random Signals: Power and energy signals. Introduction to probabilistic and statistical description of discrete and continuous communication processes. Definitions of Marginal, conditional and joint probability density and distribution functions, Stationarity and ergodicity. Auto correlation and Cross correlation functions, Energy spectral density and Power spectral density. Digital Communication: Comparison of analog and digital communication systems. Essentials of PCM linear delta and adaptive delta modulation. Study of components of complete digital communication system. Multiplexing, Introduction to bit, word and frame synchronization to matched filter detection. Noise: Various noise sources in amplifier and communication systems, Comparison of various electronic devices for noise performance, Signal to noise ratio and noise figure. Equivalent noise bandwidth. Noise temperature, Effect of cascading, statistical properties of noise Representation of white and band pass noise in communication systems. System Performance: Qualitative idea of Noise – performance of analog CW and pulse modulation systems. Qualitative idea of Probability of error performance of ASK, FSK BPSK, and simple QAM systems.

B. E. III YEAR (ELECTRONICS & ELECTRICAL ENGINEERING)

VI SEMESTER EXAMINATION

EEE 351 A Alternating Current Machines - II (EEE)

3L, 1T

3 Hours, 100 Marks

Synchronous Machines: Constructional features armature winding and winding factors. Cooling of alternators. Theory of cylindrical rotor machine. Saturation effect, phasor diagram. Regulation by Synchronous impedance, MMF, AIEE and A.S.A. methods and their relative comparison. Theory of salient pole machines, Blondel's two – reaction theory. Doherty – Nickel modification, phasor diagram. Direct and quadrature axis reactances transient, sub – transient and sequence reactances and their determination, parallel operation of alternators Synchronizing operation on infinite bus, synchronizing power, power angle characteristics, reluctance torque and stability of salient pole and cylindrical rotor machine. Synchronous Motors: Starting, performance and phasor diagram, Calculation of torque and stiffness coefficient, V- curve and power circle diagram, Hunting and damping Synchronous induction Motor;

EEE 352 A Modern Control Systems (EEE)

2L, 1T

3 Hours, 100 Marks

State Variable Characterization: System representation in state variable form, phase variables, comonical variables, physical variable: Matrix representation of state equations. Relationship between state equation and transfer function: Characteristic equation, eigen values and eigen vectors, stranfomration of phase variables, state transition matrix, its significance and methods of determination. Stability analysis using Liapunov's Methods. Sampled Data Systems: Importance of sampling in control systems; mathematical analysis of the sampling process in frequency domain. Reconstruction of sampled signals using Hold circuits. Z – Transform : Transfer function in terms of the z – transform, inverse z – transform, state variable representation of sampled data systems; phase variable physical variable and canonical variable forms; solution of discrete state equation; state transition matrix state diagrams, stability analysis using bilinear transformation.

EEE 353 A Electrical Power switch Gear and Protection (EEE)

3L, 1T

3 Hours, 100 Marks

Power Station Layout : Single and sectionalized busbar system, Duplicate busbar system and tie- bar reactors, switches, insulators and fuses. Power system faults: Types of faults, concept of per unit quantities, Analysis of symmetrical faults. Calculation of current limiting reactors there construction Location and uses. Symmetrical components of unsymmetrical phasor; sequence impedance and sequence networks, solution of unsymmetrical fault problem in power systems. Measurement of sequence components of current and voltage. Circuit Breakers: Principles of arc interruption, low and high resistance interruptions. Theories of arc interruption, recovery rate theory and energy balance theory. Inductive and capacitive current interruption, current chopping, resistance switching. Recovery voltage, re-striking voltage and rate of re-striking voltage and factors affecting them. Types of circuit breakers. Various types of oil and air blast circuit breakers, vacuum and SF circuit breakers. High speed reclosing Rating of circuit breakers and determination of breaking current, making current and recovery voltage.

Testing of circuit breakers. System Protection; Relays Basic requirement of protective relaying, primary and back –up protection. Types of electromagnetic relays, their construction and operating characteristics. Line Protection: Differential pilot wire systems. Time graded directional over current and earth fault protection. Elements of distance protection and power line carrier protection. Bus Protection : Frame Leakage and circulating current protection. Generator Protection : Field failure, field earth fault, over current, phase unbalance and insulation protection : Differential and restricted earth fault schemes. Protection against prime mover failure. Transformer Protection: Over current, earth fault frame leakage and differential protection. Buchholz relay. Differential scheme for the protection of generator transformer units.

EC 358 A Microprocessor & Microcomputer (EC/ECC/EEE)

3L, 1T

3 Hours, 100 Marks

Microprocessor Architecture: Architecture of 8 – bit 8085, Z80, 6800 microprocessors; their instruction sets and addressing modes. Assembly language programming of Intel’s 8085 Microprocessor. Introduction to assemblers. Microprocessor Interfacing : Interfacing of address; data and control buses Memory and I/O devices, Interrupt and DMA for 8085 microprocessor. Introduction of Micro controllers : Architecture and instruction set of MCS – 51 series of micro controllers. Application of Micro controllers. 16 and 32 – bit Microprocessors: CPU architecture addressing modes and feature of 16 and 32 bit microprocessor – 8086. Salient features of 80286, 80386, 80486 and Pentium series microprocessors. Bus standards: Introduction to multi bus VME, RS – 232-C, IEEE 488, PCI, USB, RS 422 and 485.

EEE 371 A - Radiation & Wave Propagation (EEE)

2L,1T

3Hours, 100Marks

Transmission Lines: Type of transmission lines, General transmission line equations. Line constants and equivalent circuits. Infinite line, Lines with reflections. Coaxial cables: Transmission lines at audio and radio frequencies. Losses in transmission lines. Transmission equalizers. Characteristics of quarter wave, half wave and other lengths. Smith chart and its applications. Transmission line applications. Stub matching. Radio Wave Propagation: Mechanism of radio wave propagation. Reflection, refraction interference and diffraction of radio waves. Theory of ground wave, space wave and sky wave propagation. Effect of conductivity, dielectric constant, curvature and surface imperfections of earth on wave propagation, Duct propagation and tropospheric scattering. Radiation: Retarded potentials and concept of electromagnetic radiation. Alternating current element and radiated power, radiation resistance. Radiation from dipole and monopole antennas. Antennas: Quarter wave and half wave antennas. C-Impedance, mutual impedance and directional characteristics of antennas. Antennas patterns. Effective length and effective area of antennas , Antennas gain efficiency, beamwidth and polarization. Antenna temperature.

B. E. IV YEAR (ELECTRONICS & ELECTRICAL ENGINEERING)

VII SEMESTER EXAMINATION

EEE 401A: Power Electronics (EEE)

3L, 1T

3 Hours, 100 Marks

Converters: Two transistors model, characteristics of SCR, Single phase and polyphase uncontrolled and controlled rectifiers, Dual Converters.AC voltage regulators: On off and phase angle control, single – phase bi- directional controller for neutral connected and neutral not connected resistive load.DC. Chopper: Thyristor turn – off methods in dc circuits (various classed), single quadrant two quadrant and four quadrant choppers, steps up choppers, Thyristor commutation in choppers, voltage current and load communication, multiphase choppers.Inverters: Voltage Source inverters: Single phase half bridge and full bridge inverter with auxiliary commutation and with complementary commutation, three phase inverter with 120° and 180° mode.Current source Inverters: Single phase and capacitor commutated, CSI with resistive load, Single phase and three phase auto sequential commutated inverter, single phase Thyristor series inverter, parallel or push –pull inverters.Cycloconverters: step down cycloconverters: Single phase to single phase, three phase to single phase and three phase to three phase cycloconverters, non circulating current and circulating current mode, idea of step up cycloconverters.

EEE 402 A Control System Design (EEE)

3L, 1T

3 Hours, 100 Marks

Introduction to compensation and type of Compensation, phase lag, phase lead, phase – lag – lead compensation. Design in frequency domain and time domain realization of compensators using passive components.Concept of observability & controllability, principle of duality.Design of Controllers in state – space approach state feedback, output feedback, Concept of pole placement, design of PID Controller, Deadbeat control.Computer controlled system, basic idea of Direct & distributed control systems.

EC 403 A Advance Communication systems (EC/ECC/EEE)

3L, 1T

3 Hours, 100 Marks

Line – of Sight and Troposcatter Communication: Principle of working and essential features of microwave LOS and troposcatter communication Propagation study and performance requirements. Diversity techniques.Satellite communications: Basic considerations. Up – link and down link parameters. Orbit and frequency selection. Transmission losses, noise and interference. Elements of multiple access techniques. Frequency reuse techniques. Functional description of earth stations.Optical Communications: Ray propagation in optical fibers. Types of fibers. Losses and dispersion in fibers. Transmitter and receiver subsystem for optical communications. Laser and LED sources. Optical amplifier. Cable joints couplers and connectors. Splicing techniques. Modulation techniques. PIN and avalanche photo diode detectors. Characteristics of analog and digital transmission in optical communication systems. Noise considerations.

EC – 404 A Advance Computer Technology (EC/EEE)

3L, 1T

3 Hours, 100 Marks

Computer Architecture: Microprogrammed control organization, CPU – memory speed mismatch and solutions, Word- length, caches and buffers. Speeding up instruction cycle, instruction fetch and decode overlaps.Parallelism in execution : Instruction pipe- line and vector processing concepts. Introduction to Array processors.Memory Organisation : Memory hierarchy. Associative memory, cache memory, paging and segmentation.Advanced Systems: Organization of parallel processing, multiprocessing multiprogramming, distributed processing and time sharing systems.Software : Introductory theory of Compilers, Interpreters and operating systems.

EC- 408 A Engineering management and Economics (EC/ECC/EEE)

2L

3 Hours, 100 Marks

Principles of Management: Management function. Theories of management and their application Span of control, Responsibility, authority, leadership, motivation, communication, Management of Change, Importance of organization structure

Financial Management: Functions and importance of financial management, Book-keeping, Interest and depreciation. Salvage value Various types of costs, profit/volume ratio. Break even analysis and marginal costing

Marketing and Strategic Management: Concept of marketing and its various components Product Life Cycle Strategic Mission Vision Goals Industry Life Cycle SWOT analysis

Stores and Purchase Management : Function of store and Purchase management.

Inventory Management:. Inventory control and management Economic order quantity. A-B-C analysis..

Forms of Business Ownership: Proprietorship, partnership, joint stock companies, joint sectors

Production Planning and Control: Job, Batch and mass production, production efficiency, productivity.

Site selection. Production planning. Routing, scheduling and follow up. Elements of time and motion study. Quality control and quality assurance

Nature and Scope of Economics: Basic concept of managerial economics. Supply and demand, free competition, monopoly and oligopoly

B. E. IV YEAR (ELECTRONICS & ELECTRICAL ENGINEERING)

VIII SEMESTER EXAMINATION

EC 451 A Digital Signal Processing (EC/EEE)

2L, 1T

3 Hours, 100 Marks

Digital Signal Processing : Advantage of digital filters and processing. Fundamentals of discrete time systems. Fourier transform of sequences. Discrete – time filter structures. Z – Transform system representation solution of linear constant co- efficient difference equations. Digital filters design by transformation from analog filters. Simple realization of IIR and FIR filters DFT and FFT.

EEE 453 A Power systems operation and control (EEE)

2L, 1T

3 Hours, 100 Marks

Power system operation: Advantage and disadvantage of power system interconnection, control of current and power interconnection. Automatic Generation Control: Elements of Load frequency, control two area control, flat frequency, flat tie line bias controls, capability chart, sending end and receiving end power circle diagrams. Maximum power limits. Power System stability : Meaning of power system stability, stability limits, infinite bus, power angle curve, steady state and transient stability, Inertia constant, swing equation (Solution not to be done) equal area criteria of stability, factors affecting stability methods of improving stability. Power System Electronics : Input – output curves, incremental rate curves, effect of operating conditions, for minimum input in single and multi-fed systems. Transmission loss formula. HVDC Transmission: Introduction to HVDC transmission, type of DC links, advantages and limitations of HVDC transmission, converter station equipments. Voltage Surges: Causes of high voltage surges. Typical voltage surge wave form. Surge velocity surge impedance. Wave reflection and refraction. Over voltage protection. Use of overhead earth wire and lightning arrestors. Elements of insulation co-ordination.

EEE 454 A Electrical Machine Design (EEE)

3L, 1T

3 Hours, 100 Marks

General : Factors and limitations in design, output coefficient and other factors, emf equation; classification of magnetic circuit, materials and allowable flux densities. Calculation of magnetic circuits, magnetizing current design of coils for given ampere-turns, field forms. Armature winding: General features of armature windings, single layer, double layer winding, integral and fractional slot winding factors, Harmonics and eddy current losses in conductors. Heating, cooling and ventilation: Heat dissipation, heat flow, heating and cooling curves, heating cooling cycles, estimation of maximum temperature rise, cooling media, quantity of cooling media, types of enclosures, Ratings, Heat dissipation from transformers. Design of Transformers : General consideration output equation; output equation, emf per turn , Choice of flux density and current density, Main dimensions and conductor size, window, yoke and overall dimensions. Design of induction motors: General considerations. Output equation, choice of specific electric and magnetic loadings, efficiency, power factors, selection of frame size, selection of number of stator slots, squirrel cage rotor bars. Design of Synchronous Machines: General considerations, Output equation choice of specific electric and magnetic loadings election of frame size, selection of number of slots and air gap length.

EC 458 A Computer Communication and Data Networks (EC/ECC/EEE)

3L, 1T

3 Hours, 100 Marks

Computer communication: Layered Architecture of computer communication networks. DNA, SNA and ISO- OSI models. Properties of LANs, MANs, and WANs. Physical level, data link and transport protocols. Multiple access protocol organization. Routing techniques flow and congestion control in packet switched networks. Window scheme. Network interconnection – bridges and routers. Dead Lock avoidance. Elements of queuing analysis. Introduction to network security. Data Networks: Structure and functions of network protocols. Data link control procedures. Operation of HDLC, SDLC, BISY NC, X.25 and x.21 Protocols Elements of Polling ALOHA, Reservation ALOHA, CSMA and token ring. Characteristic features of LANs. Basics of Internet: Evolution; dialup, XDSL, ADSL, cable modem and other access methods. IP address and domain name system, TCP/IP, Internet applications and www.

EC 459 A Microwave Engineering (EC/EEE)

3L, 1T

3 Hours, 100 Marks

Wave Guides : Theory of wave propagation in rectangular wave guides, cut off frequency. Dominant and higher modes. Generation of different modes and suppression of unwanted modes. Field distribution. SWR and impedance relations in wave guides. Coupling between coaxial lines and wave guides. Wave guide stub-matching. Resonators: Theory and application of cavity resonators. Coupling to cavity, Q of cavity resonators. Microwave Components: Attenuators, phase shifters, directional couplers, tees, isolators, circulators, tunings screws, coupling probe, loops, mixers and detectors. Use of scattering parameters. Microwave Generators and Amplifiers: Theory of velocity modulation. Theory of operation and characteristics of two cavity and multicavity klystron, amplifier and oscillators. Reflex klystron O and M type travelling wave tube and backward wave oscillators – principle of operation . Construction, type and application of Magnetrons. Microwave Solid State Devices: Special considerations for UHF and microwave transistors and oscillators. Parametric amplifiers. Manley- Rowe relation linearized equations. Parametric up converters. Negative resistance amplifiers. Principle of working and application of impact diode, hot carrier diode, PIN diode, Gunn diode and LSA diode Quantum mechanical explanation, description and application of MASER amplifiers.

CORE ELECTIVES

EEE 456 Telematics (EEE)

3L, 1T

3 Hours, 100 Marks

Digital Telephony : Principle of working of SPC digital telephone exchanges. Digital switching, space, time, TS, ST, STS, TST switch blocks. Termination of subscriber lines Signalling systems with digital exchanges. Principle of common channel signalling. Synchronization aspect for digital telephony. Store Program Control for call processing.

Integrated Digital Networks: Data Communication terminology. Introduction to Circuits, message and packet switching concept. Basic aspects of multiplexing, signaling and synchronization in integrated digital networks. Overview of ISDN and BISDN. Concepts of basic rate and primary rate ISDN. Access and facilities provisions. Elements of fast packet switching, frame relay, ATM, SONET and SDH. Introduction to photonic switching.

EEE 457 Mobile Communication Engineering (EEE)

3L, 1T

3 Hours, 100 Marks

Basic technical concepts: Concept of mobile telecommunications. Mobile radio network issues, cell size coding, modulation and diversity Base station subsystems. Access methods. Location strategies for personal communications services. Cell design principles.

Radio Paging System: Types of radio paging system. On site and wide area paging digital codes like POCSAG, elements of radio paging system engineering.

Microcellular radio communication: Fixed and dynamic channel assignment. Cellular systems and power control basic features and system architecture in cordless telephones. Marine and aircraft communication. Overview of mobile terrestrial communication by satellite.

Cellular Radio System: Allocation of spectrum and channels, Concepts of hexagon cells, mobile identification system and registration of mobile, call procedure and measurement of signal strength, GSM and CDMA radio system architecture, roaming, digital speech and channel coding. Efficient use of radio spectrum, multi operator working, cells and frequency reuse.

EEE 458 Medical Electronics (EEE)

3L, 1T

3 Hours, 100 Marks

Introduction to Physiology : Physiological system of the human body. Nerve physiology. Function of nerves and myoneural junction. Cardiac muscle and its contractions. Blood flow system. Arterial pressure Mechanism of respiration, Function of Spinal cord. Generation, Propagation and distribution of action potentials.

Recording of Bio- Electric Events : Kinds of electrodes, amplifiers and display units for recording bioelectric potentials. Principles of ECG, EEG, and EMG. Electrophysiological signals from a micro electrode and salt bridge, Use of field effect – devices as electrometers. Principle of driven shield. Use of photon – coupled amplifiers. Artifacts.

Bio – Medical Measurement : Electronic methods of measuring blood pressure, blood flow, blood pH, skin and systemic body temperature and pulse rate.

Electronic Medical Instrument : Electronic pace makers. Implantable power sources. Defibrillators. Micro power transmitter for telemetering bio – signal. Surgical and therapeutic diathermy units. Physiological stimulators Basic diagnostic X – ray units. Introduction to patient monitoring and intensive care units.

EEE 459 High Voltage Engineering (EEE)

3L, 1T

3 Hours, 100 Marks

Breakdown in gases : Mechanisms of breakdown in gases, various related ionization process. Townsend – ends and streamer theories. Paschen's law, Breakdown in Non – uniform fields. Effect of wave shape of impressed voltages on the breakdown of sphere gap and rod gap.

Breakdown in Liquids and Solids: Mechanisms of breakdown in liquids suspended particle, suspended water cavitations and bubble and electronic breakdown theories. Mechanisms of breakdown in solids, intrinsic electromechanical, erosion, surface, thermal and streamer, relation between electronic strength of solids and time intrinsic breakdown strength.

Impulse Generator: Specification of an impulse voltage, wave, standard impulse, reasons for adopting the particular shape, Analysis and control of simple circuit of impulse generator. Multistage impulse generator (Marx Circuit) circuit working, earthing and tripping, Techniques to observe wave front on CRO.

Generation of High Voltage: Methods of generation of power frequency high voltage cascade transformers and resonance and methods, generation of high voltage d.c. voltage stabilization. Tesla coil.

Measurement of High Voltage: Potential dividers – resistive capacity and mixed dividers of high voltage. Sphere gap, construction, mounting effect of nearby earthed objects humidity and atmospheric conditions. Effect of irradiation and polarity. Electrostatic voltmeter. Principle and classification, constructional details of an absolute electrostatic voltmeter Oscilloscopes and their application in high voltage measurement.

High Voltage Testing: Measurement of insulation resistance of cables. Wet and dry flashover test of insulators in simulated polluted conditions. Testing of transformers and rotating machines, measurement

of breakdown strength of oil. Basic technique of nondestructive testing of insulators measurement of loss angle and partial discharge measurement techniques.

EEE 460A Electric Traction Engineering (EEE)

3L, 1T

3 Hours, 100 Marks

Train movement and performance : Speed – time curve, its analysis and construction. Schedule speed and factors affecting it. Train resistance and its components. Tractive efforts calculations. Average acceleration and speed, energy output and consumption.

Power Transmission and Weight Transference: Methods of transmission of power from motor to wheels, Idea about riding qualities of an electric locomotive, Grouping of motors and weight transference. Adhesive weight, Factors affecting slip.

Traction Motors: Performance of (i) d.c. motors (ii) a.c. single phase series motors at low frequencies and at commercial frequency and (iii) polyphase induction motors, under traction service conditions, Specific problems and methods of overcoming them, Special features of construction. Effect of differences in driving wheel diameters and speed time – curves on division of load. Traction motor rating speed factor. Track and overhead equipment.

Power supply of traction : overhead and conductor rail systems. Third rail construction. Bonding of conductor and track – rails. Overhead construction for trolley. Buses and railways, centenary construction.

Temperature effects, current collectors. Outlines of feeding and distributing systems for d.c. low frequency a.c. and commercial frequency a.c. traction Voltage drop control, Electrolytic and inductive coordination. Power leading curves Positions of Sub- stations and load sharing.

Breaking of Electrified Railways : Mechanical versus electric breaking, Theostatic breaking, regenerative breaking, methods and energy saving in the process, magnetic track brakes.

Tractional Control: Study cycle, Methods of traction motor control, series - parallel and other types of controllers, Use of inter locks, Runback prevents Multiple unit control. Master controllers, Reversers, Dead man's handle, use of metadyne and magnavolt diesel – electric and Gas turbo – electric traction: Generator and motor rating and characteristics of diesel – electric loco – motives, Speed acceleration and braking introduction to gas turbo – electric and straight electric traction. Train lighting and Signalling: Dynamo for train light, Lighting systems of Indian Railway, Introduction to electric signaling methods manual and automatic.

Systems of Electric Traction : Comparison between various systems, expected trends, Position of single phase commercial frequency Traction. Linear induction motor, possibility for traction purpose.

B.E. II Year (Electronics & Computer Engineering), 2016-17

SEMESTER III EXAMINATION SCHEME

<i>Branch Code</i>	<i>Subject Code</i>	<i>Subject</i>	<i>Lectures</i>	<i>Tutorials</i>	<i>Practicals</i>	<i>Contact Hours</i>	<i>Credits</i>	<i>Exam Hours</i>	<i>Marks</i>		
									<i>Theory</i>	<i>Pract & Sess</i>	<i>Total</i>
<i>A: Written Papers</i>											
MA	201 A	Advanced Engineering Mathematics (EC/ECC/EEE) - I	2	-	-	2	2	3	100	-	100
EC	202 A	Network Theory (EC/ECC/EEE)	2	1	-	3	3	3	100	-	100
ECC	203 A	Solid State Electronic Devices (ECC)	2	1	-	3	3	3	100	-	100
ECC	204 A	Data Structures (ECC)	3	1	-	4	4	3	100	-	100
EC	205 A	Digital Electronics (EC/ECC/EEE) – I	3	1	-	4	4	3	100	-	100
ECC	206 A	Object Oriented Programming (ECC)	3	1	-	4	4	3	100	-	100
Total (A)			15	5	-	20	20	-	600	-	600
<i>B: Practicals and Sessionals</i>											
ECC	211 B	Network Laboratory (ECC)	-	-	2	2	1	-	-	100	100
ECC	212 B	Electronic Devices Lab (ECC)	-	-	2	2	1	-	-	100	100
ECC	213 B	Data Structures Lab (ECC)	-	-	2	2	1	-	-	100	100
ECC	214 B	Digital Electronics Lab (EC) - I	-	-	2	2	1	-	-	100	100
ECC	216 B	Object Oriented Programming Lab (ECC)	-	-	2	2	1	-	-	100	100
Total (B)			-	-	10	10	5	-	-	500	500
Grand Total (A+B)			15	5	10	30	25	-	600	500	1100

B.E. II Year (Electronics & Computer Engineering), 2016-17

SEMESTER IV EXAMINATION SCHEME

Branch Code	Subject Code	Subject	Lectures	Tutorials	Practicals	Contact Hours	Credits	Exam Hours	Marks		
									Theory	Pract & Sess	Total
A: Written Papers											
MA	251 A	Advanced Engineering Mathematics (EC/ECC/EEE) - II	2	-	-	2	2	3	100	-	100
ECC	252 A	Electronics Circuits (ECC)	3	1	-	4	4	3	100	-	100
ECC	253 A	Discrete Structures (ECC)	3	1	-	4	4	3	100	-	100
EC	255 A	Digital Electronics (EC/ECC/EEE) – II	2	1	-	3	3	3	100	-	100
ECC	256 A	Principles of Programming Languages (ECC)	3	1	-	4	4	3	100	-	100
		OPEN ELECTIVE – I*	3	-	-	3	3	3	100	-	100
Total (A)			16	4		20	20	-	600	-	600
B: Practicals and Sessionals											
ECC	261 B	Electronics Circuits Lab (ECC)	-	-	2	2	1	-	-	100	100
ECC	262 B	Logic Design Simulation & Testing Lab (ECC)	-	-	2	2	1	-	-	100	100
ECC	263 B	Digital Electronics Lab (ECC) – II	-	-	2	2	1	-	-	100	100
ECC	264 B	Programming Languages Lab (ECC)	-	-	2	2	1	-	-	100	100
ECC	265 B	Electronics Workshop (ECC)	-	-	2	2	1	-	-	100	100
Total (B)					10	10	5	-	-	500	500
Grand Total (A+B)			16	4	10	30	25	-	600	500	1100
EC	200 E	Co-curricular Activities	-	-	-	-	0	-	-	-	100

*Select Choice based electives offered by other than Electronics & Communication Engineering Department in IVth semester:

B.E. III Year (Electronics & Computer Engineering), 2017-18

SEMESTER V EXAMINATION SCHEME

Branch Code	Subject Code	Subject	Lectures	Tutorials	Practicals	Contact Hours	Credits	Exam Hours	Marks		
									Theory	Pract & Sess	Total
A: Written Papers											
ECC	301 A	Theory & Applications of Integrated Circuits (ECC)	3	1	-	4	4	3	100	-	100
ECC	303 A	Design of Databases (ECC)	3	1	-	4	4	3	100	-	100
EC	304 A	Analog Communication Engineering (ECC)	2	1	-	3	3	3	100	-	100
ECC	307 A	Computer Graphics & Devices (ECC)	3	1	-	4	4	3	100	-	100
EC	309 A	Computer Organisation (EC/ECC/EEE)	2	1	-	3	3	3	100	-	100
		Open Elective – II*	3	-	-	3	3	3	100	-	100
Total (A)			16	5		21	21	-	600	-	600
B: Practicals and Sessionals											
ECC	312 B	Integrated Circuits Lab (ECC)	-	-	2	2	1	-	-	100	100
ECC	316 B	Computer Graphics Lab (ECC)	-	-	2	2	1	-	-	100	100
ECC	313 B	Databases Lab (ECC)	-	-	2	2	1	-	-	100	100
ECC	314 B	Analog Communication Lab (ECC)	-	-	2	2	1	-	-	100	100
Total (B)			-	-	8	8	4	-	-	400	400
Grand Total (A+B)			16	5	8	29	25	-	600	400	1000

*Select Choice based electives offered by other than Electronics & Communication Engineering Department in Vth semester:

B.E. III Year (Electronics & Computer Engineering), 2017-18

SEMESTER VI EXAMINATION SCHEME

Branch Code	Subject Code	Subject	Lectures	Tutorials	Practicals	Contact Hours	Credits	Exam Hours	Marks		
									Theory	Pract & Sess	Total
A: Written Papers											
ECC	351 A	Business Information Systems (ECC)	2	1	-	3	3	3	100	-	100
ECC	357 A	Power & Industrial Electronics (ECC)	2	1	-	3	3	3	100	-	100
EC	353 A	Digital Communication Systems (EC/ECC)	3	1	-	4	4	3	100	-	100
EC	358 A	Microprocessor & Microcomputers (EC/ECC/EEE)	3	1	-	4	4	3	100	-	100
EC	371 A	Radiation & Wave Propagation (ECC/EEE)	2	1	-	3	3	3	100	-	100
		OPEN ELECTIVE – III*	3	-	-	3	3	3	100	-	100
Total (A)			15	5		20	20	-	600	-	600
B: Practicals and Sessionals											
ECC	362 B	Power & Industrial Electronics Lab (ECC)	-	-	2	2	1	-	-	100	100
ECC	363 B	Digital Communication Lab (EC)	-	-	2	2	1	-	-	100	100
ECC	364 B	Microprocessor Lab (EC)	-	-	2	2	1	-	-	100	100
ECC	365 B	Business Automation Lab (ECC)	-	-	2	2	1	-	-	100	100
ECC	366 B	Radiation & Wave Propagation Lab (ECC)	-	-	2	2	1	-	-	100	100
Total (B)			-	-	10	10	5	-	-	500	500
Grand Total (A+B)			15	5	10	30	25	-	600	500	1100
EC	300 E	Co-curricular Activities	-	-	-	-	0	-	-	-	100

*Select Choice based electives offered by other than Electronics & Communication Engineering Department in VIth semester:

B.E. IV Year (Electronics & Computer Engineering), 2018-19

SEMESTER VII EXAMINATION SCHEME

Branch Code	Subject Code	Subject	Lectures	Tutorials	Practicals	Contact Hours	Credits	Exam Hours	Marks		
									Theory	Pract & Sess	Total
A: Written Papers											
ECC	401 A	VLSI Design Techniques (ECC)	3	1	-	4	4	3	100	-	100
ECC	402 A	Design of Operating Systems (ECC)	3	1	-	4	4	3	100	-	100
EC	403 A	Advance Communication Systems (EC/ECC/EEE)	3	1	-	4	4	3	100	-	100
ECC	404 A	Parallel Processing Technology (ECC)	3	1	-	4	4	3	100	-	100
EC	408 A	Engineering Management & Economics (EC/ECC/EEE)	2	-	-	2	2	3	100	-	100
ECC		Core Elective – I	3	1	-	4	4	3	100		100
Total (A)			17	5	-	22	22	-	600	-	600
B: Practicals and Sessionals											
ECC	421 B	VLSI Simulation Lab (ECC)	-	-	2	2	1	-	-	100	100
ECC	422 B	Operating Systems Lab (ECC)	-	-	2	2	1	-	-	100	100
ECC	423 B	Advance Communication Systems Lab (ECC)	-	-	2	2	1	-	-	100	100
ECC	425 B	Project (EC) (Phase – I)*	-	-	2	2	-	-	-	-	-
Total (B)			-	-	8	8	3	-	-	300	300
Grand Total (A+B)			17	5	8	30	25	-	600	300	900

* ECC 425 B: A combined exam of Phase I & II shall be conducted at the end of VIII Semester.

B.E. IV Year (Electronics & Computer Engineering), 2018-19

SEMESTER VIII EXAMINATION SCHEME

Branch Code	Subject Code	Subject	Lectures	Tutorials	Practicals	Contact Hours	Credits	Exam Hours	Marks		
									Theory	Pract & Sess	Total
A: Written Papers											
ECC	451 A	Real Time & Embedded System (ECC)	3	1	-	4	4	3	100	-	100
ECC	453 A	Multimedia Systems (ECC)	3	1	-	4	4	3	100	-	100
ECC	454 A	Mobile Communication & Computing (ECC)	3	1	-	4	4	3	100	-	100
EC	458 A	Computer Communication & Data Networks (EC/ECC/EEE)	3	1	-	4	4	3	100	-	100
ECC		Core Elective – II	3	1	-	4	4	3	100	-	100
Total (A)			15	5		20	20	-	500	-	500
B: Practicals and Sessionals											
ECC	471 B	Embedded Systems Lab (ECC)	-	-	2	2	1	-	-	100	100
ECC	472 B	Computer Networking Lab (ECC)	-	-	2	2	1	-	-	100	100
ECC	473 B	Multimedia Lab (ECC)	-	-	2	2	1	-	-	100	100
ECC	474 B	Wireless & Mobile Lab (ECC)	-	-	2	2	1	-	-	100	100
ECC	425 B	Project (EC) (Phase –II)*	-	-	2	2	1	-	-	200	200
Total (B)			-	-	10	10	5	-	-	600	600
Total (A+B)			15	5	10	30	25	-	500	600	1100
C: Others											
ECC	476 C	Practical Training II (EC)	-	-	-	-	13	-	-	100	100
Total (C)			-	-	-	-	13	-	-	100	100
Grand Total (A+B+C)			15	5	10	30	38	-	500	700	1200
EC	400 E	Co-curricular Activities	-	-	-	-	0	-	-	-	100

*Project (Phase II) is continuation of Project (Phase I) & combined examination shall be conducted.

List of Core Electives	
ECC 421 A	Robotic & Computer Vision (ECC)
ECC 422 A	Digital Signal Processing (ECC)
ECC 423 A	Microwave Engineering (ECC)
ECC 424 A	Telematics (ECC)
ECC 425 A	Medical Electronics (ECC)
ECC 426 A	Software Engineering (ECC)
ECC 427 A	Client Server Technology (ECC)
ECC 428 A	Object Oriented Software Engineering (ECC)
ECC 429 A	Information Theory and Coding (ECC)
ECC 430 A	System Software (ECC)

List of Open Electives	
Name of subject	Semester
BCT 291 A Open Elective-I: Sustainable Architecture CE 291A Open Elective-I :Energy Efficient Building Design ChE 291 A Open Elective-I : Renewable Energy Sources CSE 292A Open Elective-I :Object Oriented Programming Through JAVA EE 291 A Open Elective-I : Industrial Applications of Electrical Drives Ma 291 A Open Elective-I :Mathematical Statistics For Engineers ME 291 A Open Elective-I:Renewable Energy Sources ME 292A Open Elective-I: Automobile Engineering MI 291A Open Elective-I: Tunneling For Engineering Projects PI 291A Open Elective-I: Manufacturing Science SE 291A Open Elective-I: Computer Oriented Numerical Analysis	Fourth Semester
BCT 341 A Open Elective-II: Traditional Indian Architecture CE 341A Open Elective-II: Non Urban Public Hygiene & Drinking Water ChE 341 A Open Elective-II : Petroleum Refining Technology EE 341 A Open Elective-II : Optimization Techniques EE 342 A Open Elective-II : Artificial Intelligence Ma 341 A Open Elective-II :Mathematical Theory of Operations Research ME 342A Open Elective-II: Finite Elements Method MI 341A Open Elective-II: Application of GIS & Remote Sensing in Engineering SE 341A Open Elective-II :Structural Dynamics	Fifth Semester
BCT 391 A Open Elective-III: Climate Responsive Architecture CE 391A Open Elective-III: Ecosystem & Biodiversity ChE 391 A Open Elective-III : Nanotechnology CSE 391A Open Elective-III : WEB TECHNOLOGIES (Open) EC 391 A Open Elective-III: Electronic Instrumentation EE 391 A Open Elective-III: Soft Computing Techniques EE 392 A Open Elective-III: Energy Conservation Ma 391 A Open Elective-III: Advanced Numerical Analysis ME 391A Open Elective-III: Design Planning And Control Of Production System ME 392A Open Elective-III: Systems Design And Analysis MI 391A Open Elective-III: Project Environment Clearance PI 391A Open Elective-III: Quality Management SE 391A Open Elective-III :Finite Element Method	Sixth Semester
BCT: Building Construction Technology, CE: Civil Engineering, ChE: Chemical Engineering, CSE: Computer Science and Engineering, EC: Electronics & Communication, EE: Electrical Engineering, ME: Mechanical Engineering, MI: Mining Engineering, PI: Production & Industrial Engineering, SE: Structural Engineering, Ma: Mathematics	

SYLLABUS OF OPEN ELECTIVES-I

BCT 291 A Open Elective-I: Sustainable Architecture

3L

3 Hrs, MM 100

Concepts of sustainability : Energy and Global environment, Energy use and Climate change – Its impact, Types of Energy systems, Concept of Sustainability - Principles of conservation -synergy with nature, Bioregionalism - community basis shelter technology within bioregional patterns and scales, Ethical- environmental degradation.

Sustainable planning & Design: Sustainable Development -Sustainable approach to site planning and design - site inventories- relationships between site factors - development impacts from one area of the site on the other areas - phasing of development - limits of change - Design facility within social and environmental thresholds

Sustainable Building Materials and Construction : Properties, Uses and Examples of -Primary, secondary and Tertiary Sustainable Materials, Principles to improve the energy efficiency - siting and vernacular design, shade, ventilation, earth shelter, thermal inertia and air lock entrances. Techniques of sustainable construction - technologies, methods of effectiveness, and design synthesis – alternative materials and construction methods: solar water heating panels; photovoltaic electricity generation; use of local materials and on site growth of food, fuel and building materials.

Recycling and Reuse : Pre building, Building, Post building stages - Architectural Reuse, Waste prevention, Construction and Demolition recycling- Conservation of natural and building resources- Energy and material savings – types of wastes - Elimination of waste and minimize pollution- various Decomposing methods – Innovative reuse of various wastes Case Studies and Rating systems : Sustainable Development Case Studies: illustrated examples of the planning, development, and construction. Green architecture and various international rating systems for sustainability- EAM (UK), CASBEE (Japan), LEED (US), Green Star (Australia), etc. – Indian systems – TERI GRIHA rating, LEED India rating, IGBC

CE 291A Open Elective-I :Energy Efficient Building Design

3L

3 Hrs, MM:100

Environment and man, external environment and built environment, Built-environment – integrated approach.

Climate: elements of climate, classification of climate, Micro-climate, site climate.

Comfort: desirable conditions, thermal comfort factors, comfort indices, effective and corrected effective temp. Tropical summer index.

Thermal Design: heat loss from a building under steady state condition, heat gains due to solar radiation, steady state and cyclic conditions, Means of thermal control – mechanical, structural control, air infiltration into buildings by natural means, shape of buildings,-thermal cube, fabric heat loss, ventilation loss and volume.

Light & Lighting: illumination requirement, day-lighting, artificial lighting, energy conservation.

Noise Control: Sources of noise, means of control, control requirements, behaviour of sound in rooms, vibration & vibration control.

Building Services: Mechanical & electrical services in building, lifts, escalators.

ChE 291 A Open Elective-I : Renewable Energy Sources

3L

3 Hrs, MM:100

Sources of energy: Energy sources and their availability, renewable energy sources.

Energy from Biomass: Introduction, Biomass as a source of energy, Biomass conversion technologies, Biogas generation, classification of biogas plants, Biomass gasification.

Solar Energy: Sun and solar energy, solar radiation and its measurement, solar energy collectors, solar energy storage, Photovoltaic systems, Application of solar energy.

Wind Energy: Wind as an Energy source, Basic principles of wind energy conversion, Types of Wind machines, Components of wind energy conversion system, Performance of wind machines, application of wind energy.

Geothermal Energy: Introduction, Origin and distribution of geothermal energy, types of geothermal resources, Hybrid geothermal power plant, Application of geothermal energy.

Hydrogen energy: Introduction, Hydrogen production, Hydrogen storage, Hydrogen transportation.

Energy from the Oceans: Introduction, Ocean Thermal Electric Conversion (OTEC), Energy from Tides, Ocean Waves.

CSE 292A - OBJECT ORIENTED PROGRAMMING THROUGH JAVA (Open)

3L

3 Hours, 100 Marks

Overview of object oriented concepts in JAVA.

Introduction – Java & internet, java applets and its applications, Java features like – security, portability, byte code, java virtual Machine, object oriented, robust, multi threading, architectural neutral, distributed & dynamic.

Data types and control structures, operators, arrays, Java methods and classes.

Inheritance of procedures and data, Packages and interface, exception handling, multi-threaded programming – thread priorities, synchronization, messaging, creating and controlling of threads. IO and applets.

String handling and various string functions.

Java utilities like java.lang, java.util and their uses, java.io, basics of networking using Java.

Java applets and their use, event handling, AWT and working with windows.

Introductory study of Java Beans, Servlets and JDBC.

EE 291 A Open Elective I: Industrial Application Of Electrical Drives

3L

3 Hours, 100 Marks

Operating-Characteristics : Individual, group and collective drives, steady state individual and joint characteristics of electric motors and driven industrial units under different conditions of operation.

Transient Characteristics : Causes of transient conditions starting, braking, reversing, speed transition and sudden system changes. Forces and torques on the drives referred to a common reference shaft. General equation of motion, Accelerating and deaccelerating times. Starting and braking time and means of reducing.

Drives Control : Parameters characterizing speed control methods of electric drives, speed control of Industrial d.c. and a.c. motors under constant and varying torque and h.p. conditions.

Families of speed torque characteristics : Idea of manual and automatic control gears, Master-controller.

Motor Ratings : Continuous-short time and intermittent ratings, overload capacity. Effect of altitude, Motor heating and cooling curves. Equivalent current, power and torque. Selection motor for various duty cycles. Permissible frequency of starting, features of load diagram construction. Load equalisation and use of fly wheels. Types of motor enclosures.

Illumination : Units of light, Point , linear and surfact sources. Laws of illumination. Candle power distribution, MSCP and reduction factor, Indoor lighting system and their classification. Contrast, glare, shadow and colour. Mounting height and spacing. General and local lighting Total lumen and point by point methods of calculations. Outdoor lighting distributor and protector fittings. Isolux diagram. Flood, gas, discharge and arc-lamp-working, characteristics and applications.

Electric Heating and Welding : Principles of electric heating. Direct and indirect resistance heating, lead baths and salt baths. Resistance oven convection and radiation ovens. Arc resistance and induction furnance, elements of operation, performance and power supply arrangements. temperature regulation of ovens and furnances. Induction, high frequency and dielectric heating and their uses. Elementary study of different kinds of electric welding operation, Power supply for welding. Elements of Electrics Traction : Electric traction versus others System of electric traction for tramways, trolley buses, motor coach trains and locomotive hauled trains. Idea about suitability of electric motor for traction. Conductor rail and pantograph. meaning for multiple-unit operation.

Economics : Methods for economic selection of Industrial drives, loss factor and cost of losses, Effect of load factor. Power factor and factory diversity factor. Methods of power factor improvement and its economic limit. Economic calculations for illumination schemes Echnomic value of good lighting.

Ma-291 A Open Elective-I :Mathematical Statistics for Engineers

3L

3 Hrs., M M :100

Theory of probability : Theoretical probability distribution (Binomial, Poisson and Normal).

Correlation and Regression Analysis : Karl-Pearson's coefficient , Spearman's coefficient, Regression analysis of two variables system.

Sampling Theory : Test of significance, Large sample tests for mean and proportions. χ^2 (chi-square) , t and F Test of significance for Small sample.

Theory of attributes: association and independence of attributes, coefficient of association.

Index Number: Various types of index numbers, construction of index number of prices, fixed base and chain base methods

ME- 291A Open Elective-I: Renewable Energy Sources

3L

3 Hrs, MM:100

Principal types of fossil fuel fired power plants and their effects on livestock and environment; Concepts of NCES, Criteria for assessing the potential of NCES, Limitations of RES.

Solar Energy - Solar radiation data, solar energy conversion into heat, Analysis of Flat plate and Concentrating collectors, Testing procedures, Paraboloid Dish, Central Receiver; concept of collector tracking, energy storage systems; Solar thermal systems for residential water heating, Solar Pond, industrial process heating and power generation. Photo voltaic: p-n junctions, I-V characteristics of solar cells, Calculation of energy for photovoltaic power generation; Battery Characteristics, DC Power Conditioning Converters, AC Power Conditioning -Inverters.

Wind Energy: Energy available from wind, General formula, Lift and drag. Basis of Wind energy conversion, Effect of density, Frequency variances, Angle of attack, Wind speed, Determination of torque coefficient, Principle of Operation of wind turbines, types of wind turbines and characteristics, Generators for Wind Turbines, Control strategies.

Biomass and Biofuels: Conversion routes- combustion, pyrolysis of biomass to produce solid, liquid and gaseous fuels; Constructional details of gasifier; Aerobic and anaerobic digestion, Biofuels and their production; biofuels, Biomass systems for thermal applications and power generation.

Geothermal Energy: Definition and classification of resources, typical geothermal gradient; Dry, flash and binary steam systems; Utilization for electricity generation and direct heating, Wellhead power generating units. Basic features: Atmospheric exhaust and condensing, Exhaust types of conventional steam turbines.

An overview of other renewable devices- Fuel cells: principle, types, applications; Ocean thermal energy conversion (OTEC), Thermoelectric, MHD, Wave energy, Tidal energy, etc.

Economic Viability: Calculation of the cost of energy supply from renewables, Payback period, Carbon footprints; Comparison with conventional fossil fuel driven systems in terms of costs and emissions; Calculation of carbon dioxide reduction and incremental costs for renewable options.

ME 292 A Open Elective-I: Automobile Engineering

3L

3Hrs, MM:100

Power Unit: Automobile engine types, classification; Engine parts: cylinder head, block and crank case, piston and rings; Carburation, fuel injection, valve operation; Fuel combustion, mechanical power and engine performance characteristics; Engine cooling and thermal stresses in parts,.

Chassis and Suspension: Load on frame, general considerations for strength and stiffness, engine mounting; Dampers, leaf and coil springs, various arrangements of suspension systems.

Transmission System: Clutches, flywheels, torque convertors; Gear-box: simple, synchromesh and overdrive; Type of universal joints, propeller shaft, differential; Rolling, air, gradient resistances and propulsive power calculation.

Steering: Steering geometry, Ackermann and Davis steering mechanisms; Telescopic steering; Steering shaft, gear-box, linkages, steering angles, front and rear axles; Vehicle longitudinal, static and dynamic balancing and electronic stability; Power steering: types and mechanism; Effect of caster, camber, toe-in and toe-out on tyre wear.

Brakes and Tyres: Servo-action, brake components; Bendix and Gerling system lock-head, hydraulic, vacuum, air and power brakes, and retarders; Pneumatic and tubeless tyres;

Features of a Modern passenger Car: Introduction to ABS, Front and side air bags, EBD, Climatizer, ESP, night-vision dashboard system; sun-roofing, collision warning system, Hybrid cars.

MI 291A Open Elective-I: Tunneling for Engineering Projects (MI)

3L

3 Hrs, MM:100

Tunneling: Introduction about tunnels, functions, advantages and disadvantages of tunnels compared to open cuts, Criteria for selection of size and shape of tunnels, consideration in tunneling, geological investigation, tunnel alignment, tunnel shafts, pilot tunnels. Advantages of twin tunnels and pilot tunnels, portals and adits.

Conventional Method of Tunneling: Drilling, Blasting, Loading and Transport of Muck, Supports, Ventilation, Drainage, and Equipments. Drivage work in varying ground conditions using conventional methods

Fast Tunneling: Dill jumbos, trackless mucking and transportation units. Tunnel boring machine

Tunneling in Soft Ground: General characteristics of soft ground, shield methods, needle beam method and NATM method of tunneling in practice.

Tunneling (rock bolting and guniting), Safety measures, Ventilation in tunneling, Lighting, Drainage.

PI 291A Open Elective-I: Manufacturing Science

3L

3 Hrs, MM:100

History and introduction to science of basic manufacturing processes and its classification.

Primary manufacturing processes: Introduction to liquid state forming process (casting), solid state forming process (drawing, extrusion, rolling, forging and other sheet metal working) and powder state forming process (powder metallurgy).

Secondary manufacturing processes: Introduction to material removal processes

Conventional Machining processes (basic machining operations performed of lathe, shaper, milling, drilling and grinding machine).

