PONDICHERRY UNIVERSITY

Structure and Detailed Syllabus

Four years Multidisciplinary Undergraduate Programme
with Multiple Exit options in

GEOGRAPHY

B.Sc. Geography Degree (Honours)

with effect from the Academic Session

2023-24

Contents

1. NEP 2020 Regulations
2. Summary Table of Credit Distribution for the Award under Each Category
3. Semester wise Structure of Credits for the Undergraduate Programme as per the NEP 2020 Guidelines and Hours of Teaching per Week
4. Course Wise Scheme of Examination for B.Sc. Geography as per NEP 2020
    - A. Course Pattern (MAJOR) and Scheme of Examination for B.Sc. Geography Programme as per NEP 2020
    - B. Course Pattern (MINOR) and Scheme of Examination for B.Sc. Geography Programme as per NEP 2020
    - C. Course Pattern (MULTI-DISCIPLINARY) and Scheme of Examination for B.Sc. Geography Programme as per NEP 2020
    - D. Course Pattern (Ability Enhancement courses (language)) and Scheme of Examination for B.Sc. Geography Programme as per NEP 2020
    - E. Course Pattern (Skill Enhancement courses) and Scheme of Examination for B.Sc. Geography Programme as per NEP 2020
    - F. Course Pattern (Value- Added Courses) and Scheme of Examination for B.Sc. Geography Programme as per NEP 2020
    - G. Other courses (GEO-WP and GEO-RP)
5. Semester-wise Structure of Credits for B.Sc. Geography Programme as per the NEP 2020
6. Detailed Syllabus

PONDICHERRY UNIVERSITY

NEP 2020 - REGULATIONS

1. INTRODUCTION

- Government of India has launched the National Education Policy (NEP – 2020) encompassing radical changes in the delivery and governance of Higher Education in India.
- Pondicherry University is adopting to implement the NEP curriculum framework from the Academic Year 2023-24 across all Academic Programmes.
- Pondicherry University NEP Regulations provide clear procedure for implementation of different provisions of NEP in Higher Education in terms of Undergraduate Degree (Honours/ Honours with Research) programmes.
- Whereas the University seeks to enforce the academic disciplines to adopt to the spirit of NEP in terms of entry-exit requirements, academic bank of credits and credit transfers.
- Whereas the regulations ought to preserve the academic autonomy of the Schools/ Departments in formulating curriculum, outlining learning outcome descriptors, pedagogical approaches, evaluation methods and assignment of grades.
- These regulations are poised for skill development, inter/multi-disciplinary learning, wider access and inclusiveness and entrepreneurship.

1.1 Major Highlights

a) NEP-Regulations are applicable from the Academic Year 2023-24
b) All Schools/ Departments are mandated to launch Integrated UG (Honours/ Honours with Research) with entry-exit facility
c) These academic programs will have lateral entry facility in all the years of study
d) First Year ends with the award of a Certificate, second year with a Diploma, third year with a UG degree and fourth year ends with an Honours/ Honours with Research Degree.
e) Existing CBCS system will be replaced with comprehensive Pondicherry University NEP-Regulations.
f) Skill development and holistic-multi-disciplinary learning are the focus of NEP.
g) Summer vacation is proposed for conducting Internships/ field studies/ exploring/ scientific innovations/ conducting social/community outreach programmes and other similar field work related programmes.
h) Boards of Studies with inputs from programme committee would design curriculum as per the NEP guidelines of Pondicherry University outlined hereunder.
i) Faculty members are encouraged to design courses having components of job-oriented skills. They are also encouraged to adopt innovative methods of Teaching-Learning for imparting the same and to have suitable assessment practices.
j) Internationalisation of Higher Education is encouraged by designing Joint/ Dual/ twinning Degree programmes under MoU with Foreign Universities/ National Institutes.
k) All Departments/Schools to network with Industry/ R&D Labs/ PSUs/ Govt. Departments/Academic Institutions for facilitating student internships.
l) Overall monitoring and implementation of NEP-2020 will be the responsibility of a standing committee of NEP.