Introduction to basic metal joining processes (welding, brazing, soldering and mechanical fastening).

Non conventional machining processes (Basic introduction, classification, need for their development, characteristics and their industrial applications).

SE 291 A OPEN ELECTIVE -I: Computer oriented Numerical Analysis

3L

3 Hrs. MM : 100

Error Analysis:- Approximations and errors, Round off errors. Roots of Equations:- Bisection method, Newton – Raphson method. Curve Fitting:- Linear Regression, Least Square Ft, Co-relation. Interpolation:- Linear & Quadratic, Newton's & Lagrange's polynomials. Numerical Differentiation:- Forward / Backward / Centered F.D. method. Numerical Integration:- Trapezoidal rule, Simpson's rule. Solution of simultaneous Linear algebraic equations.

SYLLABUS OF OPEN ELECTIVES-II

BCT 341 A Open Elective-II: Traditional Indian Architecture

3L,

3 Hrs, MM 100

To provide theoretical knowledge base on the uniqueness of Indian traditional Architecture principles, the meaning of space, the manifestation of energy, the selection of site and how 62 integration of built form with site happens at metaphysical level based on articulation of celestial grid.

To introduce the principles of Vastu and relationship between building and site. To familiarize the students with the units of measurement in traditional architecture. To introduce concepts of orientation and cosmogram according to the Vastu Purusha Mandala. To study the detailing and design of various building components and their material and method of construction.

Vastu - its definition and classification - Relationship to earth.. Features of good building site - good building shapes - macro, micro, enclosed and material spaces - relationship between built space, living organism and universe - impact of built space on human psyche.

Orientation of building, site, layout and settlement - positive and negative energies - importance of cardinal and ordinal directions - The celestial grid or mandala and its types. The Vaastu Pursha Mandala and its significance in creation of patterns, and lay-outs, Types of lay-outs. Simple design of residential buildings.

Building heights -Base and basement - wall and roof specifications - column and beam designs - Pitched roof and domical roofs - significance of pyramid.

Use of wood, stone, metal, brick and lime - marking technology, corbelling technology, jointing technology - foundations for heavy and light structures - Landscaping in and around buildings - Aesthetics in Indian Architecture.

CE 341A Open Elective-II: Non Urban Public Hygiene & Drinking Water

3L,

3 Hrs, MM 100

Communicable disease: Disease and immunity, communicable disease sources, mode of transfer. Control of communicable disease.

Fly and mosquito control: Life cycle of flies and mosquitoes. Various methods of fly and mosquitoes control.

Milk and food sanitation: Essential of dairy farm and cattle shed sanitation. Tests for milk and dairy products. Food epidemic, food poisoning. Botulism. Rural sanitation, village latrines, aqua privies, storm water and sullage problems, animal waste, methods of composting. Biogas collection and disposal of refuse, solid waste management through vermicomposting.

Septic tank (only salient features), percolation pits, sub surface disposal.

Rural water supply: Importance of village community in India, conditions of Indian villages with special regards to economic, social and health aspects. Quality of water needed for village community, sources of water for village water supplied, domestic roof water harvesting. Types of wells of sanitary aspects in well construction. Disinfections of wells. Different types of pumps used for village wells. Operation and maintenance of pumps, water borne diseases. Quality of water, human and cattle population and their water requirement. Rate of water supply. Standards of potable water. Rain water storage.

Treatment of water: Disinfection, desalination, Defluoridation, distribution of water.

ChE 341 A Open Elective-II: Petroleum Refining Technology

3L,

3 Hrs, MM 100

Origin occurrence of petroleum, Formation and Evaluation of Crude Oil. Testing of Petroleum Products. Petroleum refining processes, general processing, topping and vacuum distillations. Thermal cracking in vapor, liquid and mixed phase. Overview of Refinery Products

Catalytic cracking - Houdry fixed bed, fluidized bed, T.C.C. Houdry flow etc. Catalytic reforming - conversion of petroleum gases into motor fuel with special reference to alkylation, polymerization, hydrogenation and dehydrogenation.

Treatment Techniques: Removal of Sulphur Compounds in all Petroleum Fractions to improve performance, Destruction of Sulphur Compounds and Catalytic Desulphurization, Solvent Treatment Processes, Dewaxing, Clay Treatment and Hydrofining.

Production of aviation gasoline, motor fuel, kerosene, diesel oil, tractor fuel and jet fuel, hydrodesulfurisation, Lubricating oil manufacture, Petroleum waxes and asphalts.

Octane number, Cetane number, Diesel index, their determination and importance Storage of petroleum products: tanks, bullets, special types of spheres etc. Transportation of petroleum products: road, rail, sea and pipeline; Importance of pipeline transportation.

EE 341 A Open Elective II: Optimization Techniques

3L

3 Hrs, 100 Marks

Introduction to Optimization : Historical Development, Engineering application of optimization, Statement &

Classification of optimization problems, Classical optimization techniques for single & multiple variable functions.

Linear Programming : Introduction, application, standard form, Basic Solutions, Simplex method, Revised Simplex method, Duality, Transportation problem, Carmarkar's method.

Nonlinear programming : Unconstrained Optimization, Introduction, Fibonacci method, Golden section search, Gradient method, Newton's method, Quasi Newton method.

Dynamic Programming : Introduction, Multistage decision process, Concept of optimization & principle of optimality, Computational procedure in dynamic programming.

Advanced topics in optimization : Introduction, Separable programming, Multi objective optimization, Calculus of variation.

Books :

Engineering Optimization – S. S. Rao, New Age International Publishers.

An introduction to optimization – Er. K. P. Chong, S. H. Zak (Wiley Slident Edition)

Operations Research : An international – H. A. Taha (PHI)

Introduction to operation research – Hiller F.K. & Lieberman (TMH)

EE 342 A: ARTIFICIAL INTELLIGENCE

3L

3 Hours, 100 Marks

Introduction: Economics for Electrical Engineering, concept of physical efficiency and financial efficiency of electrical goods and services supply and demand, Elasticity. Necessities and luxuries, free competition, monopoly, law of diminishing returns.

Interest and Depreciation: Interest rates and equivalence, annuities and various factors, concept of depreciation in utilizing electrical energy, economic life of electrical machines, salvage value, various methods of depreciation calculations, equivalent capital recovery depreciation.

Economical choice of Electrical Apparatus: Motors, transformers, Economical choice between synchronous motors and Induction motor running them simultaneously.

Comparison of Alternatives: Basic economic study patterns, annual cost, capitalized cost, present worth, rate of return, Increment investment, pay back and benefit to cost ratio methods and their respective fields of applications.

Ma 341 A Open Elective-II :Mathematical Theory of Operations Research

3L

3 Hrs., MM : 100

Linear programming problems-Simplex Method, two phase method, Duality of LPP.

Theory of games: Competitive strategies, minimax and maximin criteria, two person zero-sum games with and without saddle point, dominance .

Inventories: Single item deterministic inventory models with finite and infinite rates of replenishment, economic lot-size model with known demand

Replacement problems: Replacement of item that deteriorate, replacement of items that fail completely, group replacement policy, individual replacement policy

Queuing theory-Ques with Poisson input and exponential service time, the queue length, waiting time and busy period in steady state case, model with service in phase, multiserver queueing models.

ME 342A Open Elective-II: Finite Elements Method

3L

3 Hrs., MM: 100

Introduction: Basic concept of Finite element method; Rayleigh-Ritz and weighted residual method of variational approximation, Numerical Solution of equilibrium problem by Gaussian elimination.

Finite Element Analysis of One-dimensional Problem; Basic Concepts, derivation of elements equations, connectivity of elements, imposition of boundary conditions, Solution of equations, Application in One dimensional problem of Solid mechanics and heat transfer.

Finite Element Analysis of Two Dimensional Problem: Single variable problems: finite element discretization, interpolation, function, numerical integration and modeling considerations for triangular, rectangular, Quadrilateral, Isoparametric and Plane frame elements, Evaluation of equation and their solutions, Application in Two Dimensional Problem of Solid mechanics, Heat Transfer and Eigen value problems.

MI 341A Open Elective-II: Application of GIS & Remote Sensing in Engineering

3L

3 Hrs, MM:100

Remote Sensing: Introduction to Remote Sensing, Terminology in Remote Sensing, Types of Remote sensing, advantage and disadvantage of remote sensing data, Electromagnetic radiation atmospheric. Windows remote sensing platforms and sensors systems, path-row referencing system, remote sensing data product, procedure for obtaining satellite data. Hardware and software related to remote sensing.

Different types of platforms, sensors and their characteristics, Orbital parameters of a satellite, Multi concept in remote sensing.

Image Interpretation and analysis: Elements of visual image interpretation, Digital image pre-processing, radiometric correction, geometric correction, resolution of remote sensing data, image enhancement, contrast enhancement, spatial filtering band rationing image classification supervised and unsupervised classification, remote sensing applications in forestry, geology, hydrogeology, Land use and land cover mapping.

Principles of interpretation of aerial and satellite images, equipments and aids required for interpretation, ground truth – collection and verification, advantage of multirate and multiband images. Digital image Processing concept.

Geographic Information System (GIS): Fundamental of GIS: Basis concept including definition and history of GIS, Essential Elements of GIS, Uses and users of GIS, General GIS Applications, Geodesy, Grids, Datum's and projection systems, GIS Data structure, Data Formats, GIS layers and Digitization overview of GPS and its application, Hardware and software related to GIS.

Raster and vector Based GIS: Raster based GIS, Definition of Raster Based GIS, Spatial Referencing Definition and Representation of Raster Data. Vector based GIS, Definition and concept of vector based GIS, Data structure, Data Capture and Basic operations of spatial analysis, advantages and disadvantage in raster and vector based GIS, Introduction to network in GIS, GIS Project Planning Management and Implementation.

Application of GIS :in Map revision, Land use, Agriculture, Forestry, Archaeology, Municipal, Geology, water resources, soil Erosion, Land suitability analysis, change detection, Use of GIS in Mining.

SE 341A Open Elective-II :Structural Dynamics

3L

3 Hrs, MM: 100

Vibrations of single degree of freedom system, sources of vibration, Types of vibration, Degree of freedom, spring action and damping, equation of motion of single degree of freedom system, undamped system of single degree of freedom, combination of stiffnesses, damped system of single degree of freedom, dry friction, damping forced vibration of damped system, introduction to multi degree freedom system.

SYLLABUS OF OPEN ELECTIVES-III

BCT 391 A Open Elective-III: Climate Responsive Architecture

3L,

3 Hrs, MM 100

Understanding Climate and its impact on architectural design, fundamentals of climatology and environmental studies. Introduction – Elements of Climate, measurement and representation of climatic data. Classification of climate, major climatic zones of India.

Thermal Comfort: Effect of climatic elements on Thermal comfort; indices for Thermal comfort Thermal performance of building elements: Thermal and physical properties of building materials and their effect on indoor environments.

Natural ventilation: Functions, effects of openings and external features on internal air circulation. Design considerations for achieving natural ventilation.

Sun path diagram, use of solar charts, types of shading devices

Day light factor: components, design considerations for indoor spaces

Micro Climate: factors and effects

Construction techniques for improving thermal performance of walls and roofs. Passive cooling techniques: traditional and contemporary

Design considerations for buildings and settlements in tropical climates with special reference to hot-dry, warm-humid and composite climates; Mahoney Tables.

Exercises:

Design of shading devices.

Layout of Residence for hot - dry, warm-humid and composite climates.

CE 391A Open Elective-III: Ecosystem & Biodiversity

3L,

3 Hrs, MM 100

Concept of an ecosystem, structure & function of ecosystem, Bio-Geo chemical cycles (Hydrological, carbon, oxygen, nitrogen, phosphorus & sulphur cycle), energy flow in ecosystem, food chain

Major ecosystems (Description only) : Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystem, Riverine and stream ecosystem, Marine ecosystem, Estuarine ecosystem.

Biodiversity : Definition and its importance. Biodiversity at global, national & local level. Hot spots of biodiversity, Threats to biodiversity & causes of biodiversity loss. Conservation of biodiversity.

Value of biodiversity: Consumptive use, productive use, social value, ethical value, aesthetic value& optional value.

Bio-geographical classification of India. India as mega- diversity nation

ChE 391 A Open Elective-III: Nanotechnology

3L,

3 Hrs, MM 100

Introduction to Nanotechnology: Introduction to nanotechnology and materials, Nanomaterials, Introduction to nano sizes and properties comparison with the bulk materials, different shapes and sizes and morphology.

Fabrication of Nanomaterials: Wet Chemical Synthesis Methods, Colloidal Nanoparticles Production, Sol Gel Methods, Microwave and Atomization, Gas phase Production Methods : Chemical Vapour Depositions.

Kinetics at Nanoscale: Nucleation and growth of particles, Issues of Aggregation of Particles, Layers of surface Charges, Zeta Potential and pH.

Carbon Nanomaterials: Synthesis of carbon buckyballs, List of stable carbon allotropes extended fullerenes, metallofullerenes solid C₆₀, bucky onions nanotubes.

Nanomaterials characterization: Instrumentation Fractionation principles of Particle size measurements, Particle size and its distribution, XRD, Zeta potential Microscopies SEM, TEM, Atomic Forced Microscopy, Scanning and Tunneling Microscopy

Applications in Chemical Engineering: Self-assembly and molecular manufacturing : Surfactant based system Colloidal system applications, ZnO, TiO₂, Silver Nanoparticles Functional materials Applications, Production Techniques of Nanotubes, Carbon arc, bulk synthesis, commercial processes of synthesis of nanomaterials, Nanoclay, Commercial case study of nano synthesis - applications in chemical engineering.

CSE 391A – WEB TECHNOLOGIES (Open)

3L,

3 Hrs, MM 100

Understanding Microsoft .NET Framework and ASP.NET, Creating components in Visual C#. CLR, Framework Class Library, Undocumented Types.

Programming the .NET Framework, Common Types, Math, Strings, Collections, Regular Expressions. Core Types, Serialization, Remoting, Graphics, Rich Client Applications, Globalization, Configuration, Advanced Component Services.

Multithreading, Thread Synchronization, Inter-thread Communication and Monitor. Delegates & Events. Validating User Input.

Creating a Connection to the Database, Displaying a DataSet, List-Bound Control, Paging and Selection, DataGrid Control, Accessing Data with DataReaders and SqlDataReader. Overview of Stored Procedures.

Managing State, State management, Application and Session Variables, Cookies and Cookieless Sessions. Configuring, Optimizing. Using the Cache object.

Reading and Writing XML Data, Overview of XML Architecture, DataSet Object, XML Web Server Control, Reading, Transforming, and Displaying XML, Nested Data. Creating an XML Web Service.

Securing a Microsoft ASP.NET Web Application, Web Application Security Overview, Windows-Based Authentication, Forms-Based Authentication, Passport Authentication, Registering New Users, Permitting Users to Sign Out.

AJAX.NET Architecture, Working with AJAX Pro and Controls, Accordion, Calendar, CascadingDropDown, CollapsiblePanel, Filtered TextBox, Numeric Up Down, Modal Popup, Popup Control. Page_Load Event and Click Event Procedure, Adding server controls to an ASP.NET Web Form basics, handling text and numbers.

EC 391 A: ELECTRONIC INSTRUMENTATION

3L

3 Hours, 100 Marks

Transducers: Construction, characteristics and circuits for common types of resistive, capacitive, inductive, magneto-structive; piezo-electric. Photo-electric and thermo-electric transducers for measurement of process physical variables. Various sensing elements and transducers for measurement of Force, Pressure, Humidity, Moisture, strain, Velocity, Acceleration and pH. Inductive and Capacitive proximity switches. Physical and electrical loading of and by the transducer Systems.

Signal Conditioning: Analog and digital signal conditioning for instrumentation. Objectives of DAS, components of analog DAS and digital Data acquisition system, digital data recording system, multi channel DAS, modern digital acquisition system.

Electronic Displays: Principle of LED numeric, matrix and alpha-numeric displays, flat panel CRT, LCD, electro-luminiscent and electrophoretic and touch screen displays.

EE 391 A Open Elective III: Soft Computing Techniques

3L

3 Hours, 100 Marks

Soft Computing : Introduction of soft computing, soft computing vs. hard computing, various types of soft computing techniques, applications of soft computing.

Artificial Intelligence : Introduction, Various types of production systems, characteristics of production systems, breadth first search, depth first search techniques, other Search Techniques like hill Climbing, Best first Search, A* algorithm, AO* Algorithms and various types of control strategies. Knowledge representation issues, Prepositional and predicate logic, monotonic and non monotonic reasoning, forward Reasoning, backward reasoning, Weak & Strong Slot & filler structures, NLP.

Neural Network : Structure and Function of a single neuron: Biological neuron, artificial neuron, definition of ANN, Taxonomy of neural net, Difference between ANN and human brain, characteristics and applications of ANN, single layer network, Perceptron training algorithm.

Fuzzy rule base system : fuzzy propositions, formation, decomposition & aggregation of fuzzy rules, fuzzy reasoning, fuzzy inference systems, fuzzy decision making & Applications of fuzzy logic.

EE 392 A Open Elective III: Energy Conservation

3L

3 Hours, 100 Marks

Elements of Energy Conservation and Management : General energy problem, Sector wise Energy consumption, demand supply gap, Scope for energy conservation and its benefits, Energy conservation Principle Maximum energy efficiency, Maximum cost effectiveness. Mandatory provisions of EC act Features of EC act Standards and labeling, designated consumers, Energy Conservation Building Codes (ECBC). Energy management concept and objectives Initializing Planning, Leading, Controlling, Promoting, Monitoring and Reporting, energy management programmes.

Energy Conservation Approaches In Industries : energy saving opportunities in electric motors Benefits of Power factor improvement and its techniques Shunt capacitor, Synchronous Condenser etc., Effects of harmonics on Motors, and remedies leading to energy conservation Energy conservation by VSD Methods and techniques of energy conservation in ventilation and air conditioners compressors pumps, fans and blowers Area Sealing, Insulating the Heating / cooling fluid pipes, automatic door closing Air curtain, Thermostat / Control Energy conservation in electric furnaces, ovens and boilers lighting techniques Natural, CFL, LED lighting sources and fittings

Energy Conservation in Power Generation, Transmission and Distribution : Performance improvement of existing power plant: cogeneration, small hydro, DG Set. Demand side management Load response programmes Types of tariff and restructuring of electric tariff Technical measures to optimize T and D losses.

Ma 391 A Open Elective-III: Advanced Numerical Analysis

3L

3 Hrs., MM : 100

Solution of Algebraic and Transcendental Equations: Newton-Raphson method for real multiple roots, for complex roots and for system of non-linear equations; Synthetic Division, Birge-Vieta Method.

Solution of simultaneous Linear Equations and Eigen Value Problems: Direct methods: Gauss-elimination, Gauss-Jordan, Iterative Methods: Jacobi iteration, Gauss-seidel iteration and Successive Relaxation method. Eigen value Problems: power method

Curve fitting and Function Approximation: Chebyshev approximations, Chebyshev Expansion, Chebyshev Polynomials. Economization of Power Series.

Numerical Solution of Partial Differential Equations: Finite difference Approximation to partial derivatives. Solution of Laplace and poisson equations, Solution of one and two dimensional heat and wave equation by the method of separation of variables.

ME 391A Open Elective-III: Design Planning and Control of Production System

3L

3 Hrs, MM:100

Production Planning: Planning horizon, product exploring, Make and buy decisions, operations planning, demand forecasting, conversion of forecast into production goal.

Scheduling: Operation sequencing and balancing, Scheduling for mass production and job order production, MRP, ERP.

Inventory System: Cost factors relevant to operations and inventory control, EOQ with shortages and uniform production, quantity discount.

Project Planning and Control: Network control, control cost consideration and optimization, Resource allocation and levelling, Aggregate production planning, decision rules.

Supply Chain Management:: Strategic framework of Supply chain – meaning, scope and performance of supply chain, supply chain drivers and obstacles. Role of e-business in a supply chain.

ME 392A Open Elective-III: Systems Design and Analysis

3L

3 Hrs, MM:100

System Fundamental Concept: System definition, systems approach, Classification- General Systems, Discrete Systems, Controlled systems.

Procedure for Engineering a system: Defining system objective, formulation of objective criteria, Development of system alternatives.

Systems Optimization: Formulation of system, Design problem and application of search methods, Linear programming and dynamic programming for optimum solutions.

System Schedule: Time models, resource allocation, Time cost trade-off, system cost economic flow graph.

MI 391A Open Elective-III: Project Environment Clearance

3L

3 Hrs, MM:100

Brief introduction of Environment Protection Act 1986 and other relevant legal provisions applicable to get environment clearance in India.

Impact of major engineering projects on various components of the environment: Socio-Economy, Land, Water, Air, Noise and others.

Preparation of Environment management plan: Public hearing, collecting baseline data, Environment impact assessment and predication, Environment management plan, environment monitoring and management.

PI 391A Open Elective-III: Quality Management

3L

3 Hrs, MM:100 Marks

Introduction: History of Quality, Objectives , importance and need of quality, Contributions of Quality Gurus- Juran, Deming, Crosby, Feigenbaum, Ishikawa, Taguchi etc., Impact of Quality on business performance.

Process and Statistical Quality Control: Quality System; Quality control techniques; Process capability; Control Charts- Theory of control charts, control limits and specification limits, Control charts for variables-X R Charts, Control Charts for attributes p, np, c and u charts.

Acceptance Sampling : Fundamental concepts of acceptance sampling; OC Curves; Single , Double and multiple sampling;

Quality Management: Introduction to Quality management; quality control and quality assurance; Quality control tools; cost of quality and cost of poor quality.

ISO 9000: ISO 9000 series; terminologies; need for ISO 9000 certification; basic procedure and work instructions; steps in ISO 9000 registration; Internal and third party audit for registration; Clauses of ISO 9000-2000 .

SE 391A Open Elective-III :Finite Element Method

3L

3 Hrs, MM:100 Marks

Introduction to Finite Element Method, Basic Concept of Finite Element Method, Analysis of continuum:- Structural, thermal, Potential etc., Finite Element Analysis of an elastic continuum:- Displacement approach, Direct Formulation, Energy Integral, Co and C1 continuity, Convergence criteria.

Elements:- Types and Properties. Conforming and Non conforming.

Shape Functions:- Lagrangian and Serendity family for one and two dimensional cases.

Pascal triangle, Super / Sub and Iso parametric elements.

Steps in Finite Element Analysis of an elastic continuum.

**B. E. II YEAR (ELECTRONICS & COMPUTER ENGINEERING)
III SEMESTER EXAMINATION**

Ma 201 A (EC/ECC/EEE) - Advanced Engineering Mathematics I

2L

3 Hours, 100 Marks

Section A

Differential equations : Simultaneous differential equations, Total differential equations, Partial differential equations of first order, Charpit's method, Linear homogeneous partial differential equations with constant coefficients, Second order partial differential equations : Monge's method for the equation of type

$$Rr + Ss + Tt = V$$

Solution of Wave, Heat and Laplace equations using separation of variables method.

Section B

Complex Analysis : Analytic function, Harmonic function, Construction of an Analytic function, Complex integration: Cauchy's integral theorem, Cauchy's integral formula, Derivative of Cauchy's integral formula.

Taylor's and Laurent's series expansion of complex functions.

Cauchy's residue theorem and its application to evaluate the contour integrals of type $\int_0^{2\pi} f(x)dx$ and

$$\int_{-\infty}^{+\infty} f(x)dx$$

Transformations: conformal and bilinear transformations.

Section C

Probability and Statistics: Theorems of probability and their application, Binomial, Poisson and Normal probability distribution. Correlation and Regression analysis of two parameters.

Note: Candidates are required to attempt FIVE questions in all, selecting at least one from each Section.

EC 202 A – Network Theory (EC/ECC/EEE)

2L, 1T

3 Hours, 100 Marks

Network Equations: Topology incidence, cut-set and tie-set matrices. Mesh and nodal analysis of networks with independent and dependent sources. Duality, Transient and steady state solutions of D.C. and A.C. networks.

Network Theorems: Superposition, Thevenin, Norton, Reciprocity. Maximum power transfer. Millman and Tellegen's Theorems and their applications to D.C. and A.C. circuits

Resonance: Resonance in series and parallel- circuits. Q-Factor, bandwidth and selectivity.

Non-sinusoidal Periodic Waveforms: Fourier series- trigonometric and exponential forms. Response of network to non-sinusoidal periodic waveforms.

Two Port Networks: Different two port parameters and their inter-relations and characteristic functions, interconnection of two port networks, Brune's test. Network configurations. Symmetrical and asymmetrical two port communication networks. Iterative, Image and characteristic impedances, Propagation, attenuation, phase and Image transfer constants. Balanced, unbalanced and reciprocal networks; T.L. lattice and bridged T network

Network Functions: Generalized concept of complex frequency, Impedance and admittance functions. Exponential excitation and system functions. Driving point and transfer functions. Pole zero configuration of system functions.

ECC 203 A – Solid state Electronics Devices (ECC)

2L, 1T

3 Hours, 100 Marks

Introduction to Solid State Devices: Space charge region and junction capacitance. Minority carrier injection, carrier storage and transient response. Impact ionization and avalanche break-down.

Analytical theory of junction diodes, BJT, JFET, MOSFET, UJT, diffused transistors, avalanche transistors. Degenerated semi-conductors and theory of tunneling. Theory of tunnel diodes, Zener diodes, Varactor diodes, photo diodes, LEDs, photo-transistors, photo FETs and LASER. Elementary theory of composite junction. Ohmic junctions and hetero junctions.

Characteristics and small signal models of MOSFET, MISFET and MESFET; Characteristics of CMOS and BiCMOS; design of CMOS inverter: Power dissipation characterization, timing issues and noise margins; CMOS based NAND and NOR gates.

Single crystal growth, wafer preparation epitaxial growth deposition and characterization of oxide layers, masking Ltnography, dopant diffusion, and ion- implantation.

Process integration, MOS based silicon microcircuits, BJT based silicon microcircuits, BiCMOS process flow.

ECC 204 A - Data Structure (ECC)

3L, 1T

3 Hours, 100 Marks

Complexity Analysis : Time and Space complexity of algorithms, asymptotic analysis, big O and other notations, importance of efficient algorithms, program performance measurement, data structure and algorithms.

Linear Lists : Abstract data type, sequential and linked representations, comparison of insertion, deletion and search operations for sequential and linked lists, list and chain classes, doubly linked lists, circular lists, linked lists through simulated pointers, skip lists, applications of lists in bin sort, radix sort, sparse tables.

Stacks and Queues : Abstract data types, sequential and linked implementation, exception handling in classes, representative applications such as parenthesis matching, towers of Hanoi.

Hashing : Search efficiency in lists and skip lists, hashing as a search structure, hash table.

Trees : Binary trees and their properties, terminology, sequential and linked implementations, tree traversal methods and algorithms, heaps as priority queues, heap implementation, insertion and deletion operations.

Search Trees : Binary search trees, search efficiency, insertion and deletion operations, importance of balancing, AVL Trees, searching insertion and deletions in AVL trees, red- black trees, comparison with AVL trees, search insert and delete operations.

Sorting : Selection sort, heap sort, bubble sort, quick sort, merge sort and radix sort, their operations.

EC 205A – Digital Electronics - I (EC/EEE/ECC)

3L, 1T

3 Hours, 100 Marks

Device Characteristics: Steady state and transient switching characteristics of diodes, BJTs, FETs, UJTs. Wave shaping circuits. Integrating and differentiating circuits, effects of time constant, relation of tilt time to time constants. Clipper and clamper circuits using diodes and transistors. Saturated and unsaturated transistor switches. Speed-up capacitors. Inverter circuits. Performance of pulse transformer and lumped distributed parameter electromagnetic delay lines.

Relaxation Oscillators: Theory, operation and performance of astable, monostable and bistable multivibrators. Different triggering circuits. Theory of Schmitt trigger. Comparison of performance of various circuits configurations of multivibrators and their fields of applications. Tunnel diode. UJT relaxation oscillator. Theory of astable and monostable blocking oscillators and their triggering methods.

Sweep Circuits: Free running and triggered modes. Theory and common circuits of voltage and current time base generators.

Sampling Gates: Theory, operation and applications of unidirectional and bi-directional sampling gates using diodes and transistors.

ECC 206 A - Object Oriented Programming (ECC)

3L, 1T

3 Hours, 100 Marks

A review of C. Concepts of object oriented programming using C++. Data Types: elementary and derived data types, literals.

Operators and expressions: Operators, association and precedence rules of operators, expressions using unary, binary and ternary operators.

Statements: declarations as statements, selection statements, iteration statements, goto statement, break statement return statement, try –catch block.

Functions: void functions, functions with return value, call by value and call by reference parameter passing, default parameters, recursive functions, inline functions.

Classes: classes, object friend functions, classes within a class, local classes, global classes constructors, destructors.

Derived classes: single and multiple derivation of classes, multilevel and hybrid derivation of classes, constructors, destructors.

Polymorphism: Function and operator overloading, virtual functions.

Streams: input and output of built –in data types, manipulators.

File streams : opening a file, accessing a file, closing a file.

Exceptions: catching exceptions, rethrowing the exception, standard exceptions.

Templates: defining a template, template instantiation, function templates, class templates.

Elementary case study of a object oriented database in C++.

**B. E. II YEAR (ELECTRONICS & COMPUTER ENGINEERING)
IV SEMESTER EXAMINATION**

Ma 251 A - ADVANCED ENGINEERING MATHEMATICS (EC/ECC/EEE) - II

2L

3 Hours, 100 Marks

Section A

Transforms: Laplace Transform, Inverse Laplace Transform, Properties of Laplace Transforms, Application of Laplace Transform to solve differential equation with constant coefficients. Z- Transforms. Infinite Fourier Transforms.

Section B

Numerical Analysis : Interpolation with equal intervals: Newton-Gregory interpolation formulae, Lagrange's interpolation formula for unequal intervals. Central difference interpolation formulae: Gauss' forward and backward formulae, Stirling's and Bessel's interpolation formulae. Numerical integration : Trapezoidal rule, Simpson's 1/3 and 3/8 rule. Numerical solution of algebraic and transcendental equations : Bisection, regula falsi and Newton-Raphson methods. Numerical solution of linear simultaneous equations : Gauss' elimination, Gauss-Jordon, Jacobi and Gauss-Siedal methods. Numerical solution of ordinary differential equations : Euler's, Runge-Kutta Fourth order and Milne's methods.

Section C

Special function : Series solution of Bessel and Legendre's differential equations. Generating function of Bessel and Legendre's Polynomials. Orthogonal Property of

Bessel and Legendre's function. Rodrigue's formula.

Note: Candidates are required to attempt FIVE questions in all, selecting at least one from each Section.

ECC 252 A – Electronic Circuits (ECC)

3L, IT

3 Hours, 100 Marks

Biasing: Biasing and stabilization techniques of BJT, JFET, MOSFET for use as amplifiers in various configurations. Small signal models for BJT, JFET and MOSFET in discrete and integrated form. Frequency dependence characterization and equivalent circuits. Miller effect.

Untuned small signal BJT amplifiers: Study of Single stage and multistage. RC coupled and transformer coupled amplifiers. Frequency response, bandwidth, gain and factors affecting them. Various two transistor integrated circuit amplifier stages. Introduction of d.c. amplifiers, differential amplifiers, Cascode and Darlington circuits. Follower circuits and boot-strapping.

Untuned large signal amplifiers: Classification of power amplifiers. Study of single ended, parallel and push-pull Class A, AB and B power amplifiers. Complementary, symmetry and quasi-complementary circuits, Driver and out-put stages, with and without out-put transformers for power amplifiers. Output circuit efficiency calculations for various classes and configuration of amplifiers. Thermal considerations. Derating curves.

Power Supply Circuit: Design factors and applications of various power supply filters and voltage multiplying rectifier circuits.

Regulated Power Supplies: Regulator circuits using solid state devices and monolithic ICS. Adjustable constant voltage power supplies. Adjustable constant current power supplies. Higher output power supplies with solid state pre-regulations. Protection circuits for power supplies. Rating and specifications.

ECC 253 A – Discrete Structures (ECC)

3L, 1T

3 Hours, 100 Marks

Introduction to Discrete Mathematical Structures, Formal Methods: Induction and Analogy, Abstraction. Sets, sequences, empty set, power set, operations on sets, Venn diagram, ordered pair, principle of inclusion and exclusion. Introduction to mathematical logic, statements and notations, well-formed formulas, tautologies, tautological implications, normal forms, the theory of Inference for statement calculus, predicate logic. Graph Terminology, Degrees of Nodes, Isomorphic Graphs, Dijkstra's Shortest Path Algorithm, Planar Graphs, Eulerian Graphs, Hamiltonian Graphs, Traveling Salesman Problem. Trees Introduction Rooted and other Trees, Representation of Prefix Codes, Representation of Arithmetic Expression, Representation of Prefix Codes, Spanning Trees, Traversing Binary Trees, Binary Search Trees. Relations, matrix and graph representation of relation, properties of relations, partitions. Equivalence Relations, Compatibility Relations, Composition of Binary Relations, Transitive and Symmetric closures partially ordered set lattices. Functions, Matrix representation of functions, composition of function, inverse-function. Algebraic Structures, General properties of algebraic systems, groupoids, semigroup, monoids group rings. Applications of algebra to control structure of a program. Homomorphism, Congruences, admissible partitions. Group and their graphs.

EC 255 A – Digital Electronics - II (EC/ECC/EEE)

2L, 1T

3 Hours, 100 Marks

Counters and Registers: Binary and decade ripple counters. One bit counters. Up, down and up-down, synchronous counters. Programmable counters. Divide-by N counters. Storage registers, shift-right, shift-left and bi-directional shift registers. Serial input, serial output, parallel input, parallel output, parallel-in-serial out, serial in parallel out and Universal shift registers and synchronous parallel loading of shift registers. Static and dynamic MOS shift registers. Ring and Johnson counters
Arithmetic Circuits: Digital Comparators, half, and full adders; parallel and serial binary adders, half and full binary subtractors. BCD adders and subtractors. Binary multipliers and divider circuits
Miscellaneous Sub-systems: Encoders, decoders and code converters. Parity checking circuits. Multiplexers and demultiplexers. Digital to analog and analog to digital converters.
Semi-conductor memories: Random and sequential access memories. RAM, ROM, PROM, EPROM.EEPROM, EAPROM, EPLA, GALs. MOS and CMOS memories.

ECC 256 A – Principles of Programming Languages (ECC)

3L, 1T

3 Hours, 100 Marks

Importance of programming languages, brief history, features of good programming language. Translators, Syntax, semantics, virtual computers. Binding and binding time. Elementary and structured data types, their specification and implementation. Type checking and type conversion, vectors arrays, records, character string, variable size data structures. Sets, input and output files. Evolution of the concept of data type, abstraction, encapsulation and information hiding, subprograms, type definition and abstract data types. Implicit and explicit sequence control, sequence control within expression and between statements. Subprogram sequence control, Recursive subprograms. Exception and exception handlers, Coroutines and scheduled subprograms. Task and concurrency, exceptions. Names and referencing environments, Static, dynamic and block structure, Local data and local referencing environments. Dynamic and static scope of shared data, Block structure, parameters and their transmission. Tasks and shared data. Storage requirement for major run –time elements. Program and system controlled storage management. Static and stack – based storage management. Fixed size and variable – size heap storage management.

ECC 262 B - Logic design Simulation and testing (ECC)

2P

100 Marks

Sequential Logic: Storage devices and sequential sub-systems. Introduction to synchronous and asynchronous sequential systems. Mealey and Moore circuits. Cost vs. speed.

Synchronous Sequential Systems: Introductory examples. The finite state model – basic definition. Memory elements and their excitation functions. Synthesis of synchronous sequential circuits. Analysis and design of synchronous sequential circuits. State assignment and reduction technique. Introduction to threshold logic and relay circuits.

Asynchronous Sequential Systems: Fundamental mode circuits, Analysis procedure. Circuits with latches. State assignment in Asynchronous sequential circuits. Design of pulse mode asynchronous sequential circuits. Problems in asynchronous circuits – Races and Hazards.

Ma 261 A: Special Mathematics (all branches) (For Diploma Passed Candidates - common for all branches)

3L, 1T

3 Hrs. MM : 100

Differential Calculus: Asymptotes, curvature, envelopes, evolutes, and curve tracing

Integral Calculus: Rectification . Volumes and surfaces of solids of revolution, differentiations under sign of integration

Differential Equations: Differential equations with constant coefficients and variable coefficients.

Mechanics: Friction , common catenary, kinematics of uniplanar motion, simple harmonic motion

Vector calculus: Gradient , divergence, curl, green's theorem , stoke's theorem, gauss divergence theorem (Verification only)

**B. E. III YEAR (ELECTRONICS & COMPUTER ENGINEERING)
V SEMESTER EXAMINATION**

ECC 301 A - Theory and applications of Integrated Circuits (ECC)

3L, 1T

3 Hours, 100 Marks

Crystal Growth : Czochralski and Bridgman growth, wafer preparation and specifications.

Epitaxial Growth : Thermodynamics of vapour phase growth, selective growth, MOCVD, Molecular beam epitaxy technology gas source MBE and chemical beam epitaxy.

Oxidation : Deal – Grave model, linear and parabolic rate coefficients, oxide characterization, types of oxidation and their kinematics, oxidation induced stacking faults, oxidation systems.

Etching : Wet etching, basic regimes of plasma etching, reactive ion etching and its damages, lift – off, and sputter etching.

Lithography : Optical, electron, X-ray and ion-beam, contact/ proximity and projection printers, advanced mask concepts, alignment.

Metallization : Applications and choices, physical vapor deposition, patterning, problem areas, multilevel metallization.

VLSI Process Integration : NMOS and CMOS IC technology, MOS Memory IC Technology, bipolar IC fabrication.

Assembly Technique and packaging : Package types, packaging design consideration, VLSI assembly technologies.

Yield and Reliability : Yield loss in VLSI, yield loss modeling, reliability requirements, accelerated testing, BIST.

Applications – CMOS inverter, combinational & sequential logic, Arithmetic Building blocks - Adder, multiplier, shifters;

Memory and Array Structure: Core, ROM, RAM, peripheral circuitry, memory reliability and yield, SRAM and DRAM design, flash memory.

ECC 303 A – Design of Data Bases (ECC)

3L, 1T

3 Hours, 100 Marks

Introduction to database systems. A historical perspective, file systems v/s DBMS, advantages of a DBMS, Data abstraction, models, instances and schemes. Data independence, Data definition and manipulation languages. Database manager, administration and users. Overall system structure.

Entities and entity sets. Relationships and relationship sets. Attributes, mapping, keys, E-R diagram and its conversion to tables. Design of an E-R database scheme.

Structure of relational database. The relational algebra. The tuple and domain relational calculus. Modification of databases and views.

Query languages, SQL and query by examples. Pitfall in relational database design. Normalization using functional, multi valued and join dependencies. Domain key normal form.

Data storage: Physical storage media, files organization, organisation of records into blocks, sequential files, mapping relational data to files data dictionary storage, buffer management.

Basic concept of indexing and hashing, properties of indexes, index specification in SQL, B* – Tree and B - Tree index files. Hash base indexing, static hash functions, dynamic hash function.

Introduction to object oriented model : object structure, class hierarchy, multiple inheritance, object identity, object containment, physical organization, object oriented queries, scheme modification. Comparison between RDBMS and OODBMS, crash recovery, failure classification, storage hierarchy.

Transaction model, log-based recovery, Buffer Management, check points, shadow paging, failure with loss of non-volatile storage, stable storage implementation, concurrency control schedule. Testing for serializability, lock-based protocols, Time stamp based protocols, validation techniques.

EC 304 A - Analog Communication Engineering (ECC)

2L, 1T

3 Hours 100 Marks

Introduction to analog techniques for electrical communication. Concept of baseband and carrier transmission. Elementary study of AM, DSBSC SSB, FM and PM.

Amplitude Modulation : Analysis of standard AM waves and signal power distribution. Different circuits for amplitude modulation and their comparison. Methods of generating DSBSC, SSB and VSB – AM and their characteristics. Envelope and coherent demodulation methods for standard AM. DSBSC, SSB signals. Design considerations of AM modulators and demodulators. Frequency Division Multiplexing.

Angle modulation : Theory of frequency and phase modulations. Spectrum and BW of FM and PM signals. Direct and indirect methods of generating narrow – band and wide band FM. Discriminators and PLL demodulators for FM and PM. Pre-emphasis and de – emphasis. Idea of noise suppression properties of FM and PM systems. Concept of FDM

ECC 307A – Computer Graphics & Devices (ECC)

3L, 1T

3 Hours, 100 Marks

Introduction to computer graphics. Application areas, Display devices, raster scan, random scan, color monitor, display file, frame buffer.

Points, line, plane and coordinates. Character, vector circle generation algorithms, antialiasing techniques. Representation of polygons. Interfacing and filling polygon. 2 –D Transformations, translation, rotation, scaling, shearing, reflection, composite transformations, raster transformations.

Windows, multiple windowing, view-port, viewing transformation. Clipping algorithm for point, line using Sutherland and Cohen, polygon, text clipping. Segment and segment operation.

Interactive graphics, user dialogue, Input modes, Interactive picture construction technique.

Concept of 3 – D, representation of 3 – D object, 3 – D transformation, translation, rotation, reflection, scaling. Parallel, perspective, isometric projections.

Basic illumination models, halftone, dithering, color model RGB & CMY.

Design and operation of devices such as mouse, tablet, joystick, touch screen, laser and inkjet printers, plotters, LCD and CRT monitors, 3-D display techniques.

EC 309 A - Computer Organization (EC/ECC/EEE)

2L, 1T

3 Hours, 100 Marks

Elements of Computer Organization

Evolution of Computers : Generations of Computers, modeling of Computers at Gates, Registers and Processors level.

CPU Architecture : Fixed and floating point arithmetic and ALU organization. Instruction format, types, sequencing and interpretation. Instruction fetch and execute cycles. Addressing techniques. Hardwired and Micro – programmed control.

Secondary Memories : Magnetic memories core, tape, disk and floppy disc, introduction to magnetic bubble and CCD memories.

I/O Devices : Principle and construction of Keyboard, Mouse, digitizer, joystick, optical scanner, Resistive membrane touch screen, Tele-typewriter, CRT Terminals, TFT monitors, Line Dot Matrix, Daisy Wheel, Ink Jet and Laser printers.

Communication of I/O with CPU and memory : Speed mismatch of I/O v/s memory and CPU. Communication methods for I/O to CPU and Memory : Polling, interrupt, DMA and I/O channel.

**B. E. III YEAR (ELECTRONICS & COMPUTER ENGINEERING)
VI SEMESTER EXAMINATION**

ECC 351 A - Business Information Systems (ECC)

2L, 1T

3 Hours, 100 Marks

Introductory concepts : Data and information – creation and qualities; Systems and Business Information Systems – resources, categories; E-business.

Business Automation Hardware – Input and output techniques for business such as Bar-codes, OMR, Printers and storage devices.

Characteristics categories and design of Business Automation Software – graphics, spreadsheets, database, multimedia and web based software.

Networks, telecommunication and internet technologies and devices for business – EDI, RFID, Modems, B2B and B2C.

Information Security – Control over information systems, malware, encryption, decryption, protection of business information.

ECC 357 A – Power & Industrial Electronics (ECC)

2L, 1T

3 Hours, 100 Marks

Power electronics devices: Characteristics and operation of SCR, PUT, SUS, SBS, SCS, TRIAC, DIAC, IGBT, GTO, MCA and light activated thyristors. Ratings and rating extension by series/parallel operation.

Electronic Power Control: Electronic methods of power control. SCR firing methods, Phase control techniques. Line commutation and different types of commutation. One, two and four quadrant converters. Bridge inverters, series and parallel inverters. Cyclo converters. Introductory study of DC choppers.

Electrical Drives: Performance characteristics of series, shunt and compound d.c. motors. Motor starters. Characteristics of single and three phase induction motors, Universal motor, Amplidyne and selsyns.

AC and DC Motor Speed Control: Philosophy of speed control, open and closed control and single and three phase AC, DC and universal motors using thyristors. PWM inverter technique and introduction to variable frequency drive

Misc. Industrial Applications: Photo relays and their applications, X-ray tubes. Particle accelerators. Principle of Electron Microscope, Uninterruptible supplies. Switched mode power supplies

Programmable Logic Controllers (PLC): Advantages of PLC, CPU configurations, Digital and analog inputs and outputs, ladder circuits and process flow diagram. Console and operator panel.

EC 353 A - Digital Communication System (EC/ECC)

3L, 1T

3 Hours, 100Marks

Random Signals: Power and energy signals. Introduction to probabilistic and statistical description of discrete and continuous communication processes. Marginal, conditional and joint probability density and density and distribution functions. Stationarity and ergodicity. Auto correlation and Cross correlation functions, Energy spectral density and Power spectral density. Simple linear system analysis under random excitation in time and frequency domains.

Introduction to techniques ASK, FSK, PSK, BPSK, QPSK and simple QAM.

Digital Communication : Sampling theorem and principle of pulse analog modulation. Elements of PCM, Delta and adaptive delta modulation.

Study of components of digital communication system. Concept TDM, synchronous and asynchronous transmission. Introduction to bit, word and frame synchronization.

Noise : Various noise sources in amplifier ASK, FSK BPSK, and simple QAM and communication systems, Comparison of various electronic devices for noise performance, Signal to noise ratio and noise figure. Equivalent noise bandwidth. Noise temperature, Effect of cascading, statistical properties of noise Representation of white and band pass noise in communication systems.

Comparison of analog and digital communication systems. System Performance: Noise – performance of analog CW and pulse modulation systems using coherent and non – coherent. Baseband PCM and delta modulation systems, performance in terms of probability of error and S/N ratio. Probability of error performance of band pass systems.

EC 358 A - Microprocessor & Microcomputer (EC/ECC/EEE)

3L, 1T

3 Hours, 100 Marks

Microprocessor Architecture: Architecture of 8 – bit 8085, Z80, 6800 microprocessors; their instruction sets and addressing modes. Assembly language programming of Intel’s 8085 Microprocessor. Introduction to assemblers.

Microprocessor Interfacing : Interfacing of address; data and control buses Memory and I/O devices, Interrupt and DMA for 8085 microprocessor.

Introduction of Micro controllers : Architecture and instruction set of MCS – 51 series of micro controllers. Application of Micro controllers.

16 and 32 – bit Microprocessors: CPU architecture addressing modes and feature of 16 and 32 bit microprocessor – 8086. Salient features of 80286, 80386, 80486 and Pentium series microprocessors.

Bus standards: Introduction to multibus VME, RS – 232-C, IEEE 488, PCI, USB, RS 422 and 485.

EC 371 A - Radiation & Wave Propagation (ECC/EEE)

2L, 1T

3 Hours, 100 Marks

Transmission Lines : Type of transmission lines, General transmission line equations. Line constants and equivalent circuits. Infinite line, Lines with reflections.

Coaxial cables: Transmission lines at audio and radio frequencies. Losses in transmission lines. Transmission equalizers. Characteristics of quarter wave, half wave and other lengths. Smith chart and its applications. Transmission line applications. Stub matching.

Radio Wave Propagation : Mechanism of radio wave propagation. Reflection, refraction interference and diffraction of radio waves. Theory of ground wave, space wave and sky wave propagation. Effect of conductivity, dielectric constant, curvature and surface imperfections of earth on wave propagation, Duct propagation and tropospheric scattering.