1.2 Transformative initiatives in Higher Education envisaged by NEP

a) Introduce holistic and Multidisciplinary undergraduate Education, that would help develop all capacities of human beings – intellectual, aesthetic, social, physical, emotional, ethical and moral – integrating other soft skills along with specialised immersion in academics.

b) The transformed education should improve employability of students by providing internships/ skill development.

c) The hard separation line between General Education, vocational Education and experiential learning will be removed, mobility between such different types of learning is to be smoothened by creditising every learning.

d) Holistic education across the sciences, social sciences, arts, humanities and sports.

e) Credit based courses on community engagement and service, environmental education, and value-based education.

f) Opportunities for Internships with local industry, businesses, artists and craft persons to improve the employability of students.

g) Flexibility for students to move from one institution to another.

h) Learning Outcome based approach to Higher Education

2. SHORT-TITLE AND DEFINITIONS

2.1 Short-title, Commencement and Application

a) The Regulations brought out to implement GOl's National Education Policy shall be called as NEP-Regulations of Pondicherry University – 2023.

b) These Regulations shall come into force from the Academic Year 2023-24.

c) These Regulations shall apply to all the Schools/Departments and Centres of the University for award of Degrees/ Diplomas/ Certificates.

d) The UG/PG programmes governed by other statutory bodies/professional associations including NCTE, AICTE, BCI will adopt the pattern approved by those organisations.

2.2 Definitions

Terms used in the NEP – Regulations shall have the meaning assigned to them as given below unless the context otherwise requires.

a) **"Credit"** is a unit by which the coursework is measured. It determines the number of hours of instruction required per week during a semester (Minimum 15 weeks). One credit is equivalent to 15 hours of teaching (lecture and/or tutorial) or 30 hours of practical and/or field work or community engagement and service per semester.

b) **"Academic Year"** means the year starting on 1st day of July and ending on the 30th day of succeeding June.

c) **"Semester"** means 15-16 weeks of teaching–learning session of which two weeks shall be set apart for examination and evaluation; A semester comprises 90 working days and an academic year is divided into two semesters.

d) **"Summer term"** is for 8 weeks during summer vacation. Internship/ apprenticeship/work based vocational education and training can be carried out during the summer term, especially by students who wish to exit after two semesters or four semesters of study.

e) **"Grade"** means a letter grade assigned to a student in a Course for her/his performance at academic sessions as denoted in symbols of: O (outstanding), A+ (Excellent), A (Very good), B+ (Good), B (Above average), C (Average), P (Pass), F (Fail) and Ab (Absent) with a numeric value of 0=10, A+=9, A=8, B+=7, B=6, C=5, P=4, and F=O, Ab=O.

f) **"Semester Grade Point Average (SGPA)"** is computed from the grades as a measure of the students' performance in a given semester.

g) **"Cumulative GPA (CGPA)"** is the weighted average of all courses the student has taken in a given Programme;

h) **"Odd and Even Semester" "Odd Semester"** means a Semester that starts on the 2nd week of July of the Academic year and ends on the last week of November of the Academic year; and **"Even Semester"** means a Semester starting on the 2nd week of December and ending on the 4th week of succeeding April of an Academic year;

i) **"Programme"** means a set of Courses that allows a student to structure and study to attain the status of being admitted to a Degree/Diploma of the University;

j) **"Programme Committee"** means an Academic Committee constituted by the University for the purpose of conducting an Academic Programme;

k) **"Credit Requirement"** for a Degree/ Diploma/ Certificate Programme means the minimum number of credits that a student shall accumulate to achieve the status of being qualified to receive the said Degree, Diploma/ Certificate as the case may be;

l) **"Exit option"** means the option exercised by the students, to leave the Programme at the end of any given Academic year;

m) **"Lateral entry"** means a student being admitted into an ongoing Programme of the University other than in the 1st year of the programme.

2.3 Duration of the Programme

The duration of the UG programme is 4 years or 8 semesters. Students who desire to undergo a 3-year UG Programme will be allowed to exit after completion of the 3rd year. If a student wants to leave after the completion of the first or second year, the student will be given a UG Certificate or UG Diploma, respectively, provided they secure the prescribed number of credits (as given in table below). Students who exit with a UG certificate or UG diploma are permitted to re-enter within three years and complete the degree programme. Students may be permitted to take a break from the study, they are allowed to re-enter the degree programme within 3 years and complete the programme within the stipulated maximum period of seven years.

2.4 Eligibility for the UG Programme

Senior Secondary School Leaving Certificate or Higher Secondary (12th Grade) Certificate obtained after successful completion of Grade 12 or equivalent stage of education corresponding to Level A (Levels in NHEQF).

3. AWARDING OF UG CERTIFICATE, UG DIPLOMAS AND DEGREES

UG Certificate: Students who opt to exit after completion of the first year and have secured 40 credits will be awarded a UG certificate if, in addition, they complete one vocational course of 4 credits during the summer vacation of the first year.

UG Diploma: Students who opt to exit after completion of the second year and have secured 80 credits will be awarded the UG diploma if, in addition, they complete one vocational course of 4 credits during the summer vacation of the second year.