Radiation : Retarded potentials and concept of electromagnetic radiation. Alternating current element and radiated power, radiation resistance. Radiation from dipole and monopole antennas.

Antennas: Quarter wave and half wave antennas. C-Impedance, mutual impedance and directional characteristics of antennas. Antennas patterns. Effective length and effective area of antennas , Antennas gain efficiency, beamwidth and polarization. Antenna temperature.

**B. E. IV YEAR (ELECTRONICS & COMPUTER ENGINEERING)
VII SEMESTER EXAMINATION**

ECC 401 A - VLSI Design Techniques (ECC)

3L, 1T

3 Hours, 100 Marks

Introduction: Layout and design rules, materials for VLSI fabrication basic algorithmic concepts for physical design, physical design processes and complexities.

Partition: Kernigham – Lin’s algorithm, Fiduccia Mattheyses algorithm, Krishnamurty extension, hMETIS algorithm, multilevel partition techniques.

Floor- planning: Hierarchical design, wirelength estimation, slicing, and non –slicing floorplan , polar graph representation, operator concept, Stockmeyer Algorithm for floorplanning, mixed integer linear program.

Placement: Design types: ASICs SoC, microprocessor RLM; Placement techniques: Simulated annealing, partition – based, analytical, and Hall’s quadratic; Timing and congestion considerations.

Routing: Detailed global and specialized routing channel ordering, channel routing problems ad constraint graphs routing algorithms, Yoshimura and Kuh’s method, zone scanning and net merging, boundary terminal problem, minimum density spanning forest problem, topological routing, cluster graph representation.

Sequential Logic Optimization and Cell Binding: State based optimization, state minimization, algorithms; Library Binding and its algorithms, concurrent binding.

ECC 402 A – Design of Operating System (ECC)

3L, 1T

3 Hours, 100 Marks

Introduction to operating system, operating system functions, batch processing systems, multiprogramming systems, time sharing systems, real time operating systems.

Process management, process concept, process scheduling, operation on processes, cooperating processes interprocess communication.

CPU scheduling, scheduling algorithms first come first served, shortest job first, priority based, round robin, multilevel queue multilevel feedback queue.

Process synchronization, critical section problem, semaphores, monitor. Deadlocks, prevention, deadlock avoidance, deadlock detection.

Memory management, contiguous allocation, paging, segmentation, virtual memory, demand paging, page replacement, page replacement algorithms first in first out algorithms, optimal algorithm, least recently used algorithm.

File concepts, directory structure, file protection, allocation of disk space.

I/O systems, I/O hardware polling, interrupts, direct memory access. Disk scheduling, disk scheduling algorithms first come first served algorithms, shortest seek time first algorithm, SCAN algorithm, C-SCAN algorithm, C-LOOK algorithm.

Protection and security in an operating system, access matrix capabilities.

EC 403A - Advance Communication systems (EC/ECC/EEE)

3L, 1T

3 Hours, 100 Marks

Line – of Sight and Troposcatter Communication: Principle of working and essential features of microwave LOS and troposcatter communication Propagation study and performance requirements. Diversity techniques.

Satellite communications: Basic considerations. Up – link and down link parameters. Orbit and frequency selection. Transmission losses, noise and interference. Elements of multiple access techniques. Frequency reuse techniques.

Functional description of earth stations.

Optical Communications: Ray propagation in optical fibers. Types of fibers. Losses and dispersion in fibers. Transmitter and receiver subsystem for optical communications. Laser and LED sources. Optical amplifier. Cable joints couplers and connectors. Splicing techniques. Modulation techniques. PIN and avalanche photo diode detectors. Characteristics of analog and digital transmission in optical communication systems. Noise considerations.

ECC 404 A – Parallel Processing Technology (ECC)

3L, 1T

3 Hours, 100 Marks

Introduction to parallel processing and trends: parallelism in uni-processor system, parallel computer structure, architectural classification schemes for parallel computers, multiplicity of instruction data streams, serial versus parallel computers, parallelism versus pipelining.

Memory system: hierarchical, associative and cache memory structures, virtual memory system, memory allocation and management.

Principles of pipelining: pipelining principles and classifications, general pipelines and reservation tables, interleaved memory organization, instruction pre-fetch and branch handling, data buffering and busing structures, internal forwarding and register tagging, hazard detection and resolution, job sequencing and collision prevention.

Structure for array processors: SIMD computer organization, masking and data routing mechanism Inter PE communication, introduction to associative array processing.

Multiprocessor architecture : Loosely and tightly coupled multiprocessors, processor characteristics for multiprocessing, interconnection networks, cache coherence protocols.

Introduction to advance processors: Data flow computers, the VLIW architecture, fault tolerant architecture and study of TANDEM HIMALAYAN K2 system architecture.

EC 408 A - ENGINEERING MANAGEMENT AND ECONOMICS (EC/ECC/EEE)

2L

3 Hours, 100 Marks

Principles of Management: Management function. Theories of management and their application Span of control, Responsibility, authority, leadership, motivation, communication, Management of Change, Importance of organization structure

Financial Management: Functions and importance of financial management, Book-keeping, Interest and depreciation. Salvage value Various types of costs, profit/volume ratio. Break even analysis and marginal costing

Marketing and Strategic Management: Concept of marketing and its various components Product Life Cycle Strategic Mission Vision Goals Industry Life Cycle SWOT analysis

Stores and Purchase Management : Function of store and Purchase management.

Inventory Management:. Inventory control and management Economic order quantity. A-B-C analysis..

Forms of Business Ownership: Proprietorship, partnership, joint stock companies, joint sectors

Production Planning and Control: Job, Batch and mass production, production efficiency, productivity.

Site selection. Production planning. Routing, scheduling and follow up. Elements of time and motion

study. Quality control and quality assurance

Nature and Scope of Economics: Basic concept of managerial economics. Supply and demand, free competition, monopoly and oligopoly

**B. E. IV YEAR (ELECTRONICS & COMPUTER ENGINEERING)
VIII SEMESTER EXAMINATION**

ECC 451 A – Real Time and Embedded systems (ECC)

3L, 1T

3 Hours, 100 Marks

Introduction to embedded systems and their basics, Multitasking. Use of programming languages, Real time kernel, size of embedded programs.

Data Representation Fixed Precision Binary members, binary representation of Integers and Real numbers, ASCII and BCD.

Hardware requirements and time constraints, reliability and cost, design decisions.

Selection of microprocessor / Microcontroller for embedded systems, computing the size of memory required RAM and ROM.

S/W tools for embedded system development : Mixing C and assembly, C – Run time environment, Use of cross compilers, use of tools sets in Embedded Linux, GNU Tool chain for cross compiling.

Introduction to real – time computing: Characteristics of real – time system & tasks, performance measurement of real – time systems, estimation of program runtime.

Real – time system design: hardware requirements, systems development cycle, data – transfer techniques, synchronous and asynchronous data – transfer techniques, standard interfaces.

Real – time communication, fault – tolerance techniques, cause of failure, fault types, fault detection, redundancy, integrated failure handling.

ECC 453 A – Multimedia Systems (ECC)

3L, 1T

3 Hours, 100 Marks

Introduction to multimedia and its applications, Characteristics of Text, Sound, Image, Animation, Video.

Multimedia Hardware : SCSI, MCI, Memory and storage devices, Output Hardware, Communication devices.

Introduction to Multimedia Systems: Architecture and components, multimedia distributed processing model, synchronization, orchestration and quality of service architecture.

Audio and Speech: Data acquisition, sampling and quantization, human speech production mechanism, digital model of speech production, analysis and synthesis psycho- acoustics, low bit rate speech compression, MPEG audio compression.

Images and Video: Image acquisition and representation, composite video signal, NTSC, PAL and SECAM video standards; Bilevel image compression standards, JPEG and MPEG.

Multimedia communication: Fundamentals of data communication and networking, bandwidth requirements of different media; real time constraints: Audio latency, video data rate; Multimedia over LAN and Internet, multimedia conferencing.

Multimedia Information Systems: Operating system support for continuous media applications, limitations of OS, new OS support, Media stream protocol, file system support for continuous media, data models for multimedia and hypermedia information, content based retrieval of unstructured data.

ECC 454 A - Mobile Communication and computing (ECC)

3L, 1T

3 Hours, 100 Marks

Concept of mobile telecommunications. Mobile radio network issues, cell size coding, modulation and diversity Base station subsystems. Access methods. Location strategies for personal communications services. Cell design principles.

Elements of Radio Paging and microcellular radio communication: Fixed and dynamic channel assignment, Allocation of spectrum and channels, Concepts of hexagon cells, mobile identification system and registration of mobile, call procedure. Concepts of GSM and CDMA radio system architecture, roaming, digital speech and channel coding.

Mobility computing: Issues, challenges, and benefits;

Network Programming: Process communication techniques, remote login, ftp, socket programming, RPC, RMI, Client – server programming.

Process Migration : Steps, advantages, application taxonomy, alternatives, case study of DEMOS/MP.

Mobile Computing : Physical mobility, challenges, limits and connectivity, mobile IP and cellular IP in mobile computing, case study of CODA.

Wireless LANs : Introduction to IEEE 802.11, Bluetooth and IrDA technologies and standards.

Introduction to Mobile Adhoc Networks: Hidden and exposed terminal problems; Routing protocols: DSDV, DSR, AODV. Elements of Wireless Sensor Networks - Motes, smart dust, TinyOS, routing protocols.

Handheld Devices and OS : Palm, HP; PalmOS, WindowCE, Windows Mobile. Conceptual study Mobile Internet and WAP, gateways, Mobile agents: Aglets, Tcl, PMADE.

EC 458 A - Computer Communication and Data Networks (EC/ECC/EEE)

3L, 1T

3 Hours, 100 Marks

Computer communication: Layered Architecture of computer communication networks. DNA, SNA and ISO- OSI models. Properties of LANs, MANs, and WANs. Physical level, data link and transport protocols. Multiple access protocol organization. Routing techniques flow and congestion control in packet switched networks. Window scheme. Network interconnection – bridges and routers. Dead Lock avoidance. Elements of queuing analysis. Introduction to network security.

Data Networks: Structure and functions of network protocols. Data link control procedures. Operation of HDLC, SDLC, BISO NC, X.25 and x.21 Protocols Elements of Polling ALOHA, Reservation ALOHA, CSMA and token ring. Characteristic features of LANs.

Basics of Internet: Evolution; dialup, XDSL, ADSL, cable modem and other access methods. IP address and domain name system, TCP/IP, Internet applications and www.

LIST OF CORE ELECTIVES

ECC 421 A - Robotic & Computer Vision (ECC)

3L, 1T

3 Hours, 100 Marks

Definition, structure and application areas of Robotics; Introduction to the range of robots currently in use. Direct kinematics of the robot arm, link description and its connection; Frame assignment; Concept of actuator space, joint space and Cartesian space; Inverse kinematics, algebraic solution, geometric solution; Solvability considerations and examples. Manipulator dynamics, basic equations, Newton- Euler dynamic formulation; Lagrange formulation of the manipulator dynamics; Simulation. Controller design, linear and non – linear control approaches, special considerations like coupling, time variation and model uncertainty; Computed torque, variable structure and adaptive control techniques. Digital image fundamentals, digitization and 2- D parameters, types of operation; Basic tools: Convolution, Fourier transforms and statistical approaches. Image analysis and processing. Basic enhancement and restoration techniques, unsharp masking, noise suppression, distortion suppression, segmentation, thresholding, edge finding, binary mathematical morphology, grey – value mathematical morphology.

ECC 422 A - Digital Signal Processing (ECC)

3L, 1T

3 Hours, 100 Marks

Digital Signal Processing : Advantage of digital filters and processing. Fundamentals of discrete time systems. Fourier transform of sequences. Discrete – time filter structures. Z – Transform system representation solution of linear constant co- efficient difference equations. Digital filters design by transformation from analog filters. Simple realization of IIR and FIR filters DFT and FFT.

ECC 423 A - Microwave Engineering (ECC)

3L, 1T

3 Hours, 100 Marks

Wave Guides : Theory of wave propagation in rectangular wave guides, cut off frequency. Dominant and higher modes. Generation of different modes and suppression of unwanted modes. Field distribution. SWR and impedance relations in wave guides. Coupling between coaxial lines and wave guides. Wave guide stub-matching. Resonators: Theory and application of cavity resonators. Coupling to cavity, Q of cavity resonators. Microwave Components: Attenuators, phase shifters, directional couplers, tees, isolators, circulators, tunings screws, coupling probe, loops, mixers and detectors. Use of scattering parameters. Microwave Generators and Amplifiers: Theory of velocity modulation. Theory of operation and characteristics of two cavity and multicavity klystron, amplifier and oscillators. Reflex klystron O and M type travelling wave tube and backward wave oscillators – principle of operation . Construction, type and application of Magnetrons. Microwave Solid State Devices: Special considerations for UHF and microwave transistors and oscillators. Parametric amplifiers. Manley- Rowe relation linearized equations. Parametric up converters. Negative resistance amplifiers. Principle of working and application of impact diode, hot carrier diode, PIN diode, Gunn diode and LSA diode Quantum mechanical explanation, description and application of MASER amplifiers.

ECC 424 A - Telematics (ECC)

3L, 1T

3 Hours, 100Marks

Digital Telephony : Principle of working of SPC digital telephone exchanges. Digital switching, space, time. TS, ST, STS, TST switch blocks. Termination of subscriber lines Signalling systems with digital exchanges. Principle of common channel signalling. Synchronization aspect for digital telephony. Store Program Control for call processing. Integrated Digital Networks: Data Communication terminology. Introduction to Circuits, message and packet switching concept. Basic aspects of multiplexing, signaling and synchronization in integrated digital networks. Overview of ISDN and BISDN. Concepts of basic rate and primary rate ISDN. Access and facilities provisions. Elements of fast packet switching, frame relay, ATM, SONET and SDH. Introduction to photonic switching.

ECC 425 A - Medical Electronics (ECC)

3L, 1T

3 Hours, 100 Marks

Introduction to Physiology : Physiological system of the human body. Nerve physiology. Function of nerves and myoneural junction. Cardiac muscle and its contractions. Blood flow system. Arterial pressure Mechanism of respiration, Function of Spinal cord. Generation, Propagation and distribution of action potentials.

Recording of Bio- Electric Events : Kinds of electrodes, amplifiers and display units for recording bioelectric potentials. Principles of ECG, EEG, and EMG. Electrophysiological signals from a micro electrode and salt bridge, Use of field effect – devices as electrometers. Principle of driven shield. Use of photon – coupled amplifiers. Artifacts.

Bio – Medical Measurement : Electronic methods of measuring blood pressure, blood flow, blood pH, skin and systemic body temperature and pulse rate.

Electronic Medical Instrument : Electronic pace makers. Implantable power sources. Defibrillators. Micro power transmitter for telemetering bio – signal. Surgical and therapeutic diathermy units. Physiological stimulators Basic diagnostic X – ray units. Introduction to patient monitoring and intensive care units.

ECC 426 A – Software Engineering (ECC)

3L, 1T

3 Hours, 100 Marks

Introduction, software characteristics and software crisis. The software engineering approach; software process & process maturity. Various software development models. Software life cycle concept.

The software project management concepts and team organization. Software process and project metrics. Software measurement. Metrics for software quality and its integration with the software process.

Software scope/ project estimation the COCOMO model and the Function Point approach.

Software quality assurance. Software reviews, cost impact and software defects. Formal Technical Reviews, software reliability.

Conventional methods for software engineering. Analysis concepts and principles. The software requirements specifications. Software prototyping.

Software design and software engineering, software architecture. Effective modular design functional independence, cohesion and coupling concepts. Component level / procedural design.

Software testing techniques and strategies.

. ECC 427 A – Client – Server Technology (ECC)

3L, 1T

3 Hours, 100 Marks

Introduction Client/ Server architecture. Benefits, application, centralize multiuser, Distributed single user

Architecture, distributed computing environment.

Approach to Distribution: Distributed models, multi tiered environment, cooperative processing, application components, and distribution points. Presentation distribution, distributed processing, distributed function and transaction processing, data distribution.

Client technologies: Function, Application and tools, operating system, hardware plate forms, database access, interprocess communication tools.

Server technologies: Function, server operating system, hardware plate forms, data access, distributed data access, database engines.

System networks architectures: Components, layers, pear – to – pear communication between SNA layers.

Data Management: Distributed data management, method of the distribution, distributed data access. Database transaction management.

Distributed DBMS: Architecture, storing data in a distributed DBMS, distributed catalog, management, distributed query processing, Update distributed data. Introduction to distributed transactions, distributed concurrency control, and distributed recovery.

ECC 428 A – Object Oriented Software Engineering (ECC)

3L, 1T

3 Hours, 100 Marks

Object – oriented concepts and principles. Identifying the elements of an object model. Object oriented projects metrics and estimation.

Object – oriented analysis: Domain analysis, the OOA process, the object – relationship model.

Design for object – oriented systems. The system design process.

Object – oriented testing – testing OOA and OOD models. The object – oriented testing strategies. Inter class testing.

Technical metrics for O – O systems. Class – oriented metrics & metrics for O – O projects.

Advanced topics in software engineering. Component – based software engineering and development. Classifying and retrieving components. Review of CASE tools.

ECC 429 A – Information Theory and Coding (ECC)

3L, 1T

3 Hours, 100 Marks

Uncertainty, information, measure of information, average information entropy, property of entropy, information rate. Discrete memoryless source. Source coding theorem.

Discrete memoryless channel, self and Mutual information, properties, channel capacity, channel coding theorem Shannon Hartley theorem, Information capacity theorem.

Data compaction, prefix coding, Huffman coding, Lempel – Ziv coding, Compression of information.

Type of errors, codes error control coding, linear block code, error detection and correction codes, syndrome decoding, cyclic codes, hamming code, BCH, convolution codes, encoders and decoders performance of codes.

ECC 430 A - Systems Software (ECC)

3L, 1T

3 Hours, 100 Marks

Introduction to system software, machine architecture, machine level representation of programs, assembly language programming and optimizing program performance.

Assemblers, basic function, machine dependent and independent assembler features, assembler design options.

Two – pass, one – pass and multi- pass assembler design

Macro- processors, basic functions, machine independent features nested definitions and calls, design options.

General purpose macro – processor design, macro – processing within language translators.

Loaders and linkers, basic functions, machine dependent and independent features, linkers, loaders and editors, design options.

Relocating loaders and dynamic linking loader designs.

B.E. II Year (Electronics & Communication Engineering), 2016-17

SEMESTER III EXAMINATION SCHEME

Branch Code	Subject Code	Subject	Lectures	Tutorials	Practicals	Contact Hours	Credits	Exam Hours	Marks		
									Theory	Pract & Sess	Total
A: Written Papers											
MA	201 A	Advanced Engineering Mathematics (EC/ECC/EEE) - I	2	-	-	2	2	3	100	-	100
EC	202 A	Network Theory (EC/ECC/EEE)	2	1	-	3	3	3	100	-	100
EC	207 A	Solid State Electronic Devices (EC)	2	1	-	3	3	3	100	-	100
EC	204 A	Electronic Circuit (EC) – I	3	1	-	4	4	3	100	-	100
EC	205 A	Digital Electronics (EC/ECC/EEE) – I	3	1	-	4	4	3	100	-	100
EC	206 A	Electronic Instruments & Measurements (EC)	2	1	-	3	3	3	100	-	100
Total (A)			14	5		19	19	-	600	-	600
B: Practicals and Sessionals											
EC	211 B	Network Laboratory (EC)	-	-	2	2	1	-	-	100	100
EC	212 B	Electronic Instruments & Measurement Lab (EC)	-	-	2	2	1	-	-	100	100
EC	213 B	Electronic Circuits Lab (EC) – I	-	-	2	2	1	-	-	100	100
EC	214 B	Digital Electronics Lab (EC) - I	-	-	2	2	1	-	-	100	100
EC	215 B	Logic System Design (EC) - I	-	-	2	2	1	-	-	100	100
EC	216 B	Computer Programming (EC)	-	-	2	2	1	-	-	100	100
Total (B)			-	-	12	12	6	-	-	600	600
Grand Total (A+B)			14	5	12	31	25	-	600	600	1200

B.E. II Year (Electronics & Communication Engineering), 2016-17

SEMESTER IV EXAMINATION SCHEME

Branch Code	Subject Code	Subject	Lectures	Tutorials	Practicals	Contact Hours	Credits	Exam Hours	Marks		
									Theory	Pract & Sess	Total
A: Written Papers											
MA	251 A	Advanced Engineering Mathematics (EC/ECC/EEE) - II	2	-	-	2	2	3	100	-	100
EC	252 A	R.F. Circuits & Systems	2	1	-	3	3	3	100	-	100
EC	254 A	Electronics Circuits (EC/EEE) – II	3	1	-	4	4	3	100	-	100
EC	255 A	Digital Electronics (EC/ECC/EEE) – II	2	1	-	3	3	3	100	-	100
EC	257 A	Industrial Electronics (EC/EEE)	3	1	-	4	4	3	100	-	100
EC	291A	OPEN ELECTIVE - I	3	-	-	3	3	3	100	-	100
Total (A)			15	4		19	19	-	600	-	600
B: Practicals and Sessionals											
EC	261 B	R.F. Circuits Lab (EC)	-	-	2	2	1	-	-	100	100
EC	263 B	Electronics Circuits Lab (EC) – II	-	-	2	2	1	-	-	100	100
EC	264 B	Digital Electronics Lab (EC) – II	-	-	2	2	1	-	-	100	100
EC	265 B	Logic System Design (EC) - II	-	-	2	2	2	-	-	100	100
EC	267 B	Industrial Electronics Lab (EC)	-	-	2	2	1	-	-	100	100
Total (B)					12	12	6	-	-	500	500
Grand Total (A+B)			15	4	12	31	25	-	600	500	1100
EC	200 E	Co-curricular Activities	-	-	-	-	0	-	-	-	100

*Choice based electives offered by Electronics & Communication Engineering Department in IVth semester:

B.E. III Year (Electronics & Communication Engineering), 2017-18

SEMESTER V EXAMINATION SCHEME

Branch Code	Subject Code	Subject	Lectures	Tutorials	Practicals	Contact Hours	Credits	Exam Hours	Marks		
									Theory	Pract & Sess	Total
A: Written Papers											
EC	304 A	Analog Communication Engineering (EC/ECC)	2	1	-	3	3	3	100	-	100
EC	306 A	Theory & Applications of Integrated Circuits (EC)	3	1	-	4	4	3	100	-	100
EC	309 A	Computer Organisation (EC/ECC/EEE)	2	1	-	3	3	3	100	-	100
EC	310 A	Radiation & Wave Propagation (EC) – I	3	1	-	4	4	3	100	-	100
EC	311 A	Feedback & Control Systems (EC)	2	1	-	3	3	3	100	-	100
EC	341A	Open Elective – II*	3	-	-	3	3	3	100	-	100
Total (A)			15	5		20	20	-	600	-	600
B: Practicals and Sessionals											
EC	313 B	Analog Communication Lab (EC)	-	-	2	2	1	-	-	100	100
EC	314 B	Radiation & Wave Propagation Lab (EC) – I	-	-	2	2	1	-	-	100	100
EC	315 B	Integrated Circuits Lab (EC)	-	-	2	2	1	-	-	100	100
EC	316 B	Electronics Workshop (EC)	-	-	2	2	1	-	-	100	100
EC	317 B	Control System Lab (EC)	-	-	2	2	1	-	-	100	100
Total (B)			-	-	10	10	5	-	-	500	500
Grand Total (A+B)			15	5	10	30	25	-	600	500	1100

*Choice based electives offered by Electronics & Communication Engineering Department in Vth semester:

B.E. III Year (Electronics & Communication Engineering), 2017-18

SEMESTER VI EXAMINATION SCHEME

Branch Code	Subject Code	Subject	Lectures	Tutorials	Practicals	Contact Hours	Credits	Exam Hours	Marks		
									Theory	Pract & Sess	Total
A: Written Papers											
EC	352 A	Electronics Measurements (EC)	2	1	-	3	3	3	100	-	100
EC	353 A	Digital Communication Systems (EC/ECC)	3	1	-	4	4	3	100	-	100
EC	355 A	Radiation & Wave Propagation (EC) – II	2	1	-	3	3	3	100	-	100
EC	358 A	Microprocessor & Microcomputers (EC/ECC/EEE)	3	1	-	4	4	3	100	-	100
EC	361 A	Audio & Video Electronics (EC)	2	1	-	3	3	3	100	-	100
EC	391A	OPEN ELECTIVE – III*	3	-	-	3	3	3	100	-	100
Total (A)			15	5		20	20	-	600	-	600
B: Practicals and Sessionals											
EC	367 B	Audio & Video Lab (EC)	-	-	2	2	1	-	-	100	100
EC	362 B	Electronics Measurement Lab (EC)	-	-	2	2	1	-	-	100	100
EC	363 B	Digital Communication Lab (EC)	-	-	2	2	1	-	-	100	100
EC	364 B	Microprocessor Lab (EC)	-	-	2	2	1	-	-	100	100
EC	365 B	Radiation & Wave Propagation Lab (EC) – II	-	-	2	2	1	-	-	100	100
Total (B)			-	-	10	10	5	-	-	500	500
Grand Total (A+B)			15	5	10	30	25	-	600	500	1100
EC	300 E	Co-curricular Activities	-	-	-	-	0	-	-	-	100

*Choice based electives offered by by Electronics & Communication Engineering Department in VIth semester:

B.E. IV Year (Electronics & Communication Engineering), 2018-19

SEMESTER VII EXAMINATION SCHEME

Branch Code	Subject Code	Subject	Lectures	Tutorials	Practicals	Contact Hours	Credits	Exam Hours	Marks		
									Theory	Pract & Sess	Total
A: Written Papers											
EC	402 A	Telematics (EC)	3	1	-	4	4	3	100	-	100
EC	403 A	Advanced Communication Systems (EC/ECC/EEE)	3	1	-	4	4	3	100	-	100
EC	404 A	Advanced Computer Technology (EC/EEE)	3	1	-	4	4	3	100	-	100
EC	407 A	Radar & Navigational Aids (EC)	3	1	-	4	4	3	100	-	100
EC	408 A	Engineering Management & Economics (EC/ECC/EEE)	2	-	-	2	2	3	100	-	100
EC		Core Elective – I	2	1	-	3	3	3	100		100
Total (A)			16	5	-	21	21	-	600	-	600
B: Practicals and Sessionals											
EC	412 B	Telematics Lab (EC)	-	-	2	2	1	-	-	100	100
EC	413 B	Advanced Communication Systems Lab (EC)	-	-	2	2	1	-	-	100	100
EC	417 B	Advanced Computer Lab (EC)	-	-	2	2	1	-	-	100	100
EC	415 B	Project (EC) (Phase – I)*	-	-	2	2	-	-	-	-	-
EC	416 B	Seminar	-	-	2	2	1	-	-	100	100
Total (B)			-	-	10	10	4	-	-	400	400
Grand Total (A+B)			16	5	10	31	25	-	600	400	1000

* EC 415 B: A combined exam of Phase I & II shall be conducted at the end of VIII Semester.

B.E. IV Year (Electronics & Communication Engineering), 2018-19

SEMESTER VIII EXAMINATION SCHEME

Branch Code	Subject Code	Subject	Lectures	Tutorials	Practicals	Contact Hours	Credits	Exam Hours	Marks		
									Theory	Pract & Sess	Total
A: Written Papers											
EC	451 A	Digital Signal Processing (EC/EEE)	2	1	-	3	3	3	100	-	100
EC	452 A	Electronic Instrumentation (EC)	2	1	-	3	3	3	100	-	100
EC	457 A	Mobile Communication (EC)	2	1	-	3	3	3	100	-	100
EC	458 A	Computer Communication & Data Networks (EC/ECC/EEE)	3	1	-	4	4	3	100	-	100
EC	459 A	Microwave Engineering (EC/EEE)	3	1	-	4	4	3	100	-	100
EC		Core Elective – II	2	1	-	3	3	-	100		100
Total (A)			14	6		20	20	-	600	-	600
B: Practicals and Sessionals											
EC	461 B	DSP Lab (EC)	-	-	2	2	1	-	-	100	100
EC	462 B	Instrumentation Lab (EC)	-	-	2	2	1	-	-	100	100
EC	463 B	Microwave Lab (EC)	-	-	2	2	1	-	-	100	100
EC	465 B	Computer Communication & Data Networks Lab (EC)	-	-	2	2	1	-	-	100	100
EC	415 B	Project (EC) (Phase – II)*	-	-	2	2	1	-	-	200	200
Total (B)			-	-	10	10	5	-	-	600	600
Total (A+B)			14	6	10	30	25	-	600	600	1200
C: Others											
EC	476 C	Practical Training II (EC)	-	-	-	-	13	-	-	100	100
Total (C)			-	-	-	-	13	-	-	100	100
Grand Total (A+B+C)			14	6	10	30	38	-	600	700	1300
EC	400 E	Co-curricular Activities	-	-	-	-	0	-	-	-	100

*Project (Phase II) is continuation of Project (Phase I) & combined examination shall be conducted.

List of Core Electives	
EC 481 A	Medical Electronics (EC)
EC 482 A	Design Principles of Communication Systems (EC)
EC 484 A	Solid State and IC Technology (EC)
EC 485 A	Computer and Microprocessor Control of Industrial Processes (EC)
EC 487 A	Entrepreneurship Development (EC)
EC 488 A	Reliability and Maintainability of Electronic Systems (EC)
EC 490 A	Robotics Engineering (EC)

List of Open Electives	
Name of subject	Semester
BCT 291 A Open Elective-I: Sustainable Architecture CE 291A Open Elective-I :Energy Efficient Building Design ChE 291 A Open Elective-I : Renewable Energy Sources CSE 291A Open Elective-I :Object Oriented Programming Through C++ CSE 292A Open Elective-I :Object Oriented Programming Through JAVA EE 291 A Open Elective-I : Industrial Applications of Electrical Drives Ma 291 A Open Elective-I :Mathematical Statistics For Engineers ME 291 A Open Elective-I:Renewable Energy Sources ME 292A Open Elective-I: Automobile Engineering MI 291A Open Elective-I: Tunneling For Engineering Projects PI 291A Open Elective-I: Manufacturing Science SE 291A Open Elective-I: Computer Oriented Numerical Analysis	Fourth Semester
BCT 341 A Open Elective-II: Traditional Indian Architecture CE 341A Open Elective-II: Non Urban Public Hygiene & Drinking Water ChE 341 A Open Elective-II : Petroleum Refining Technology CSE 341A Open Elective-II :Data Structures and Algorithms EE 341 A Open Elective-II : Optimization Techniques EE 342 A Open Elective-II : Artificial Intelligence Ma 341 A Open Elective-II :Mathematical Theory of Operations Research ME 342A Open Elective-II: Finite Elements Method MI 341A Open Elective-II: Application of GIS & Remote Sensing in Engineering SE 341A Open Elective-II :Structural Dynamics	Fifth Semester
BCT 391 A Open Elective-III: Climate Responsive Architecture CE 391A Open Elective-III: Ecosystem & Biodiversity ChE 391 A Open Elective-III : Nanotechnology CSE 391A Open Elective-III : WEB TECHNOLOGIES CSE 392A Open Elective - III : DATABASE MANAGEMENT SYSTEMS EE 391 A Open Elective-III: Soft Computing Techniques EE 392 A Open Elective-III: Energy Conservation Ma 391 A Open Elective-III: Advanced Numerical Analysis ME 391A Open Elective-III: Design Planning And Control Of Production System ME 392A Open Elective-III: Systems Design And Analysis MI 391A Open Elective-III: Project Environment Clearance PI 391A Open Elective-III: Quality Management SE 391A Open Elective-III :Finite Element Method	Sixth Semester
BCT: Building Construction Technology, CE: Civil Engineering, ChE: Chemical Engineering, CSE: Computer Science and Engineering, EC: Electronics & Communication, EE: Electrical Engineering, ME: Mechanical Engineering, MI: Mining Engineering, PI: Production & Industrial Engineering, SE: Structural Engineering, Ma: Mathematics	

SYLLABUS OF OPEN ELECTIVES-I

BCT 291 A Open Elective-I: Sustainable Architecture

3L

3 Hrs, MM

100

Concepts of sustainability : Energy and Global environment, Energy use and Climate change – Its impact, Types of Energy systems, Concept of Sustainability - Principles of conservation -synergy with nature, Bioregionalism - community basis shelter technology within bioregional patterns and scales, Ethical- environmental degradation. Sustainable planning & Design: Sustainable Development -Sustainable approach to site planning and design - site inventories- relationships between site factors - development impacts from one area of the site on the other areas - phasing of development - limits of change - Design facility within social and environmental thresholds Sustainable Building Materials and Construction : Properties, Uses and Examples of -Primary, secondary and Tertiary Sustainable Materials, Principles to improve the energy efficiency - siting and vernacular design, shade, ventilation, earth shelter, thermal inertia and air lock entrances. Techniques of sustainable construction - technologies, methods of effectiveness, and design synthesis – alternative materials and construction methods: solar water heating panels; photovoltaic electricity generation; use of local materials and on site growth of food, fuel and building materials.

Recycling and Reuse : Pre building, Building, Post building stages - Architectural Reuse, Waste prevention, Construction and Demolition recycling- Conservation of natural and building resources- Energy and material savings – types of wastes - Elimination of waste and minimize pollution- various Decomposing methods – Innovative reuse of various wastes Case Studies and Rating systems : Sustainable Development Case Studies: illustrated examples of the planning, development, and construction. Green architecture and various international rating systems for sustainability- EAM (UK), CASBEE (Japan), LEED (US), Green Star (Australia), etc. – Indian systems – TERI GRIHA rating, LEED India rating, IGBC

CE 291A Open Elective-I :Energy Efficient Building Design

3L

3 Hrs, MM

100

Environment and man, external environment and built environment, Built-environment – integrated approach.

Climate: elements of climate, classification of climate, Micro-climate, site climate.

Comfort: desirable conditions, thermal comfort factors, comfort indices, effective and corrected effective temp. Tropical summer index.

Thermal Design: heat loss from a building under steady state condition, heat gains due to solar radiation, steady state and cyclic conditions, Means of thermal control – mechanical, structural control, air infiltration into buildings by natural means, shape of buildings,-thermal cube, fabric heat loss, ventilation loss and volume.

Light & Lighting: illumination requirement, day-lighting, artificial lighting, energy conservation.

Noise Control: Sources of noise, means of control, control requirements, behaviour of sound in rooms, vibration & vibration control.

Building Services: Mechanical & electrical services in building, lifts, escalators.

ChE 291 A Open Elective-I : Renewable Energy Sources

3L

3 Hrs, MM

100

Sources of energy: Energy sources and their availability, renewable energy sources.

Energy from Biomass: Introduction, Biomass as a source of energy, Biomass conversion technologies, Biogas generation, classification of biogas plants, Biomass gasification.

Solar Energy: Sun and solar energy, solar radiation and its measurement, solar energy collectors, solar energy storage, Photovoltaic systems, Application of solar energy.

Wind Energy: Wind as an Energy source, Basic principles of wind energy conversion, Types of Wind machines, Components of wind energy conversion system, Performance of wind machines, application of wind energy.

Geothermal Energy: Introduction, Origin and distribution of geothermal energy, types of geothermal resources, Hybrid geothermal power plant, Application of geothermal energy.

Hydrogen energy: Introduction, Hydrogen production, Hydrogen storage, Hydrogen transportation.

Energy from the Oceans: Introduction, Ocean Thermal Electric Conversion (OTEC), Energy from Tides, Ocean Waves.

CSE 291A - Object Oriented Programming Through C++ (Open)

3L

3 Hrs, MM 100

A review of C. Concepts of object oriented programming using C++. Data types: elementary and derived data types, literals.

Operators and expressions: operators, association and precedence rules of operators, expressions using unary, binary and ternary operators.

Statements: declarations as statements, selection statements, iteration statements, goto statement, break statement, continue statement, return statement, try-catch block.

Functions: void functions, functions with return value, call by value and call by reference parameter passing, default parameters, recursive functions, inline functions.

Classes: classes, objects, friend functions, classes within a class, local classes, global classes, constructors, destructors.

Derived classes: single and multiple derivation of classes, multilevel and hybrid derivation of classes, constructors, destructors.

Polymorphism: function and operator overloading, virtual functions.

Streams: input and output of built-in data types, manipulators.

File streams: opening a file, accessing a file, closing a file.

Exceptions: catching exceptions, rethrowing the exception, standard exceptions.

Templates: defining a template, template instantiation, function templates, class templates.

Elementary case study of a object oriented database in C++.

CSE 292A - Object Oriented Programming Through JAVA (Open)

3L

3 Hrs, MM 100

Overview of object oriented concepts in JAVA.

Introduction – Java & internet, java applets and its applications, Java features like – security, portability, byte code, java virtual Machine, object oriented, robust, multi threading, architectural neutral, distributed & dynamic.

Data types and control structures, operators, arrays, Java methods and classes.

Inheritance of procedures and data, Packages and interface, exception handling, multi-threaded programming – thread priorities, synchronization, messaging, creating and controlling of threads. IO and applets.

String handling and various string functions.

Java utilities like java.lang, java.util and their uses, java.io, basics of networking using Java.

Java applets and their use, event handling, AWT and working with windows.

Introductory study of Java Beans, Servlets and JDBC.

EE 291 A Open Elective I: Industrial Application Of Electrical Drives

3L

3 Hrs, MM 100

Operating-Characteristics : Individual, group and collective drives, steady state individual and joint characteristics of electric motors and driven industrial units under different conditions of operation.

Transient Characteristics : Causes of transient conditions starting, braking, reversing, speed transition and sudden system changes. Forces and torques on the drives referred to a common reference shaft. General equation of motion, Accelerating and deaccelerating times. Starting and braking time and means of reducing.

Drives Control : Parameters characterizing speed control methods of electric drives, speed control of Industrial d.c. and a.c. motors under constant and varying torque and h.p. conditions.

Families of speed torque characteristics : Idea of manual and automatic control gears, Master-controller.

Motor Ratings : Continuous-short time and intermittent ratings, overload capacity. Effect of altitude, Motor heating and cooling curves. Equivalent current, power and torque. Selection motor for various duty cycles. Permissible frequency of starting, features of load diagram construction. Load equalisation and use of fly wheels. Types of motor enclosures.

Illumination : Units of light, Point , linear and surfact sources. Laws of illumination. Candle power distribution, MSCP and reduction factor, Indoor lighting system and their classification. Contrast, glare, shadow and colour.

Mounting height and spacing. General and local lighting Total lumen and point by point methods of calculations. Outdoor lighting distributor and protector fittings. Isolux diagram. Flood, gas, discharge and arc-lamp-working, characteristics and applications.

Electric Heating and Welding : Principles of electric heating. Direct and indirect resistance heating, lead baths and salt baths. Resistance oven convection and radiation ovens. Arc resistance and induction furnance, elements of operation, performance and power supply arrangements. temperature regulation of ovens and furnances. Induction, high frequency and dielectric heating and their uses. Elementary study of different kinds of electric welding operation, Power supply for welding. Elements of Electrics Traction : Electric traction versus others System of electric traction for tramways, trolley buses, motor coach trains and locomotive hauled trains. Idea about suitability of electric motor for traction. Conductor rail and pantograph. meaning for multiple-unit operation.

Economics : Methods for economic selection of Industrial drives, loss factor and cost of losses, Effect of load factor. Power factor and factory diversity factor. Methods of power factor improvement and its economic limit. Economic calculations for illumination schemes Echnomic value of good lighting.

Ma-291 A Open Elective-I :Mathematical Statistics for Engineers

3L

3 Hrs, MM 100

Theory of probability : Theoretical probability distribution (Binomial, Poisson and Normal).

Correlation and Regression Analysis : Karl-Pearson's coefficient , Spearman's coefficient, Regression analysis of two variables system.

Sampling Theory : Test of significance, Large sample tests for mean and proportions. χ^2 (chi-square) , t and F Test of significance for Small sample.

Theory of attributes: association and independence of attributes, coefficient of association.

Index Number: Various types of index numbers, construction of index number of prices, fixed base and chain base methods

ME- 291A Open Elective-I: Renewable Energy Sources

3L

3 Hrs, MM

100

Principal types of fossil fuel fired power plants and their effects on livestock and environment; Concepts of NCES, Criteria for assessing the potential of NCES, Limitations of RES.

Solar Energy - Solar radiation data, solar energy conversion into heat, Analysis of Flat plate and Concentrating collectors, Testing procedures, Paraboloid Dish, Central Receiver; concept of collector tracking, energy storage systems; Solar thermal systems for residential water heating, Solar Pond, industrial process heating and power generation. Photo voltaic: p-n junctions, I-V characteristics of solar cells, Calculation of energy for photovoltaic power generation; Battery Characteristics, DC Power Conditioning Converters, AC Power Conditioning - Inverters.

Wind Energy: Energy available from wind, General formula, Lift and drag. Basis of Wind energy conversion, Effect of density, Frequency variances, Angle of attack, Wind speed, Determination of torque coefficient, Principle of Operation of wind turbines, types of wind turbines and characteristics, Generators for Wind Turbines, Control strategies.

Biomass and Biofuels: Conversion routes- combustion, pyrolysis of biomass to produce solid, liquid and gaseous fuels; Constructional details of gasifier; Aerobic and anaerobic digestion, Biofuels and their production; biofuels, Biomass systems for thermal applications and power generation.

Geothermal Energy: Definition and classification of resources, typical geothermal gradient; Dry, flash and binary steam systems; Utilization for electricity generation and direct heating, Wellhead power generating units. Basic features: Atmospheric exhaust and condensing, Exhaust types of conventional steam turbines.

An overview of other renewable devices- Fuel cells: principle, types, applications; Ocean thermal energy conversion (OTEC), Thermoelectric, MHD, Wave energy, Tidal energy, etc.

Economic Viability: Calculation of the cost of energy supply from renewables, Payback period, Carbon footprints; Comparison with conventional fossil fuel driven systems in terms of costs and emissions; Calculation of carbon dioxide reduction and incremental costs for renewable options.

ME 292 A Open Elective-I: Automobile Engineering

3L

3Hrs, MM

100

Power Unit: Automobile engine types, classification; Engine parts: cylinder head, block and crank case, piston and rings; Carburation, fuel injection, valve operation; Fuel combustion, mechanical power and engine performance characteristics; Engine cooling and thermal stresses in parts,.

Chassis and Suspension: Load on frame, general considerations for strength and stiffness, engine mounting; Dampers, leaf and coil springs, various arrangements of suspension systems.

Transmission System: Clutches, flywheels, torque convertors; Gear-box: simple, synchromesh and overdrive; Type of universal joints, propeller shaft, differential; Rolling, air, gradient resistances and propulsive power calculation.

Steering: Steering geometry, Ackermann and Davis steering mechanisms; Telescopic steering; Steering shaft, gear-box, linkages, steering angles, front and rear axles; Vehicle longitudinal, static and dynamic balancing and electronic stability; Power steering: types and mechanism; Effect of caster, camber, toe-in and toe-out on tyre wear.

Brakes and Tyres: Servo-action, brake components; Bendix and Gerling system lock-head, hydraulic, vacuum, air and power brakes, and retarders; Pneumatic and tubeless tyres;

Features of a Modern passenger Car: Introduction to ABS, Front and side air bags, EBD, Climatizer, ESP, night-vision dashboard system; sun-roofing, collision warning system, Hybrid cars.

MI 291A Open Elective-I: Tunneling for Engineering Projects (MI)

**3L
100**

3 Hrs, MM

Tunneling: Introduction about tunnels, functions, advantages and disadvantages of tunnels compared to open cuts, Criteria for selection of size and shape of tunnels, consideration in tunneling, geological investigation, tunnel alignment, tunnel shafts, pilot tunnels. Advantages of twin tunnels and pilot tunnels, portals and adits.

Conventional Method of Tunneling: Drilling, Blasting, Loading and Transport of Muck, Supports, Ventilation, Drainage, and Equipments. Drivage work in varying ground conditions using conventional methods

Fast Tunneling: Dill jumbos, trackless mucking and transportation units. Tunnel boring machine

Tunneling in Soft Ground: General characteristics of soft ground, shield methods, needle beam method and NATM method of tunneling in practice.

Tunneling (rock bolting and guniting), Safety measures, Ventilation in tunneling, Lighting, Drainage.

PI 291A Open Elective-I: Manufacturing Science

**3L
100**

3 Hrs, MM

History and introduction to science of basic manufacturing processes and its classification.

Primary manufacturing processes: Introduction to liquid state forming process (casting), solid state forming process (drawing, extrusion, rolling, forging and other sheet metal working) and powder state forming process (powder metallurgy).

Secondary manufacturing processes: Introduction to material removal processes

Conventional Machining processes (basic machining operations performed of lathe, shaper, milling, drilling and grinding machine).

Introduction to basic metal joining processes (welding, brazing, soldering and mechanical fastening).

Non conventional machining processes (Basic introduction, classification, need for their development, characteristics and their industrial applications).

SE 291 A open elective-I: Computer oriented Numerical Analysis

3L

3 Hrs. MM 100

Error Analysis:- Approximations and errors, Round off errors. Roots of Equations:- Bisection method, Newton – Raphson method. Curve Fitting:- Linear Regression, Least Square Ft, Co-relation. Interpolation:- Linear & Quadratic, Newton’s & Lagrange’s polynomials. Numerical Differentiation:- Forward / Backward / Centered F.D. method. Numerical Integration:- Trapezoidal rule, Simpson’s rule. Solution of simultaneous Linear algebraic equations.

SYLLABUS OF OPEN ELECTIVES-II

BCT 341 A Open Elective-II: Traditional Indian Architecture

**3L
100**

3 Hrs, MM

To provide theoretical knowledge base on the uniqueness of Indian traditional Architecture principles, the meaning of space, the manifestation of energy, the selection of site and how integration of built form with site happens at metaphysical level based on articulation of celestial grid.

To introduce the principles of Vastu and relationship between building and site. To familiarize the students with the units of measurement in traditional architecture. To introduce concepts of orientation and cosmogram according to the Vasthu Purusha Mandala. To study the detailing and design of various building components and their material and method of construction.

Vastu - its definition and classification - Relationship to earth.. Features of good building site - good building shapes - macro, micro, enclosed and material spaces - relationship between built space, living organism and universe - impact of built space on human psyche.

Orientation of building, site, layout and settlement - positive and negative energies - importance of cardinal and ordinal directions - The celestial grid or mandala and its types. The Vastu Purusha Mandala and its significance in creation of patterns, and lay-outs, Types of lay-outs. Simple design of residential buildings.

Building heights -Base and basement - wall and roof specifications - column and beam designs - Pitched roof and domical roofs - significance of pyramid.

Use of wood, stone, metal, brick and tile - marking technology, corbelling technology, jointing technology - foundations for heavy and light structures - Landscaping in and around buildings - Aesthetics in Indian Architecture.

CE 341A Open Elective-II: Non Urban Public Hygiene & Drinking Water

**3L
100**

3 Hrs, MM

Communicable disease: Disease and immunity, communicable disease sources, mode of transfer. Control of communicable disease.

Fly and mosquito control: Life cycle of flies and mosquitoes. Various methods of fly and mosquitoes control.