3-year UG Degree: Students who wish to undergo a 3-year UG programme will be awarded UG Degree in the Major discipline after successful completion of three years, securing 120 credits and satisfying the minimum credit requirement as mentioned in table below.

4-year UG Degree (Honours): A four-year UG Honours degree in the major discipline will be awarded to those who complete a four-year degree programme with 160 credits and have satisfied the credit requirements as mentioned in table below.

4-year UG Degree (Honours with Research): Students who secure 75% marks and above in the first six semesters and wish to undertake research at the undergraduate level can choose a research stream in the fourth year. They should do a research project or dissertation under the guidance of a faculty member of the University College. The research project dissertation will be in the major discipline. The students who secure 160 credits, including 12 credits from a research project/ dissertation, are awarded UG Degree (Honours with Research).

4. STRUCTURE OF THE UNDERGRADUATE PROGRAMME

Every Integrated Programme offered by the University shall confirm to the structure specified hereunder. A programme must mandate the students to complete 120 credits to complete a basic Bachelor's Degree within first 3 years. With an additional 40 credits of course work one can pursue 4th Year Honours or Honours with Research Degree. The UG Programme will consist of the following categories of courses and the minimum credit requirements for 3-year UG and 4-year UG(Honours) or UG (Honours with Research) programmes are given below.

Summary Table of Credit Distribution for the Award under Each Category

S. No.	Broad Category of Course	Minimum Credit Requirement			
		1-year Certificate	2-year Diploma	3-year B.Sc. Degree	4-Year B.Sc. Degree with Honours
1	Major (GEO-MJD) (including summer internship)	8	28	60	80
2	Minor (GEO-MID)	8	16	24	32
3	Multi-disciplinary (GEO-MLD)	6	9	9	9
4	Ability Enhancement Courses (GEO-AEC)	4	8	8	8
5	Skill Enhancement Courses (GEO-SEC)	6	9	9	9
6	Value Added Courses common for all UG (GEO-VAC)	8	8	8	8
7	Research Project / Dissertation (GEO-RP)	-	-	-	12
8	Community Engagement and Service (GEO-WP) (winter project)	-	2	2	2
	Total	**40**	**80**	**120**	**160**

Semester wise Structure of Credits for the Undergraduate Programme as per the NEP 2020 Guidelines and Hours of Teaching per Week

Figures in the parenthesis indicates the Credit Distribution

Semester	Level of Teaching	Major Discipline (MJD)	Minor Discipline (MID)*	Multi-Disciplinary Courses (MLD)	Ability Enhancement courses (language) (AEC)	Skill Enhancement courses (SEC)	Common Value- Added Courses (VAC)	Total Credits
I	100 Level	GEO-MJD - 1: Physical Geography (4)	GEO-MID-1(A): History of India (4) GEO-MID-1(B): Basic Sociology (4) GEO-MID-1(C): Climatology (4) **Choose any one**	GEO-MLD-1: Basic Botany (3) **Compulsory**	GEO-AEC-1: English (2)	GEO-SEC-1(A): Simple Astronomical Calculation and Scale (P#) (3) GEO-SEC-1(B): Sustainable Forest Resource Management (3) GEO-SEC-1(C): Geoinformatics for Forest Resource Management (3) **Choose any one**	GEO-VAC-1: Environmental Studies (2) GEO-VAC-2: Understanding India (2) [Theory/ Field Based] (NEP Value Added Common courses I & II) **Compulsory**	**20**
Hours of Teaching per week		6	6	6	3	6	3 + 3	**Total Teaching hours per week - 33**

*Students to choose any one streams of minor courses (Allied/ Specialization/ Elective)

For Practical Papers, the 6 hours per week class will consist of 4 hours of teaching and 2 hours of tutorials

Assessment for **Theory Papers** – Attendance – 5 Marks; Mid-Semester Exam (one only) – 20 Marks; End Semester Exam – 75 Marks = Total 100 Marks

Assessment for **Practical Papers** – Viva – 20 Marks; Record – 30 Marks; End Semester Exam – 50 Marks = Total 100 Marks