Milk and food sanitation: Essential of dairy farm and cattle shed sanitation. Tests for milk and dairy products. Food epidemic, food poisoning. Botulism. Rural sanitation, village latrines, aqua privies, storm water and sullage problems, animal waste, methods of composting. Biogas collection and disposal of refuse, solid waste management through vermicomposting.

Septic tank (only salient features), percolation pits, sub surface disposal.

Rural water supply: Importance of village community in India, conditions of Indian villages with special regards to economic, social and health aspects. Quality of water needed for village community, sources of water for village water supplied, domestic roof water harvesting. Types of wells of sanitary aspects in well construction. Disinfections of wells. Different types of pumps used for village wells. Operation and maintenance of pumps, water borne diseases. Quality of water, human and cattle population and their water requirement. Rate of water supply. Standards of potable water. Rain water storage.

Treatment of water: Disinfection, desalination, Defluoridation, distribution of water.

ChE 341 A Open Elective-II: Petroleum Refining Technology

3L

3 Hrs, MM

100

Origin occurrence of petroleum, Formation and Evaluation of Crude Oil. Testing of Petroleum Products. Petroleum refining processes, general processing, topping and vacuum distillations. Thermal cracking in vapor, liquid and mixed phase. Overview of Refinery Products

Catalytic cracking - Houdry fixed bed, fluidized bed, T.C.C. Houdry flow etc. Catalytic reforming - conversion of petroleum gases into motor fuel with special reference to alkylation, polymerization, hydrogenation and dehydrogenation.

Treatment Techniques: Removal of Sulphur Compounds in all Petroleum Fractions to improve performance, Destruction of Sulphur Compounds and Catalytic Desulphurization, Solvent Treatment Processes, Dewaxing, Clay Treatment and Hydrofining.

Production of aviation gasoline, motor fuel, kerosene, diesel oil, tractor fuel and jet fuel, hydrodesulfurisation, Lubricating oil manufacture, Petroleum waxes and asphalts.

Octane number, Cetane number, Diesel index, their determination and importance Storage of petroleum products: tanks, bullets, special types of spheres etc. Transportation of petroleum products: road, rail, sea and pipeline; Importance of pipeline transportation.

CSE 341A Open Elective-II data structures and algorithms (Open)

3L

3 Hrs, MM

100

Introduction to data structure, String storage representation and manipulation. Markov algorithm and primitive data structures.

Concepts of non primitive data structures. Linear data structure. Array, stack, queue, their applications and implementations using sequential storage representation and linked representation.

Linear linked list, double linked list, circular linear linked list and generalized lists and applications.

Concept of non-linear data structures, Tree, graph, set and their representation, Binary Tree, Threaded tree, different techniques of tree traversal, breadth first search, depth first search, application of tree and graph such that Polish notation, concepts of heap.

Sorting, searching algorithms and comparative study of different sorting and searching techniques such that selection sort, heap sort, bubble sort, quick sort, merge sort and radix sort. Linear search and binary search, hashing. External sorting.

Time and space complexity of the algorithms – Big-O, θ , Ω , and small-o, Asymptotic complexity, Upper and Lower bound time and space trade offs.

EE 341 A Open Elective-II: Optimization Techniques

3L

3 Hrs, MM

100

Introduction to Optimization : Historical Development, Engineering application of optimization, Statement & Classification of optimization problems, Classical optimization techniques for single & multiple variable functions.

Linear Programming : Introduction, application, standard form, Basic Solutions, Simplex method, Revised Simplex method, Duality, Transportation problem, Carnmarkar's method.

Nonlinear programming : Unconstrained Optimization, Introduction, Fibonacci method, Golden section search, Gradient method, Newton's method, Quasi Newton method.

Dynamic Programming : Introduction, Multistage decision process, Concept of optimization & principle of optimality, Computational procedure in dynamic programming.

Advanced topics in optimization : Introduction, Separable programming, Multi objective optimization, Calculus of variation.

Books :

Engineering Optimization – S. S. Rao, New Age International Publishers.

An introduction to optimization – Er. K. P. Chong, S. H. Zak (Wiley Slident Edition)

Operations Research : An international – H. A. Taha (PHI)

Introduction to operation research – Hiller F.K. & Lieberman (TMH)

EE 342 A Open Elective-II: artificial intelligence (e)

3L

3 Hrs, MM

100

Introduction: Economics for Electrical Engineering, concept of physical efficiency and financial efficiency of electrical goods and services supply and demand, Elasticity. Necessities and luxuries, free competition, monopoly, law of diminishing returns.

Interest and Depreciation: Interest rates and equivalence, annuities and various factors, concept of depreciation in utilizing electrical energy, economic life of electrical machines, salvage value, various methods of depreciation calculations, equivalent capital recovery depreciation.

Economical choice of Electrical Apparatus: Motors, transformers, Economical choice between synchronous motors and Induction motor running them simultaneously.

Comparison of Alternatives: Basic economic study patterns, annual cost, capitalized cost, present worth, rate of return, Increment investment, pay back and benefit to cost ratio methods and their respective fields of applications.

Ma 341 A Open Elective-II :Mathematical Theory of Operations Research

3L

3 Hrs, MM

100

Linear programming problems-Simplex Method, two phase method, Duality of LPP.

Theory of games: Competitive strategies, minimax and maximin criteria, two person zero-sum games with and without saddle point, dominance .

Inventories: Single item deterministic inventory models with finite and infinite rates of replenishment, economic lot-size model with known demand

Replacement problems: Replacement of item that deteriorate, replacement of items that fail completely, group replacement policy, individual replacement policy

Queing theory-Queues with Poisson input and exponential service time, the queue length, waiting time and busy period in steady state case, model with service in phase, multiserver queueing models.

ME 342A Open Elective-II: Finite Elements Method

3L

3 Hrs, MM 100

Introduction: Basic concept of Finite element method; Rayleigh-Ritz and weighted residual method of variational approximation, Numerical Solution of equilibrium problem by Gaussian elimination.

Finite Element Analysis of One-dimensional Problem; Basic Concepts, derivation of elements equations, connectivity of elements, imposition of boundary conditions, Solution of equations, Application in One dimensional problem of Solid mechanics and heat transfer.

Finite Element Analysis of Two Dimensional Problem: Single variable problems: finite element discretization, interpolation, function, numerical integration and modeling considerations for triangular, rectangular, Quadrilateral, Isoparametric and Plane frame elements, Evaluation of equation and their solutions, Application in Two Dimensional Problem of Solid mechanics, Heat Transfer and Eigen value problems.

MI 341A Open Elective-II: Application of GIS & Remote Sensing in Engineering

3L

3 Hrs, MM

100

Remote Sensing: Introduction to Remote Sensing, Terminology in Remote Sensing, Types of Remote sensing, advantage and disadvantage of remote sensing data, Electromagnetic radiation atmospheric. Windows remote sensing platforms and sensors systems, path-row referencing system, remote sensing data product, procedure for obtaining satellite data. Hardware and software related to remote sensing.

Different types of platforms, sensors and their characteristics, Orbital parameters of a satellite, Multi concept in remote sensing.

Image Interpretation and analysis: Elements of visual image interpretation, Digital image pre-processing, radiometric correction, geometric correction, resolution of remote sensing data, image enhancement, contrast enhancement, spatial filtering band rationing image classification supervised and unsupervised classification, remote sensing applications in forestry, geology, hydrogeology, Land use and land cover mapping.

Principles of interpretation of aerial and satellite images, equipments and aids required for interpretation, ground truth – collection and verification, advantage of multiband and multiband images. Digital image Processing concept.

Geographic Information System (GIS): Fundamental of GIS: Basis concept including definition and history of GIS, Essential Elements of GIS, Uses and users of GIS, General GIS Applications, Geodesy, Grids, Datum's and projection systems, GIS Data structure, Data Formats, GIS layers and Digitization overview of GPS and its application, Hardware and software related to GIS.

Raster and vector Based GIS: Raster based GIS, Definition of Raster Based GIS, Spatial Referencing Definition and Representation of Raster Data. Vector based GIS, Definition and concept of vector based GIS, Data

structure, Data Capture and Basic operations of spatial analysis, advantages and disadvantage in raster and vector based GIS, Introduction to network in GIS, GIS Project Planning Management and Implementation. Application of GIS :in Map revision, Land use, Agriculture, Forestry, Archaeology, Municipal, Geology, water resources, soil Erosion, Land suitability analysis, change detection, Use of GIS in Mining.

SE 341A Open Elective-II :Structural Dynamics

**3L
100**

3 Hrs, MM

Vibrations of single degree of freedom system, sources of vibration, Types of vibration, Degree of freedom, spring action and damping, equation of motion of single degree of freedom system, undamped system of single degree of freedom, combination of stiffnesses, damped system of single degree of freedom, dry friction, damping forced vibration of damped system, introduction to multi degree freedom system.

SYLLABUS OF OPEN ELECTIVES-III

BCT 391 A Open Elective-III: Climate Responsive Architecture

**3L,
100**

3 Hrs, MM

Understanding Climate and its impact on architectural design, fundamentals of climatology and environmental studies.

Introduction – Elements of Climate, measurement and representation of climatic data. Classification of climate, major climatic zones of India.

Thermal Comfort: Effect of climatic elements on Thermal comfort; indices for Thermal comfort Thermal performance of building elements: Thermal and physical properties of building materials and their effect on indoor environments.

Natural ventilation: Functions, effects of openings and external features on internal air circulation. Design considerations for achieving natural ventilation.

Sun path diagram, use of solar charts, types of shading devices

Day light factor: components, design considerations for indoor spaces

Micro Climate: factors and effects

Construction techniques for improving thermal performance of walls and roofs. Passive cooling techniques: traditional and contemporary

Design considerations for buildings and settlements in tropical climates with special reference to hot-dry, warm-humid and composite climates; Mahoney Tables.

Exercises:

Design of shading devices.

Layout of Residence for hot - dry, warm-humid and composite climates.

CE 391A Open Elective-III: Ecosystem & Biodiversity

**3L,
100**

3 Hrs, MM

Concept of an ecosystem, structure & function of ecosystem, Bio-Geo chemical cycles (Hydrological, carbon, oxygen, nitrogen, phosphorus & sulphur cycle), energy flow in ecosystem, food chain

Major ecosystems (Description only) : Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystem, Riverine and stream ecosystem, Marine ecosystem, Estuarine ecosystem.

Biodiversity : Definition and its importance. Biodiversity at global, national & local level. Hot spots of biodiversity, Threats to biodiversity & causes of biodiversity loss. Conservation of biodiversity.

Value of biodiversity: Consumptive use, productive use, social value, ethical value, aesthetic value& optional value.

Bio-geographical classification of India. India as mega- diversity nation

ChE 391 A Open Elective-III: Nanotechnology

**3L,
100**

3 Hrs, MM

Introduction to Nanotechnology: Introduction to nanotechnology and materials, Nanomaterials, Introduction to nano sizes and properties comparison with the bulk materials, different shapes and sizes and morphology.

Fabrication of Nanomaterials: Wet Chemical Synthesis Methods, Colloidal Nanoparticles Production, Sol Gel Methods, Microwave and Atomization, Gas phase Production Methods : Chemical Vapour Depositions.

Kinetics at Nanoscale: Nucleation and growth of particles, Issues of Aggregation of Particles, Layers of surface Charges, Zeta Potential and pH.

Carbon Nanomaterials: Synthesis of carbon buckyballs, List of stable carbon allotropes extended fullerenes, metallofullerenes solid C60, bucky onions nanotubes.

Nanomaterials characterization: Instrumentation Fractionation principles of Particle size measurements, Particle size and its distribution, XRD, Zeta potential Microscopies SEM, TEM, Atomic Forced Microscopy, Scanning and Tunneling Microscopy

Applications in Chemical Engineering: Self-assembly and molecular manufacturing : Surfactant based system Colloidal system applications, ZnO,TiO₂, Silver Nanoparticles Functional materials Applications, Production Techniques of Nanotubes, Carbon arc, bulk synthesis, commercial processes of synthesis of nanomaterials, Nanoclay, Commercial case study of nano synthesis - applications in chemical engineering.

CSE 391A Open Elective-II: Web Technologies (Open)

**3L,
100**

3 Hrs, MM

Understanding Microsoft .NET Framework and ASP.NET, Creating components in Visual C#. CLR, Framework Class Library, Undocumented Types.

Programming the .NET Framework, Common Types, Math, Strings, Collections, Regular Expressions. Core Types, Serialization, Remoting, Graphics, Rich Client Applications, Globalization, Configuration, Advanced Component Services.

Multithreading, Thread Synchronization, Inter-thread Communication and Monitor. Delegates & Events. Validating User Input.

Creating a Connection to the Database, Displaying a DataSet, List-Bound Control, Paging and Selection, DataGrid Control, Accessing Data with DataReaders and SqlDataReader. Overview of Stored Procedures.

Managing State, State management, Application and Session Variables, Cookies and Cookieless Sessions. Configuring, Optimizing. Using the Cache object.

Reading and Writing XML Data, Overview of XML Architecture, DataSet Object, XML Web Server Control, Reading, Transforming, and Displaying XML, Nested Data. Creating an XML Web Service.

Securing a Microsoft ASP.NET Web Application, Web Application Security Overview, Windows-Based Authentication, Forms-Based Authentication, Passport Authentication, Registering New Users, Permitting Users to Sign Out.

AJAX.NET Architecture, Working with AJAX Pro and Controls, Accordion, Calendar, CascadingDropDown, CollapsiblePanel, Filtered TextBox, Numeric Up Down, Modal Popup, Popup Control. Page_Load Event and Click Event Procedure, Adding server controls to an ASP.NET Web Form basics, handling text and numbers.

CSE 392A Open Elective-II: Database Management Systems (Open)

3L

3 Hrs, MM

100

Purpose of data base system, data abstraction, data models, data independence, data definition language, data manipulation language, data base manager, data base administrator, data base users, overall system structure.

E-R Models, entities and entity sets, relationships and relationship sets, attributes, mapping constraints, keys, E-R diagrams, reducing E-R diagrams to tables, generation, aggregation, design of an E-R data base scheme

Basic concept of object oriented model, New database applications, object structure, class hierarchy, multiple inheritance, object identity, object containment, physical organization, object oriented queries, scheme modification.

File and system structure, overall system structure, file organization, logical and physical file organization, sequential, random, hierarchical, inverted, multilist, Indexing and hashing, B-tree index files

Introduction to distributed database. Introduction to SQL Query and SQL joins.

EE 391 A Open Elective-III: Soft Computing Techniques

3L

3 Hrs, MM

100

Soft Computing : Introduction of soft computing, soft computing vs. hard computing, various types of soft computing techniques, applications of soft computing.

Artificial Intelligence : Introduction, Various types of production systems, characteristics of production systems, breadth first search, depth first search techniques, other Search Techniques like hill Climbing, Best first Search, A* algorithm, AO* Algorithms and various types of control strategies. Knowledge representation issues, Propositional and predicate logic, monotonic and non monotonic reasoning, forward Reasoning, backward reasoning, Weak & Strong Slot & filler structures, NLP.

Neural Network : Structure and Function of a single neuron: Biological neuron, artificial neuron, definition of ANN, Taxonomy of neural net, Difference between ANN and human brain, characteristics and applications of ANN, single layer network, Perceptron training algorithm.

Fuzzy rule base system : fuzzy propositions, formation, decomposition & aggregation of fuzzy rules, fuzzy reasoning, fuzzy inference systems, fuzzy decision making & Applications of fuzzy logic.

EE 392 A Open Elective-III: Energy Conservation

3L

3 Hrs, MM

100

Elements of Energy Conservation and Management : General energy problem, Sector wise Energy consumption, demand supply gap, Scope for energy conservation and its benefits, Energy conservation Principle Maximum energy efficiency, Maximum cost effectiveness. Mandatory provisions of EC act Features of EC act Standards and labeling, designated consumers, Energy Conservation Building Codes (ECBC). Energy management concept and objectives Initializing Planning, Leading, Controlling, Promoting, Monitoring and Reporting, energy management programmes. Energy Conservation Approaches In Industries : energy saving opportunities in electric motors Benefits of Power factor improvement and its techniques Shunt capacitor, Synchronous Condenser etc., Effects of harmonics on Motors, and remedies leading to energy conservation Energy conservation by VSD Methods and techniques of energy conservation in ventilation and air conditioners compressors pumps, fans and blowers Area Sealing, Insulating the Heating / cooling fluid pipes, automatic door closing Air curtain, Thermostat / Control Energy conservation in electric furnaces, ovens and boilers lighting techniques Natural, CFL, LED lighting sources and fittings Energy Conservation in Power Generation, Transmission and Distribution : Performance improvement of existing power plant: cogeneration, small hydro, DG Set. Demand side management Load response programmes Types of tariff and restructuring of electric tariff Technical measures to optimize T and D losses.

Ma 391 A Open Elective-III: Advanced Numerical Analysis

3L

3 Hrs, MM

100

Solution of Algebraic and Transcendental Equations: Newton-Raphson method for real multiple roots, for complex roots and for system of non-linear equations; Synthetic Division, Birge-Vieta Method.

Solution of simultaneous Linear Equations and Eigen Value Problems: Direct methods: Gauss-elimination, Gauss-Jordan, Iterative Methods: Jacobi iteration, Gauss-seidel iteration and Successive Relaxation method. Eigen value Problems: power method

Curve fitting and Function Approximation: Chebyshev approximations, Chebyshev Expansion, Chebyshev Polynomials. Economization of Power Series.

Numerical Solution of Partial Differential Equations: Finite difference Approximation to partial derivatives.

Solution of Laplace and poisson equations, Solution of one and two dimensional heat and wave equation by the method of separation of variables.

ME 391A Open Elective-III: Design Planning and Control of Production System

3L

3 Hrs, MM

100

Production Planning: Planning horizon, product exploring, Make and buy decisions, operations planning, demand forecasting, conversion of forecast into production goal.

Scheduling: Operation sequencing and balancing, Scheduling for mass production and job order production, MRP, ERP.

Inventory System: Cost factors relevant to operations and inventory control, EOQ with shortages and uniform production, quantity discount.

Project Planning and Control: Network control, control cost consideration and optimization, Resource allocation and levelling, Aggregate production planning, decision rules.

Supply Chain Management:: Strategic framework of Supply chain – meaning, scope and performance of supply chain, supply chain drivers and obstacles. Role of e-business in a supply chain.

ME 392A Open Elective-III: Systems Design and Analysis

**3L
100**

3 Hrs, MM

System Fundamental Concept: System definition, systems approach, Classification- General Systems, Discrete Systems, Controlled systems.

Procedure for Engineering a system: Defining system objective, formulation of objective criteria, Development of system alternatives.

Systems Optimization: Formulation of system, Design problem and application of search methods, Linear programming and dynamic programming for optimum solutions.

System Schedule: Time models, resource allocation, Time cost trade-off, system cost economic flow graph.

MI 391A Open Elective-III: Project Environment Clearance

**3L
100**

3 Hrs, MM

Brief introduction of Environment Protection Act 1986 and other relevant legal provisions applicable to get environment clearance in India.

Impact of major engineering projects on various components of the environment: Socio-Economy, Land, Water, Air, Noise and others.

Preparation of Environment management plan: Public hearing, collecting baseline data, Environment impact assessment and predication, Environment management plan, environment monitoring and management.

PI 391A Open Elective-III: Quality Management

**3L
100**

3 Hrs, MM

Introduction: History of Quality, Objectives , importance and need of quality, Contributions of Quality Gurus- Juran, Deming, Crosby, Feigenbaum, Ishikawa, Taguchi etc., Impact of Quality on business performance.

Process and Statistical Quality Control: Quality System; Quality control techniques; Process capability; Control Charts- Theory of control charts, control limits and specification limits, Control charts for variables-X R Charts, Control Charts for attributes p, np, c and u charts.

Acceptance Sampling : Fundamental concepts of acceptance sampling; OC Curves; Single , Double and multiple sampling;

Quality Management: Introduction to Quality management; quality control and quality assurance; Quality control tools; cost of quality and cost of poor quality.

ISO 9000: ISO 9000 series; terminologies; need for ISO 9000 certification; basic procedure and work instructions; steps in ISO 9000 registration; Internal and third party audit for registration; Clauses of ISO 9000-2000 .

SE 391A Open Elective-III :Finite Element Method

3L

3 Hrs, MM

100

Introduction to Finite Element Method, Basic Concept of Finite Element Method, Analysis of continuum:- Structural, thermal, Potential etc., Finite Element Analysis of an elastic continuum:- Displacement approach, Direct Formulation, Energy Integral, Co and C1 continuity, Convergence criteria.

Elements:- Types and Properties. Conforming and Non conforming.

Shape Functions:- Lagrangian and Serendity family for one and two dimensional cases.

Pascal triangle, Super / Sub and Iso parametric elements.

Steps in Finite Element Analysis of an elastic continuum.

SECOND B E. EXAMINATION

THIRD SEMESTER

Ma 201 A (EC/ECC/EEE) - Advanced Engineering Mathematics I

2L

3 Hours, 100 Marks

Section A

Differential equations : Simultaneous differential equations, Total differential equations, Partial differential equations of first order, Charpit's method, Linear homogeneous partial differential equations with constant coefficients, Second order partial differential equations : Monge's method for the equation of type

$$Rr + Ss + Tt = V$$

Solution of Wave, Heat and Laplace equations using separation of variables method.

Section B

Complex Analysis : Analytic function, Harmonic function, Construction of an Analytic function, Complex integration: Cauchy's integral theorem, Cauchy's integral formula, Derivative of Cauchy's integral formula.

Taylor's and Laurent's series expansion of complex functions.

Cauchy's residue theorem and its application to evaluate the contour integrals of type $\int_0^{2\pi} f(x)dx$ and

$$\int_{-\infty}^{+\infty} f(x)dx$$

Transformations: conformal and bilinear transformations.

Section C

Probability and Statistics: Theorems of probability and their application, Binomial, Poisson and Normal probability distribution. Correlation and Regression analysis of two parameters.

Note: Candidates are required to attempt FIVE questions in all, selecting at least one from each Section.

EC 202 A - NETWORK THEORY (EC/ECC/EEE)

2L, 1T

3 Hours, 100 Marks

Network Equations: Topology incidence, cut-set end tie-set matrices. Mesh and nodal analysis of networks with independent and dependent sources. Duality, Transient and steady state solutions of D.C. and A.C. networks.

Network Theorems: Superposition, Thevenin, Norton, Reciprocity. Maximum power transfer. Millman and Tellegen's Theorems and their applications to D.C. and A.C. circuits

Resonance: Resonance in series and parallel- circuits. Q-Factor, bandwidth and selectivity.

Non-sinusoidal Periodic Waveforms: Fourier series- trigonometric and exponential forms. Response of network to non-sinusoidal periodic waveforms.

Two Port Networks: Different two port parameters and their inter-relations and characteristic functions, interconnection of two port networks, Brune's test. Network configurations. Symmetrical and asymmetrical two port communication networks. Iterative, Image and characteristic impedances, Propagation, attenuation, phase and Image transfer constants. Balanced, unbalanced and reciprocal networks; T.L. lattice and bridged T network

Network Functions: Generalized concept of complex frequency, Impedance and admittance functions. Exponential excitation and system functions. Driving point and transfer functions. Pole zero configuration of system functions.

EC 207 A - SOLID STATE ELECTRONICS AND DEVICES (EC)

2L, 1T

3 Hours, 100 Marks

Quantum Mechanics: Review of Schrodinger wave equation. Physical interpretation of wave function, Maxwell Boltzmann, Bose-Einstein and Fermi-Dirac statistics. Interatomic forces and types of bonding. Theory of band structure and electronic states in conductors, semi-conductors and insulators. Fermi level

Semi-conductor Physics: Conduction mechanism in semiconductors. Concept of mobility and diffusion. Concentration of carriers and ionized impurities in non-degenerate semi-conductors. Evaluation of Fermi level. Concept of effective electron mass and hole mass. Carrier transport mechanism in semi-conductors. Drift and diffusion currents in non-degenerate semi-conductors. Thermal equilibrium and non-equilibrium conditions. Carrier recombination, continuity equation and time dependent diffusion equation. Surface states and surface recombination. Carrier life time, Photo conductivity. Introduction to optical absorption, photo luminescence. Cathode luminescence and electro luminescence.

Introduction to Solid State Devices: Space charge region and junction capacitance. Minority carrier injection, carrier storage and transient response. Impact ionization and avalanche break-down.

Analytical theory of junction diodes. BJT, JFET, MOSFET, UJT, diffused transistors, avalanche transistors. Degenerate semi-conductors and theory of tunneling, Theory of tunnel diodes, zener diodes, varactor diodes, photo diodes, LEDs, photo-transistors, photo FETs and LASER. Introduction to Laser. Elementary theory of composite junction. Ohmic junctions and hetero junctions.

EC 204 A - ELECTRONIC CIRCUITS (EC) - I

3L, 1T

3 Hours, 100 Marks

Introduction: Biasing and stabilization techniques of BJT, JFET, MOSFET for use as amplifiers in various configurations. Small signal models for BJT, JFET and MOSFET in discrete and integrated form. Frequency dependence characterization and equivalent circuits. Miller effect.

Untuned small signal BJT amplifiers: Analysis and design of Single stage and multistage. RC coupled and transformer coupled amplifiers. Frequency response, bandwidth, gain and factors affecting them. Various two transistor integrated circuit amplifier stages. Introduction of d.c. amplifiers, differential amplifiers, Cascode and Darlington circuits. Follower circuits and boot-strapping.

Feedback amplifiers: Study of the effects of feedback on amplifier gain, distortion, noise, band-width and impedance levels, Regeneration and its control in multistage audio frequency amplifiers

EC 205 A - DIGITAL ELECTRONICS (EC/ECC/EEE) - I

3L, IT

3 Hours, 100 Marks

Device Characteristics: Steady state and transient switching characteristics of diodes, BJTs, FETs, UJTs. Wave shaping circuits. Integrating and differentiating circuits, effects of time constant, relation of tilt time to time constants. Clipper and clamper circuits using diodes and transistors. Saturated and unsaturated transistor switches. Speed-up capacitors. Inverter circuits. Performance of pulse transformer and lumped distributed parameter electromagnetic delay lines.

Relaxation Oscillators: Theory, operation and performance of astable, monostable and bistable multivibrators. Different triggering circuits. Theory of Schmitt trigger. Comparison of performance of various circuits configurations of multivibrators and their fields of applications. Tunnel diode. UJT relaxation oscillator. Theory of astable and monostable blocking oscillators and their triggering methods.

Sweep Circuits: Free running and triggered modes. Theory and common circuits of voltage and current time base generators.

Sampling Gates: Theory, operation and applications of unidirectional and bi-directional sampling gates using diodes and transistors.

EC 206 A - ELECTRONIC INSTRUMENTS AND MEASUREMENTS (EC)

2L, IT

3 Hours, 100 Marks

Introduction: Difference in measurements at low and high frequencies. Types of indicating instruments, balance detectors and other auxiliary apparatus used. Shielding and grounding considerations. Noise problems. Effects of physical size of components.

Characteristics of Lumped passive components: Measurement of resistance, capacitance, self and mutual inductance and incremental inductance at audio and radio frequencies. Price's guard wire and loss of charge methods for resistance measurement. Important a.c. bridges for capacitance and inductance measurements. Introduction to inductively coupled ratio arm bridge. Special considerations for radio frequency bridges. Twin-T and bridged-T networks. Resonance and heterodyne methods of parameter measurement. Q-measurements. Q-meter.

Instrument Amplifiers: Operation, performance and characteristics of single ended, differential, chopper stabilized amplifiers used in Instrumentation, Different types of choppers and their characteristics .

Electronic Analog Voltmeters: Characteristic and specification of analog electronic voltmeters of different kinds, Circuits of dc. volt meters using tubes, FETs, BJTs, and ICs, Analysis of circuits with various instrument amplifiers, configurations to compare sensitivity, stability, linearity and impedance characteristics. Theory of operation and circuits for average, peak, peak to peak and RMS responding-A.C., Voltmeters, Use of compensated multipliers, CMRR and NMRR, R.F. Voltmeters. Common types of voltmeter probes. Electronic VOM.

Electronic Analog Ammeters: Performance-specifications of instruments for audio and radio frequency current measurements. Rectifier and thermocouple ammeters. Principle of Hall effect ammeters. Use of amplifier type d.c. voltmeter as ammeter.

EC 215 B - LOGIC SYSTEM DESIGN (EC) - I

2T

100 Marks

Number systems: Binary arithmetic, Octal and hexadecimal number systems. Different numerical and alphanumeric codes. Truth functions

Basic Logic Circuits: Positive and negative logic of OR, AND, NOT, NOR, NAND, Exclusive OR and Exclusive NOR gates. RTL, DTL, DCTL, TTL, ECL, MOS and CMOS logic circuits and their realization. Power dissipation, speed, delays, noise margin, fan-in and fan-out capabilities.

Combinational Logic: Boolean algebra. Boolean functions and expressions. Simplification and minimization techniques, K-map and tabular methods. Design of minimal combinational systems and realization. Design of multiple output combinational systems. Design of hazard free combinational system.

Flip-Flops: Unclocked and clocked flip-flops. R-S, D, J-K and T flip-flops. Master-slave and edge-triggered flip-flops. Specifying parameters and timing properties of flip flops .

FOURTH SEMESTER

Ma 251 A - ADVANCED ENGINEERING MATHEMATICS (EC/ECC/EEE) - II

2L

3 Hours, 100 Marks

Section A

Transforms: Laplace Transform, Inverse Laplace Transform, Properties of Laplace Transforms, Application of Laplace Transform to solve differential equation with constant coefficients. Z- Transforms. Infinite Fourier Transforms.

Section B

Numerical Analysis : Interpolation with equal intervals: Newton-Gregory interpolation formulae, Lagrange's interpolation formula for unequal intervals. Central difference interpolation formulae: Gauss' forward and backward formulae, Stirling's and Bessel's interpolation formulae. Numerical integration : Trapezoidal rule, Simpson's 1/3 and 3/8 rule. Numerical solution of algebraic and transcendental equations : Bisection, regula falsi and Newton-Raphson methods. Numerical solution of linear simultaneous equations : Gauss' elimination, Gauss-Jordan, Jacobi and Gauss-Siedal methods. Numerical solution of ordinary differential equations : Euler's, Runge-Kutta Fourth order and Milne's methods.

Section C

Special function : Series solution of Bessel and Legendre's differential equations. Generating function of Bessel and Legendre's Polynomials. Orthogonal Property of

Bessel and Legendre's function. Rodrigue's formula.

Note: Candidates are required to attempt FIVE questions in all, selecting at least one from each Section.

EC 252 A - RF CIRCUITS AND SYSTEMS (EC)

2L, IT

3 Hours, 100 Marks

Coupling Circuits and Impedance Matching Networks: Resistive, capacitive, inductive, mutual inductive and combination type of R.F. couplings. Single and double tuned couplings. Effect of loose, tight and optimum couplings, load conditions and Q. Various impedance matching networks for low and high impedance loads. Balanced-to-unbalanced network.

RF Voltage Amplifiers: Theory, operation, performance and design of R.C. coupled and transformer coupled single and double tuned amplifiers using JFETs, MOSFETs & BJTs. Time and frequency domain analysis. Synchronously tuned multistage amplifiers. Stagger tuned, stagger damped circuits. Neutralization circuits. Cascode amplifiers. Integrated circuit frequency selective R.F. and IF amplifiers

R.F. Power Amplifiers: Special features of R.F. power devices. Theory and design of tuned class C amplifiers using VTs, BJTs, JFETs and MOSFETs. Graphical and approximate analytic methods of solution : Output circuit efficiency considerations. Biasing circuits. Characteristics of driver and output circuit power supplies. Effect of input circuit distortion. Neutralization Parasitic oscillations. Class C amplifiers, adjustments. Theory of frequency multipliers. Tuned class-B linear amplifiers

Sinusoidal Oscillators: Oscillators with two terminal and four terminal active elements. Criteria for oscillations. Analysis, characteristics and applications of different LC, RC, crystal and negative resistance audio and radio frequency oscillators using. BJTs, FETs and Ics. Linear and non-linear operation of oscillators. Amplitude and frequency stabilization.

EC 254 A - ELECTRONIC CIRCUITS (EC/EEE) - II

3L, 1T

3 Hours, 100 Marks

Untuned large signal amplifiers: Methods of analysis of large signal FET, BJT and IC amplifiers. Analysis of distortion and cross modulation. Classification of power amplifiers. Analysis and design of single ended, parallel and push-pull Class A, AB and B power amplifiers. Complementary, symmetry and quasi-complementary circuits, Driver and out-put stages, with and without out-put transformers for power amplifiers. Output circuit efficiency calculations for various classes and configuration of amplifiers. Power out-put. Thermal considerations. Derating curves.

Power Supply Circuit: Design factors and applications of various power supply filters and voltage multiplying rectifier circuits.

Regulated Power Supplies: Regulator circuits using voltage regulating tubes, solid state devices and monolithic ICS. Adjustable constant voltage power supplies. Adjustable constant current power supplies. Higher output power supplies with solid state pre-regulations. Protection circuits for power supplies. Rating and specifications.

EC 255 A - DIGITAL ELECTRONICS (EC/ECC/EEE) - II

2L, 1T

3 Hours, 100 Marks

Counters and Registers: Binary and decade ripple counters. One bit counters. Up, down and up-down, synchronous counters. Programmable counters. Divide-by N counters. Storage registers, shift-right, shift-left and bi-directional shift registers. Serial input, serial output, parallel input, parallel output, parallel-in-serial out, serial in parallel out and Universal shift registers and synchronous parallel loading of shift registers. Static and dynamic MOS shift registers. Ring and Johnson counters

Arithmetic Circuits: Digital Comparators, half, and full adders; parallel and serial binary adders, half and full binary subtractors. BCD adders and subtractors. Binary multipliers and divider circuits

Miscellaneous Sub-systems: Encoders, decoders and code converters. Parity checking circuits. Multiplexers and demultiplexers. Digital to analog and analog to digital converters.

Semi-conductor memories: Random and sequential access memories. RAM, ROM, PROM, EPROM, EEPROM, EAPROM, EPLA, GALs. MOS and CMOS memories

EC 257 A - INDUSTRIAL ELECTRONICS (EC/EEE)

3L, 1T

3 Hours, 100 Marks

Power electronics devices: Characteristics and operation of SCR, PUT, SUS, SBS, SCS, TRIAC, DIAC, IGBT, GTO, MCA and light activated thyristors. Ratings and rating extension by series/parallel operation.

Electronic Power Control: Electronic methods of power control. SCR firing methods, Phase control techniques. Line commutation and different types of commutation. One, two and four quadrant converters. Bridge inverters, series and parallel inverters. Cyclo converters

Electrical Drives: Performance characteristics of series, shunt and compound d.c. motors. Motor starters. Characteristics of single and three phase induction motors, Universal motor, Amplidyne and selsyns.

AC and DC Motor Speed Control: Philosophy of speed control, open and closed control and single and three phase AC, DC and universal motors using thyristors. PWM inverter technique and introduction to variable frequency drive

Misc. Industrial Applications: Photo relays and their applications, X-ray tubes. Particle accelerators. Principle of Electron Microscope, Uninterruptible supplies. Switched mode power supplies

Programmable Logic Controllers (PLC): Advantages of PLC, CPU configurations, Digital and analog inputs and outputs, ladder circuits and process flow diagram. Console and operator panel.

EC 265 B - LOGIC SYSTEM DESIGN (EC) - II

2T

100 Marks

Sequential Logic: Storage devices and sequential sub-systems. Introduction to synchronous and asynchronous sequential systems. Mealey and Moore circuits. Cost vs. speed.

Synchronous Sequential Systems: Introductory examples. The finite state model – basic definition. Memory elements and their excitation functions. Synthesis of synchronous sequential circuits. Analysis and design of synchronous sequential circuits. State assignment and reduction technique. Introduction to threshold logic and relay circuits

Asynchronous Sequential Systems: Fundamental mode circuits, Analysis procedure. Circuits with latches. State assignment in Asynchronous sequential circuits. Design of pulse mode asynchronous sequential circuits. Problems in asynchronous circuits – Races and Hazards.

Ma 261 A: Special Mathematics (all branches)

(For Diploma Passed Candidates - common for all branches)

3L,IT

3 Hrs. MM : 100

Differential Calculus: Asymptotes, curvature, envelops evolutes, and curve tracing

Integral Calculus: Rectification . Volumes and surfaces of solids of revolution, differentiations under sign of integration

Differential Equations: Differential equations with constant coefficients and variable coefficients.

Mechanics: Friction , common catenary, kinematics of uniplanar motion, simple harmonic motion

Vector calculus: Gradient , divergence, curl, green's theorem , stoke's theorem, gauss divergence theorem (Verification only)

THIRD B.E. EXAMINATION FIFTH SEMESTER

EC 304 A - ANALOG COMMUNICATION ENGINEERING (EC/ECC)

2L, 1T

3 Hours, 100 Marks

Amplitude Modulation: Analysis of standard AM waves and signal power distribution. Different circuits for amplitude modulation and their comparison. Methods of generating DSBSC SSB and VSB AM and their characteristics. Envelope and coherent demodulation methods for standard AM, DSB-SC, SSB signals. Design considerations of AM modulators and demodulators. Frequency Division Multiplexing.

Angle Modulation: Theory of frequency and phase modulations. Spectrum and BW of FM and PM signals. Direct and indirect methods of generating narrow-band and wide-band FM. Discriminators and PLL demodulators for FM and PM. Pre-emphasis and de-emphasis. Idea of noise suppression properties of FM and PM systems.

Radio Broadcast Transmitters: Characteristics of master oscillators, buffers and frequency multipliers for AM & FM broadcast transmitters. Feeder lines. AM and FM transmitter stability considerations. Broadcast studio equipment and control room apparatus. Stereophonic broadcast considerations.

Radio Receivers: TRF and superheterodyne receivers, Selection of frequency converters, mixers and local oscillators, Characteristics of IF and RF amplifiers. Double spotting. Electrical and Electronic tuning and tracking. Automatic gain and frequency control. Tone control. Band spread. Sensitivity, selectivity, fidelity and noise performance of receivers. Diversity reception. Receiver testing. Special considerations in communication receivers. Double conversion, delayed AGC, noise-limiter and squelch. Operation of AM and FM receivers and their comparison, Introduction to stereo FM receivers.

Pulse Modulation: Uniform sampling theorem, Generation of PAM, PDM and PPM, signals and methods of reconstitution of original signal from its samples. Bandwidth requirements and comparison. Time division multiplexing.

EC 306 A - THEORY AND APPLICATIONS OF INTEGRATED CIRCUITS (EC)

3L, 1T

3 Hours, 100 Marks

Introduction: Distinction between characteristics of linear and digital IC's, Biasing consideration in linear IC's. Parasites and their effects in IC's. General performance, differences between discrete circuits and IC versions. Power requirements and power supplies for linear IC's

IC Fabrication: Processing steps for IC Fabrication, Epitaxial growth, surface passivation, photolithography and etching, elements of diffusion processes. Ion implantation & isolation techniques

Operational Amplifiers: Differential amplifier stage. Characteristics and error signals. Stages of operational amplifiers Multistage operational amplifiers. Characteristic of operational amplifier in different configurations. Frequency response and stability considerations of operational amplifier, Compensation in operational amplifiers. Characteristics of wide band operational amplifiers

Applications of Operational Amplifiers: General applications of Op. Amps. in linear and non-linear circuits. Theory and characteristics of Active filters. Applications of Op. Amps. in wave form generators.

Other Linear ICs: Four quadrant multiplier and its simple applications. CMOS multiplexers. Voltage Regulator ICs with feed back current limiting. Positive- and Negative voltage IC regulators

Linear PLL: Basic theory of first, second and higher order loops. Lock-in and Lock-out processes. Tracking performance. Noise in linear PLL systems. Important applications of linear PLL. Measuring PLL parameters.

EC 309 A - COMPUTER ORGANISATION (EC/ECC/EEE)

2L, IT

3 Hours, 100 Marks

Elements of Computer Organisation

Evolution of Computers: Generations of Computers, Modeling of computers at Gates, Registers and Processors level.

CPU Architecture: Fixed and floating point arithmetic and ALU organization. Instruction format, types, sequencing and interpretation. Instruction fetch and execute cycles. Addressing techniques. Hardwired and Micro-programmed control

Secondary Memories: Magnetic memories core, tape, disk and floppy disc. Introduction to Magnetic Bubbles and CCD memories

I/O Devices: Principle and construction of Keyboard, Mouse, digitizer, joystick, optical scanner, Resistive membrane touch screen, Tele-typewriter, CRT terminals, TFT monitors, Line, Dot Matrix, Daisy wheel, Ink jet and Laser printers.

Communication of I/O with CPU and Memory: Speed mismatch of I/O v/s memory and CPU. Communication methods for I/O to CPU and Memory : Polling, interrupt, DMA and I/O channel.

EC 310 A - RADIATION & WAVE PROPAGATION (EC) – I

3L, IT

3 Hours, 100 Marks

Transmission Lines: Types of transmission lines. General transmission line equations. Line constants and equivalent circuits. Infinite line, Lines with reflections. SWR Lines, dissipationless lines. Cable circuits and composite lines.

Coaxial cables. Transmission lines at audio and radio frequencies. Losses in transmission lines. Transmission equalizers. Characteristics of quarter wave, half wave and other lengths. Smith chart and its applications. Transmission line applications. Stub matching

Radio Wave Propagation: Mechanism of radio wave propagation, Reflection, refraction interference and diffraction of radio waves. Theory of ground wave, space wave and sky wave propagation. Effect of conductivity, dielectric constant, curvature and surface imperfections of earth on wave propagation, Duct propagation and tropospheric scattering. Characteristics of ionosphere and its effects on wave propagation, critical frequency, skipzone and maximum usable frequency. Multiple hop transmission, oblique and vertical incidence transmission. Effect of earth's magnetic field, solar activity and meteorological conditions on wave propagations.

Coordinate System: Cartesian, Cylindrical and Spherical Coordinate Systems. Vector components and unit vectors in the coordinate systems. Gradient, Divergence and Curl in various coordinate systems.

Electric & Magnetic fields: Electric field intensity, Gauss's law, Divergence theorem. Potential difference & potential. Potential Gradient. Conductor Properties & boundary conditions for conductors. Method of Images. Boundary conditions for perfect Dielectric Materials. Biot-Savart Law, Ampere's Circuital law, Curl, Stoke's theorem. Magnetic flux density, Boundary conditions for Magnetic fields.

Vector Magnetic Potential. Faraday's law, Displacement current. Maxwell's equations in point form & Integral form.

EC 311 A - FEEDBACK & CONTROL SYSTEMS (EC)

2L, IT

3 Hours, 100 Mark

Introduction: Elements of control systems, concept of open loop and closed loop systems. Examples and application of open loop and closed loop systems, brief idea of multivariable control systems. Mathematical models and electrical analogy for physical systems. Transfer function analysis. Block diagram, signal flow graphs, reduction techniques and gain formulae.

System Response: Steady state response to DC and periodic functions by pole zero plots. Natural frequencies of networks and transient response. Magnitude and phase from s-plane vectors. Response of linear systems to singularity functions like impulse, step, ramp, parabolic and combination thereof .

System Performance and Stability :Time and frequency response of control systems. Bode plots. Time and frequency response of multiple feedback amplifiers. Proportional integral and Derivative Control, Time domain and frequency domain specification and their correlation.Steady state error coefficient and error analysis.

System Stability: Stability and oscillations of feedback control systems. Concept of absolute, relative and conditional stabilities.Routh-Hurwitz and Nyquist criteria of stability Gain and phase margins. M and N circles and Nichol's chart Root locus technique and its applications. Concept of BIBO and Asymptotic stabilities.

Compensation: Lag, Lead and Lag-Lead compensators Cascade compensation in time and frequency domain. Feed-back compensation techniques.

SIXTH SEMESTER

EC 352 A - ELECTRONIC MEASUREMENT (EC)

2L, 1T

3 Hours, 100 Marks

Power Measurements: Power measurements at audio and radio frequencies. Absorption, calorimetric and transmission power meters. Electronic wattmeters.

Waveform Display Instruments and Recorders: Cathode ray Oscilloscope and its specifications. Cathode ray tube. CRO applications for low and high frequency signals. Characteristics of CRT amplifiers. Free-running and triggered mode, Synchronisation, Dual-beam and dual trace CRO's. Different sweep modes. Mesh storage and phosphor storage CRT's,. CRO Probes,

Strip chart and X-Y servo recorders.

Frequency and Phase Measurement: Frequency standards, Methods of audio and radio frequency measurements, comparisons by CRO and interpolation methods. Absorption, reaction and transmission wave meters. Dip meters. Heterodyne frequency meters, CRO methods of phase measurements, Direct reading, Phase meters for audio and radio frequencies.

Theory of Errors: Accuracy and precision. Methods of reducing systematic errors in measurements. Statistical analysis of random errors. Normal error curve. Estimation of error in computed results.

Amplifier Measurements: Measurements of modulation depth. Different modulation meters. Distortion analyzers and total distortion meters, Intermodulation method of distortion measurements. Square wave testing of tuned and untuned amplifiers. Testing of Video amplifiers

Noise Measurements: Measurements of noise voltage, noise current, noise power and figure. Brute-force method, Sine-wave method and noise generator method. Common types of noise signal generator.

Special Measurements and Tests: Introduction to Sampling, Vector and Differential Voltmeter, Vector impedance meter, Function generators, RF Signal generators and Pulse generators. Introduction to frequency synthesizers.

Wave Measurements: Various types of wave and spectrum analyser for audio, radio and microwave frequencies. Field strength measurements of radio waves.

EC 353 A - DIGITAL COMMUNICATION SYSTEM (EC/ECC)

3L, 1T

3 Hours, 100 Marks

Random signals: Power and energy signals. Introduction to probabilistic and statistical description of discrete and continuous communication processes. Marginal, conditional and joint probability density and distribution functions. Stationarity and ergodicity. Auto correlation and Cross correlation functions. Energy spectral density and Power spectral density. Simple linear system analysis under random excitation in time and frequency domains.

Introduction to techniques ASK, FSK, PSK, BPSK, QPSK and simple QAM.

Digital communication: Comparison of analog and digital communication systems. Essentials of PCM, linear delta and adaptive delta modulation. Study of components of complete digital communication system. Multiplexing, Introduction to bit, word and frame synchronizations. Important digital carrier modulation methods, Introduction to matched filter detection.

Noise: Various noise sources in amplifiers and communication systems. Comparison of various electronic devices for noise performance. Signal to noise ratio and noise figure. Equivalent noise bandwidth. Noise temperature. Effect of cascading, statistical properties of noise. Representation of white and band pass noise in communication systems.

System Performance: Noise-performance of analog CW and pulse modulation systems using coherent and non-coherent detection. Baseband PCM and delta modulation systems performance in terms of probability of error and S/N ratio. Probability of error performance of band pass systems.

EC 358 A - MICROPROCESSORS AND MICROCOMPUTERS (EC/ECC/EEE)
3L, 1T **3 Hours, 100 Marks**

Microprocessor Architecture: Architecture of 8-bit 8085, Z80, 6800 Microprocessors; their instruction sets and addressing modes. Assembly language programming of Intel's 8085 Microprocessor. Introduction to assemblers.

Microprocessor interfacing: Interfacing of address, data and control buses, Memory and I/O devices, Interrupt and DMA for 8085 microprocessor.

Introduction of Microcontrollers: Architecture and instruction set of MCS-51 series of microcontrollers. Application of Microcontrollers.

16 and 32-bit Microprocessors: CPU architecture, addressing modes and features of 16 and 32 bit microprocessors – 8086. Salient features of 80286, 80386, 80486 and Pentium series microprocessors.

Bus standards: Introduction to Multibus, VME, RS-232-C, IEEE 488, PCI, USB, RS 422 and 485.

EC 355 A - RADIATION AND WAVE PROPAGATION (EC) – II
2L, 1T **3 Hours, 100 Marks**

Radiation: Retarded potentials and concept of electromagnetic radiation. Alternating current element and power radiated, Radiation resistance. Radiation from dipole and monopole antennas.

Antennas: Quarter wave and half wave antennas. Application of network theorems to antennas. Resonant and non-resonant antennas. Radiation resistance, J impedance, mutual impedance and directional characteristics of antennas. Antennas patterns. Effective length and effective area of antennas, Antenna gain efficiency, beamwidth and polarization. Antenna temperature. Loaded antennas. Colinear, broad-side, endfire and combination arrays and computation of their radiation patterns. Multiplication of radiation patterns. Binomial array, Yagi Rhombic, log periodic antennas and Baluns. Receiving antennas. Antenna systems for diversity reception. Elements of design considerations for medium wave and short wave antennas.

Antenna Measurements: Antenna length, resonance, impedance, gain directivity polarization, phase and radiated power measurements.

EC 361 A – AUDIO & VIDEO ELECTRONICS (EC)

2L, IT

3 Hours, 100 Marks

Audio Systems: Monaural, binaural, monophonic, stereophonic and quadraphonic, high-fidelity and surround-sound audio system descriptions. Digital and optical recording and reproduction.

Television Transmission: Scanning and synchronizing. Analysis of composite video signals. Common standards of Television. Colour TV cameras, Picture carrier, sound carrier and colour carrier signals. Encoding the picture information, Chrominance modulation. Colour resolution. Compatibility of Monochrome and colour systems. Block diagrams of colour TV transmitters and functions of each part.

Television Reception: Decoding the picture information. Functional block diagrams of Monochrome and colour TV receivers. Raster, sync, and AGC circuits. R.F. alignment.

Video Systems: Principle of working of video tape recorders and disc players. Common standards. Introduction to MPEG digital recording.

FINAL B.E. EXAMINATION

SEVENTH SEMESTER

EC 402 A – TELEMATICS (EC)

3L, IT

3 Hours, 100 Marks

Digital Telephony: Principle of working of SPC digital telephone exchanges. Digital switching, space, time. TS, ST, STS, TST switch blocks. Termination of subscriber lines Signalling systems with digital exchanges. Principle of common channel signalling. Synchronization aspect for digital telephony. Store Program Control for call processing.

Integrated Digital Networks: Data Communication terminology. Introduction to Circuits, message and packet switching concept. Basic aspects of multiplexing, signaling and synchronization in integrated digital networks. Overview of ISDN and BISDN. Concepts of basic rate and primary rate ISDN. Access and facilities provisions. Elements of fast packet switching, frame relay, ATM, SONET and SDH. Introduction to photonic switching.

EC 403 A - ADVANCE COMMUNICATION SYSTEMS (EC/ECC/EEE)

3L, IT

3 Hours, 100 Marks

Line-of-Sight and Troposcatter Communication: Principle of working and essential features of microwave LOS and troposcatter communication. Propagation study and performance requirements. Diversity techniques.

Satellite Communications: Basic considerations. Up-link and down link parameters. Orbit and frequency selection. Transmission losses, noise and interference. Elements of multiple access techniques. Frequency reuse techniques. Functional description of earth stations

Optical Communications: Ray propagation in optical fibers. Types of fibers. Losses and dispersion in fibers. Transmitter and receiver subsystem for optical communications. Laser and LED sources. Optical Amplifier. Cable joints, couplers and connectors. Splicing techniques. Modulation techniques. PIN and avalanche photo diode detectors. Characteristics of analog and digital transmission in optical communication systems. Noise considerations.

EC 407 A – RADAR AND NAVIGATIONAL AIDS (EC)

3L, IT

3 Hours, 100 Marks

Radar Operation and Performance: Components of radar system Radar performance factors and specifications. Pulse considerations and duty cycle. Equations for monostatic and bistatic radar, Radar cross section and range. Pulse integration. System losses. Radar antenna patterns, phased arrays and interferometer. Duplexer, Radar tracking and scanning. Monopulse, sequential lobing and conical scanning methods. CW, FMCW, MTI, SAR and Pulse doppler radars. Weather radars

Electronic Navigation: Principle of operation of radar direction finder and range system, Loran system, DME and TACAN system. Microwave altimeters, Elements of Microwave remote sensing. Satellite based Global Positioning System.

EC 404 A - ADVANCED COMPUTER TECHNOLOGY (EC/EEE)

3L, IT

3 Hours, 100 Marks

Computer Architecture: Microprogrammed control organization, CPU-memory speed mismatch and solutions : Word-length, caches and buffers. Speeding up instruction cycle, instruction fetch and decode overlaps.

Parallelism in execution: Instruction pipe-line and vector processing concepts. Introduction to Array processors.

Memory Organisation: Memory hierarchy. Associative memory. cache memory, Paging and segmentation.

Advanced Systems: Organization of parallel processing, multiprocessing, multiprogramming, distributed processing and time sharing systems.

Software: Introductory theory of Compilers, Interpreters and operating systems.

EC 408 A - ENGINEERING MANAGEMENT AND ECONOMICS (EC/ECC/EEE)

2L

3 Hours, 100 Marks

Principles of Management: Management function. Theories of management and their application Span of control, Responsibility, authority, leadership, motivation, communication, Management of Change, Importance of organization structure

Financial Management: Functions and importance of financial management, Book-keeping, Interest and depreciation. Salvage value Various types of costs, profit/volume ratio. Break even analysis and marginal costing

Marketing and Strategic Management: Concept of marketing and its various components Product Life Cycle Strategic Mission Vision Goals Industry Life Cycle SWOT analysis

Stores and Purchase Management : Function of store and Purchase management.

Inventory Management:. Inventory control and management Economic order quantity. A-B-C analysis..

Forms of Business Ownership: Proprietorship, partnership, joint stock companies, joint sectors

Production Planning and Control: Job, Batch and mass production, production efficiency, productivity.

Site selection. Production planning. Routing, scheduling and follow up. Elements of time and motion study. Quality control and quality assurance

Nature and Scope of Economics: Basic concept of managerial economics. Supply and demand, free competition, monopoly and oligopoly

EIGHTH SEMESTER

EC 451 A - DIGITAL SIGNAL PROCESSING (EC/EEE)

2L, IT

3 Hours, 100 Marks

Digital Signal Processing: Advantages of digital filters and processing. Fundamentals of discrete time systems. Fourier transform of sequences. Discrete-time filter structures. Z-transform system representation, solution of linear constant co-efficient difference equations. Digital filters design by transformation from analog filters. Simple realizations of IIR and FIR filters. DFT and FFT.

EC 452 A - ELECTRONIC INSTRUMENTATION (EC)

2L, IT

3 Hours, 100 Marks

Transducers: Construction, characteristics and circuits for common types of resistive, capacitive, inductive, magneto-structive; piezo-electric. Photo-electric and thermo-electric transducers for measurement of process physical variables. Various sensing elements and transducers for measurement of Force, Pressure, Humidity, Moisture, strain, Velocity, Acceleration and pH. Inductive and Capacitive proximity switches. Physical and electrical loading of and by the transducer Systems.

Signal Conditioning: Analog and digital signal conditioning for instrumentation. Applications of OPAMP, A/D and D/A converters. Use of microprocessors. Techniques of S/N ratio improvement, Methods of shielding and grounding. Protection from RFI & EMI.

Electronic Displays: Principle of LED numeric, matrix and alpha-numeric displays, gas discharged plasma panels, flat panel CRT, LCD, electro-luminescent and electrophoretic displays.

Digital Instrumentation: Principle of operation of probes, logic monitors, digital pulser and logic analyser. Components of a digital universal counter. Digital period; frequency and time interval measurement. Errors in digital counter. High frequency measurement with digital counters. Different types of integrating and non-integrating digital voltmeters and multimeters, Errors and field applications of various digital voltmeters and counters. Introduction to Digital oscilloscope. Elements of data acquisition systems.

EC 457 A - MOBILE COMMUNICATION (EC)

2L, IT

3 Hours, 100 Marks

Basic technical concepts: Concept of mobile telecommunications. Mobile radio network issues, cell size, coding, modulation and diversity. Base station subsystems. Access methods. Location strategies for personal communications services. Cell design principles.

Radio Paging System: Types of radio paging system. On-site and wide area paging, digital codes like POCSAG, elements of radio paging system engineering.

Microcellular radio communications: Fixed and dynamic channel assignment. Cellular systems and power control. Basic features and system architecture in cordless telephones. Marine and aircraft communication. Overview of mobile terrestrial communication by satellite.

Cellular Radio System: Allocation of spectrum and channels, Concept of Hexagon cells, mobile identification system and registration of mobile, call procedure and measurement of signal strength, GSM and CDMA radio system architecture, roaming, digital speech and channel coding. Efficient use of radio spectrum, multi operator working, cells and frequency reuse.

EC 458 A - COMPUTER COMMUNICATION AND DATA NETWORKS (EC/ECC/EEE)

3L, IT

3 Hours, 100 Marks

Computer Communication: Layered architecture of computer communication networks. DNA, SNA and ISO-OSI models. Properties of LANs, MANs and WANs. Physical level, data link and transport protocols. Multiple access protocol organization. Routing techniques, flow and congestion control in packet switched networks. Window scheme. Network interconnection-bridges and routers. Dead lock avoidance. Elements of queuing analysis. Introduction to network security.

Data Networks: Structure and functions of network protocols. Data link control procedures. Operation of HDLC, SDLC, BISYNC, X.25 and X.21 Protocols Elements of Polling, ALOHA, Reservation ALOHA, CSMA and token ring. Characteristic features of LANs

Basics of Internet: Evolution; dialup, XDSL, ADSL, cable modem and other access methods. IP address and domain name system, TCP/IP, Internet applications and www.

EC 459 A - MICROWAVE ENGINEERING (EC/EEE)

3L, IT

3 Hours, 100 Marks

Wave Guides: Theory of wave propagation in rectangular wave guides, cut off frequency. Dominant and higher modes. Generation of different modes and suppression of unwanted modes. Field distribution. SWR and impedance relations in wave guides. Coupling between coaxial lines and wave guides. Wave guide stub-matching

Resonators: Theory and application of cavity resonators. Coupling to cavity, Q of cavity resonators

Microwave Components: Details about attenuators, phase shifters, directional couplers, tees, isolators, circulators, tuning, screws, coupling probe, loops, mixers and detectors. Use of scattering parameters

Microwave Generators and Amplifiers: Theory of velocity modulation. Theory of operation and characteristics of two cavity and multicavity klystron, amplifier and oscillators. Reflex klystron. O and M type travelling wave tube and backward wave oscillators - principle of operation. Construction, type and application of Magnetrons.

Microwave Solid State Devices: Special considerations for UHF and microwave transistors and oscillators. Parametric amplifiers. Manley-Rowe relation, linearized equations. Parametric up converters. Negative resistance amplifiers. Principle of working and application of impact diode, hot carrier diode, PIN diode, Gunn diode and LSA diode. Quantum mechanical explanation, description and application of MASER amplifiers.

ELECTIVES

EC 481 A - MEDICAL ELECTRONICS (EC)

2L, IT

3 Hours, 100 Marks

Introduction to Physiology: Physiological system of the human body. Nerve physiology. Function of nerves and myoneural junction. Cardiac muscle and its contractions. Blood flow system. Arterial pressure. Mechanism of respiration, Function of spinal cord. Generation, propagation and distribution of action potentials.

Recording of Bio-electric Events: Kinds of electrodes, amplifiers and display units for recording bioelectric potentials. Principles of ECG, EEG, and EMG. Electrophysiological signals from a micro electrode and salt bridge, Use of field effect-devices as electrometers. Principle of driven shield. Use of photon-coupled amplifiers. Artifacts

Bio-Medical Measurement: Electronic methods of measuring blood pressure, blood flow, blood pH, skin and systemic body temperature and pulse rate.

Electronic Medical Instrument: Electronic pace makers. Implantable power sources. Defibrillators. Micro power transmitter for telemetering bio-signal. Surgical and therapeutic diathermy units. Physiological stimulators. Basic diagnostic X-ray units. Introduction to patient monitoring and intensive care units.

EC 482 A - DESIGN PRINCIPLES OF COMMUNICATION SYSTEMS (EC)

2L, IT

3 Hours, 100 Marks

Design methodology: Design methodology for AM and FM radio broadcast, transmitters and receivers.

Design aspects of PCM: PCM transmitters and receivers with base band transmission.

Design considerations for microwave and optical communication: analog and digital microwave communication. LOS links, troposcatter links and optical communication links

EC 484 A -SOLID STATE AND IC TECHNOLOGY (EC)

2L, IT

3 Hours, 100 Marks

Solid State Device Fabrication: Crystal growth and doping. Impurity control and junction formation methods. Zone processes, Pick's laws, Evaluation of diffused layers. Epitaxial- systems and processes

Fabrication considerations: Diffusion during subsequent processing. Oxidation techniques and oxide masking. Etching techniques and processes, Photo-engraving. Contacts and interconnections. Alloying Epitaxial planner technology. Packaging, Scaling, Introduction to the technology of semiconductor devices using III-V & II-VI groups compounds

IC Fabrication: -Epitaxial growth. Surface passivation techniques. Photolithography. Etching. Junction formation. Diffusion processes. Constant source and limited source diffusion. Ion implantation. Isolation techniques. Monolithic diodes, transistors, capacitors and resistors. Differences in bipolar and MOS-ICs. Introduction to thin and thick film techniques

EC 485 A - COMPUTER AND MICROPROCESSOR CONTROL OF INDUSTRIAL PROCESSES (EC)

2L, IT

3 Hours, 100 Marks

Process Control Computer Systems: Minis, Micros classification by hardware features and software facilities. Performance evaluation techniques. System selection criteria

Characteristics of Digital Processors: Organisation and characteristics for process control. Input/output arrangements. Addressing techniques. Memory systems

Device Technology and Process Environment: Assessment of the use of digital switching devices in hazardous environments—Noise, temperature, humidity, vibration-static and dynamic.

Transducers: Generation of digital signal using process transducers, Multiplexing

Process Control System Software: Introduction to process control languages, application packages and operating system for real time process control. Development systems for Micros Introduction to logic analyser, cross assembler and cross compilers

EC 487 A - ENTREPRENEURSHIP DEVELOPMENT (EC)

2L, IT

3 Hours, 100 Marks

Entrepreneurship and Economic Development: Definition of entrepreneurship. Entrepreneurship and economic growth. History of Socio-Economic development in India. Achieving societies and their development statistics. Characteristics of under-developed, developing and developed societies, Wage employment and self-employment, Linkage between large, medium and small scale industries.

Entrepreneurship Characteristics and Skills: Identification of personal characteristics of an entrepreneur. Goal setting, risk taking, decision-making, time management and problem solving. Staff assessment

Creativity: Hindrance to creative thinking, developing creativity, personality traits of creative persons

Leadership: Qualities and influencing abilities. Negotiation skills and their development

Communication: Types of communication, barriers to effective communication, methods for improving communication

Entrepreneurship Opportunities and Selection: Types of entrepreneurship opportunities—manufacturing, service, trading and professional, Need analysis. Identification of local resources

Evaluation of Potential Opportunities: Setting decision criterion and selection of product/service/profession. Evaluation Technical, Financial and Economic feasibility

Starting a New Enterprise: Nature of information necessary for getting started. Information from governmental agencies like, SISI, RICO, RFC, DIC etc. Procedural requirements for establishing new enterprise, Selecting type of business organisation. Registration and Licensing, Incentive and Facilities available for small scale enterprises.

Enterprise Management: Product Design and Development Concepts of product design and development. Design by innovation and evolution. Enhancing product value

Facilities Planning and Production Management: Selection of relevant technology. Make or buy decisions. Plant layout and process planning, setting production levels and delivery schedules, Economic utilisation of

labour, raw material and equipment. Inventory Management. Control of production plants. Quality assurance and quality circle

Product Costing: Fixed costs and variable costs. Sales price and revenue. Break even analysis. Product Pricing. Profit planning

Financial Management: Financial Management and accounting in small enterprise, Difference between financial, accounting, cost accounting and management accounting, Book-keeping, Balance sheet, "Profit and Loss Account and their analysis. Cash flow and financial ratio". Assessing financial needs of enterprise. Fixed and Working Capital, Sources of funding

Financial Regulation and Taxes: Sales Tax Act, Income Tax Act, Excise, Local Taxes and Insurance

Practical Work: Students be given practical work in identification of opportunities, need analysis, market survey, evaluation of alternatives and preparation of feasibility report

EC 488 A – RELIABILITY AND MAINTAINABILITY OF ELECTRONIC SYSTEMS (EC)

2L, IT

3 Hours, 100 Marks

Introduction: Life cycle, Reliability and Maintainability management, design reviews.

Reliability: Mathematical modeling, environmental factors, fault tree analysis, failure reporting and corrective actions, reliability testing.

Maintainability: Mathematical modeling, system design, unit design, assembly design, maintainability testing, reliability and maintainability documents.

EC 490 A- ROBOTICS ENGINEERING (EC)

2L, 1T

3 Hours, 100 Marks

Introduction: Introduction to Sensors, drivers, isolators, actuators, microprocessors & microcontrollers, DC and DAC. Basic concepts of pneumatic, hydraulic, and mechanical movements. Basic Robot elements, Types of Robots, Industrial applications, Future trends.

Sensors: Ultrasonic, temperature, stress & strain, optical, displacement, gravity & tilt sensors. Introduction to robotic vision and image processing.

Robot output: Robot output control, stepper motor, servo motors, DC motors and drives. Grippers, transporters, rotators, and cable drive systems.

Robotics: Need and application of sensors in robots, Sensor interfacing, data acquisition and conversion systems, encoders and decoder applications in robots, microcontroller/microprocessor interfacing for sensors and actuators, Robot Axes: introduction to different robotic axes systems and their drive configuration. Robotic control system, feedback mechanism. Introduction to Robot dynamics and application of robots in industry. Concept of autonomous automatous robots.

**B.E. II YEAR (INFORMATION TECHNOLOGY)
SEMESTER III EXAMINATION SCHEME 2018**

Subject Nomenclature			Lecture	Tutorial	Practical	Contact Hrs	Credit	Exam Hrs	Marks		
									Theory	Practical and Sessional	Total
A. THEORY PAPERS											
Ma	201A	Advanced Engineering Mathematics-I (CSE/IT)	3	1	-	4	4	3	100	-	100
CSE	211A	Discrete Structures (CSE/IT)	3	1	-	4	4	3	100	-	100
CSE	212A	Object Oriented Programming (CSE/IT)	2	1	-	3	3	3	100	-	100
CSE	213A	Data Structures and Algorithms (CSE/IT)	3	1	-	4	4	3	100	-	100
CSE	214A	Logic Design (CSE/IT)	2	1	-	3	3	3	100	-	100
CSE	215A	Computer Oriented Statistical Methods (CSE/IT)	2	1	-	3	3	3	100	-	100
TOTAL(A)			15	6	-	21	21		600	-	600
B. PRACTICALS AND SESSIONALS											
CSE	212B	Object Oriented Programming Laboratory (CSE/IT)	-	-	2	2	1	3	-	100	100
CSE	213B	Data Structures and Algorithm Laboratory (CSE/IT)	-	-	2	2	1	3	-	100	100
CSE	214B	Logic Design Laboratory (CSE/IT)	-	-	2	2	1	3	-	100	100
CSE	216B	Scripting Languages Laboratory (CSE/IT)	-	-	2	2	1	3	-	100	100
TOTAL(B)			-	-	8	8	4		-	400	400
TOTAL(A+B)			15	6	8	29	25		600	400	1000

To pass, a candidate must obtain:

- At least P Grade in each written paper.
- At least B Grade in each practical & sessional.
- At least 5.00 SGPA in a semester.

**B.E. II YEAR (INFORMATION TECHNOLOGY)
SEMESTER IV EXAMINATION SCHEME 2018**

Subject Nomenclature			Lecture	Tutorial	Practical	Contact Hrs	Credit	Exam Hrs	Marks		
									Theory	Practical and Sessional	Total
A. THEORY PAPERS											
Ma	202A	Advanced Engineering Mathematics-II (CSE/IT)	3	1	-	4	4	3	100	-	100
CSE	221A	Principles of Programming Languages (CSE/IT)	3	1	-	4	4	3	100	-	100
CSE	224A	Computer Architecture & Microprocessors (IT)	3	1	-	4	4	3	100	-	100
CSE	223A	Database and File Systems (CSE/IT)	2	1	-	3	3	3	100	-	100
CSE	225A	Communication Engineering (CSE/IT)	3	0	-	3	3	3	100	-	100
		Open Elective-I	3	0	-	3	3	3	100	-	100
TOTAL(A)			17	4	-	21	21		600	-	600
B. PRACTICALS AND SESSIONALS											
CSE	221B	Programming Laboratory (CSE/IT)	-	-	2	2	1	3	-	100	100
CSE	224B	Computer Architecture & Microprocessor Laboratory (IT)	-	-	2	2	1	3	-	100	100
CSE	223B	Database & File Systems Laboratory (CSE/IT)	-	-	2	2	1	3	-	100	100
CSE	226B	Unix/Linux Laboratory (CSE/IT)	-	-	2	2	1	3	-	100	100
TOTAL(B)			-	-	8	8	4		-	400	400
TOTAL(A+B)			17	4	8	29	25		600	400	1000
CSE	200E	Co-curricular Activities	-	-	-	-	0	-	-	-	100

List of Open Electives I : Enclosed with examination scheme of VIII Semester

To pass, a candidate must obtain:

- At least P Grade in each written paper.
- At least B Grade in each practical & sessional.
- At least 5.00 SGPA in a semester.

**B.E. III YEAR (INFORMATION TECHNOLOGY)
SEMESTER V EXAMINATION SCHEME 2018**

Subject Nomenclature			Lecture	Tutorial	Practical	Contact Hrs	Credit	Exam Hrs	Marks		
									Theory	Practical and Sessional	Total
A. THEORY PAPERS											
CSE	311A	Theory of Computation (CSE/IT)	3	1	-	4	4	3	100	-	100
CSE	312A	Database Management System (CSE/IT)	2	1	-	3	3	3	100	-	100
CSE	313A	System Programming (CSE/IT)	2	1	-	3	3	3	100	-	100
CSE	316A	Computer Networks (CSE/IT)	3	1	-	4	4	3	100	-	100
CSE	317A	Human Computer Interaction (IT)	3	1	-	4	4	3	100	-	100
		Open Elective -II	3	0	-	3	3	3	100	-	100
TOTAL(A)			16	5	-	21	21		600	-	600
B. PRACTICALS AND SESSIONALS											
CSE	312B	Database Management System Laboratory (CSE/IT)	-	-	2	2	1	3	-	100	100
CSE	313B	System Programming Laboratory (CSE/IT)	-	-	2	2	1	3	-	100	100
CSE	317B	Human Computer Interaction Laboratory (IT)	-	-	2	2	1	3	-	100	100
CSE	316B	Computer Networks Laboratory (CSE/IT)	-	-	2	2	1	3	-	100	100
TOTAL(B)			-	-	8	8	4		-	400	400
TOTAL(A+B)			16	5	8	29	25		600	400	1000

List of Open Electives II: Enclosed with examination scheme of VIII Semester

To pass, a candidate must obtain:

- At least P Grade in each written paper.
- At least B Grade in each practical & sessional.
- At least 5.00 SGPA in a semester.

**B.E. III YEAR (INFORMATION TECHNOLOGY)
SEMESTER VI EXAMINATION SCHEME 2018**

Subject Nomenclature			Lecture	Tutorial	Practical	Contact Hrs	Credit	Exam Hrs	Marks		
									Theory	Practical and Sessional	Total
A. THEORY PAPERS											
CSE	322A	Operating System Design (CSE/IT)	3	1	-	4	4	3	100	-	100
CSE	325A	Artificial Intelligence (CSE/IT)	2	1	-	3	3	3	100	-	100
CSE	327A	Web Technologies (IT)	2	1	-	3	3	3	100	-	100
CSE	328A	Robotics (CSE/IT)	3	1	-	4	4	3	100	-	100
CSE	323A	Java Programming (CSE/IT)	2	0	-	2	2	3	100	-	100
		Open Elective-III	3	0	-	3	3	3	100	-	100
TOTAL(A)			15	4	-	19	19		600	-	600
B. PRACTICALS AND SESSIONALS											
CSE	322B	Operating System Design Laboratory (CSE/IT)	-	-	2	2	1	3	-	100	100
CSE	325B	Artificial Intelligence Laboratory (CSE/IT)	-	-	2	2	1	3	-	100	100
CSE	327B	Web Technologies Laboratory(IT)	-	-	2	2	1	3	-	100	100
CSE	328B	Robotics Laboratory (CSE/IT)	-	-	2	2	1	3	-	100	100
CSE	323B	Minor Project Laboratory(CSE/IT)	-	-	4	4	2	3	-	100	100
TOTAL(B)					12	12	6		-	500	500
TOTAL(A+B)			15	4	12	31	25		600	500	1100
CSE	300E	Co-curricular Activities	-	-	-	-	0	-	-	-	100

List of Open Electives III : Enclosed with examination scheme of VIII Semester

To pass, a candidate must obtain:

- At least P Grade in each written paper.
- At least B Grade in each practical & sessional.
- At least 5.00 SGPA in a semester.

**B.E. FINAL YEAR (INFORMATION TECHNOLOGY)
SEMESTER VII EXAMINATION SCHEME 2018**

A. THEORY PAPER											
Subject Nomenclature	Subject	Lecture (L)	Tutorial (T)	Practical (P)	Contact	Credit	Unit	Exam. Hrs.	Marks		
									Theory	Practicals & sessionals	Total
CSE 411A	Design & Analysis of Algorithms (CSE/IT)	3	1	-	4	4	1	3	60	-	60
CSE 413A	Software Engineering (CSE/IT)	3	1	-	6	5	1	3	60	-	60
CSE 414A	Principles of Compiler Design (CSE/IT)	3	1	-	6	5	1	3	60	-	60
CSE 416A	Data Warehousing & Data Mining (IT)	3	1	-	6	5	1	3	60	-	60
CSE A	Elective - I	3	1	-	6	5	1	3	60	-	60
Total (A)		15	5	-	28	24	5	-	300	-	300
B. PRACTICALS AND SESSIONALS											
CSE 413B	Software Engineering Laboratory (CSE/IT)			2					-	60	60
CSE 414B	Compiler Design Laboratory (CSE/IT)			2						60	60
CSE 416B	Data Warehousing & Data Mining Laboratory (IT)			2					-	60	60
CSE B	Elective – I Laboratory			2					-	60	60
CSE 418 D	Seminar (IT)			2	2	1	½	-	-	60	60
Total (B+D)		-	-	10	-	-	-	-	-	300	300
Total of Semester (A+B+D)		15	5	10	30	25	5	-	300	300	600

For a pass, a candidate must obtain:

(a) 35 percent in each of the written paper (b) 50 percent in each of practical and sessionals, and (c) 45 percent in the Grand Total

List of Elective –I:

- CSE 441A – Geographic Information System (IT)
- CSE 442A – E-Commerce (IT)
- CSE 443A – E-Governance (IT)
- CSE 444A – Enterprise Resource Planning (IT)
- CSE 452A – Image Processing (CSE/IT)
- CSE 453A – Client-Server Technology (CSE/IT)
- CSE 454A – Multimedia Technology (CSE/IT)
- CSE 456A – Web Technology (CSE/IT)
- CSE 457A – Digital Signal Processing (CSE/IT)

**B.E. FINAL YEAR (INFORMATION TECHNOLOGY)
SEMESTER VIII EXAMINATION SCHEME 2018**

A. THEORY PAPER											
Subject Nomenclature	Subject	Lecture (L)	Tutorial (T)	Practical (P)	Contact	Credit	Unit	Exam. Hrs.	Marks		
									Theory	Practicals & sessionals	Total
CSE 426A	Computer Network Management (IT)	3	1	-	6	5	1	3	50	-	50
CSE 427A	Information and Network Security (IT)	3	1	-	6	5	1	3	50	-	50
CSE A	Elective – II	3	1	-	4	4	½	3	50	-	50
CSE A	Elective – III	3	1	-	4	4	½	3	50	-	50
Total (A)		12	4	4	20	18	3	-	200	-	200
B. PRACTICALS AND SESSIONALS											
CSE 426B	Network Management Laboratory (IT)			2					-	50	50
CSE 427B	Computer Information and Network Security Laboratory (IT)			2					-	50	50
CSE B	Elective –II Labaoratory			2					-	50	50
CSE B	Elective – III Laboratory			2					-	50	50
CSE 432D	Project (IT)			6	6	3	½		-	100	100
CSE 433C	Practical Training (IT)						1½		-	75	75
CSE 434C	Educational Tour (IT)						½		-	25	25
	Total (B+C+D)			14					-	400	400
	Total of Semester (A+B+C+D)	12	4	14	28	22	6		200	400	600
Total of year									600	600	1200
Joint award for VII& VIII Semesters (Marks not counted for award of division / degree)											
FE 223E	Co-curricular Activities	-	2	2	2	1	½	-			100

For a pass, a candidate must obtain:

(b) 35 percent in each of the written paper (b) 50 percent in each of practical and sessionals, and (c) 45 percent in the Grand Total

List of Elective – II

- CSE 451A – Medical & Health Information System (IT)
- CSE 452A – Virtual Reality (IT)
- CSE 453A – Project Management and Software Tools (IT)
- CSE 454A – Knowledge Management (IT)
- CSE 455A – Decision Support & Executive Information System (IT)
- CSE 466A – Graph Theory (CSE/IT)
- CSE 470A - Computational Science (CSE/IT)

List of Elective – III

- CSE 456A – Social, Ethical Issues and IT Laws (IT)
- CSE 461A – Intelligent Database System (CSE/IT)
- CSE 462A – Object Oriented DBMS (CSE/IT)
- CSE 463A – Object Oriented Software Engineering (CSE/IT)
- CSE 465A – Information Theory & Coding (CSE/IT)
- CSE 468A – Mobile Computing (CSE/IT)
- CSE 469A – Bioinformatics (CSE/IT)

List of Open Electives	
Name of subject	Semester
BCT 291 A Open Elective-I: Sustainable Architecture CE 291A Open Elective-I :Energy Efficient Building Design ChE 291 A Open Elective-I : Renewable Energy Sources EE 291 A Open Elective-I : Industrial Applications of Electrical Drives EE 292 A Open Elective-II: Engineering Economics Ma 291 A Open Elective-I :Mathematical Statistics For Engineers ME 291 A Open Elective-I:Renewable Energy Sources ME 292A Open Elective-I: Automobile Engineering MI 291A Open Elective-I: Tunneling For Engineering Projects PI 291A Open Elective-I: Manufacturing Science	Fourth Semester
BCT 341 A Open Elective-II: Traditional Indian Architecture CE 341A Open Elective-II: Non Urban Public Hygiene & Drinking Water ChE 341 A Open Elective-II : Petroleum Refining Technology EE 341 A Open Elective-II : Optimization Techniques Ma 341 A Open Elective-II :Mathematical Theory of Operations Research ME 341A Open Elective-II : Economics Analysis and Management of Operations ME 342A Open Elective-II: Systems Design And Analysis MI 341A Open Elective-II: Application of GIS & Remote Sensing in Engineering PI 341A Open Elective-II: Principles of Management & Economics SE 341A Open Elective-II :Structural Dynamics	Fifth Semester
BCT 391 A Open Elective-III: Climate Responsive Architecture CE 391A Open Elective-III: Ecosystem & Biodiversity ChE 391 A Open Elective-III : Nanotechnology EC 391 A Open Elective-III: Electronic Instrumentation EE 391 A Open Elective-III: Soft Computing Techniques EE 392 A Open Elective-III: Energy Conservation Ma 391 A Open Elective-III: Advanced Numerical Analysis ME 391A Open Elective-III: Design Planning And Control Of Production System ME 392A Open Elective-III: Finite Elements Method MI 391A Open Elective-III: Project Environment Clearance PI 391A Open Elective-III: Quality Management SE 391A Open Elective-III :Finite Element Method	Sixth Semester
BCT: Building Construction Technology, CE: Civil Engineering, ChE: Chemical Engineering, CSE: Computer Science and Engineering, EC: Electronics & Communication, EE: Electrical Engineering, ME: Mechanical Engineering, MI: Mining Engineering, PI: Production & Industrial Engineering, SE: Structural Engineering, Ma: Mathematics	

THIRD SEMESTER

Ma 201 A – ADVANCED ENGINEERING MATHEMATICS – I (CSE/IT)

3L,1T

3 Hours, 100 Marks

Section A

Differential equations : Simultaneous differential equations, Total differential equations, Partial differential equations of first order, Charpit's method, Linear partial differential equations with constant coefficients, Second order partial differential equations, Monge's method for the equation of type $Rr + Ss + Tt = V$

Solution of Wave, Heat and Laplace equations using separation of variables method.

Section B

Complex Analysis : Analytic function, Harmonic function, Construction of an Analytic function, Cauchy-Riemann equations in Cartesian and Polar form.

Complex integration, Cauchy's integral theorem, Cauchy's integral formula, Derivative of Cauchy's integral formula.

Taylor's and Laurent's series expansion of complex functions.

Cauchy's residue theorem and its application for evaluation of the contour integrals of $f(\sin x, \cos x)$ from 0 to 2π and $f(x)$ from $-\infty$ to ∞

Transformations: shifting, rotating, conformal and bilinear transformations.

Section C

Probability and Statistics: Theorems of probability and their application, Binomial, Poisson and Normal probability distribution. Correlation and Regression analysis of two parameters.

Note: Candidates are required to attempt FIVE questions in all, selecting at least one from each Section.

CSE 211 A - DISCRETE STRUCTURES (CSE/IT)

3L, 1T

3 Hours, 100 Marks

Introduction to Discrete Mathematical Structures, Formal Methods: Induction and Analogy, Abstraction.

Sets, sequences, empty set, power set, operations on sets, Venn diagram, ordered pair, principle of inclusion and exclusion. Counting and Combinatorics.

Introduction to mathematical logic, statements and notations, well-formed formulas, tautologies, tautological implications, normal forms, the theory of Inference for statement calculus, predicate logic.

Graph Terminology, Degrees of Nodes, Isomorphic Graphs, Dijkstra's Shortest Path Algorithm, Planar Graphs, Eulerian Graphs, Hamiltonian Graphs, Traveling Salesman Problem.

Trees, Introduction, Rooted and Other Trees, Representation of Prefix Codes, representation of Arithmetic Expression, Representation of Prefix Codes, Spanning Trees, Traversing Binary Trees, Binary Search Trees.

Relations, matrix and graph representation of relation, properties of relations, partitions. Equivalence Relations, Compatibility Relations, Composition of Binary Relations, Transitive and symmetric closures, partially ordered set, lattices. Recurrence relations.

Functions, Matrix representation of functions, composition of function, inverse function.

Algebraic Structures, General properties of algebraic systems, groupoids, semigroup, monoids, group, rings. Applications of algebra to control structure of a program. Homomorphism, congruences, admissible partitions. Groups and their graphs.

CSE 212 A - OBJECT ORIENTED PROGRAMMING (CSE/IT)

2L,1T

3 Hours, 100 Marks

A review of C. Concepts of object oriented programming using C++. Data types: elementary and derived data types, literals.

Operators and expressions: operators, association and precedence rules of operators, expressions using unary, binary and ternary operators.

Statements: declarations as statements, selection statements, iteration statements, go to statement, break statement, continue statement, return statement, try-catch block.

Functions: void functions, functions with return value, call by value and call by reference parameter passing, default parameters, recursive functions, inline functions.

Classes: classes, objects, friend functions, classes within a class, local classes, global classes, constructors, destructors.

Derived classes: single and multiple derivation of classes, multilevel and hybrid derivation of classes, constructors, destructors.

Polymorphism: function and operator overloading, virtual functions.

Streams: input and output of built-in data types, manipulators.

File streams: opening a file, accessing a file, closing a file.

Exceptions: catching exceptions, rethrowing the exception, standard exceptions.

Templates: defining a template, template instantiation, function templates, class templates.

Elementary case study of an object oriented database in C++.

CSE 213 A - DATA STRUCTURES AND ALGORITHMS (CSE/IT)

3L, 1T

3 Hours, 100 Marks

Introduction to data structure, String storage representation and manipulation. Markov algorithm and primitive data structures.

Concepts of non primitive data structures. Linear data structure. Array, stack, queue, their applications and implementations using sequential storage representation and linked representation.

Linear linked list, double linked list, circular linear linked list and generalised lists and applications.

Concept of non-linear data structures, Tree, graph, set and their representation, Binary Tree, Threaded tree, different techniques of tree traversal, breadth first search, depth first search, application of tree and graph such that Polish notation, concepts of heap.

Sorting, searching algorithms and comparative study of different sorting and searching techniques such that selection sort, heap sort, bubble sort, quick sort, merge sort and radix sort. Linear search and binary search, hashing. External sorting.

Time and space complexity of the algorithms – Big-O, θ , Ω , and small-o, Asymptotic complexity, Upper and Lower bound time and space trade offs.

CSE 214 A - LOGIC DESIGN (CSE/IT)

2L, 1T

3 Hours, 100 Marks

Introduction to number systems, concept of logic gates, boolean algebra and simplification of boolean expressions, K-map, tabular method, combinational circuits, half adder, full adder, flip flops, transfer circuits, clocks, shift registers and binary and BCD counters.

Multiplexer, demultiplexer, encoder, decoder.

Analysis and design of synchronous sequential systems, finite memory and flow chart method of design, State assignment, races and hazards, Introduction to threshold logic & relay circuits, sequential adder.

Introduction to switching devices, positive and negative logic. OR, AND, NOR, NAND, Exclusive OR and Exclusive NOR gates, RTL, DCL, DCTL, TTL, RCTL, ECL, HTL, MOS AND CMOS logic circuit and their realization. Fan-in and Fan-out capacity. Speed and delay in logic circuit.

CSE 215 A - COMPUTER ORIENTED STATISTICAL METHODS (IT)

2L, 1T

3 Hours, 100 Marks

Frequency distribution, Class interval, limit, boundaries, class mark, histograms and frequency polygon, relative frequency distribution, cumulative frequency distribution curves, Frequency curves.

Measure of central tendency, mean, arithmetic and weighted arithmetic and their properties, median, mode, the Empirical relation between mean, median and mode, geometric mean, harmonic mean. The root mean square (RSM). Quartiles, Deciles, and Percentiles.

Measures of Dispersions, range, mean deviation, standard deviation. Variance, properties of standard deviation, Empirical relation between measure of dispersions, Absolute and relative dispersion, coefficient of variation.

Moments for grouped data, relations between moments, computations. Skewness, Kurtosis, Population moments.

Probability theory, conditional probability, independent, dependent and mutually exclusive events. Probability distribution. Mathematical expectations. Combinations and permutations.

Sampling theory, random samples, random numbers, sampling distribution of means, preposition, differences and sums, Standard errors.

Decision theory, statistical decision, hypotheses, tests of hypotheses and significance. Decision rules, Type I, II, errors, level of significance. Special tests. Tests involving binomial and normal distribution, two tail and one tail test Curve fitting, equations of approximations curve, free hand method of curve fitting, the straight line.

Subject approach shall be algorithmic.

CSE 216B – SCRIPTING LANGUAGES LABORATORY (CSE/IT)

2P

100 Marks

PEARL, PYTHON, AWK, SHELL. Data types, variables, and control structures. Basic introduction to PEARL, PYTHON, AWK, SHELL, simple application programme, followed by 200-300 LOC application development.

FOURTH SEMESTER

Ma 202 A – ADVANCED ENGINEERING MATHEMATICS – II (CSE/IT)

3L, 1T

3 Hours, 100 Marks

Section A

Transforms: Laplace Transform, Inverse Laplace Transform, Properties of Laplace Transforms, Application of Laplace Transform to solve differential equation with constant coefficients. Z- Transforms. Infinite Fourier Transforms.

Section B

Numerical Analysis : Interpolation with equal intervals: Newton-Gregory interpolation formulae, Lagrange's interpolation formula for unequal intervals. Central difference interpolation formulae: Gauss' forward and backward formulae, Stirling' s and Bessel's interpolation formulae. Numerical integration : Trapezoidal rule, Simpson' s 1/3 and 3/8 rule. Numerical solution of algebraic and transcendental equations : Bisection, regula falsi and Newton-Raphson methods. Numerical solution of linear simultaneous equations : Gauss' elimination, Gauss-Jordon, Jacobi and Gauss-Siedal methods. Numerical solution of ordinary differential equations : Euler's, Runge-Kutta Fourth order and Milne's methods.

Section C

Special function : Series solution of Bessel and Legendre's differential equations. Generating function of Bessel and Legendre's Polynomials. Orthogonal Property of

Bessel and Legendre's function. Rodrigue's formula.

Note: Candidates are required to attempt FIVE questions in all, selecting at least one from each Section.

CSE 221 A - PRINCIPLES OF PROGRAMMING LANGUAGES (CSE/IT)

3L, 1T

3 Hours, 100 Marks

Importance of programming languages, brief history , features of good programming language. Translators, Syntax, semantics, virtual computers. Binding and binding time.

Elementary and structured data types, their specifications and implementation. Type checking and type conversion, vectors arrays, records, character string, variable size data structures. Sets, input and output files.

Evolution of the concept of data type, abstraction, encapsulation and information binding, subprograms, type definition and abstract data types.

Implicit and explicit sequence control, sequence control within expression and between statements. Subprogram sequence control, Recursive subprograms, Exception and exception handlers, Coroutines and scheduled subprograms. Task and concurrency exception.

Names and referencing environments, Static, dynamic and block structure, Local data and local referencing environments.

Dynamic and static scope of shared data, Block structure, parameters and their transmission. Tasks and shared data. Storage requirement for major run-time elements. Program and system controlled storage management. Static and stack-based storage management. Fixed size and variable-size heap storage management.

CSE 223 A - DATABASE AND FILE SYSTEMS (CSE/IT)

2L, 1T

3 Hours, 100 Marks

Introduction to database systems. A historical perspective, file systems v/s DBMS, advantages of a DBMS, Data abstraction, models, instances and schemes. Data independency. Data definition and manipulation languages. Database manager, administration and users. Overall system structure.

Entities and entity sets. Relationships and relationship sets. Attributes, mapping, keys, E-R diagram and its conversion to tables. Design of an E-R database scheme.

Structure of relational database. The relational algebra. The tuple and domain relational calculus. Modification of databases and views.

Query languages, SQL and query by examples. Security of databases against misuse. Domain constraints, referential integrity, functional dependencies, assertions and triggers. Pitfall in relational database design. Normalization using functional, multi valued and join dependencies. Domain key normal form. Alternative approaches to database design.

Data storage, Physical storage media, files organization, organisation of records into blocks, sequential files , mapping relational data to files, data dictionary storage, buffer management,

Basic concept of indexing and hashing, properties of indexes, index specification in SQL,. B+ - Tree and B-Tree index files. Hash base indexing, static hash functions, dynamic hash function.

CSE 224 A –COMPUTER ARCHITECTURE AND MICROPROCESSORS (IT)

3L, 1T

3 Hours, 100 Marks

Stored program concept, Von-Newman Architecture, Harvard Architecture.

Construction of ALU, number representation, floating point number system, and arithmetic operations on floating point numbers.

Concept of control unit, execution of instructions, Hardwired and Microprogrammed control unit, Microinstructions, Horizontal and vertical format, Microprogramming, Wilkes control .

Memory element, Hierarchy of memories, Associative memory, cache memory, Data transfer technique, DMA, Interrupts.

Introduction to Microprocessors, 8085 Architecture, Flag Register, general purpose registers, Instruction format, Instruction set, Addressing modes, timing diagrams.

Assembly language programming, subprograms, Interrupt programming, Interfacing concepts, I/O mapped I/O and Memory mapped I/O.

CSE 225A – COMMUNICATION ENGINEERING (CSE/IT)

3L,0T

3 Hours, 100 Marks

Introduction to analog and digital techniques for electrical communication. Concept of baseband and carrier transmission. Elementary study of AM, DSBSC SSB, FM and PM.

Sampling theorem and principle of pulse analog modulation. Elements of PCM, fundamentals of digital carrier modulation techniques for data communication.

Concept of FDM and TDM. Meaning of synchronous and asynchronous transmission. Principle of models. Effects of noise in communication systems.

General structure of telecommunication networks. Simplex, duplex and half-duplex lines, concepts of centralized and common control switching in telephone networks.

Qualitative study of radio-wave propagation. Introductory study of microwave LOS tropospheric scatter, satellite and optical communications.

FIFTH SEMESTER
CSE 311 A – THEORY OF COMPUTATION (CSE/IT)

3L, 1T

3 Hours, 100 Marks

Introduction to Automata theory, description of finite automata, transition Systems. Properties of transition functions, acceptability of a string by a FA.

Non-deterministic finite state machine. Conversion from NDFSA to DFA. The equivalence of DFA and NDFSA. Finite automata. Mealy & Moore machine with outputs. Conversion from a Moore machine to Mealy machine and vice-versa. Minimization of finite automata.

Regular set and regular grammar. Regular expression, finite automata and regular expressions, transition system and regular expression. Equivalence of two finite automata. Equivalence of two regular expressions. Kleen's closure theorem. Construction of finite automata equivalence to a regular expression.

Context free languages and derivation trees. Left most and right most derivations. Normal forms of context free grammars (i) Chomsky-normal form (ii) Greibach-normal form.

Push down automata, acceptance by PDA, PDA and context free languages.

Introduction to Linear bounded automata, acceptance by LBA, LBA and context sensitive language.

Turing machine model, representation of TMs, languages acceptability by TMs, design of TMs, universal TMs and other modifications of TM, and Chomsky-Hierarchy grammar.

CSE 312 A – DATABASE MANAGEMENT SYSTEM (CSE/IT)

2L, 1T

3 Hours, 100 Marks

Review of Database Models. Basic concepts of object oriented model, New data base applications, object structure, class hierarchy, Multiple inheritance, object identity, object containment, physical organization, object oriented queries, scheme modification. Comparison between RDBMS and OODBMS, crash recovery. Failure classification, storage hierarchy.

Transaction model , log-based recovery, Buffer Management , check points, shadow paging , failure with loss of non-volatile storage, stable storage implementation, concurrency control schedule, Testing for serializability, lock-based protocols, Time stamp based protocols, validation techniques, multiple Granularity, Multiversion schemes, Insert and Delete operations.

Basics of XML, Schema, Syntax and Sementics, view, manipulations, query, design, constraints, translation from Relational database, applications.

Security and Integrity violations, Authorizations and views, security specification in SQL, Encryption, statistical databases. Introduction to distributed databases, Internet data bases. Data base Design case study.

CSE 313 A - SYSTEM PROGRAMMING (CSE/IT)

2L, 1T

3 Hours, 100 Marks

System Software and Machine Architecture, General register level architecture, VAX, Pentium, RISC Machines – Power PC, instruction and data formats.

Assemblers: Basic functions, Algorithm and Data Structures.

Machine dependent assembler features: Instruction formats and addressing modes, program relocation.

Machine Independent features: Literals, symbol definitions.

Program blocks, control sections and Linking.

Assembler design, one pass and multi-pass assemblers, MASM, and SPARC assemblers.

Loaders and Linkers: Loaders functions, absolute loader, boot strap-loader, Machine dependent and independent features, relation and lining. Data structures and algorithm of loader, Library Search, Linkage editors, Dynamic and Static Linking. Specific examples.

Macroprocessors: Functions, algorithms and data astructures, macro-expansion. Macros of HLLs, specific examples and macroprocessors.

Basic idea of compilers, phases/posses of compiles. Interpreters, compiler-compilers. Sun OS complier, lex, yacc, gcc. Operating System, its functions, types of OS, User interface, run time environment, interrupt processing, process scheduling, memory management, file processing, job scheduling, protection.

CSE 316A- COMPUTER NETWORKS (CSE/IT)

3L, 1T

3 Hours, 100 Marks

Introduction to Computer Networks, advantages, LAN, MAN, WAN, Network topologies. OSI reference model, Basic concepts, services and layers of OSI model. Physical layer protocols- RS 232C,RS-449, X.21, X.24, Ethernet, Data link layer- basic link protocols, character and bit oriented protocols, Flow control, Error detection, Error control, High level Data Link control (HDLC).

Network layer- Virtual circuit, X.25 specification, Data grams, Transport, Session, Presentation and Application layers. Connection less and connection oriented protocols, circuit, message and packet switching.

Introductory study of TCP/IP protocol suit, LAN Topologies and transmission media, twisted pairs, coaxial, optical fibers. LAN access techniques, random access method, ALOHA, CSMA, CSMA/CD, Controlled access schemes.

Introduction to Network interconnections, Bridges and Routers.

INTERNET and WWW. Domain name system, E-mail, HTML, TELNET and file transfer protocol (FTP).

Introduction to Wireless Networks.

Basic idea of information and Network Security – Encryption, Decryption, DES, RSA, Digital Signatures, Firewalls, BGP.

CSE 317 A - HUMAN COMPUTER INTERACTION (IT)

3L, 1T

3 Hours, 100 Marks

Evolution of HCI. Introduction to computer graphics, models of interactive graphics system, display file, problems of picture transformation, taxonomy of display system. Introduction to picture structures and transformations.

Display Processor - typical CRT specification, display file and picture file organization, language concepts of interactive computer graphics.

Usability Engineering Methods and Concepts:: Emergence of usability, user centered system development. Strategic Use of Complex Computer Systems, strategies in the intermediate layers of knowledge, Evidence for the effects of aggregation strategies on performance, possible explanations of inefficient computer usage.

Human factors in programming and software development.

User Interface design activities. User Interface software tools, Themes in evaluating tools.

Input devices and techniques, Underlying principles, interaction tasks; 1, 2 and 3 dimension locators; various body movements for control of input devices. Output Devices and techniques. Visual displays, resolution, color vision, and displays, Virtual reality displays.

Interactive techniques and their characteristics. Basic interaction styles, command language, menus, direct manipulations. interaction objects for graphical user interface, navigation, components of GUI, Multimedia, interfaces and types. Multimedia hardware requirements, applications of multimedia techniques, effects of multimedia on user performance.

SIXTH SEMESTER
CSE 322A – OPERATING SYSTEM DESIGN (CSE/IT)

3L,1T

3 Hours, 60 Marks

Introduction to operating system, operating system functions, batch processing systems, multiprogramming systems, time sharing systems, real time operating systems.

Process management, process concept, process scheduling, operation on processes, cooperating processes, interprocess communication.

CPU scheduling, scheduling algorithms – first come first served, shortest job first, priority based, round robin, multilevel queue, multilevel feedback queue.

Process synchronization, critical section problem, semaphores, monitors. Deadlocks, deadlock prevention, deadlock avoidance, deadlock detection.

Memory management, contiguous allocation, paging, segmentation, virtual memory, demand paging, page replacement, page replacement algorithms – first in first out algorithm, optimal algorithm, least recently used algorithm.

File concepts, directory structure, file protection, allocation of disk space.

I/O systems, I/O hardware – polling, interrupts, direct memory access. Disk scheduling, disk scheduling algorithms – first come first served algorithm, shortest seek time first algorithm, SCAN algorithm, C-SCAN algorithm, C-LOOK algorithm.

Protection and security in an operating system, access matrix, capabilities.

Case studies of Windows / LINUX operating System.

CSE 323 A - JAVA PROGRAMMING (CSE / IT)

3L, 0T

3 Hours, 100 Marks

Evolution of programming languages, generation of programming languages, type of programming languages. Basic feature of Java, flow control, classes, objects, interfaces, exception and packages.

Java classes and object, access control and inheritance, constructions, inheritance and overloading. Extension of classes.

Data type, control-flow, basics of exception handling, operations on data types.

Introductory idea of threads and their applications.

Basic IO packages and standard utilities. Application of Java for system programming.

Introduction to LINUX shell, variables, condition and control structures.

Introduction to TCL/TK programming language.

CSE 325A – ARTIFICIAL INTELLIGENCE (CSE/IT)

3L, IT

3 Hours, 100 Marks

Defining artificial intelligence (AI), historical foundations, development of logic, turing test, AI application areas.

Propositional calculus, syntax and semantics, Predicate calculus syntax and semantics. Inferencing and unification.

Searching structures and strategies for state space search, using the state space to represent reasoning with the predicate calculus. Heuristic searches and algorithms and use of heuristics in games. Control and implementations of state space search, recursion-based search, pattern directed search and Production systems.

Languages for AI, problem solving, introduction to Prolog, its syntax, abstract data types, production system and designing of alternative search strategies.

Overview of expert system, knowledge engineering process, conceptual models. Framework of organization and applying human knowledge. Managing uncertainty in expert system—concepts of Bayesian probability theory, non-monotonic logic and reasoning with belief, fuzzy logic and Dempster/Shافر approaches to uncertainty. Case studies of typical expert system.

Knowledge representation and its issues, network representation, conceptual graphs and structured representation.

Automated reasoning, resolution theorem proving issues and design of automated reasoning programs.

CSE 327A - WEB TECHNOLOGIES(IT)

2L, 1T

3 Hours, 100 Marks

Internet and Web Essentials, Clients, Servers and communication.

An introduction to HTML, Lists, adding graphics to HTML page, creating tables, linking documents, forms, frames, Cascading Style sheets(CSS).

Java Script: Introduction, programming constructs: variables, operators and expressions, conditional checking, functions and dialog boxes, JavaScript DOM, creating forms, introduction to Cookies, JQuery.

AJAX: Introduction, HTTP Request, XMLHttpRequest, AJAX Server Script.

PHP: Introduction, syntax, statements, operators, PHP and MySQL, PHP and AJAX.

Introduction to ASP.net, J2EE, Java servlets and JSP.

CSE 328A- ROBOTICS (CSE/IT)

3L, 1T

3 Hours, 100 Marks

Introduction: Automation and Robotics, CAD/CAM for Robotics – An overview of Robotics – present and future applications – classification by coordinate system and control system.

Components of the Industrial Robotics: Function line diagram representation of robot arms, common types of arms. Components, Architecture, number of degrees of freedom – Requirements and challenges of end effectors, determination of the end effectors, comparison of Electric, Hydraulic and Pneumatic types of locomotion devices.

Motion Analysis: Homogeneous transformations as applicable to rotation and translation numerical problems. Manipulator Kinematics: Specifications of matrices, D-H notation joint coordinates and world coordinates. Forward and inverse kinematics numerical problems.

Trajectory planning and avoidance of obstacles, path planning, Skew motion, joint integrated motion –straight line motion – Robot programming, languages and software packages.

Robot actuators and Feed back components: position sensors – potentiometers, resolvers, encoders – Velocity sensors.

Introduction to Microcontroller Families, Introduction to AVR microcontrollers, Interfacing of: LEDs, Switches, Relays, LCD, 7 Segment Display, ADC, Stepper Motors, DC Motors, IR Sensors, Serial Communication, GSM module, GPS module, I2C devices, PWM Techniques

Software tools for robot programming, Cross Compilers. Machine vision and image processing
Robot Application in Manufacturing: Material Transfer - Material handling, loading and unloading-
Processing - spot and continuous arc welding & spray painting - Assembly and Inspection.

Mini software simulation project

SEVENTH SEMESTER

CSE 411A - DESIGN AND ANALYSIS OF ALGORITHMS (CSE/IT)

3L, 1T

3 Hours, 60 Marks

Review of Algorithm and its specification, performance analysis and Randomized Algorithms. Random access machines (RAM), computational complexity of RAM program. Time and Space complexity, Asymptotic notations (Big-O, θ , Ω , and small-o).

Design of Efficient Algorithms: Designing Methods. *Divide and conquer*: Binary Search, finding maximum and minimum, Merge Sort, Quick Sort. *Greedy methods*: Knapsack problem, tree vertex splitting, minimum cost spanning tree. *Dynamic programming*: Matrix Chain Multiplication, Longest Common Subsequence, Multi Stage Graph and 0/1 Knapsack Problem. *Branch and Bound*: Traveling Salesman Problem and Lower Bound Theory.

Sorting and Comparative study: Algorithms and comparisons of Radix sort, Heap sort, Merge sort and Quick sort. Order statistics and expected time for order statistics.

Matrix multiplication and related operations: Strassen's Matrix Multiplication Algorithm, inversion of matrices, LUP decomposition of matrices and its applications.

Advanced Trees: Definitions Operations on Weight Balanced Trees (Huffman Trees), 2-3 Trees and Red- Black Trees. Augmenting Red-Black Trees to Dynamic Order Statistics and Interval Tree Applications.

Graph Theory Algorithms: Algorithms for Connectedness, Finding all Spanning Trees in a Weighted Graph and Planarity Testing, Breadth First and Depth First Search, Vertex cover problem.

CSE 413A- SOFTWARE ENGINEERING (CSE/IT)

3L, 1T

3 Hours, 60 Marks

Introduction, software characteristics and software crisis. The software engineering approach; software process & process maturity. Various software development models. Software life cycle concept.

The software project management concepts and team organization. Software process and project metrics. Software measurement. Metrics for software quality and its integration with the software process.

Software scope/project estimation – the COCOMO model and the Function Point approach.

Software quality assurance. Software reviews, cost impact and software defects. Formal Technical Reviews, software reliability.

Conventional methods for software engineering. Analysis concepts and principles. The software requirements specifications. Software prototyping.

Software design and software engineering, software architecture. Effective modular design—functional independence, cohesion and coupling concepts. Component level/procedural design.

Software testing techniques and strategies.

CSE 414 A - PRINCIPLES OF COMPILER DESIGN (CSE/IT)

3L, 1T

3 Hours, 60 Marks

Introduction to translators , compilers, interpreters, compilation process.

Lexical analyzer, input buffering, specification and recognition of tokens, regular expressions to NFA, minimization of DFA, keywords and reserve word policies, LEX - the lexical analyzer generator.

Syntax analyzer, context free grammars, top down parsing, Brute force parser, recursive descent parser, LL (1) parser. Bottom up parsing, operator precedence parsing, LR parser, LALR parser, YACC - the parser generator.

Syntax directed translation schemes, implementation of syntax directed translators, synthesized attributes, inherited attributes, construction of syntax trees, bottom up evaluation of S- attributed definitions, L- attributed definitions, top down translation of L - attributed definitions.

Errors, lexical phase errors, syntactic phase errors.

Intermediate languages, postfix notation, syntax trees, parse trees, three address code- quadruples, triples and indirect triples.

Translation of assignment statements, boolean expressions, statements that alter flow of control, array references, procedure calls, declarations, case statement, record structures.

Symbol tables, operation on symbol tables, symbol table organization for non-block structured languages, symbol table organization for block-structured languages.

Run time storage management, storage allocation and referencing data in block structured languages, storage allocation in FORTRAN.

Code optimization, sources of optimization, loop optimization, DAG and optimization of basic blocks.

Code generation, a machine model, next use information, register allocation and assignment, a simple code generator, code generation from DAG's, peephole optimization.

CSE 416A – DATA WAREHOUSING AND DATA MINING (IT)

3L, 1T

3 Hours, 60 Marks

Data warehousing: Definition, usage and trends. DBMS vs. data warehouse, Data marts, Metadata, Multidimensional data mode, Data cubes, Schemas for Multidimensional Database: stars, snowflakes and fact constellations. Data warehouse process & architecture, OLTP vs. OLAP, ROLAP vs. MOLAP, types of OLAP, servers, 3-Tier data warehouse architecture, distributed and virtual data warehouses, data warehouse manager.

Data mining definition & task, KDD versus data mining, data mining techniques, tools and applications. Data mining query languages, data specification, specifying knowledge, hierarchy specification, pattern presentation & visualization specification, data mining languages and standardization of data mining.

Data mining techniques: Association rules, clustering techniques, Decision tree knowledge discovery through Neural Networks & Genetic Algorithm, Rough Sets, and Support Vector Machines and Fuzzy techniques.

Decision support system, component of decision support, designing decision support system.

Knowledge management system, definition, functionalities

Introduction to Big Data Platform – Traits of Big data -Challenges of Conventional Systems -

Web Data – Evolution of Analytic Scalability - Analytic Processes and Tools - Analysis vs

Reporting - Modern Data Analytic Tools - Statistical Concepts: Sampling Distributions – Re-Sampling- Statistical Inference - Prediction Error.

ELECTIVE-I **CSE 442 A - E-COMMERCE (IT)**

3L, 1T

3 Hours, 60 Marks

Introduction to electronic commerce, need of e-Commerce, Economic consideration. Infrastructure for E-Commerce, Intranets and Extranets and various Internet protocols.

Tools for E-Commerce: Introduction to web Server hardware and Web server Software. Introduction of markup languages, web portals, search engines, push technology. E-Commerce software Requirements- Catalogue display, shopping cart, transaction processing, and catalogue customization. E-Commerce software development tools and hosting services.

Security Threats to E-Commerce: Introduction to web hacking. E-Commerce Security threats- Intellectual Property threat, client threat, communication channel threat and server threat. Policy for Protecting E-Commerce Assets. Ensuring transaction Integrity and security.

Electronic payment systems: Introduction to Electronic cash, Electronic Wallets, Smart cards, Credit and Charge Cards.

Business strategies for web: Creating effective web presence, Identifying and reaching customers, creating and maintaining brands on web. Business models for selling on web.

Introduction to purchasing, logistics and support activities on web.

Introduction to Electronic data Interchange and web auction. Supply Chain Management. Planning and management of e-commerce projects. Legal, language, ethical and taxation issues of e-commerce.

CSE 443 A – E-GOVERNANCE (IT)

3L, 1T

3 Hours, 60 Marks

Principles of public administration. Basic premise – meaning, scope, nature of public administration and its role. Evolution of public administration, politics & administration and the new public administration.

Theories of organization – the bureaucratic/classical model, behavioural model, decision model and systems approach. Organisational effectiveness.

Principles of organizations, structure of organization, Administrative behaviour, Accountability and control, people participation in administration.

Re-engineering. Role of IT in business process re-engineering (BPR), Business Process outsourcing (BPO). Process identification and mapping. Process improvement and process re-design. System security, legal and statutory/sovereign considerations. Re-organising people and managing change. Best practices.

Delivery of governance through technology.

Improving citizen – government interface, Govt-to-Govt coordination, workflow automation. Use of video-conferencing, DSS, web-technologies and enterprise wide computing paradigms. Domain knowledge and technology expertise – case studies.

CSE 453A – CLIENT-SERVER TECHNOLOGY (CSE/IT)

3L, 1T

3 Hours, 60 Marks

Introduction: Client/Server architecture, Benefits, application, centralize multiuser, Distributed single user architecture, distributed computing environment.

Approach to Distribution: Distributed models, multi tiered environment, cooperative processing, application components, and distribution points. Presentation distribution, distributed processing, distributed function and transaction processing, data distribution.

Client technologies: Function, Application and tools, operating system, hardware plate forms, database access, interprocess communication tools.

Server technologies: Function, server operating system, hardware plate forms, data access, distributed data access, database engines.

System networks Architectures: Components, layers, pear-to-pear communication between SNA layers.

Data Management: Distributed data management, method of the distribution, distributed data access. Database transaction management.

Distributed DBMS: Architecture, storing data in a distributed DBMS, Distributed catalog, management, Distributed query processing, Update distributed data. Introduction to distributed transactions, distributed concurrency control, and distributed recovery.

CSE 454 A – MULTIMEDIA TECHNOLOGY (CSE/IT)

3L, 1T

3 Hours, 60 Marks

Introduction to multimedia and its applications, Basic requirements for multimedia, Multimedia building blocks - Text, Sound, Images, Animation, Video and related tools.

Multimedia Hardware: SCSI, MCI, Memory and storage devices, Output Hardware, Communication devices.

Multimedia Software: Basic tools - Painting and drawing tools, 3-D modelling and animation tools, Images and editing tools, OCR software, Sound Editing programs, Animation, Video and Digital Movies, Video Formats, Compressing movie files.

Multimedia Authoring tools: Selecting a right tool based on various features, card and page based authoring tools, Icon based authoring tools, Time based authoring tools, Object - Oriented Tools.

Assembling and delivering a project: The multimedia team, Planning and costing, designing and producing.

Multimedia and the internet: working of internet, Tools for www - web page makers and editors, HTML and Multimedia, Video on demand, Images, sound and animation for the web.

EIGHTH SEMESTER

CSE 426 A - COMPUTER NETWORK MANAGEMENT (IT)

3L, 1T

3 Hours, 50 Marks

Introduction to network management, challenges of information Technology managers. Network management goals, organization and functions. Network operations and NOC (Network operation center).

Network installation, Maintenance, current status, Network management standards, models, organization model, Information model, management information tree.

Internet Organizations and standards, Internet documents.

SNMP model, communication model, architecture, protocol Specifications, operations.

Introductory idea of ISDN, ATM based network and management.

Network management tools and systems, BERT (Berkeley e-mail replacement tool), Basic software tools, SNMP and MIB (management information base) Tools, protocol analyzer, Traffic load Monitoring.

Web based management, Web interface and Web Management. Local and remote access. Embedded Web Based management.

Network management applications, configuration management Inventory management, fault management, fault detection, fault location and isolation Techniques.

Security management policies and procedures, Resource to prevent security Breaches, Report Management, Policy Based management.

CSE 427A - INFORMATION AND NETWORK SECURITY (IT)

3L, 1T

3 Hours, 50 Marks

Introduction to Cryptography: Simple substitution ciphers, divisibility and greatest common divisions, prime numbers and unique factorization, cryptography before computer age.

Discrete Logarithms and Diffie-Hellman: Public Key cryptography, groups, discrete logarithm problem and its hardness, Diffie-Hellman key exchange, Chinese remainder theorem.

Integer Factorization and RSA: Euler's formula, RSA Public Key Crypto System, implementation and security issues, primality testing.

Digital signature, Hash functions, modern symmetric crypto systems: DES and AES.

Computer Security overview.

Common attacks and Defense Mechanisms; Evesdropping, cryptanalysis, password pilfering, Identity spoofing, Buffer-overflow, Repudiation, intrusion & IDS system Traffic analysis, DOS attacks, Malicious software.

Basic Security models and Security resources.

Network Perimeter Security. Packet Filters, Circuit Gateways, Application Gateways, Trusted Systems, Firewall Configurations.

ELECTIVE – II

CSE 466 A - GRAPH THEORY (CSE/IT)

3L, 1T

3 Hours, 50 Marks

Introduction to graphs, applications, representation of graphs. Walk, Paths and circuits. Isomorphism, connectedness, Euler graph, subgraph, operations on graph, Hamiltonian Paths and Circuits, Traveling Salesman problem, algorithm of graph traversals, connectedness.

Tree, Spanning tree, Fundamental Circuits, Cut-sets, Connectivity and Separability,

1-isomorphism, 2-Isomorphism, Network flow, Algorithm for spanning tree, cut vertex.

Planar and Dual graphs, Kuratowski's two graph, representations of planar graph, algorithm for detection of planarity, geometric and combinatorial dual graph, thickness and crossings.

Matrix representation of graphs, incident matrix circuit matrix, cutset matrix, path matrix, adjacency matrix. Coloring, covering and partitioning, chromatic number, chromatic polynomial, matching, bipartite graph, four color problem.

Directed graphs, types, binary relations, connectedness, Euler digraph, tree, fundamental circuits, adjacency matrix, tournaments, acyclic digraph, decyclization, algorithm for finding directed circuits.

CSE 470A – COMPUTATIONAL SCIENCE (CSE/IT)

3L, 1T

3 Hours, 50 Marks

Modeling and Simulation: Definition of simulation and modeling; relationship between simulation and modeling, Purpose including benefits and limitations: role – addressing performance, optimization; supporting decision, making, forecasting, safety considerations.

Application areas: healthcare (including assisting with diagnostics); economics and finance; city and urban simulations; simulation in science and in engineering.

Types of simulations – physical, human in the loop, interaction, computer, virtual reality. The simulation process. simplifying, assumptions; validation of outcomes.

Model building: use of mathematical formula or equation, graphs, constraints. Methodologies and techniques. Use of time stepping for dynamic systems.

Theoretical considerations; Monte Carlo methods, stochastic processes, queuing theory. Software in support of simulation and modeling; packages, languages.

Operations Research: Linear programming: Integer programming, The Simplex method, Probabilistic modeling, Queuing theory, Markov models and chains, Prediction and estimation, Decision analysis, Forecasting, Risk management.

Software tools for Simulations and Modeling.

ELECTIVE - III

CSE463A–OBJECT ORIENTED SOFTWARE ENGINEERING (CSE/IT)

3L, 1T

3 Hours, 50 Marks

Object-oriented concepts and principles. Identifying the elements of an object model. Object oriented projects metrics and estimation.

Object-oriented analysis: Domain analysis, the OOA process, the object-relationship model.

Design for object- oriented systems. The system design process.

Object-oriented testing - testing OOA and OOD models. The object-oriented testing strategies. Inter class testing.

Technical metrics for O-O systems. Class-oriented metrics & metrics for O-O projects.

Advanced topics in software engineering. Component-based software engineering and development. Classifying and retrieving components.

Review of CASE tools.

CSE 465 A - INFORMATION THEORY AND CODING (CSE/IT)

3L, 1T

3 Hours, 50 Marks

Uncertainty, information, measure of information, average information, entropy, property of entropy, information rate. Discrete memoryless source, Source coding theorem,

Discrete memoryless channel, self and Mutual information, properties, channel capacity, channel coding theorem, Shannon – Hartley theorem, Information capacity theorem.

Data compaction, prefix coding, Huffman coding, Lempal-Ziv coding. Compression of information.

Type of errors, codes, error control coding, linear block code, error detection and correction codes, syndrome decoding, cyclic codes, hamming code, BCH, convolution codes, encoders and decoders, performance of codes.

CSE 469A-BIOINFORMATICS (CSE/IT)

3L, 1T

3 Hours, 50 Marks

Introduction to Molecular Biology and Biological chemistry: Genetic material, Gene structure and information content, protein structure and functions, nature of chemical bonds, molecular biology tools, genomic information content.

Data Searches and pair-wise alignments: Dot plots, Gaps, Dynamic Programming, database searches and family of algorithms –BLAST and FASTA.

Substitution patterns: Pattern substitution with in genes, estimating substitution numbers, variation of evolutionary rates between genes, molecular clocks.

Phylogenetics: Its history, phylogentic trees, distance matrix methods. Character-based methods – parsimony, ancestral sequences. Strategies for faster searches – branch and bound, heuristic. Consensus trees, parametric tests. The tree of life.

Genomics and gene Recognition: prokaryotic and eukaryotic genomes and their structures, open reading frames, gene expression.

Protein and RNA structure prediction: Amino-acids, polypeptide composition, structure. Algorithms for modeling protein folding, and reverse protein folding.

Information integration for life science discovery: Nature of biological data, data sources, challenges in information integration.

SYLLABUS OF OPEN ELECTIVES-I

BCT 291 A Open Elective-I: Sustainable Architecture

3L

3 Hrs, MM 100

Concepts of sustainability : Energy and Global environment, Energy use and Climate change – Its impact, Types of Energy systems, Concept of Sustainability - Principles of conservation -synergy with nature, Bioregionalism - community basis shelter technology within bioregional patterns and scales, Ethical- environmental degradation.

Sustainable planning & Design: Sustainable Development -Sustainable approach to site planning and design - site inventories-relationships between site factors - development impacts from one area of the site on the other areas - phasing of development - limits of change - Design facility within social and environmental thresholds

Sustainable Building Materials and Construction : Properties, Uses and Examples of -Primary, secondary and Tertiary Sustainable Materials, Principles to improve the energy efficiency - siting and vernacular design, shade, ventilation, earth shelter, thermal inertia and air lock entrances. Techniques of sustainable construction - technologies, methods of effectiveness, and design synthesis – alternative materials and construction methods: solar water heating panels; photovoltaic electricity generation; use of local materials and on site growth of food, fuel and building materials.

Recycling and Reuse : Pre building, Building, Post building stages - Architectural Reuse, Waste prevention, Construction and Demolition recycling- Conservation of natural and building resources- Energy and material savings – types of wastes - Elimination of waste and minimize pollution- various Decomposing methods – Innovative reuse of various wastes Case Studies and Rating systems : Sustainable Development Case Studies: illustrated examples of the planning, development, and construction. Green architecture and various international rating systems for sustainability- EAM (UK), CASBEE (Japan), LEED (US), Green Star (Australia), etc. – Indian systems – TERI GRIHA rating, LEED India rating, IGBC

CE 291A Open Elective-I :Energy Efficient Building Design

3L

3 Hrs, MM:100

Environment and man, external environment and built environment, Built-environment – integrated approach.

Climate: elements of climate, classification of climate, Micro-climate, site climate.

Comfort: desirable conditions, thermal comfort factors, comfort indices, effective and corrected effective temp. Tropical summer index.

Thermal Design: heat loss from a building under steady state condition, heat gains due to solar radiation, steady state and cyclic conditions, Means of thermal control – mechanical, structural control, air infiltration into buildings by natural means, shape of buildings, thermal cube, fabric heat loss, ventilation loss and volume.

Light & Lighting: illumination requirement, day-lighting, artificial lighting, energy conservation.

Noise Control: Sources of noise, means of control, control requirements, behaviour of sound in rooms, vibration & vibration control.

Building Services: Mechanical & electrical services in building, lifts, escalators.

ChE 291 A Open Elective-I : Renewable Energy Sources

3L

3 Hrs, MM:100

Sources of energy: Energy sources and their availability, renewable energy sources.

Energy from Biomass: Introduction, Biomass as a source of energy, Biomass conversion technologies, Biogas generation, classification of biogas plants, Biomass gasification.

Solar Energy: Sun and solar energy, solar radiation and its measurement, solar energy collectors, solar energy storage, Photovoltaic systems, Application of solar energy.

Wind Energy: Wind as an Energy source, Basic principles of wind energy conversion, Types of Wind machines, Components of wind energy conversion system, Performance of wind machines, application of wind energy.

Geothermal Energy: Introduction, Origin and distribution of geothermal energy, types of geothermal resources, Hybrid geothermal power plant, Application of geothermal energy.

Hydrogen energy: Introduction, Hydrogen production, Hydrogen storage, Hydrogen transportation.

Energy from the Oceans: Introduction, Ocean Thermal Electric Conversion (OTEC), Energy from Tides, Ocean Waves.

EE 291 A Open Elective I: Industrial Application Of Electrical Drives

3L

3 Hours, 100 Marks

Operating-Characteristics : Individual, group and collective drives, steady state individual and joint characteristics of electric motors and driven industrial units under different conditions of operation.

Transient Characteristics : Causes of transient conditions starting, braking, reversing, speed transition and sudden system changes. Forces and torques on the drives referred to a common reference shaft. General equation of motion, Accelerating and decelerating times. Starting and braking time and means of reducing.

Drives Control : Parameters characterizing speed control methods of electric drives, speed control of Industrial d.c. and a.c. motors under constant and varying torque and h.p. conditions.

Families of speed torque characteristics : Idea of manual and automatic control gears, Master-controller.

Motor Ratings : Continuous-short time and intermittent ratings, overload capacity. Effect of altitude, Motor heating and cooling curves. Equivalent current, power and torque. Selection motor for various duty cycles. Permissible frequency of starting, features of load diagram construction. Load equalisation and use of fly wheels. Types of motor enclosures.

Illumination : Units of light, Point , linear and surfact sources. Laws of illumination. Candle power distribution, MSCP and reduction factor, Indoor lighting system and their classification. Contrast, glare, shadow and colour. Mounting height and spacing. General and local lighting Total lumen and point by point methods of calculations. Outdoor lighting distributor and protector fittings. Isolux diagram. Flood, gas, discharge and arc-lamp-working, characteristics and applications.

Electric Heating and Welding : Principles of electric heating. Direct and indirect resistance heating, lead baths and salt baths. Resistance oven convection and radiation ovens. Arc resistance and induction furnace, elements of operation, performance and power supply arrangements. temperature regulation of ovens and furnances. Induction, high frequency and dielectric heating and their uses. Elementary study of different kinds of electric welding operation, Power supply for welding. Elements of Electrics Traction : Electric traction versus others System of electric traction for tramways, trolley buses, motor coach trains and locomotive hauled trains. Idea about suitability of electric motor for traction. Conductor rail and pantograph. meaning for multiple-unit operation.

Economics : Methods for economic selection of Industrial drives, loss factor and cost of losses, Effect of load factor. Power factor and factory diversity factor. Methods of power factor improvement and its economic limit. Economic calculations for illumination schemes Economic value of good lighting.

EE 292 A Open Elective I: Engineering Economics

3L

3 Hours, 100 Marks

Introduction: Economics for Electrical Engineering, concept of physical efficiency and financial efficiency of electrical goods and services supply and demand, Elasticity. Necessities and luxuries, free competition, monopoly, law of diminishing returns.

C:\USERS\FAYYAZ\DESKTOP\BE(IT) CBCS SYALLABUS 2018 EXAMINATION BY NCB.DOCX

Interest and Depreciation: Interest rates and equivalence, annuities and various factors, concept of depreciation in utilizing electrical energy, economic life of electrical machines, salvage value, various methods of depreciation calculations, equivalent capital recovery depreciation.

Economical choice of Electrical Apparatus: Motors, transformers, Economical choice between synchronous motors and Induction motor running them simultaneously.

Comparison of Alternatives: Basic economic study patterns, annual cost, capitalized cost, present worth, rate of return, Increment investment, pay back and benefit to cost ratio methods and their respective fields of applications.

Ma-291 A Open Elective-I :Mathematical Statistics for Engineers

3L **3 Hrs., M M :100**

Theory of probability : Theoretical probability distribution (Binomial, Poisson and Normal).

Correlation and Regression Analysis : Karl-Pearson's coefficient , Spearman's coefficient, Regression analysis of two variables system.

Sampling Theory : Test of significance, Large sample tests for mean and proportions. χ^2 (chi-square) , t and F Test of significance for Small sample.

Theory of attributes: association and independence of attributes, coefficient of association.

Index Number: Various types of index numbers, construction of index number of prices, fixed base and chain base methods

ME- 291A Open Elective-I: Renewable Energy Sources

3L **3 Hrs, MM:100**

Principal types of fossil fuel fired power plants and their effects on livestock and environment; Concepts of NCES, Criteria for assessing the potential of NCES, Limitations of RES.

Solar Energy - Solar radiation data, solar energy conversion into heat, Analysis of Flat plate and Concentrating collectors, Testing procedures, Paraboloid Dish, Central Receiver; concept of collector tracking, energy storage systems; Solar thermal systems for residential water heating, Solar Pond, industrial process heating and power generation. Photo voltaic: p-n junctions, I-V characteristics of solar cells, Calculation of energy for photovoltaic power generation; Battery Characteristics, DC Power Conditioning Converters, AC Power Conditioning -Inverters.

Wind Energy: Energy available from wind, General formula, Lift and drag. Basis of Wind energy conversion, Effect of density, Frequency variances, Angle of attack, Wind speed, Determination of torque coefficient, Principle of Operation of wind turbines, types of wind turbines and characteristics, Generators for Wind Turbines, Control strategies.

Biomass and Biofuels: Conversion routes- combustion, pyrolysis of biomass to produce solid, liquid and gaseous fuels; Constructional details of gasifier; Aerobic and anaerobic digestion, Biofuels and their production; biofuels, Biomass systems for thermal applications and power generation.

Geothermal Energy: Definition and classification of resources, typical geothermal gradient; Dry, flash and binary steam systems; Utilization for electricity generation and direct heating, Wellhead power generating units. Basic features: Atmospheric exhaust and condensing, Exhaust types of conventional steam turbines.

An overview of other renewable devices- Fuel cells: principle, types, applications; Ocean thermal energy conversion (OTEC), Thermoelectric, MHD, Wave energy, Tidal energy, etc.

Economic Viability: Calculation of the cost of energy supply from renewables, Payback period, Carbon footprints; Comparison with conventional fossil fuel driven systems in terms of costs and emissions; Calculation of carbon dioxide reduction and incremental costs for renewable options.

ME 292 A Open Elective-I: Automobile Engineering

3L **3Hrs, MM:100**

Power Unit: Automobile engine types, classification; Engine parts: cylinder head, block and crank case, piston and rings; Carburation, fuel injection, valve operation; Fuel combustion, mechanical power and engine performance characteristics; Engine cooling and thermal stresses in parts,.

Chassis and Suspension: Load on frame, general considerations for strength and stiffness, engine mounting; Dampers, leaf and coil springs, various arrangements of suspension systems.

Transmission System: Clutches, flywheels, torque convertors; Gear-box: simple, synchromesh and overdrive; Type of universal joints, propeller shaft, differential; Rolling, air, gradient resistances and propulsive power calculation.

Steering: Steering geometry, Ackermann and Davis steering mechanisms; Telescopic steering; Steering shaft, gear-box, linkages, steering angles, front and rear axles; Vehicle longitudinal, static and dynamic balancing and electronic stability; Power steering: types and mechanism; Effect of caster, camber, toe-in and toe-out on tyre wear.

Brakes and Tyres: Servo-action, brake components; Bendix and Gerling system lock-head, hydraulic, vacuum, air and power brakes, and retarders; Pneumatic and tubeless tyres;

Features of a Modern passenger Car: Introduction to ABS, Front and side air bags, EBD, Climatizer, ESP, night-vision dashboard system; sun-roofing, collision warning system, Hybrid cars.

MI 291A Open Elective-I: Tunneling for Engineering Projects (MI)

3L

3 Hrs, MM:100

Tunneling: Introduction about tunnels, functions, advantages and disadvantages of tunnels compared to open cuts, Criteria for selection of size and shape of tunnels, consideration in tunneling, geological investigation, tunnel alignment, tunnel shafts, pilot tunnels. Advantages of twin tunnels and pilot tunnels, portals and adits.

Conventional Method of Tunneling: Drilling, Blasting, Loading and Transport of Muck, Supports, Ventilation, Drainage, and Equipments. Drivage work in varying ground conditions using conventional methods

Fast Tunneling: Dill jumbos, trackless mucking and transportation units. Tunnel boring machine

Tunneling in Soft Ground: General characteristics of soft ground, shield methods, needle beam method and NATM method of tunneling in practice.

Tunneling (rock bolting and guniting), Safety measures, Ventilation in tunneling, Lighting, Drainage.

PI 291A Open Elective-I: Manufacturing Science

3L

3 Hrs, MM:100

History and introduction to science of basic manufacturing processes and its classification.

Primary manufacturing processes: Introduction to liquid state forming process (casting), solid state forming process (drawing, extrusion, rolling, forging and other sheet metal working) and power state forming process (powder metallurgy).

Secondary manufacturing processes: Introduction to material removal processes

Conventional Machining processes (basic machining operations performed of lathe, shaper, milling, drilling and grinding machine).

Introduction to basic metal joining processes (welding, brazing, soldering and mechanical fastening).

Non conventional machining processes (Basic introduction, classification, need for their development, characteristics and their industrial applications).

SYLLABUS OF OPEN ELECTIVES-II

BCT 341 A Open Elective-II: Traditional Indian Architecture

3L, **3 Hrs, MM 100**

To provide theoretical knowledge base on the uniqueness of Indian traditional Architecture principles, the meaning of space, the manifestation of energy, the selection of site and how 62 integration of built form with site happens at metaphysical level based on articulation of celestial grid.

To introduce the principles of Vastu and relationship between building and site. To familiarize the students with the units of measurement in traditional architecture. To introduce concepts of orientation and cosmogram according to the Vasthu Purusha Mandala. To study the detailing and design of various building components and their material and method of construction.

Vastu - its definition and classification - Relationship to earth.. Features of good building site - good building shapes - macro, micro, enclosed and material spaces - relationship between built space, living organism and universe - impact of built space on human psyche.

Orientation of building, site, layout and settlement - positive and negative energies - importance of cardinal and ordinal directions - The celestial grid or mandala and its types. The Vaastu Pursha Mandala and its significance in creation of patterns, and lay-outs, Types of lay-outs. Simple design of residential buildings.

Building heights -Base and basement - wall and roof specifications - column and beam designs - Pitched roof and domical roofs - significance of pyramid.

Use of wood, stone, metal, brick and tile - marking technology, corbelling technology, jointing technology - foundations for heavy and light structures - Landscaping in and around buildings - Aesthetics in Indian Architecture.

CE 341A Open Elective-II: Non Urban Public Hygiene & Drinking Water

3L, **3 Hrs, MM 100**

Communicable disease: Disease and immunity, communicable disease sources, mode of transfer. Control of communicable disease.

Fly and mosquito control: Life cycle of flies and mosquitoes. Various methods of fly and mosquitoes control.

Milk and food sanitation: Essential of dairy farm and cattle shed sanitation. Tests for milk and dairy products. Food epidemic, food poisoning. Botulism. Rural sanitation, village latrines, aqua privies, storm water and sullage problems, animal waste, methods of composting. Biogas collection and disposal of refuse, solid waste management through vermicomposting.

Septic tank (only salient features), percolation pits, sub surface disposal.

Rural water supply: Importance of village community in India, conditions of Indian villages with special regards to economic, social and health aspects. Quality of water needed for village community, sources of water for village water supplied, domestic roof water harvesting. Types of wells of sanitary aspects in well construction. Disinfections of wells. Different types of pumps used for village wells. Operation and maintenance of pumps, water borne diseases. Quality of water, human and cattle population and their water requirement. Rate of water supply. Standards of potable water. Rain water storage.

Treatment of water: Disinfection, desalination, Defluoridation, distribution of water.

ChE 341 A Open Elective-II: Petroleum Refining Technology

3L, **3 Hrs, MM 100**

Origin occurrence of petroleum, Formation and Evaluation of Crude Oil. Testing of Petroleum Products. Petroleum refining processes, general processing, topping and vacuum distillations. Thermal cracking in vapor, liquid and mixed phase. Overview of Refinery Products

Catalytic cracking - Houdry fixed bed, fluidized bed, T.C.C. Houdry flow etc. Catalytic reforming - conversion of petroleum gases into motor fuel with special reference to alkylation, polymerization, hydrogenation and dehydrogenation.

Treatment Techniques: Removal of Sulphur Compounds in all Petroleum Fractions to improve performance, Destruction of Sulphur Compounds and Catalytic Desulphurization, Solvent Treatment Processes, Dewaxing, Clay Treatment and Hydrofining.

Production of aviation gasoline, motor fuel, kerosene, diesel oil, tractor fuel and jet fuel, hydrodesulfurisation, Lubricating oil manufacture, Petroleum waxes and asphalts.

Octane number, Cetane number, Diesel index, their determination and importance Storage of petroleum products: tanks, bullets, special types of spheres etc. Transportation of petroleum products: road, rail, sea and pipeline; Importance of pipeline transportation.

EE 341 A Open Elective II: Optimization Techniques

3L **3 Hrs, 100 Marks**

Introduction to Optimization : Historical Development, Engineering application of optimization, Statement & Classification of optimization problems, Classical optimization techniques for single & multiple variable functions.

Linear Programming : Introduction, application, standard form, Basic Solutions, Simplex method, Revised Simplex method, Duality, Transportation problem, Carmarkar's method.

Nonlinear programming : Unconstrained Optimization, Introduction, Fibonacci method, Golden section search, Gradient method, Newton's method, Quasi Newton method.

Dynamic Programming : Introduction, Multistage decision process, Concept of optimization & principle of optimality, Computational procedure in dynamic programming.

Advanced topics in optimization : Introduction, Separable programming, Multi objective optimization, Calculus of variation.

Books :

Engineering Optimization – S. S. Rao, New Age International Publishers.

An introduction to optimization – Er. K. P. Chong, S. H. Zak (Wiley Slident Edition)

Operations Research : An international – H. A. Taha (PHI)

Introduction to operation research – Hiller F.K. & Lieberman (TMH)

Ma 341 A Open Elective-II :Mathematical Theory of Operations Research

3L **3 Hrs., MM : 100**

Linear programming problems-Simplex Method, two phase method, Duality of LPP.

Theory of games: Competitive strategies, minimax and maximin criteria, two person zero-sum games with and without saddle point, dominance .

Inventories: Single item deterministic inventory models with finite and infinite rates of replenishment, economic lot-size model with known demand

Replacement problems: Replacement of item that deteriorate, replacement of items that fail completely, group replacement policy, individual replacement policy

Queing theory-Ques with Poisson input and exponential service time, the queue length, waiting time and busy period in steady state case, model with service in phase, multiserver queueing models.

ME 341A Open Elective-II : Economics Analysis and Management of Operations

3L **3 Hrs., MM: 100**

Business Goals & Form of Business Organization, Introduction to Management- Elements of Management, Principle of Management. Concept of Costing- Breakeven Analysis, Depreciation & Estimate.

Marketing- 5Ps of Marketing- Product, Price, Demand Forecasting, Promotion, Person and Place. Concept of Advertising and It's Objective.

Financial Analysis-Statement and Financial Ratio.

Introduction to Privatization Liberalization, Globalization Ratio & Their Impact on Economy.

ME 342A Open Elective-II: Systems Design and Analysis

3L **3 Hrs., MM: 100**

Introduction: Basic concept of Finite element method; Rayleigh-Ritz and weighted residual method of variational approximation, Numerical Solution of equilibrium problem by Gaussian elimination.

Finite Element Analysis of One-dimensional Problem; Basic Concepts, derivation of elements equations, connectivity of elements, imposition of boundary conditions, Solution of equations, Application in One dimensional problem of Solid mechanics and heat transfer.

Finite Element Analysis of Two Dimensional Problem: Single variable problems: finite element discretization, interpolation, function, numerical integration and modeling considerations for triangular, rectangular, Quadrilateral, Isoparametric and Plane frame elements, Evaluation of equation and their solutions, Application in Two Dimensional Problem of Solid mechanics, Heat Transfer and Eigen value problems.

MI 341A Open Elective-II: Application of GIS & Remote Sensing in Engineering

3L **3 Hrs, MM:100**

Remote Sensing: Introduction to Remote Sensing, Terminology in Remote Sensing, Types of Remote sensing, advantage and disadvantage of remote sensing data, Electromagnetic radiation atmospheric. Windows remote sensing platforms and sensors systems, path-row referencing system, remote sensing data product, procedure for obtaining satellite data. Hardware and software related to remote sensing.

Different types of platforms, sensors and their characteristics, Orbital parameters of a satellite, Multi concept in remote sensing.

Image Interpretation and analysis: Elements of visual image interpretation, Digital image pre-processing, radiometric correction, geometric correction, resolution of remote sensing data, image enhancement, contract enhancement, spatial filtering band rationing image classification supervised and unsupervised classification, remote sensing applications in forestry, geology, hydrogeology, Land use and land cover mapping.

Principles of interpretation of aerial and satellite images, equipments and aids required for interpretation, ground truth – collection and verification, advantage of multirate and multiband images. Digital image Processing concept.

Geographic Information System (GIS): Fundamental of GIS: Basis concept including definition and history of GIS, Essential Elements of GIS, Uses and users of GIS, General GIS Applications, Geodesy, Grids, Datum's and projection systems, GIS Data structure, Data Formats, GIS layers and Digitization overview of GPS and its application, Hardware and software related to GIS.

Raster and vector Based GIS: Raster based GIS, Definition of Raster Based GIS, Spatial Referencing Definition and Representation of Raster Data. Vector based GIS, Definition and concept of vector based GIS, Data structure, Data Capture and Basic operations of spatial analysis, advantages and disadvantage in raster and vector based GIS, Introduction to network in GIS, GIS Project Planning Management and Implementation.

Application of GIS :in Map revision, Land use, Agriculture, Forestry, Archaeology, Municipal, Geology, water resources, soil Erosion, Land suitability analysis, change detection, Use of GIS in Mining.

PI 341A Open Elective-II: Principles of Management & Economics

3L **3 Hrs, MM: 100**

Introduction: Definition of management; Historical developments. Evolution of management; various schools of management theories; management functions; principles of management.

Types of organization: Organization and organization structures; Line, staff, function and committee type structures of organizations; flow of responsibility and authority in organization. Types of business organizations: sole proprietorship, partnership, private and public limited, co-operative societies, public sectors, joint sectors- their formation and dissolution.

Personnel management: Objectives of personnel management; functions of personnel management; nature of personnel management.

Economic analysis: Money time relationship; Law of supply and demand, Demand curves, demand elasticity, equilibrium concept, economies of scale.

Financial management: Assets and liabilities; balance sheet; profit and loss accounts, ratio analysis.

Operations management: Introduction to operations management; history, function and scope of operations management, areas of operations management; general model of managing operations; Introduction to production planning and control.

Introduction to marketing management; Budget and budgetary control; Purchasing process; Motivation; Leadership; Moral, job satisfaction.

SE 341A Open Elective-II :Structural Dynamics

3L **3 Hrs, MM: 100**

Vibrations of single degree of freedom system, sources of vibration, Types of vibration, Degree of freedom, spring action and damping, equation of motion of single degree of freedom system, undamped system of single degree of freedom, combination of stiffnesses, damped system of single degree of freedom, dry friction, damping forced vibration of damped system, introduction to multi degree freedom system.

SYLLABUS OF OPEN ELECTIVES-III

BCT 391 A Open Elective-III: Climate Responsive Architecture

3L, **3 Hrs, MM 100**

Understanding Climate and its impact on architectural design, fundamentals of climatology and environmental studies.

Introduction – Elements of Climate, measurement and representation of climatic data. Classification of climate, major climatic zones of India.

Thermal Comfort: Effect of climatic elements on Thermal comfort; indices for Thermal comfort Thermal performance of building elements: Thermal and physical properties of building materials and their effect on indoor environments.

Natural ventilation: Functions, effects of openings and external features on internal air circulation. Design considerations for achieving natural ventilation.

Sun path diagram, use of solar charts, types of shading devices

Day light factor: components, design considerations for indoor spaces

Micro Climate: factors and effects

Construction techniques for improving thermal performance of walls and roofs. Passive cooling techniques: traditional and contemporary

Design considerations for buildings and settlements in tropical climates with special reference to hot-dry, warm-humid and composite climates; Mahoney Tables.

Exercises:

Design of shading devices.

Layout of Residence for hot - dry, warm-humid and composite climates.

CE 391A Open Elective-III: Ecosystem & Biodiversity

3L, **3 Hrs, MM 100**

Concept of an ecosystem, structure & function of ecosystem, Bio-Geo chemical cycles (Hydrological, carbon, oxygen, nitrogen, phosphorus & sulphur cycle), energy flow in ecosystem, food chain

Major ecosystems (Description only) : Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystem, Riverine and stream ecosystem, Marine ecosystem, Estuarine ecosystem.

Biodiversity : Definition and its importance. Biodiversity at global, national & local level. Hot spots of biodiversity, Threats to biodiversity & causes of biodiversity loss. Conservation of biodiversity.

Value of biodiversity: Consumptive use, productive use, social value, ethical value, aesthetic value& optional value.

Bio-geographical classification of India. India as mega- diversity nation

ChE 391 A Open Elective-III: Nanotechnology

3L, 3 Hrs, MM 100

Introduction to Nanotechnology: Introduction to nanotechnology and materials, Nanomaterials, Introduction to nano sizes and properties comparison with the bulk materials, different shapes and sizes and morphology.

Fabrication of Nanomaterials: Wet Chemical Synthesis Methods, Colloidal Nanoparticles Production, Sol Gel Methods, Microwave and Atomization, Gas phase Production Methods : Chemical Vapour Depositions.

Kinetics at Nanoscale: Nucleation and growth of particles, Issues of Aggregation of Particles, Layers of surface Charges, Zeta Potential and pH.

Carbon Nanomaterials: Synthesis of carbon buckyballs, List of stable carbon allotropes extended fullerenes, metallofullerenes solid C60, bucky onions nanotubes.

Nanomaterials characterization: Instrumentation Fractionation principles of Particle size measurements, Particle size and its distribution, XRD, Zeta potential Microscopies SEM, TEM, Atomic Forced Microscopy, Scanning and Tunneling Microscopy

Applications in Chemical Engineering: Self-assembly and molecular manufacturing : Surfactant based system Colloidal system applications, ZnO,TiO₂, Silver Nanoparticles Functional materials Applications, Production Techniques of Nanotubes, Carbon arc, bulk synthesis, commercial processes of synthesis of nanomaterials, Nanoclay, Commercial case study of nano synthesis - applications in chemical engineering.

EC 391 A Open Elective-III: Electronic Instrumentation

3L 3 Hrs, MM:100

Transducers: Construction, characteristics and circuits for common types of resistive, capacitive, inductive, magneto-structure; piezo-electric. Photo-electric and thermo-electric transducers for measurement of process physical variables. Various sensing elements and transducers for measurement of Force, Pressure, Humidity, Moisture, strain, Velocity, Acceleration and pH. Inductive and Capacitive proximity switches. Physical and electrical loading of and by the transducer Systems.

Signal Conditioning: Analog and digital signal conditioning for instrumentation. Objectives of DAS, components of analog DAS and digital Data acquisition system, digital data recording system, multi channel DAS, modern digital acquisition system.

Electronic Displays: Principle of LED numeric, matrix and alpha-numeric displays, flat panel CRT, LCD, electro-luminiscent and electrophoretic and touch screen displays.

EE 391 A Open Elective III: Soft Computing Techniques

3L 3 Hours, 100 Marks

Soft Computing : Introduction of soft computing, soft computing vs. hard computing, various types of soft computing techniques, applications of soft computing.

Artificial Intelligence : Introduction, Various types of production systems, characteristics of production systems, breadth first search, depth first search techniques, other Search Techniques like hill Climbing, Best first Search, A* algorithm, AO* Algorithms and various types of control strategies. Knowledge representation issues, Propositional and predicate logic, monotonic and non monotonic reasoning, forward Reasoning, backward reasoning, Weak & Strong Slot & filler structures, NLP.

Neural Network : Structure and Function of a single neuron: Biological neuron, artificial neuron, definition of ANN, Taxonomy of neural net, Difference between ANN and human brain, characteristics and applications of ANN, single layer network, Perceptron training algorithm.

Fuzzy rule base system : fuzzy propositions, formation, decomposition & aggregation of fuzzy rules, fuzzy reasoning, fuzzy inference systems, fuzzy decision making & Applications of fuzzy logic.

EE 392 A Open Elective III: Energy Conservation

3L 3 Hours, 100 Marks

Elements of Energy Conservation and Management : General energy problem, Sector wise Energy consumption, demand supply gap, Scope for energy conservation and its benefits, Energy conservation Principle Maximum energy efficiency, Maximum cost effectiveness. Mandatory provisions of EC act Features of EC act Standards and labeling, designated consumers, Energy Conservation Building Codes (ECBC). Energy management concept and objectives Initializing Planning, Leading, Controlling, Promoting, Monitoring and Reporting, energy management programmes.

Energy Conservation Approaches In Industries : energy saving opportunities in electric motors Benefits of Power factor improvement and its techniques Shunt capacitor, Synchronous Condenser etc., Effects of harmonics on Motors, and remedies leading to energy conservation Energy conservation by VSD Methods and techniques of energy conservation in ventilation and air conditioners compressors pumps, fans and blowers Area Sealing, Insulating the Heating / cooling fluid pipes, automatic door closing Air curtain, Thermostat / Control Energy conservation in electric furnaces, ovens and boilers lighting techniques Natural, CFL, LED lighting sources and fittings

Energy Conservation in Power Generation, Transmission and Distribution : Performance improvement of existing power plant: cogeneration, small hydro, DG Set. Demand side management Load response programmes Types of tariff and restructuring of electric tariff Technical measures to optimize T and D losses.

Ma 391 A Open Elective-III: Advanced Numerical Analysis

3L

3 Hrs., MM : 100

Solution of Algebraic and Transcendental Equations: Newton-Raphson method for real multiple roots, for complex roots and for system of non-linear equations; Synthetic Division, Birge-Vieta Method.

Solution of simultaneous Linear Equations and Eigen Value Problems: Direct methods: Gauss-elimination, Gauss-Jordan, Iterative Methods: Jacobi iteration, Gauss-seidel iteration and Successive Relaxation method. Eigen value Problems: power method

Curve fitting and Function Approximation: Chebyshev approximations, Chebyshev Expansion, Chebyshev Polynomials. Economization of Power Series.

Numerical Solution of Partial Differential Equations: Finite difference Approximation to partial derivatives. Solution of Laplace and poisson equations, Solution of one and two dimensional heat and wave equation by the method of separation of variables.

ME 391A Open Elective-III: Design Planning and Control of Production System

3L

3 Hrs, MM:100

Production Planning: Planning horizon, product exploring, Make and buy decisions, operations planning, demand forecasting, conversion of forecast into production goal.

Scheduling: Operation sequencing and balancing, Scheduling for mass production and job order production, MRP, ERP.

Inventory System: Cost factors relevant to operations and inventory control, EOQ with shortages and uniform production, quantity discount.

Project Planning and Control: Network control, control cost consideration and optimization, Resource allocation and levelling, Aggregate production planning, decision rules.

Supply Chain Management:: Strategic framework of Supply chain – meaning, scope and performance of supply chain, supply chain drivers and obstacles. Role of e-business in a supply chain.

ME 392A Open Elective-III: Finite Elements Method

3L

3 Hrs, MM:100

System Fundamental Concept: System definition, systems approach, Classification- General Systems, Discrete Systems, Controlled systems.

Procedure for Engineering a system: Defining system objective, formulation of objective criteria, Development of system alternatives.

Systems Optimization: Formulation of system, Design problem and application of search methods, Linear programming and dynamic programming for optimum solutions.

System Schedule: Time models, resource allocation, Time cost trade-off, system cost economic flow graph.

MI 391A Open Elective-III: Project Environment Clearance

3L

3 Hrs, MM:100

Brief introduction of Environment Protection Act 1986 and other relevant legal provisions applicable to get environment clearance in India.

Impact of major engineering projects on various components of the environment: Socio-Economy, Land, Water, Air, Noise and others.

Preparation of Environment management plan: Public hearing, collecting baseline data, Environment impact assessment and prediction, Environment management plan, environment monitoring and management.

PI 391A Open Elective-III: Quality Management

3L

3 Hrs,MM: 100

Introduction: History of Quality, Objectives , importance and need of quality, Contributions of Quality Gurus- Juran, Deming, Crosby, Feigenbaum, Ishikawa, Taguchi etc., Impact of Quality on business performance.

Process and Statistical Quality Control: Quality System; Quality control techniques; Process capability; Control Charts- Theory of control charts, control limits and specification limits, Control charts for variables-X R Charts, Control Charts for attributes p, np, c and u charts. —

Acceptance Sampling : Fundamental concepts of acceptance sampling; OC Curves; Single , Double and multiple sampling;

Quality Management: Introduction to Quality management; quality control and quality assurance; Quality control tools; cost of quality and cost of poor quality.

ISO 9000: ISO 9000 series; terminologies; need for ISO 9000 certification; basic procedure and work instructions; steps in ISO 9000 registration; Internal and third party audit for registration; Clauses of ISO 9000-2000 .

SE 391A Open Elective-III :Finite Element Method

3L

3 Hrs,MM: 100

Introduction to Finite Element Method, Basic Concept of Finite Element Method, Analysis of continuum:- Structural, thermal, Potential etc., Finite Element Analysis of an elastic continuum:- Displacement approach, Direct Formulation, Energy Integral, Co and C1 continuity, Convergence criteria.

Elements:- Types and Properties. Conforming and Non conforming.

Shape Functions:- Lagrangian and Serendity family for one and two dimensional cases.

Pascal triangle, Super / Sub and Iso parametric elements.

Steps in Finite Element Analysis of an elastic continuum.

**B.E. II YEAR (COMPUTER SCIENCE & ENGINEERING)
SEMESTER III EXAMINATION SCHEME 2018**

Subject Nomenclature			Lecture	Tutorial	Practical	Contact Hrs	Credit	Exam Hrs	Marks		
									Theory	Practical and Sessional	Total
A. THEORY PAPERS											
Ma	201A	Advanced Engineering Mathematics-I (CSE/IT)	3	1	-	4	4	3	100	-	100
CSE	211A	Discrete Structures (CSE/IT)	3	1	-	4	4	3	100	-	100
CSE	212A	Object Oriented Programming (CSE/IT)	2	1	-	3	3	3	100	-	100
CSE	213A	Data Structures and Algorithms (CSE/IT)	3	1	-	4	4	3	100	-	100
CSE	214A	Logic Design (CSE/IT)	2	1	-	3	3	3	100	-	100
CSE	215A	Computer Oriented Statistical Methods (CSE/IT)	2	1	-	3	3	3	100	-	100
TOTAL(A)			15	6	-	21	21		600	-	600
B. PRACTICALS AND SESSIONALS											
CSE	212B	Object Oriented Programming Laboratory (CSE/IT)	-	-	2	2	1	3	-	100	100
CSE	213B	Data Structures and Algorithm Laboratory (CSE/IT)	-	-	2	2	1	3	-	100	100
CSE	214B	Logic Design Laboratory (CSE/IT)	-	-	2	2	1	3	-	100	100
CSE	216B	Scripting Languages Laboratory (CSE/IT)	-	-	2	2	1	3	-	100	100
TOTAL(B)			-	-	8	8	4		-	400	400
TOTAL(A+B)			15	6	8	29	25		600	400	1000

To pass, a candidate must obtain:

- At least P Grade in each written paper.
- At least B Grade in each practical & sessional.
- At least 5.00 SGPA in a semester.

**B.E. II YEAR (COMPUTER SCIENCE & ENGINEERING)
SEMESTER IV EXAMINATION SCHEME 2018**

Subject Nomenclature		Lecture	Tutorial	Practical	Contact Hrs	Credit	Exam Hrs	Marks			
								Theory	Practical and Sessional	Total	
A. THEORY PAPERS											
Ma	202A	Advanced Engineering Mathematics-II (CSE/IT)	3	1	-	4	4	3	100	-	100
CSE	221A	Principles of Programming Languages (CSE/IT)	3	1	-	4	4	3	100	-	100
CSE	222A	Computer Organization and Architecture (CSE)	3	1	-	4	4	3	100	-	100
CSE	223A	Database and File Systems (CSE/IT)	2	1	-	3	3	3	100	-	100
CSE	225A	Communication Engineering (CSE/IT)	3	0	-	3	3	3	100	-	100
A	Open Elective-I (Open)		3	0	-	3	3	3	100	-	100
TOTAL(A)			17	4	-	21	21		600	-	600
B. PRACTICALS AND SESSIONALS											
CSE	221B	Programming Laboratory (CSE/IT)	-	-	2	2	1	3	-	100	100
CSE	222B	Computer Organization & Architecture Laboratory (CSE)	-	-	2	2	1	3	-	100	100
CSE	223B	Database & File Systems Laboratory (CSE/IT)	-	-	2	2	1	3	-	100	100
CSE	226B	Unix/Linux Laboratory (CSE/IT)	-	-	2	2	1	3	-	100	100
TOTAL(B)			-	-	8	8	4		-	400	400
TOTAL(A+B)			17	4	8	29	25		600	400	1000
CSE	200E	Co-curricular Activities	-	-	-	-	0	-	-	-	100

List of Open Electives I: Enclosed with examination scheme of VIII Semester

To pass, a candidate must obtain:

- At least P Grade in each written paper.
- At least B Grade in each practical & sessional.
- At least 5.00 SGPA in a semester.

**B.E. III YEAR (COMPUTER SCIENCE & ENGINEERING)
SEMESTER V EXAMINATION SCHEME 2018**

Subject Nomenclature			Lecture	Tutorial	Practical	Contact Hrs	Credit	Exam Hrs	Marks		
									Theory	Practical and Sessional	Total
A. THEORY PAPERS											
CSE	311A	Theory of Computation (CSE/IT)	3	1	-	4	4	3	100	-	100
CSE	312A	Database Management System (CSE/IT)	2	1	-	3	3	3	100	-	100
CSE	313A	System Programming (CSE/IT)	2	1	-	3	3	3	100	-	100
CSE	314A	Microprocessors (CSE)	3	1	-	4	4	3	100	-	100
CSE	316A	Computer Networks (CSE/IT)	3	1	-	4	4	3	100	-	100
		Open Elective -II	3	0	-	3	3	3	100	-	100
TOTAL(A)			16	5	-	21	21		600	-	600
B. PRACTICALS AND SESSIONALS											
CSE	312B	Database Management System Laboratory (CSE/IT)	-	-	2	2	1	3	-	100	100
CSE	313B	System Programming Laboratory (CSE/IT)	-	-	2	2	1	3	-	100	100
CSE	314B	Microprocessors Laboratory (CSE)	-	-	2	2	1	3	-	100	100
CSE	316B	Computer Networks Laboratory (CSE/IT)	-	-	2	2	1	3	-	100	100
TOTAL(B)			-	-	8	8	4		-	400	400
TOTAL(A+B)			16	5	8	29	25		600	400	1000

List of Open Electives II: Enclosed with examination scheme of VIII Semester

To pass, a candidate must obtain:

- At least P Grade in each written paper.
- At least B Grade in each practical & sessional.
- At least 5.00 SGPA in a semester.

**B.E. III YEAR (COMPUTER SCIENCE & ENGINEERING)
SEMESTER VI EXAMINATION SCHEME 2018**

Subject Nomenclature		Lecture	Tutorial	Practical	Contact Hrs	Credit	Exam Hrs	Marks			
								Theory	Practical and Sessional	Total	
A. THEORY PAPERS											
CSE	321A	Computer Graphics & Visual Computing (CSE)	2	1	-	3	3	3	100	-	100
CSE	322A	Operating System Design (CSE/IT)	3	1	-	4	4	3	100	-	100
CSE	323A	Java Programming (CSE/IT)	2	0	-	2	2	3	100	-	100
CSE	325A	Artificial Intelligence (CSE/IT)	2	1	-	3	3	3	100	-	100
CSE	328A	Robotics (CSE/IT)	3	1	-	4	4	3	100	-	100
		Open Elective-III (CSE)	3	0	-	3	3	3	100	-	100
TOTAL(A)			15	4	-	19	19		600	-	600
B. PRACTICALS AND SESSIONALS											
CSE	321B	Computer Graphics & Visual Computing Laboratory (CSE)	-	-	2	2	1	3	-	100	100
CSE	322B	Operating System Design Laboratory (CSE/IT)	-	-	2	2	1	3	-	100	100
CSE	323B	Minor Project Laboratory(CSE/IT)	-	-	4	4	2	3	-	100	100
CSE	325B	Artificial Intelligence Laboratory (CSE/IT)	-	-	2	2	1	3	-	100	100
CSE	328B	Robotics Laboratory (CSE/IT)	-	-	2	2	1	3	-	100	100
TOTAL(B)			-	-	12	12	6		-	500	500
TOTAL(A+B)			15	4	12	31	25		600	500	1100
CSE	300E	Co-curricular Activities	-	-	-	-	0		-	-	100

List of Open Electives III: Enclosed with examination scheme of VIII Semester

To pass, a candidate must obtain:

- At least P Grade in each written paper.
- At least B Grade in each practical & sessional.
- At least 5.00 SGPA in a semester.

**B.E. FINAL YEAR (COMPUTER SCIENCE & ENGINEERING)
SEMESTER VII EXAMINATION SCHEME 2018**

A. THEORY PAPER

Subject Nomenclature	Subject	Lecture (L)	Tutorial (T)	Practical (P)	Contact	Credit	Unit	Exam. Hrs.	Marks		
									Theory	Practicals & sessionals	Total
CSE 411A	Design & Analysis of Algorithms (CSE/IT)	3	1	-	4	4	1	3	60	--	60
CSE 412A	Big Data Analytics (CSE)	3	1	-	6	5	1	3	60	--	60
CSE 413A	Software Engineering (CSE/IT)	3	1	-	6	5	1	3	60	--	60
CSE 414A	Principles of Compiler Design (CSE/IT)	3	1	-	6	5	1	3	60	--	60
CSE A	Elective - I	3	1	-	6	5	1	3	60	--	60
Total (A)		15	5	-	28	24	5	-	300	--	300

B. PRACTICALS AND SESSIONALS

CSE 412B	Big Data Analytics Laboratory (CSE)			2					--	60	60
CSE 413B	Software Engineering Laboratory (CSE/IT)			2					--	60	60
CSE 414B	Compiler Design Laboratory (CSE)			2					--	60	60
CSE B	Elective – I Laboratory			2					--	60	60
CSE 415 D	Seminar (CSE)			2	2	1	$\frac{1}{2}$	-	--	60	60
Total (B+D)		-	-	10	-	-	-	-	--	300	300
Total of Semester (A+B+D)		15	5	10	30	25	5	-	300	300	600

To pass, a candidate must obtain:

- 35 percent in each of the written paper
- 50 percent in each of practical and sessionals, and
- 45 percent in the Grand Total

List of Elective –I:

- CSE 451A – Soft Computing (CSE)
- CSE 452A – Image Processing (CSE/IT)
- CSE 453A – Client-Server Technology (CSE/IT)
- CSE 454A – Multimedia Technology (CSE/IT)
- CSE 455A – Computer Vision & Robotics (CSE)
- CSE 456A – Web Technology (CSE/IT)
- CSE 457A – Digital Signal Processing (CSE/IT)

**B.E. FINAL YEAR (COMPUTER SCIENCE & ENGINEERING)
SEMESTER VIII EXAMINATION SCHEME 2018**

A. THEORY PAPER											
Subject Nomenclature	Subject	Lecture (L)	Tutorial (T)	Practical (P)	Contact	Credit	Unit	Exam. Hrs.	Marks		
									Theory	Practicals & Sessionals	Total
CSE 421A	Advanced Computer Architecture (CSE)	3	1	-	4	4	½	3	50	--	50
CSE 422A	Embedded Systems (CSE)	3	1	-	6	5	1	3	50	--	50
CSE A	Elective – II	3	1	-	6	5	1	3	50	--	50
CSE A	Elective III	3	1	-	6	5	1	3	50	--	50
Total (A)		12	4	-	22	19	3½	-	200	--	200
B. PRACTICALS AND SESSIONALS											
CSE 422B	Embedded Systems Laboratory (CSE)			2					--	50	50
CSE B	Elective –II Laboratory			2					--	50	50
CSE B	Elective –III Laboratory			2					--	50	50
CSE 429D	Project (CSE)			6	6	3	½		--	100	100
CSE 435C	Practical Training (CSE)						1½		--	75	75
CSE 436C	Educational Tour (CSE)						½		--	25	25
Total (B+C+D)				12						350	350
Total of Semester (A+B+C+D)		12	4	12	28	22	6		200	350	550
Total of year									500	650	1150
Joint award for VII & VIII Semesters (Marks not counted for award of division / degree)											
FE 223E	Co-curricular Activities	-	2	2	2	1	½	-			100

To pass, a candidate must obtain:

- (d) 35 percent in each of the written paper
- (e) 50 percent in each of practical and sessionals, and
- (f) 45 percent in the Grand Total

List of Elective – II

CSE 461A – Intelligent Database System (CSE/IT)
 CSE 462A – Object Oriented DBMS (CSE/IT)
 CSE 463A – Object Oriented Software Engineering (CSE/IT)
 CSE 464A – Real-Time Systems (CSE)
 CSE 466A – Graph Theory (CSE/IT)
 CSE 470A- Computational Science

List of Elective – III

CSE 465A – Information Theory & Coding (CSE/IT)
 CSE 467A – Simulation and Modeling (CSE)
 CSE 468A – Mobile Computing (CSE/IT)
 CSE 469A - Bioinformatics (CSE/IT)

List of Open Electives	
Name of subject	Semester
BCT 291 A Open Elective-I: Sustainable Architecture CE 291A Open Elective-I :Energy Efficient Building Design ChE 291 A Open Elective-I : Renewable Energy Sources EE 291 A Open Elective-I : Industrial Applications of Electrical Drives EE 292 A Open Elective-II: Engineering Economics Ma 291 A Open Elective-I :Mathematical Statistics For Engineers ME 291 A Open Elective-I:Renewable Energy Sources ME 292A Open Elective-I: Automobile Engineering MI 291A Open Elective-I: Tunneling For Engineering Projects PI 291A Open Elective-I: Manufacturing Science	Fourth Semester
BCT 341 A Open Elective-II: Traditional Indian Architecture CE 341A Open Elective-II: Non Urban Public Hygiene & Drinking Water ChE 341 A Open Elective-II : Petroleum Refining Technology EE 341 A Open Elective-II : Optimization Techniques Ma 341 A Open Elective-II :Mathematical Theory of Operations Research ME 341A Open Elective-II : Economics Analysis and Management of Operations ME 342A Open Elective-II: Systems Design And Analysis MI 341A Open Elective-II: Application of GIS & Remote Sensing in Engineering PI 341A Open Elective-II: Principles of Management & Economics SE 341A Open Elective-II :Structural Dynamics	Fifth Semester
BCT 391 A Open Elective-III: Climate Responsive Architecture CE 391A Open Elective-III: Ecosystem & Biodiversity ChE 391 A Open Elective-III : Nanotechnology EC 391 A Open Elective-III: Electronic Instrumentation EE 391 A Open Elective-III: Soft Computing Techniques EE 392 A Open Elective-III: Energy Conservation Ma 391 A Open Elective-III: Advanced Numerical Analysis ME 391A Open Elective-III: Design Planning And Control Of Production System ME 392A Open Elective-III: Finite Elements Method MI 391A Open Elective-III: Project Environment Clearance PI 391A Open Elective-III: Quality Management SE 391A Open Elective-III :Finite Element Method	Sixth Semester
BCT: Building Construction Technology, CE: Civil Engineering, ChE: Chemical Engineering, CSE: Computer Science and Engineering, EC: Electronics & Communication, EE: Electrical Engineering, ME: Mechanical Engineering, MI: Mining Engineering, PI: Production & Industrial Engineering, SE: Structural Engineering, Ma: Mathematics	

THIRD SEMESTER (CSE)

Ma 201 A – Advanced Engineering Mathematics – I (CSE/IT)

3L,1T

3 Hours, 100Marks

Section A

Differential equations : Simultaneous differential equations, Total differential equations, Partial differential equations of first order, Charpit's method, Linear partial differential equations with constant coefficients, Second order partial differential equations, Monge's method for the equation of type $Rr + Ss + Tt = V$
Solution of Wave, Heat and Laplace equations using separation of variables method.

Section B

Complex Analysis : Analytic function, Harmonic function, Construction of an Analytic function, Cauchy-Riemann equations in Cartesian and Polar form.

Complex integration, Cauchy's integral theorem, Cauchy's integral formula, Derivative of Cauchy's integral formula.

Taylor's and Laurent's series expansion of complex functions.

Cauchy's residue theorem and its application for evaluation of the contour integrals of $f(\sin x, \cos x)$ from 0 to 2π and $f(x)$ from $-\infty$ to ∞

Transformations: shifting, rotating, conformal and bilinear transformations.

Section C

Probability and Statistics: Theorems of probability and their application, Binomial, Poisson and Normal probability distribution. Correlation and Regression analysis of two parameters.

Note: Candidates are required to attempt FIVE questions in all, selecting at least one from each Section.

CSE 211 A - DISCRETE STRUCTURES (CSE/IT)

3L, 1T

3 Hours, 100 Marks

Introduction to Discrete Mathematical Structures, Formal Methods: Induction and Analogy, Abstraction.

Sets, sequences, empty set, power set, operations on sets, Venn diagram, ordered pair, principle of inclusion and exclusion. Counting and Combinatorics.

Introduction to mathematical logic, statements and notations, well-formed formulas, tautologies, tautological implications, normal forms, the theory of Inference for statement calculus, predicate logic.

Graph Terminology, Degrees of Nodes, Isomorphic Graphs, Dijkstra's Shortest Path Algorithm, Planar Graphs, Eulerian Graphs, Hamiltonian Graphs, Traveling Salesman Problem.

Trees, Introduction, Rooted and Other Trees, Representation of Prefix Codes, representation of Arithmetic Expression, Representation of Prefix Codes, Spanning Trees, Traversing Binary Trees, Binary Search Trees.

Relations, matrix and graph representation of relation, properties of relations, partitions. Equivalence Relations, Compatibility Relations, Composition of Binary Relations, Transitive and symmetric closures, partially ordered set, lattices. Recurrence relations.

Functions, Matrix representation of functions, composition of function, inverse function.

Algebraic Structures, General properties of algebraic systems, groupoids, semigroup, monoids, group, rings. Applications of algebra to control structure of a program. Homomorphism, congruences, admissible partitions. Groups and their graphs.

CSE 212 A - OBJECT ORIENTED PROGRAMMING (CSE/IT)

2L,1T

3 Hours, 100 Marks

A review of C. Concepts of object oriented programming using C++. Data types: elementary and derived data types, literals.

Operators and expressions: operators, association and precedence rules of operators, expressions using unary, binary and ternary operators.

Statements: declarations as statements, selection statements, iteration statements, goto statement, break statement, continue statement, return statement, try-catch block.

Functions: void functions, functions with return value, call by value and call by reference parameter passing, default parameters, recursive functions, inline functions.

Classes: classes, objects, friend functions, classes within a class, local classes, global classes, constructors, destructors.

Derived classes: single and multiple derivation of classes, multilevel and hybrid derivation of classes, constructors, destructors.

Polymorphism: function and operator overloading, virtual functions.

Streams: input and output of built-in data types, manipulators.

File streams: opening a file, accessing a file, closing a file.

Exceptions: catching exceptions, rethrowing the exception, standard exceptions.

Templates: defining a template, template instantiation, function templates, class templates.

Elementary case study of a object oriented database in C++.

CSE 213 A - DATA STRUCTURES AND ALGORITHMS (CSE/IT)

3L, 1T

3 Hours, 100 Marks

Introduction to data structure, String storage representation and manipulation. Markov algorithm and primitive data structures.

Concepts of non primitive data structures. Linear data structure. Array, stack, queue, their applications and implementations using sequential storage representation and linked representation.

Linear linked list, double linked list, circular linear linked list and generalised lists and applications.

Concept of non-linear data structures, Tree, graph, set and their representation, Binary Tree, Threaded tree, different techniques of tree traversal, breadth first search, depth first search, application of tree and graph such that Polish notation, concepts of heap.

Sorting, searching algorithms and comparative study of different sorting and searching techniques such that selection sort, heap sort, bubble sort, quick sort, merge sort and radix sort. Linear search and binary search, hashing. External sorting.

Time and space complexity of the algorithms – Big-O, θ , Ω , and small-o, Asymptotic complexity, Upper and Lower bound time and space trade offs.

CSE 214 A - LOGIC DESIGN (CSE/IT)

2L, 1T

3 Hours, 100 Marks

Introduction to number systems, concept of logic gates, boolean algebra and simplification of boolean expressions, K-map, tabular method, combinational circuits, half adder, full adder, flip flops, transfer circuits, clocks, shift registers and binary and BCD counters.

Multiplexer, demultiplexer, encoder, decoder.

Analysis and design of synchronous sequential systems, finite memory and flow chart method of design, State assignment, races and hazards, Introduction to threshold logic & relay circuits, sequential adder.

Introduction to switching devices, positive and negative logic. OR, AND, NOR, NAND, Exclusive OR and Exclusive NOR gates, RTL, DCL, DCTL, TTL, RCTL, ECL, HTL, MOS AND CMOS logic circuit and their realization. Fan-in and Fan-out capacity. Speed and delay in logic circuit.

CSE 215 A - COMPUTER ORIENTED STATISTICAL METHODS (CSE/IT)

2L, 1T

3 Hours, 100 Marks

Frequency distribution, Class interval, limit, boundaries, class mark, histograms and frequency polygon, relative frequency distribution, cumulative frequency distribution curves, Frequency curves.

Measure of central tendency, mean, arithmetic and weighted arithmetic and their properties, median, mode, the Empirical relation between mean, median and mode, geometric mean, harmonic mean. The root mean square (RSM). Quartiles, Deciles, and Percentiles.

Measures of Dispersions, range, mean deviation, standard deviation. Variance, properties of standard deviation, Empirical relation between measure of dispersions, Absolute and relative dispersion, coefficient of variation.

Moments for grouped data, relations between moments, computations. Skewness, Kurtosis, Population moments.

Probability theory, conditional probability, independent, dependent and mutually exclusive events. Probability distribution. Mathematical expectations. Combinations and permutations.

Sampling theory , random samples, random numbers, sampling distribution of means, preposition, differences and sums, Standard errors.

Decision theory, statistical decision, hypotheses, tests of hypotheses and significance. Decision rules, Type I, II, errors, level of significance. Special tests. Tests involving binomial and normal distribution, two tail and one tail test Curve fitting, equations of approximations curve, free hand method of curve fitting, the straight line.

Subject approach shall be algorithmic.

CSE 216B – SCRIPTING LANGUAGES LABORATORY (CSE/IT)

2P

100 Marks

PEARL, PYTHON, AWK, SHELL. Data types, variables, and control structures. Basic introduction to PEARL, PYTHON, AWK, SHELL, simple application programme, followed by 200-300 LOC application development.

FOURTH SEMESTER

Ma 202 A – Advanced Engineering Mathematics – II (CSE/IT)

3L,1T

3 Hours, 100 Marks

Section A

Transforms: Laplace Transform, Inverse Laplace Transform, Properties of Laplace Transforms, Application of Laplace Transform to solve differential equation with constant coefficients. Z- Transforms. Infinite Fourier Transforms.

Section B

Numerical Analysis : Interpolation with equal intervals: Newton-Gregory interpolation formulae, Lagrange's interpolation formula for unequal intervals. Central difference interpolation formulae: Gauss' forward and backward formulae, Stirling's and Bessel's interpolation formulae. Numerical integration : Trapezoidal rule, Simpson's 1/3 and 3/8 rule. Numerical solution of algebraic and transcendental equations : Bisection, regula falsi and Newton-Raphson methods. Numerical solution of linear simultaneous equations : Gauss' elimination, Gauss-Jordan, Jacobi and Gauss-Siedal methods. Numerical solution of ordinary differential equations : Euler's, Runge-Kutta Fourth order and Milne's methods.

Section C

Special function : Series solution of Bessel and Legendre's differential equations. Generating function of Bessel and Legendre's Polynomials. Orthogonal Property of Bessel and Legendre's function. Rodrigue's formula.

Note: Candidates are required to attempt FIVE questions in all, selecting at least one from each Section.

CSE 221 A - PRINCIPLES OF PROGRAMMING LANGUAGES (CSE/IT)

3L, 1T

3 Hours, 100 Marks

Importance of programming languages, brief history , features of good programming language. Translators, Syntax, semantics, virtual computers. Binding and binding time.

Elementary and structured data types, their specifications and implementation. Type checking and type conversion, vectors arrays, records, character string, variable size data structures. Sets, input and output files.

Evolution of the concept of data type, abstraction, encapsulation and information binding, subprograms, type definition and abstract data types.

Implicit and explicit sequence control, sequence control within expression and between statements. Subprogram sequence control, Recursive subprograms, Exception and exception handlers, Coroutines and scheduled subprograms. Task and concurrency exception.

Names and referencing environments, Static, dynamic and block structure, Local data and local referencing environments.

Dynamic and static scope of shared data, Block structure, parameters and their transmission. Tasks and shared data. Storage requirement for major run-time elements. Program and system controlled storage management. Static and stack-based storage management. Fixed size and variable-size heap storage management.

CSE 222 A –COMPUTER ORGANIZATION AND ARCHITECTURE (CSE)

3L, 1T

3 Hours, 100 Marks

Organization of computer system, Basic Building blocks of CPU-ALU, Timing and Control Unit, Construction of ALU, integer representation, binary half and full adder. Parallel full adder. Addition and subtraction in a Parallel arithmetic element. BCD adder. Binary multiplication, Booth's algorithm. Binary division. Logical operations, implementation of logical instructions, floating point number system, and arithmetic operations on floating point numbers.

General instruction formats, addressing modes.

Concept of control unit, execution of instructions, Hardwired and Microprogrammed control unit, Microinstructions, Horizontal and vertical format, Microprogramming, Wilkes control .

Memory element , RAM, Static RAM, Dynamic RAM, dimension of memory access, ROM, PROM, EPROM, EEPROM, Magnetic, CCD and cache memories. Hierarchy of memories. Associative memory.

Interconnection of computer components, buses, bus formats and operations, isolated and memory-mapped input-output, interfacing of keyboards and printers. Interrupts in IO systems, DMA. Data transfer, DMA interrupts, polling, masking, nested interrupts. Control of data transfer, handshaking, bus scheduling, standard bus interfaces.

Introduction to printers, magnetic tapes, disks, floppy disks, optical disk.

CSE 223 A - DATABASE AND FILE SYSTEMS (CSE/IT)

2L, 1T

3 Hours, 100 Marks

Introduction to database systems. A historical perspective, file systems v/s DBMS, advantages of a DBMS, Data abstraction , models, instances and schemes. Data independency. Data definition and manipulation languages. Database manager, administration and users. Overall system structure.

Entities and entity sets. Relationships and relationship sets. Attributes, mapping, keys, E-R diagram and its conversion to tables. Design of an E-R database scheme.

Structure of relational database. The relational algebra. The tuple and domain relational calculus. Modification of databases and views.

Query languages, SQL and query by examples. Security of databases against misuse. Domain

constraints, referential integrity, functional dependencies, assertions and triggers. Pitfall in relational database design. Normalization using functional, multi valued and join dependencies. Domain key normal form. Alternative approaches to database design.

Data storage, Physical storage media, files organization, organisation of records into blocks, sequential files , mapping relational data to files, data dictionary storage, buffer management,

Basic concept of indexing and hashing, properties of indexes, index specification in SQL,. B+ - Tree and B-Tree index files. Hash base indexing, static hash functions, dynamic hash function.

CSE 225A – COMMUNICATION ENGINEERING (CSE/IT)

3L

3 Hours, 100 Marks

Introduction to analog and digital techniques for electrical communication. Concept of baseband and carrier transmission. Elementary study of AM, DSBSC SSB, FM and PM.

Sampling theorem and principle of pulse analog modulation. Elements of PCM, fundamentals of digital carrier modulation techniques for data communication.

Concept of FDM and TDM. Meaning of synchronous and asynchronous transmission. Principle of models. Effects of noise in communication systems.

General structure of telecommunication networks. Simplex, duplex and half-duplex lines, concepts of centralized and common control switching in telephone networks.

Qualitative study of radio-wave propagation. Introductory study of microwave LOS tropospheric scatter, satellite and optical communications.

FIFTH SEMESTER

CSE 311 A – THEORY OF COMPUTATION (CSE/IT)

3L, 1T

3 Hours, 100 Marks

Introduction to Automata theory, description of finite automata, transition Systems. Properties of transition functions, acceptability of a string by a FA.

Non-deterministic finite state machine. Conversion from NDFA to DFA. The equivalence of DFA and NDFA. Finite automata. Mealy & Moore machine with outputs. Conversion from a Moore machine to Mealy machine and vice-versa. Minimization of finite automata.

Regular set and regular grammar. Regular expression, finite automata and regular expressions, transition system and regular expression. Equivalence of two finite automata. Equivalence of two regular expressions. Kleen's closure theorem. Construction of finite automata equivalence to a regular expression.

Context free languages and derivation trees. Left most and right most derivations. Normal forms of context free grammars (i) Chomsky-normal form (ii) Greibach-normal form.

Push down automata, acceptance by PDA, PDA and context free languages.

Introduction to Linear bounded automata, acceptance by LBA, LBA and context sensitive language.

Turing machine model, representation of TMs, languages acceptability by TMs, design of TMs, universal TMs and other modifications of TM, and Chomsky-Hierarchy grammar.

CSE 312 A – DATABASE MANAGEMENT SYSTEM (CSE/IT)

2L, 1T

3 Hours, 100 Marks

Review of Database Models. Basic concepts of object oriented model, New data base applications, object structure, class hierarchy, Multiple inheritance, object identity, object containment, physical organization, object oriented queries, scheme modification. Comparison between RDBMS and OODBMS, crash recovery. Failure classification, storage hierarchy.

Transaction model , log-based recovery, Buffer Management , check points, shadow paging , failure with loss of non-volatile storage, stable storage implementation, concurrency control schedule, Testing for serializability, lock-based protocols, Time stamp based protocols, validation techniques, multiple Granularity, Multiversion schemes, Insert and Delete operations.

Basics of XML, Schema, Syntax and Sementics, view, manipulation, query, design, constaints, translation from Relational database, application.

Security and Integrity violations, Authorizations and views, security specification in SQL, Encryption, statistical databases. Introduction to distributed databases, Internet data bases. Data base Design case study.

CSE 313 A - SYSTEM PROGRAMMING (CSE/IT)

2L, 1T

3 Hours, 100 Marks

System Software and Machine Architecture, General register level architecture, VAX, Pentium, RISC Machines – Power PC, instruction and data formats.

Assemblers: Basic functions, Algorithm and Data Structures.

Machine dependent assembler features: Instruction formats and addressing modes, program relocation.

Machine Independent features: Literals, symbol definitions.

Program blocks, control sections and Linking.

Assembler design, one pass and multi-pass assemblers, MASM, and SPARC assemblers.

Loaders and Linkers: Loaders functions, absolute loader, boot strap-loader, Machine dependent and independent features, relation and lining. Data structures and algorithm of loader, Library Search, Linkage editors, Dynamic and Static Linking. Specific examples.

Macroprocessors: Functions, algorithms and data astructures, macro-expansion. Macros of HLLs, specific examples and macroprocessors.

Basic idea of compilers, phases of compiler. Interpreters, compiler-compilers. Sun OS complier, lex, yacc, gcc.

Operating System, its functions, types of OS, User interface, run time environment, interrupt processing, process scheduling, memory management, file processing, job scheduling, protection.

CSE 314A - MICROPROCESSORS (CSE)

3L, 1T

3 Hours, 100 Marks

An introduction to 80x86 microprocessor family, Real and Protected mode Operation, S/W model of 80x86 family, processor registers, data organization, Instruction types, addressing modes, interrupts, a comparative study of 8086, 80286, 80386, and Pentium.

Software Architecture, Addressing modes, Flags, Data transfer and string instructions, arithmetic, logical, bit manipulation, program transfer and processor control instructions.

Use of assembler directives, Using macros, instruction execution time, Interrupt Processing, working with interrupt vectors, Use of BIOS and DOS function calls, using disks and files.

Protected mode operation, Segmentation, Paging, Protection, Multitasking, Exceptions, Virtual- 8086 mode, Protected mode applications,

An introduction to supporting chips and interfacing - 8255, 8279,8253, 8259, 8257 (their advanced versions). Interfacing assembly with C- language.

CSE 316A- COMPUTER NETWORKS (CSE/IT)

3L, 1T

3 Hours, 100 Marks

Introduction to Computer Networks, advantages, LAN, MAN, WAN, Network topologies. OSI reference model, Basic concepts, services and layers of OSI model. Physical layer protocols- RS 232C,RS-449, X.21, X.24, Ethernet, Data link layer- basic link protocols, character and bit oriented protocols, Flow control, Error detection, Error control, High level Data Link control (HDLC).

Network layer- Virtual circuit, X.25 specification, Data grams, Transport, Session, Presentation and Application layers. Connection less and connection oriented protocols, circuit, message and packet switching.

Introductory study of TCP/IP protocol suit, LAN Topologies and transmission media, twisted pairs, coaxial, optical fibers. LAN access techniques, random access method, ALOHA, CSMA, CSMA/CD, Controlled access schemes.

Introduction to Network interconnections, Bridges and Routers.

INTERNET and WWW. Domain name system, E-mail, HTML, TELNET and file transfer protocol (FTP).

Introduction to Wireless Networks.

Basic idea of information and Network Security – Encryption, Decryption, DES, RSA, Digital Signatures, Firewalls, BGP.

SIXTH SEMESTER

CSE 321A COMPUTER GRAPHICS & VISUAL COMPUTING (CSE)

3L,1T

3 Hours, 100 Marks

Introduction to computer graphics. Application areas, Display devices, raster scan, random scan, color monitor, display file, frame buffer, 3-D display techniques, Input devices, Hardcopy devices.

Points, line, plane and coordinates. Character, vector, circle generation algorithms, antialiasing techniques. Representation of polygons. Interfacing and filling polygon. 2-D Transformations, translation, rotation, scaling, shearing, reflection, composite transformations, raster transformations.

Windows, multiple windowing, view-port, viewing transformation. Clipping algorithm for point, line using Sutherland and Cohen, polygon, text clipping. Segment and segment operation.

Interactive graphics, user dialogue, Input modes, Interactive picture construction technique, Curves and curved surface, interpolation and approximation curve, continuity of curve.

Concept of 3-D, representation of 3-D object, 3-D transformation, translation, rotation, reflection, scaling. Parallel, perspective, isometric projections. 3-D clipping Sutherland and Cohen algorithm. Hidden lines and surfaces removal technique. Back face, Z-buffer, painter algorithm.

Basic illumination models, halftone, dithering, color model RGB & CMY, Visualization of data set, representation, scalar, vector, tensor, multivariate data fields.
Introduction to Open GL.

CSE 322A – OPERATING SYSTEM DESIGN (CSE/IT)

3L,1T

3 Hours, 100 Marks

Introduction to operating system, operating system functions, batch processing systems, multiprogramming systems, time sharing systems, real time operating systems.

Process management, process concept, process scheduling, operation on processes, cooperating processes, interprocess communication.

CPU scheduling, scheduling algorithms – first come first served, shortest job first, priority based, round robin, multilevel queue, multilevel feedback queue.

Process synchronization, critical section problem, semaphores, monitors. Deadlocks, deadlock prevention, deadlock avoidance, deadlock detection.

Memory management, contiguous allocation, paging, segmentation, virtual memory, demand paging, page replacement, page replacement algorithms – first in first out algorithm, optimal algorithm, least recently used algorithm.

File concepts, directory structure, file protection, allocation of disk space.

I/O systems, I/O hardware – polling, interrupts, direct memory access. Disk scheduling, disk scheduling algorithms – first come first served algorithm, shortest seek time first algorithm, SCAN algorithm, C-SCAN algorithm, C-LOOK algorithm.

Protection and security in an operating system, access matrix, capabilities.

Case studies of Windows / LINUX operating System.

CSE 323 A - JAVA PROGRAMMING (CSE / IT)

3L, 0T

3 Hours, 100 Marks

Evolution of programming languages, generation of programming languages, type of programming languages. Basic feature of Java, flow control, classes, objects, interfaces, exception and packages.

Java classes and object, access control and inheritance, constructions, inheritance and overloading. Extension of classes.

Data type, control-flow, basics of exception handling, operations on data types.

Introductory idea of threads and their applications.

Basic I/O packages and standard utilities. Application of Java for system programming.

Introduction to LINUX shell, variables, condition and control structures.

Introduction to TCL/TK programming language.

CSE 325A – ARTIFICIAL INTELLIGENCE (CSE/IT)

3L, IT

3 Hours, 100 Marks

Defining artificial intelligence (AI), historical foundations, development of logic, turing test, AI application areas.

Propositional calculus, syntax and semantics, Predicate calculus syntax and semantics. Inferencing and unification.

Searching structures and strategies for state space search, using the state space to represent reasoning with the predicate calculus. Heuristic searches and algorithms and use of heuristics in games. Control and implementations of state space search, recursion-based search, pattern directed search and Production systems.

Languages for AI, problem solving, introduction to Prolog, its syntax, abstract data types, production system and designing of alternative search strategies.

Overview of expert system, knowledge engineering process, conceptual models. Framework of organization and applying human knowledge. Managing uncertainty in expert system—concepts of Bayesian probability theory, non-monotonic logic and reasoning with belief, fuzzy logic and Dempster/Shafar approaches to uncertainty. Case studies of typical expert system.

Knowledge representation and its issues, network representation, conceptual graphs and structured representation.

Automated reasoning, resolution theorem proving issues and design of automated reasoning programs.

CSE 328A- ROBOTICS (CSE/IT)

3L, 1T

3 Hours, 100 Marks

Introduction: Automation and Robotics, CAD/CAM for Robotics – An overview of Robotics and applications – classification by coordinate system and control system.

Components of the Industrial Robotics: Functional diagram, representation of robot arms, common types of arms. Components, Architecture, degrees of freedom – Requirements and challenges of end effectors, determination of the end effectors, comparison of Electric, Hydraulic and Pneumatic types of locomotion devices.

Motion Analysis: Homogeneous transformations as applicable to rotation and translation, numerical problems. Manipulator Kinematics: Specifications of matrices, D-H notation, joint coordinates and world coordinates. Forward and inverse kinematics numerical problems.

Trajectory planning and avoidance of obstacles, path planning, Skew motion, joint integrated motion –straight line motion – Robot programming, languages and software packages.

Robot actuators and Feed back components: position sensors – potentiometers, resolvers, encoders – Velocity sensors.

Introduction to Microcontroller Families, Introduction to AVR microcontrollers, Basic Idea of Interfacing of: LEDs, Switches, Relays, LCD, 7 Segment Display, ADC, Stepper Motors, DC Motors, IR Sensors, Serial Communication, GSM module, GPS module, I2C devices, PWM Techniques

Software tools for robot programming, Cross Compilers. Machine vision and image processing
Robot Application in Manufacturing: Material Transfer - Material handling, loading and unloading - Processing - spot and continuous arc welding & spray painting - Assembly and Inspection.

Mini software simulation project

SEVENTH SEMESTER
CSE 411A - DESIGN AND ANALYSIS OF ALGORITHMS (CSE/IT)

3L, 1T

3 Hours, 60 Marks

Review of Algorithm and its specification, performance analysis and Randomized Algorithms. Random access machines (RAM), computational complexity of RAM program. Time and Space complexity, Asymptotic notations (Big-O, θ , Ω , and small-o).

Design of Efficient Algorithms: Designing Methods. Divide and conquer: Binary Search, finding maximum and minimum, Merge Sort, Quick Sort. Greedy methods: Knapsack problem, tree vertex splitting, minimum cost spanning tree. Dynamic programming: Matrix Chain Multiplication, Longest Common Subsequence, Multi Stage Graph and 0/1 Knapsack Problem. Branch and Bound: Traveling Salesman Problem and Lower Bound Theory.

Sorting and Comparative study: Algorithms and comparisons of Radix sort, Heap sort, Merge sort and Quick sort. Order statistics and expected time for order statistics.

Matrix multiplication and related operations: Strassen's Matrix Multiplication Algorithm, inversion of matrices, LUP decomposition of matrices and its applications.

Advanced Trees: Definitions Operations on Weight Balanced Trees (Huffman Trees), 2-3 Trees and Red- Black Trees. Augmenting Red-Black Trees to Dynamic Order Statistics and Interval Tree Applications.

Graph Theory Algorithms: Algorithms for Connectedness, Finding all Spanning Trees in a Weighted Graph and Planarity Testing, Breadth First and Depth First Search, Vertex cover problem.

CSE 412 A – BIG DATA ANALYTICS (CSE)

3L, 1T

3 Hours, 60 Marks

Data warehousing Definition, usage and trends. DBMS vs. data warehouse, Data marts, Metadata, Multidimensional data mode, Data cubes, Schemas for Multidimensional Database: stars, snowflakes and fact constellations.

Data mining definition & task, KDD versus data mining, data mining techniques, tools and applications. Data mining query languages, data specification, specifying knowledge, hierarchy specification, pattern presentation & visualization specification, data mining languages and standardization of data mining.

Introduction to Big Data Platform – Traits of Big data -Challenges of Conventional Systems -Web Data – Evolution Of Analytic Scalability - Analytic Processes and Tools - Analysis vs Reporting - Modern Data Analytic Tools - Statistical Concepts: Sampling Distributions – Re-Sampling- Statistical Inference - Prediction Error.

Regression Modeling - Multivariate Analysis - Bayesian Modeling - Inference and Bayesian Networks - Support Vector and Kernel Methods - Analysis of Time Series: Linear Systems Analysis - Nonlinear Dynamics - Rule Induction - Neural Networks: Learning And Generalization - Competitive Learning - Principal Component Analysis and Neural Networks - Fuzzy Logic: Extracting Fuzzy Models from Data - Fuzzy Decision Trees - Stochastic Search Methods.

Mining Frequent Item sets - Market Based Model – Apriori Algorithm – Handling Large Data Sets in Main Memory – Limited Pass Algorithm – Counting Frequent Item sets in a Stream – Clustering Techniques – Hierarchical – K-Means – Clustering.

CSE 413A- SOFTWARE ENGINEERING (CSE/IT)

3L, 1T

3 Hours, 60 Marks

Introduction, software characteristics and software crisis. The software engineering approach; software process & process maturity. Various software development models. Software life cycle concept.

The software project management concepts and team organization. Software process and project metrics. Software measurement. Metrics for software quality and its integration with the software process.

Software scope/project estimation – the COCOMO model and the Function Point approach.

Software quality assurance. Software reviews, cost impact and software defects. Formal Technical Reviews, software reliability.

Conventional methods for software engineering. Analysis concepts and principles. The software requirements specifications. Software prototyping.

Software design and software engineering, software architecture. Effective modular design – functional independence, cohesion and coupling concepts. Component level/procedural design.

Software testing techniques and strategies.

CSE 414 A - PRINCIPLES OF COMPILER DESIGN (CSE/IT)

3L, 1T

3 Hours, 60 Marks

Introduction to translators , compilers, interpreters, compilation process.

Lexical analyzer, input buffering, specification and recognition of tokens, regular expressions to NFA, minimization of DFA, keywords and reserve word policies, LEX - the lexical analyzer generator.

Syntax analyzer, context free grammars, top down parsing, Brute force parser, recursive descent parser, LL (1) parser. Bottom up parsing, operator precedence parsing, LR parser, LALR parser, YACC - the parser generator.

Syntax directed translation schemes, implementation of syntax directed translators, synthesized attributes, inherited attributes, construction of syntax trees, bottom up evaluation of S- attributed definitions, L- attributed definitions, top down translation of L - attributed definitions.

Errors, lexical phase errors, syntactic phase errors.

Intermediate languages, postfix notation, syntax trees, parse trees, three address code- quadruples, triples and indirect triples.

Translation of assignment statements, boolean expressions, statements that alter flow of control, array references, procedure calls, declarations, case statement, record structures.

Symbol tables, operation on symbol tables, symbol table organization for non-block structured languages, symbol table organization for block-structured languages.

Run time storage management, storage allocation and referencing data in block structured languages, storage allocation in FORTRAN.

Code optimization, sources of optimization, loop optimization, DAG and optimization of basic blocks.

Code generation, a machine model, next use information, register allocation and assignment, a simple code generator, code generation from DAG's, peephole optimization.

ELECTIVE-I

CSE 453A – CLIENT-SERVER TECHNOLOGY (CSE/IT)

3L, 1T

3 Hours, 60 Marks

Introduction: Client/Server architecture, Benefits, application, centralize multiuser, Distributed single user architecture, distributed computing environment.

Approach to Distribution: Distributed models, multi tiered environment, cooperative processing, application components, and distribution points. Presentation distribution, distributed processing, distributed function and transaction processing, data distribution.

Client technologies: Function, Application and tools, operating system, hardware plate forms, database access, interprocess communication tools.

Server technologies: Function, server operating system, hardware plate forms, data access, distributed data access, database engines.

System networks Architectures: Components, layers, pear-to-pear communication between SNA layers.

Data Management: Distributed data management, method of the distribution, distributed data access. Database transaction management.

Distributed DBMS: Architecture, storing data in a distributed DBMS, Distributed catalog, management, Distributed query processing, Update distributed data. Introduction to distributed transactions, distributed concurrency control, and distributed recovery.

CSE 454 A – MULTIMEDIA TECHNOLOGY (CSE/IT)

3L, 1T

3 Hours, 60 Marks

Introduction to multimedia and its applications, Basic requirements for multimedia, Multimedia building blocks - Text, Sound, Images, Animation, Video and related tools.

Multimedia Hardware: SCSI, MCI, Memory and storage devices, Output Hardware, Communication devices.

Multimedia Software: Basic tools - Painting and drawing tools, 3-D modelling and animation tools, Images and editing tools, OCR software, Sound Editing programs, Animation, Video and Digital Movies, Video Formats, Compressing movie files.

Multimedia Authoring tools: Selecting a right tool based on various features, card and page based authoring tools, Icon based authoring tools, Time based authoring tools, Object - Oriented Tools.

Assembling and delivering a project: The multimedia team, Planning and costing, designing and producing.

Multimedia and the internet: working of internet, Tools for www - web page makers and editors, HTML and Multimedia, Video on demand, Images, sound and animation for the web.

EIGHTH SEMESTER

CSE 421 A - ADVANCED COMPUTER ARCHITECTURE (CSE)

3L, 1T

3 Hours, 50 Marks

Introduction to parallel processing and trends: parallelism in uni-processor system, parallel computer structure, architectural classification schemes for parallel computers, multiplicity of instruction – data streams, serial versus parallel computers, parallelism versus pipelining.

Memory hierarchy: hierarchical memory structures, virtual memory system, memory allocation and management.

Principles of pipelining: pipelining principles and classifications, general pipelines and reservation tables, interleaved memory organization, instruction pre-fetch and branch handling, data buffering and busing structures, internal forwarding and register tagging, hazard detection and resolution, job sequencing and collision prevention, dynamic pipelines and reconfigurability.

Structure for array processors: SIMD computer organization, masking and data routing mechanism Inter PE communication, introduction to associative array processing.

Multiprocessor architecture: loosely coupled and tightly coupled multiprocessors, processor characteristics for multiprocessing, interconnection networks, cache coherence protocols.

Introduction to advance processors: Data flow computers, the VLIW architecture, fault tolerant architecture and study of TANDEM HIMALAYAN K2 system architecture.

CSE 422 A - EMBEDDED SYSTEMS (CSE)

3L, 1T

3 Hours, 50 Marks

Introduction to Embedded Systems and their basics, Real time systems, Multitasking. Use of programming languages, Real time kernel, size of embedded programs.

Data Representation – Fixed Precision Binary numbers, binary representation of Integers and Real numbers, ASCII and BCD.

Hardware requirements and time constraints, reliability and cost, design decisions.

Selection of microprocessor/microcontroller for embedded systems, computing the size of memory required RAM and ROM.

S/W tools for embedded system development- High level languages support, Use of cross compilers, Use of tools sets in Embedded Linux , GNU Tool chain for cross compiling.

Concurrent Software, Scheduling, Memory Management, Shared Memory, System Initialization.

Mixing C and assembly, C-Run time environment, Costing of an Object, Using Unions.

Case Study: Use of tool-sets in Embedded Linux, GNU Tool Chain for cross compiling.

ELECTIVE-II

CSE 462A–OBJECT ORIENTED SOFTWARE ENGINEERING (CSE/IT)

3L, 1T

3 Hours, 50 Marks

Object-oriented concepts and principles. Identifying the elements of an object model. Object oriented projects metrics and estimation.

Object-oriented analysis: Domain analysis, the OOA process, the object-relationship model.

Design for object- oriented systems. The system design process.

Object-oriented testing - testing OOA and OOD models. The object-oriented testing strategies. Inter class testing.

Technical metrics for O-O systems. Class-oriented metrics & metrics for O-O projects.

Advanced topics in software engineering. Component-based software engineering and development. Classifying and retrieving components.

Review of CASE tools.

CSE 464A – REAL-TIME SYSTEMS (CSE)

3L, 1T

3 Hours, 50 Marks

Introduction to real-time computing: Characteristics of real-time system & tasks, performance measurement of real-time systems, estimation of program runtime.

Real-time system design: hardware requirements, systems development cycle, data-transfer techniques, synchronous and asynchronous data-transfer techniques, standard interfaces.

Task assignment and scheduling: priority scheduling, dynamic scheduling, buses in dynamic scheduling, dynamic priority assignment. Real-time programming languages and tools. Desired language characteristics, data typing. Control structure, run-time error handling, over-loading and generics, run-time support, real-time databases.

Real-time communication, fault-tolerance techniques, cause of failure, fault types, fault detection, redundancy, integrated failure handling.

Reliability evaluation techniques; parameter values, reliability model for hardware redundancy, software error model, clock synchronization.

CSE 466 A - GRAPH THEORY (CSE/IT)

3L, 1T

3 Hours, 50 Marks

Introduction to graphs, applications, representation of graphs. Walk, Paths and circuits. Isomorphism, connectedness, Euler graph, subgraph, operations on graph, Hamiltonian Paths and Circuits, Traveling Salesman problem, algorithm of graph traversals, connectedness.

Tree, Spanning tree, Fundamental Circuits, Cut-sets, Connectivity and Separability, 1-isomorphism, 2-Isomorphism, Network flow, Algorithm for spanning tree, cut vertex.

Planar and Dual graphs, Kuratowski's two graph, representations of planar graph, algorithm for detection of planarity, geometric and combinatorial dual graph, thickness and crossings.

Matrix representation of graphs, incident matrix circuit matrix, cutset matrix, path matrix, adjacency matrix. Coloring, covering and partitioning, chromatic number, chromatic polynomial, matching, bipartite graph, four color problem.

Directed graphs, types, binary relations, connectedness, Euler digraph, tree, fundamental circuits, adjacency matrix, tournaments, acyclic digraph, decyclization, algorithm for finding directed circuits.

CSE 470A – COMPUTATIONAL SCIENCE (CSE/IT)

3L, 1T

3 Hours, 50 Marks

Modeling and Simulation: Definition of simulation and modeling; relationship between simulation and modeling, Purpose including benefits and limitations: role – addressing performance, optimization; supporting decision, making, forecasting, safety considerations.

Application areas: healthcare (including assisting with diagnostics); economics and finance; city and urban simulations; simulation in science and in engineering.

Types of simulations – physical, human in the loop, interaction, computer, virtual reality. The simulation process. simplifying, assumptions; validation of outcomes.

Model building: use of mathematical formula or equation, graphs, constraints. Methodologies and techniques. Use of time stepping for dynamic systems.

Theoretical considerations; Monte Carlo methods, stochastic processes, queuing theory. Software in support of simulation and modeling; packages, languages.

Operations Research: Linear programming: Integer programming, The Simplex method, Probabilistic modeling, Queuing theory, Markov models and chains, Prediction and estimation, Decision analysis, Forecasting, Risk management.

Software tools for Simulations and Modeling.

ELECTIVE-III

CSE 465 A - INFORMATION THEORY AND CODING (CSE/IT)

3L, 1T

3 Hours, 50 Marks

Uncertainty, information, measure of information, average information, entropy, property of entropy, information rate. Discrete memoryless source, Source coding theorem,

Discrete memoryless channel, self and Mutual information, properties, channel capacity, channel coding theorem, Shannon – Hartley theorem, Information capacity theorem.

Data compaction, prefix coding, Huffman coding, Lempel-Ziv coding. Compression of information.

Type of errors, codes, error control coding, linear block code, error detection and correction codes, syndrome decoding, cyclic codes, hamming code, BCH, convolution codes, encoders and decoders, performance of codes.

CSE 469A-BIOINFORMATICS (CSE/IT)

3L, 1T

3 Hours, 50 Marks

Introduction to Molecular Biology and Biological chemistry: Genetic material, Gene structure and information content, protein structure and functions, nature of chemical bonds, molecular biology tools, genomic information content.

Data Searches and pair-wise alignments: Dot plots, Gaps, Dynamic Programming, database searches and family of algorithms –BLAST and FASTA.

Substitution patterns: Pattern substitution with in genes, estimating substitution numbers, variation of evolutionary rates between genes, molecular clocks.

Phylogenetics: Its history, phylogentic trees, distance matrix methods. Character-based methods – parsimony, ancestral sequences. Strategies for faster searches – branch and bound, heuristic. Consensus trees, parametric tests. The tree of life.

Genomics and gene Recognition: prokaryotic and eukaryotic genomes and their structures, open reading frames, gene expression.

Protein and RNA structure prediction: Amino-acids, polypeptide composition, structure. Algorithms for modeling protein folding, and reverse protein folding.

Information integration for life science discovery: Nature of biological data, data sources, challenges in information integration.

SYLLABUS OF OPEN ELECTIVES-I

BCT 291 A Open Elective-I: Sustainable Architecture

3L

3 Hrs, MM 100

Concepts of sustainability : Energy and Global environment, Energy use and Climate change – Its impact, Types of Energy systems, Concept of Sustainability - Principles of conservation -synergy with nature, Bioregionalism - community basis shelter technology within bioregional patterns and scales, Ethical- environmental degradation.

Sustainable planning & Design: Sustainable Development -Sustainable approach to site planning and design - site inventories-relationships between site factors - development impacts from one area of the site on the other areas - phasing of development - limits of change - Design facility within social and environmental thresholds

Sustainable Building Materials and Construction : Properties, Uses and Examples of -Primary, secondary and Tertiary Sustainable Materials, Principles to improve the energy efficiency - siting and vernacular design, shade, ventilation, earth shelter, thermal inertia and air lock entrances. Techniques of sustainable construction - technologies, methods of effectiveness, and design synthesis – alternative materials and construction methods: solar water heating panels; photovoltaic electricity generation; use of local materials and on site growth of food, fuel and building materials.

Recycling and Reuse : Pre building, Building, Post building stages - Architectural Reuse, Waste prevention, Construction and Demolition recycling- Conservation of natural and building resources- Energy and material savings – types of wastes - Elimination of waste and minimize pollution- various Decomposing methods – Innovative reuse of various wastes Case Studies and Rating systems : Sustainable Development Case Studies: illustrated examples of the planning, development, and construction. Green architecture and various international rating systems for sustainability- EAM (UK), CASBEE (Japan), LEED (US), Green Star (Australia), etc. – Indian systems – TERI GRIHA rating, LEED India rating, IGBC

CE 291A Open Elective-I :Energy Efficient Building Design

3L

3 Hrs, MM:100

Environment and man, external environment and built environment, Built-environment – integrated approach.

Climate: elements of climate, classification of climate, Micro-climate, site climate.

Comfort: desirable conditions, thermal comfort factors, comfort indices, effective and corrected effective temp. Tropical summer index.

Thermal Design: heat loss from a building under steady state condition, heat gains due to solar radiation, steady state and cyclic conditions, Means of thermal control – mechanical, structural control, air infiltration into buildings by natural means, shape of buildings, -thermal cube, fabric heat loss, ventilation loss and volume.

Light & Lighting: illumination requirement, day-lighting, artificial lighting, energy conservation.

Noise Control: Sources of noise, means of control, control requirements, behaviour of sound in rooms, vibration & vibration control.

Building Services: Mechanical & electrical services in building, lifts, escalators.

ChE 291 A Open Elective-I : Renewable Energy Sources

3L

3 Hrs, MM:100

Sources of energy: Energy sources and their availability, renewable energy sources.

Energy from Biomass: Introduction, Biomass as a source of energy, Biomass conversion technologies, Biogas generation, classification of biogas plants, Biomass gasification.

Solar Energy: Sun and solar energy, solar radiation and its measurement, solar energy collectors, solar energy storage, Photovoltaic systems, Application of solar energy.

Wind Energy: Wind as an Energy source, Basic principles of wind energy conversion, Types of Wind machines, Components of wind energy conversion system, Performance of wind machines, application of wind energy.

Geothermal Energy: Introduction, Origin and distribution of geothermal energy, types of geothermal resources, Hybrid geothermal power plant, Application of geothermal energy.

Hydrogen energy: Introduction, Hydrogen production, Hydrogen storage, Hydrogen transportation.

Energy from the Oceans: Introduction, Ocean Thermal Electric Conversion (OTEC), Energy from Tides, Ocean Waves.

EE 291 A Open Elective I: Industrial Application Of Electrical Drives

3L

3 Hours, 100 Marks

Operating-Characteristics : Individual, group and collective drives, steady state individual and joint characteristics of electric motors and driven industrial units under different conditions of operation.

Transient Characteristics : Causes of transient conditions starting, braking, reversing, speed transition and sudden system changes. Forces and torques on the drives referred to a common reference shaft. General equation of motion, Accelerating and deaccelerating times. Starting and braking time and means of reducing.

Drives Control : Parameters characterizing speed control methods of electric drives, speed control of Industrial d.c. and a.c. motors under constant and varying torque and h.p. conditions.

Families of speed torque characteristics : Idea of manual and automatic control gears, Master-controller.

Motor Ratings : Continuous-short time and intermittent ratings, overload capacity. Effect of altitude, Motor heating and cooling curves. Equivalent current, power and torque. Selection motor for various duty cycles. Permissible frequency of starting, features of load diagram construction. Load equalisation and use of fly wheels. Types of motor enclosures.

Illumination : Units of light, Point , linear and surfact sources. Laws of illumination. Candle power distribution, MSCP and reduction factor, Indoor lighting system and their classification. Contrast, glare, shadow and colour. Mounting height and spacing. General and local lighting Total lumen and point by point methods of calculations. Outdoor lighting distributor and protector fittings. Isolux diagram. Flood, gas, discharge and arc-lamp-working, characteristics and applications.

Electric Heating and Welding : Principles of electric heating. Direct and indirect resistance heating, lead baths and salt baths. Resistance oven convection and radiation ovens. Arc resistance and induction furnace, elements of operation, performance and power supply arrangements. temperature regulation of ovens and furnances. Induction, high frequency and dielectric heating and their uses. Elementary study of different kinds of electric welding operation, Power supply for welding. Elements of Electric Traction : Electric traction versus others System of electric traction for tramways, trolley buses, motor coach trains and locomotive hauled trains. Idea about suitability of electric motor for traction. Conductor rail and pantograph. meaning for multiple-unit operation.

Economics : Methods for economic selection of Industrial drives, loss factor and cost of losses, Effect of load factor. Power factor and factory diversity factor. Methods of power factor improvement and its economic limit. Economic calculations for illumination schemes Economic value of good lighting.

EE 292 A Open Elective I: Engineering Economics

3L

3 Hours, 100 Marks

Introduction: Economics for Electrical Engineering, concept of physical efficiency and financial efficiency of electrical goods and services supply and demand, Elasticity. Necessities and luxuries, free competition, monopoly, law of diminishing returns.

Interest and Depreciation: Interest rates and equivalence, annuities and various factors, concept of depreciation in utilizing electrical energy, economic life of electrical machines, salvage value, various methods of depreciation calculations, equivalent capital recovery depreciation.

Economical choice of Electrical Apparatus: Motors, transformers, Economical choice between synchronous motors and Induction motor running them simultaneously.

Comparison of Alternatives: Basic economic study patterns, annual cost, capitalized cost, present worth, rate of return, Increment investment, pay back and benefit to cost ratio methods and their respective fields of applications.

Ma-291 A Open Elective-I :Mathematical Statistics for Engineers

3L

3 Hrs., M M :100

Theory of probability : Theoretical probability distribution (Binomial, Poisson and Normal).

Correlation and Regression Analysis : Karl-Pearson's coefficient , Spearman's coefficient, Regression analysis of two variables system.

Sampling Theory : Test of significance, Large sample tests for mean and proportions. χ^2 (chi-square) , t and F Test of significance for Small sample.

Theory of attributes: association and independence of attributes, coefficient of association.

Index Number: Various types of index numbers, construction of index number of prices, fixed base and chain base methods

ME- 291A Open Elective-I: Renewable Energy Sources

3L

3 Hrs, MM:100

Principal types of fossil fuel fired power plants and their effects on livestock and environment; Concepts of NCES, Criteria for assessing the potential of NCES, Limitations of RES.

Solar Energy - Solar radiation data, solar energy conversion into heat, Analysis of Flat plate and Concentrating collectors, Testing procedures, Paraboloid Dish, Central Receiver; concept of collector tracking, energy storage systems; Solar thermal systems for residential water heating, Solar Pond, industrial process heating and power generation. Photo voltaic: p-n junctions, I-V characteristics of solar cells, Calculation of energy for photovoltaic power generation; Battery Characteristics, DC Power Conditioning Converters, AC Power Conditioning -Inverters.

Wind Energy: Energy available from wind, General formula, Lift and drag. Basis of Wind energy conversion, Effect of density, Frequency variances, Angle of attack, Wind speed, Determination of torque coefficient, Principle of Operation of wind turbines, types of wind turbines and characteristics, Generators for Wind Turbines, Control strategies.

Biomass and Biofuels: Conversion routes- combustion, pyrolysis of biomass to produce solid, liquid and gaseous fuels; Constructional details of gasifier; Aerobic and anaerobic digestion, Biofuels and their production; biofuels, Biomass systems for thermal applications and power generation.

Geothermal Energy: Definition and classification of resources, typical geothermal gradient; Dry, flash and binary steam systems; Utilization for electricity generation and direct heating, Wellhead power generating units. Basic features: Atmospheric exhaust and condensing, Exhaust types of conventional steam turbines.

An overview of other renewable devices- Fuel cells: principle, types, applications; Ocean thermal energy conversion (OTEC), Thermoelectric, MHD, Wave energy, Tidal energy, etc.

Economic Viability: Calculation of the cost of energy supply from renewables, Payback period, Carbon footprints; Comparison with conventional fossil fuel driven systems in terms of costs and emissions; Calculation of carbon dioxide reduction and incremental costs for renewable options.

ME 292 A Open Elective-I: Automobile Engineering

3L

3Hrs, MM:100

Power Unit: Automobile engine types, classification; Engine parts: cylinder head, block and crank case, piston and rings; Carburation, fuel injection, valve operation; Fuel combustion, mechanical power and engine performance characteristics; Engine cooling and thermal stresses in parts,.

Chassis and Suspension: Load on frame, general considerations for strength and stiffness, engine mounting; Dampers, leaf and coil springs, various arrangements of suspension systems.

Transmission System: Clutches, flywheels, torque convertors; Gear-box: simple, synchromesh and overdrive; Type of universal joints, propeller shaft, differential; Rolling, air, gradient resistances and propulsive power calculation.

Steering: Steering geometry, Ackermann and Davis steering mechanisms; Telescopic steering; Steering shaft, gear-box, linkages, steering angles, front and rear axles; Vehicle longitudinal, static and dynamic balancing and electronic stability; Power steering: types and mechanism; Effect of caster, camber, toe-in and toe-out on tyre wear.

Brakes and Tyres: Servo-action, brake components; Bendix and Gerling system lock-head, hydraulic, vacuum, air and power brakes, and retarders; Pneumatic and tubeless tyres;

Features of a Modern passenger Car: Introduction to ABS, Front and side air bags, EBD, Climatizer, ESP, night-vision dashboard system; sun-roofing, collision warning system, Hybrid cars.

MI 291A Open Elective-I: Tunneling for Engineering Projects (MI)

3L

3 Hrs, MM:100

Tunneling: Introduction about tunnels, functions, advantages and disadvantages of tunnels compared to open cuts, Criteria for selection of size and shape of tunnels, consideration in tunneling, geological investigation, tunnel alignment, tunnel shafts, pilot tunnels. Advantages of twin tunnels and pilot tunnels, portals and adits.

Conventional Method of Tunneling: Drilling, Blasting, Loading and Transport of Muck, Supports, Ventilation, Drainage, and Equipments. Drivage work in varying ground conditions using conventional methods

Fast Tunneling: Dill jumbos, trackless mucking and transportation units. Tunnel boring machine

Tunneling in Soft Ground: General characteristics of soft ground, shield methods, needle beam method and NATM method of tunneling in practice.

Tunneling (rock bolting and guniting), Safety measures, Ventilation in tunneling, Lighting, Drainage.

PI 291A Open Elective-I: Manufacturing Science

3L

3 Hrs, MM:100

History and introduction to science of basic manufacturing processes and its classification.

Primary manufacturing processes: Introduction to liquid state forming process (casting), solid state forming process (drawing, extrusion, rolling, forging and other sheet metal working) and powder state forming process (powder metallurgy).

Secondary manufacturing processes: Introduction to material removal processes

Conventional Machining processes (basic machining operations performed of lathe, shaper, milling, drilling and grinding machine).

Introduction to basic metal joining processes (welding, brazing, soldering and mechanical fastening).

Non conventional machining processes (Basic introduction, classification, need for their development, characteristics and their industrial applications).

SYLLABUS OF OPEN ELECTIVES-II

BCT 341 A Open Elective-II: Traditional Indian Architecture

3L,

3 Hrs, MM 100

To provide theoretical knowledge base on the uniqueness of Indian traditional Architecture principles, the meaning of space, the manifestation of energy, the selection of site and how 62 integration of built form with site happens at metaphysical level based on articulation of celestial grid.

To introduce the principles of Vastu and relationship between building and site. To familiarize the students with the units of measurement in traditional architecture. To introduce concepts of orientation and cosmogram according to the Vasthu Purusha Mandala. To study the detailing and design of various building components and their material and method of construction.

Vastu - its definition and classification - Relationship to earth.. Features of good building site - good building shapes - macro, micro, enclosed and material spaces - relationship between built space, living organism and universe - impact of built space on human psyche.

Orientation of building, site, layout and settlement - positive and negative energies - importance of cardinal and ordinal directions - The celestial grid or mandala and its types. The Vaastu Purusha Mandala and its significance in creation of patterns, and lay-outs, Types of lay-outs. Simple design of residential buildings.

Building heights -Base and basement - wall and roof specifications - column and beam designs - Pitched roof and domical roofs - significance of pyramid.

Use of wood, stone, metal, brick and tile - marking technology, corbelling technology, jointing technology - foundations for heavy and light structures - Landscaping in and around buildings - Aesthetics in Indian Architecture.

CE 341A Open Elective-II: Non Urban Public Hygiene & Drinking Water

3L,

3 Hrs, MM 100

Communicable disease: Disease and immunity, communicable disease sources, mode of transfer. Control of communicable disease.

Fly and mosquito control: Life cycle of flies and mosquitoes. Various methods of fly and mosquitoes control.

Milk and food sanitation: Essential of dairy farm and cattle shed sanitation. Tests for milk and dairy products. Food epidemic, food poisoning. Botulism. Rural sanitation, village latrines, aqua privies, storm water and sullage problems, animal waste, methods of composting. Biogas collection and disposal of refuse, solid waste management through vermicomposting.

Septic tank (only salient features), percolation pits, sub surface disposal.

Rural water supply: Importance of village community in India, conditions of Indian villages with special regards to economic, social and health aspects. Quality of water needed for village community, sources of water for village water supplied, domestic roof water harvesting. Types of wells of sanitary aspects in well construction. Disinfections of wells. Different types of pumps used for village wells. Operation and maintenance of pumps, water borne diseases. Quality of water, human and cattle population and their water requirement. Rate of water supply. Standards of potable water. Rain water storage.

Treatment of water: Disinfection, desalination, Defluoridation, distribution of water.

ChE 341 A Open Elective-II: Petroleum Refining Technology

3L,

3 Hrs, MM 100

Origin occurrence of petroleum, Formation and Evaluation of Crude Oil. Testing of Petroleum Products. Petroleum refining processes, general processing, topping and vacuum distillations. Thermal cracking in vapor, liquid and mixed phase. Overview of Refinery Products

Catalytic cracking - Houdry fixed bed, fluidized bed, T.C.C. Houdry flow etc. Catalytic reforming - conversion of petroleum gases into motor fuel with special reference to alkylation, polymerization, hydrogenation and dehydrogenation.

Treatment Techniques: Removal of Sulphur Compounds in all Petroleum Fractions to improve performance, Destruction of Sulphur Compounds and Catalytic Desulphurization, Solvent Treatment Processes, Dewaxing, Clay Treatment and Hydrofining.

Production of aviation gasoline, motor fuel, kerosene, diesel oil, tractor fuel and jet fuel, hydrodesulfurisation, Lubricating oil manufacture, Petroleum waxes and asphalts.

Octane number, Cetane number, Diesel index, their determination and importance Storage of petroleum products: tanks, bullets, special types of spheres etc. Transportation of petroleum products: road, rail, sea and pipeline; Importance of pipeline transportation.

EE 341 A Open Elective II: Optimization Techniques

3L

3 Hrs, 100 Marks

Introduction to Optimization : Historical Development, Engineering application of optimization, Statement & Classification of optimization problems, Classical optimization techniques for single & multiple variable functions.

Linear Programming : Introduction, application, standard form, Basic Solutions, Simplex method, Revised Simplex method, Duality, Transportation problem, Carmarkar's method.

Nonlinear programming : Unconstrained Optimization, Introduction, Fibonacci method, Golden section search, Gradient method, Newton's method, Quasi Newton method.

Dynamic Programming : Introduction, Multistage decision process, Concept of optimization & principle of optimality, Computational procedure in dynamic programming.

Advanced topics in optimization : Introduction, Separable programming, Multi objective optimization, Calculus of variation.

Books :

Engineering Optimization – S. S. Rao, New Age International Publishers.

An introduction to optimization – Er. K. P. Chong, S. H. Zak (Wiley Slident Edition)

Operations Research : An international – H. A. Taha (PHI)

Introduction to operation research – Hiller F.K. & Lieberman (TMH)

Ma 341 A Open Elective-II :Mathematical Theory of Operations Research

3L

3 Hrs., MM : 100

Linear programming problems-Simplex Method, two phase method, Duality of LPP.

Theory of games: Competitive strategies, minimax and maximin criteria, two person zero-sum games with and without saddle point, dominance .

Inventories: Single item deterministic inventory models with finite and infinite rates of replenishment, economic lot-size model with known demand

Replacement problems: Replacement of item that deteriorate, replacement of items that fail completely, group replacement policy, individual replacement policy

Queing theory-Ques with Poisson input and exponential service time, the queue length, waiting time and busy period in steady state case, model with service in phase, multiserver queueing models.

ME 341A Open Elective-II : Economics Analysis and Management of Operations

3L

3 Hrs., MM: 100

Business Goals & Form of Business Organization, Introduction to Management- Elements of Management, Principle of Management.

Concept of Costing- Breakeven Analysis, Depreciation & Estimate.

Marketing- 5Ps of Marketing- Product, Price, Demand Forecasting, Promotion, Person and Place. Concept of Advertising and It's Objective.

Financial Analysis-Statement and Financial Ratio.

Introduction to Privatization Liberalization, Globalization Ratio & Their Impact on Economy.

ME 342A Open Elective-II: Systems Design and Analysis

3L

3 Hrs., MM: 100

Introduction: Basic concept of Finite element method; Rayleigh-Ritz and weighted residual method of variational approximation, Numerical Solution of equilibrium problem by Gaussian elimination.

Finite Element Analysis of One-dimensional Problem; Basic Concepts, derivation of elements equations, connectivity of elements, imposition of boundary conditions, Solution of equations, Application in One dimensional problem of Solid mechanics and heat transfer.

Finite Element Analysis of Two Dimensional Problem: Single variable problems: finite element discretization, interpolation, function, numerical integration and modeling considerations for triangular, rectangular, Quadrilateral, Isoparametric and Plane frame elements, Evaluation of equation and their solutions, Application in Two Dimensional Problem of Solid mechanics, Heat Transfer and Eigen value problems.

MI 341A Open Elective-II: Application of GIS & Remote Sensing in Engineering

3L

3 Hrs, MM:100

Remote Sensing: Introduction to Remote Sensing, Terminology in Remote Sensing, Types of Remote sensing, advantage and disadvantage of remote sensing data, Electromagnetic radiation atmospheric. Windows remote sensing platforms and sensors systems, path-row referencing system, remote sensing data product, procedure for obtaining satellite data. Hardware and software related to remote sensing.

Different types of platforms, sensors and their characteristics, Orbital parameters of a satellite, Multi concept in remote sensing.

Image Interpretation and analysis: Elements of visual image interpretation, Digital image pre-processing, radiometric correction, geometric correction, resolution of remote sensing data, image enhancement, contract enhancement, spatial filtering band rationing

image classification supervised and unsupervised classification, remote sensing applications in forestry, geology, hydrogeology, Land use and land cover mapping.

Principles of interpretation of aerial and satellite images, equipments and aids required for interpretation, ground truth – collection and verification, advantage of multiband and multiband images. Digital image Processing concept.

Geographic Information System (GIS): Fundamental of GIS: Basis concept including definition and history of GIS, Essential Elements of GIS, Uses and users of GIS, General GIS Applications, Geodesy, Grids, Datum's and projection systems, GIS Data structure, Data Formats, GIS layers and Digitization overview of GPS and its application, Hardware and software related to GIS.

Raster and vector Based GIS: Raster based GIS, Definition of Raster Based GIS, Spatial Referencing Definition and Representation of Raster Data. Vector based GIS, Definition and concept of vector based GIS, Data structure, Data Capture and Basic operations of spatial analysis, advantages and disadvantage in raster and vector based GIS, Introduction to network in GIS, GIS Project Planning Management and Implementation.

Application of GIS :in Map revision, Land use, Agriculture, Forestry, Archaeology, Municipal, Geology, water resources, soil Erosion, Land suitability analysis, change detection, Use of GIS in Mining.

PI 341A Open Elective-II: Principles of Management & Economics

3L

3 Hrs, MM: 100

Introduction: Definition of management; Historical developments. Evolution of management; various schools of management theories; management functions; principles of management.

Types of organization: Organization and organization structures; Line, staff, function and committee type structures of organizations; flow of responsibility and authority in organization. Types of business organizations: sole proprietorship, partnership, private and public limited, co-operative societies, public sectors, joint sectors- their formation and dissolution.

Personnel management: Objectives of personnel management; functions of personnel management; nature of personnel management.

Economic analysis: Money time relationship; Law of supply and demand, Demand curves, demand elasticity, equilibrium concept, economies of scale.

Financial management: Assets and liabilities; balance sheet; profit and loss accounts, ratio analysis.

Operations management: Introduction to operations management; history, function and scope of operations management, areas of operations management; general model of managing operations; Introduction to production planning and control.

Introduction to marketing management; Budget and budgetary control; Purchasing process; Motivation; Leadership; Moral, job satisfaction.

SE 341A Open Elective-II :Structural Dynamics

3L

3 Hrs, MM: 100

Vibrations of single degree of freedom system, sources of vibration, Types of vibration, Degree of freedom, spring action and damping, equation of motion of single degree of freedom system, undamped system of single degree of freedom, combination of stiffnesses, damped system of single degree of freedom, dry friction, damping forced vibration of damped system, introduction to multi degree freedom system.

SYLLABUS OF OPEN ELECTIVES-III

BCT 391 A Open Elective-III: Climate Responsive Architecture

3L,

3 Hrs, MM 100

Understanding Climate and its impact on architectural design, fundamentals of climatology and environmental studies.

Introduction – Elements of Climate, measurement and representation of climatic data. Classification of climate, major climatic zones of India.

Thermal Comfort: Effect of climatic elements on Thermal comfort; indices for Thermal comfort Thermal performance of building elements: Thermal and physical properties of building materials and their effect on indoor environments.

Natural ventilation: Functions, effects of openings and external features on internal air circulation. Design considerations for achieving natural ventilation.

Sun path diagram, use of solar charts, types of shading devices

Day light factor: components, design considerations for indoor spaces

Micro Climate: factors and effects

Construction techniques for improving thermal performance of walls and roofs. Passive cooling techniques: traditional and contemporary

Design considerations for buildings and settlements in tropical climates with special reference to hot-dry, warm-humid and composite

climates; Mahoney Tables.

Exercises:

Design of shading devices.

Layout of Residence for hot - dry, warm-humid and composite climates.

CE 391A Open Elective-III: Ecosystem & Biodiversity

3L,

3 Hrs, MM 100

Concept of an ecosystem, structure & function of ecosystem, Bio-Geo chemical cycles (Hydrological, carbon, oxygen, nitrogen, phosphorus & sulphur cycle), energy flow in ecosystem, food chain

Major ecosystems (Description only) : Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystem, Riverine and stream ecosystem, Marine ecosystem, Estuarine ecosystem.

Biodiversity : Definition and its importance. Biodiversity at global, national & local level. Hot spots of biodiversity, Threats to biodiversity & causes of biodiversity loss. Conservation of biodiversity.

Value of biodiversity: Consumptive use, productive use, social value, ethical value, aesthetic value& optional value.

Bio-geographical classification of India. India as mega- diversity nation

ChE 391 A Open Elective-III: Nanotechnology

3L,

3 Hrs, MM 100

Introduction to Nanotechnology: Introduction to nanotechnology and materials, Nanomaterials, Introduction to nano sizes and properties comparison with the bulk materials, different shapes and sizes and morphology.

Fabrication of Nanomaterials: Wet Chemical Synthesis Methods, Colloidal Nanoparticles Production, Sol Gel Methods, Microwave and Atomization, Gas phase Production Methods : Chemical Vapour Depositions.

Kinetics at Nanoscale: Nucleation and growth of particles, Issues of Aggregation of Particles, Layers of surface Charges, Zeta Potential and pH.

Carbon Nanomaterials: Synthesis of carbon buckyballs, List of stable carbon allotropes extended fullerenes, metallofullerenes solid C60, bucky onions nanotubes.

Nanomaterials characterization: Instrumentation Fractionation principles of Particle size measurements, Particle size and its distribution, XRD, Zeta potential Microscopies SEM, TEM, Atomic Forced Microscopy, Scanning and Tunneling Microscopy

Applications in Chemical Engineering: Self-assembly and molecular manufacturing : Surfactant based system Colloidal system applications, ZnO,TiO₂, Silver Nanoparticles Functional materials Applications, Production Techniques of Nanotubes, Carbon arc, bulk synthesis, commercial processes of synthesis of nanomaterials, Nanoclay, Commercial case study of nano synthesis - applications in chemical engineering.

EC 391 A Open Elective-III: Electronic Instrumentation

3L

3 Hrs, MM:100

Transducers: Construction, characteristics and circuits for common types of resistive, capacitive, inductive, magneto-structive; piezo-electric. Photo-electric and thermo-electric transducers for measurement of process physical variables. Various sensing elements and transducers for measurement of Force, Pressure, Humidity, Moisture, strain, Velocity, Acceleration and pH. Inductive and Capacitive proximity switches. Physical and electrical loading of and by the transducer Systems.

Signal Conditioning: Analog and digital signal conditioning for instrumentation. Objectives of DAS, components of analog DAS and digital Data acquisition system, digital data recording system, multi channel DAS, modern digital acquisition system.

Electronic Displays: Principle of LED numeric, matrix and alpha-numeric displays, flat panel CRT, LCD, electro-luminiscent and electrophoretic and touch screen displays.

EE 391 A Open Elective III: Soft Computing Techniques

3L

3 Hours, 100 Marks

Soft Computing : Introduction of soft computing, soft computing vs. hard computing, various types of soft computing techniques, applications of soft computing.

Artificial Intelligence : Introduction, Various types of production systems, characteristics of production systems, breadth first search, depth first search techniques, other Search Techniques like hill Climbing, Best first Search, A* algorithm, AO* Algorithms and

various types of control strategies. Knowledge representation issues, Propositional and predicate logic, monotonic and non monotonic reasoning, forward Reasoning, backward reasoning, Weak & Strong Slot & filler structures, NLP.

Neural Network : Structure and Function of a single neuron: Biological neuron, artificial neuron, definition of ANN, Taxonomy of neural net, Difference between ANN and human brain, characteristics and applications of ANN, single layer network, Perceptron training algorithm.

Fuzzy rule base system : fuzzy propositions, formation, decomposition & aggregation of fuzzy rules, fuzzy reasoning, fuzzy inference systems, fuzzy decision making & Applications of fuzzy logic.

EE 392 A Open Elective III: Energy Conservation

3L

3 Hours, 100 Marks

Elements of Energy Conservation and Management : General energy problem, Sector wise Energy consumption, demand supply gap, Scope for energy conservation and its benefits, Energy conservation Principle Maximum energy efficiency, Maximum cost effectiveness. Mandatory provisions of EC act Features of EC act Standards and labeling, designated consumers, Energy Conservation Building Codes (ECBC). Energy management concept and objectives Initializing Planning, Leading, Controlling, Promoting, Monitoring and Reporting, energy management programmes.

Energy Conservation Approaches In Industries : energy saving opportunities in electric motors Benefits of Power factor improvement and its techniques Shunt capacitor, Synchronous Condenser etc., Effects of harmonics on Motors, and remedies leading to energy conservation Energy conservation by VSD Methods and techniques of energy conservation in ventilation and air conditioners compressors pumps, fans and blowers Area Sealing, Insulating the Heating / cooling fluid pipes, automatic door closing Air curtain, Thermostat / Control Energy conservation in electric furnaces, ovens and boilers lighting techniques Natural, CFL, LED lighting sources and fittings

Energy Conservation in Power Generation, Transmission and Distribution : Performance improvement of existing power plant: cogeneration, small hydro, DG Set. Demand side management Load response programmes Types of tariff and restructuring of electric tariff Technical measures to optimize T and D losses.

Ma 391 A Open Elective-III: Advanced Numerical Analysis

3L

3 Hrs., MM : 100

Solution of Algebraic and Transcendental Equations: Newton-Raphson method for real multiple roots, for complex roots and for system of non-linear equations; Synthetic Division, Birge-Vieta Method.

Solution of simultaneous Linear Equations and Eigen Value Problems: Direct methods: Gauss-elimination, Gauss-Jordan, Iterative Methods: Jacobi iteration, Gauss-seidel iteration and Successive Relaxation method. Eigen value Problems: power method Curve fitting and Function Approximation: Chebyshev approximations, Chebyshev Expansion, Chebyshev Polynomials.

Economization of Power Series.

Numerical Solution of Partial Differential Equations: Finite difference Approximation to partial derivatives. Solution of Laplace and poisson equations, Solution of one and two dimensional heat and wave equation by the method of separation of variables.

ME 391A Open Elective-III: Design Planning and Control of Production System

3L

3 Hrs, MM:100

Production Planning: Planning horizon, product exploring, Make and buy decisions, operations planning, demand forecasting, conversion of forecast into production goal.

Scheduling: Operation sequencing and balancing, Scheduling for mass production and job order production, MRP, ERP.

Inventory System: Cost factors relevant to operations and inventory control, EOQ with shortages and uniform production, quantity discount.

Project Planning and Control: Network control, control cost consideration and optimization, Resource allocation and levelling, Aggregate production planning, decision rules.

Supply Chain Management:: Strategic framework of Supply chain – meaning, scope and performance of supply chain, supply chain drivers and obstacles. Role of e-business in a supply chain.

ME 392A Open Elective-III: Finite Elements Method

3L

3 Hrs, MM:100

System Fundamental Concept: System definition, systems approach, Classification- General Systems, Discrete Systems, Controlled systems.

Procedure for Engineering a system: Defining system objective, formulation of objective criteria, Development of system alternatives. Systems Optimization: Formulation of system, Design problem and application of search methods, Linear programming and dynamic programming for optimum solutions.

System Schedule: Time models, resource allocation, Time cost trade-off, system cost economic flow graph.

MI 391A Open Elective-III: Project Environment Clearance

3L

3 Hrs, MM:100

Brief introduction of Environment Protection Act 1986 and other relevant legal provisions applicable to get environment clearance in India.

Impact of major engineering projects on various components of the environment: Socio-Economy, Land, Water, Air, Noise and others.

Preparation of Environment management plan: Public hearing, collecting baseline data, Environment impact assessment and predication, Environment management plan, environment monitoring and management.

PI 391A Open Elective-III: Quality Management

3L

3 Hrs,MM: 100

Introduction: History of Quality, Objectives , importance and need of quality, Contributions of Quality Gurus- Juran, Deming, Crosby, Feigenbaum, Ishikawa, Taguchi etc., Impact of Quality on business performance.

Process and Statistical Quality Control: Quality System; Quality control techniques; Process capability; Control Charts- Theory of control charts, control limits and specification limits, Control charts for variables-X R Charts, Control Charts for attributes p, np, c and u charts. —

Acceptance Sampling : Fundamental concepts of acceptance sampling; OC Curves; Single , Double and multiple sampling;

Quality Management: Introduction to Quality management; quality control and quality assurance; Quality control tools; cost of quality and cost of poor quality.

ISO 9000: ISO 9000 series; terminologies; need for ISO 9000 certification; basic procedure and work instructions; steps in ISO 9000 registration; Internal and third party audit for registration; Clauses of ISO 9000-2000 .

SE 391A Open Elective-III :Finite Element Method

3L

3 Hrs,MM: 100

Introduction to Finite Element Method, Basic Concept of Finite Element Method, Analysis of continuum:- Structural, thermal, Potential etc., Finite Element Analysis of an elastic continuum:- Displacement approach, Direct Formulation, Energy Integral, Co and C1 continuity, Convergence criteria.

Elements:- Types and Properties. Conforming and Non conforming.

Shape Functions:- Langrangian and Serendity family for one and two dimensional cases.

Pascal triangle, Super / Sub and Iso parametric elements.

Steps in Finite Element Analysis of an elastic continuum.