Semester	Level of Teaching	Major Discipline (MJD)	Minor Discipline* (MID)	Multi-Disciplinary Courses (MLD)	Ability Enhancement courses (language) (AEC)	Skill Enhancement courses (SEC)	Common Value- Added Courses (VAC)	Total Credits
II	100	GEO-MJD – 2: Human Geography (4)	GEO-MID-2(A): Land Measurement and Division (P#) (4) GEO-MID-2(B): Psychology (4) GEO-MID-2(C): Industrial Geography (4) **Choose any one**	GEO-MLD-2: Basic Zoology (3) **Compulsory**	GEO-AEC-4: Modern Indian Language (Hindi/ Bangla/ Tamil/ Telegu) (2)	GEO-SEC-2(A): Remote Sensing & GIS (P#) (3) GEO-SEC-2(B): Geospatial Application for Disaster Management (3) GEO-SEC-2(C): Remote Sensing for Water Resource Management (3) **Choose any one**	GEO-VAC-3: Health and Wellbeing (2) GEO-VAC-4: Digital Technology (2) [Theory/ Field Based] (NEP Value Added Common courses I & II) **Compulsory**	**20**
Hours of Teaching per week		6	6	6	3	6	3 + 3	**Total Teaching hours per week - 33**

*Students to choose any one streams of minor courses (Allied/ Specialization/ Elective)

For Practical Papers, the 6 hours per week class will consist of 4 hours of teaching and 2 hours of tutorials

Assessment for **Theory Papers** – Attendance – 5 Marks; Mid-Semester Exam (one only) – 20 Marks; End Semester Exam – 75 Marks = Total 100 Marks

Assessment for **Practical Papers** – Viva – 20 Marks; Record – 30 Marks; End Semester Exam – 50 Marks = Total 100 Marks

Semester	Level of Teaching	Major Discipline (MJD)	Minor Discipline* (MID)	Multi-Disciplinary Courses (MLD)	Ability Enhancement courses (language) (AEC)	Skill Enhancement courses (SEC)	Total Credits
III	200	GEO-MJD - 3: Geography of India (4) GEO-MJD - 4: Cartographic Techniques (P#) (4)	GEO-MID-3(A): Computer Application (4) GEO-MID-3(B): Transport Geography (4) GEO-MID-3(C): Fundamentals of Geoinformatics (4) **Choose any one**	GEO-MLD-3: Public Administration (3) **Compulsory**	GEO-AEC-5: English (2)	GEO-SEC-3(A): Statistics for Geographers (P#) (3) GEO-SEC-3(B): Basics of Cartography (P#) (3) GEO-SEC-3(C): Geography of Andaman and Nicobar Islands (3) **Choose any one**	**20**
Hours of Teaching per week		6 + 6	6	6	3	6	**Total Teaching hours per week - 33**

FOR GEO-WP students to undergo 15 days Community Engagement Service in the END of SEMESTER III (Winter-Break)

*Students to choose any one streams of minor courses (Allied/ Specialization/ Elective)

For Practical Papers, the 6 hours per week class will consist of 4 hours of teaching and 2 hours of tutorials

Assessment for **Theory Papers** – Attendance – 5 Marks; Mid-Semester Exam (one only) – 20 Marks; End Semester Exam – 75 Marks = Total 100 Marks

Assessment for **Practical Papers** – Viva – 20 Marks; Record – 30 Marks; End Semester Exam – 50 Marks = Total 100 Marks

Semester	Level of Teaching	Major Discipline (MJD)	Minor Discipline* (MID)	Ability Enhancement courses (language) (AEC)	Internship/ Winter Project/ Summer Project	Total Credits
IV	200	GEO-MJD - 5: Economic Geography (4) GEO-MJD - 6: Geomorphology (4) GEO-MJD - 7: Thematic Mapping (P#) (4)	GEO-MID-4(A): Basic content writing skills (4) GEO-MID-4(B): Disaster Management (4) GEO-MID-4(C): Natural Resource Management (4) **Choose any one**	GEO-AEC-8: Modern Indian Language (Hindi/ Bangla/ Tamil/ Telegu) (2)	GEO-WP- Community engagement and Service (2) – Generating solutions to real life problems (Winter project will be of 15 days to be conducted in the ***winter break after the end of Semester III***. Students will prepare a Report on the activities carried out for award of 2 credits) The Report will be evaluated in IVth Semester	**20**
Hours of Teaching per week		6 + 6 + 6	6	3	6	**Total Teaching hours per week - 33**

FOR GEO-MJD 11 students to undergo 60 days Internship at the END of SEMESTER IV (Summer-Break)

*Students to choose any one streams of minor courses (Allied/ Specialization/ Elective)

For Practical Papers, the 6 hours per week class will consist of 4 hours of teaching and 2 hours of tutorials

Assessment for **Theory Papers** – Attendance – 5 Marks; Mid-Semester Exam (one only) – 20 Marks; End Semester Exam – 75 Marks = Total 100 Marks

Assessment for **Practical Papers** – Viva – 20 Marks; Record – 30 Marks; End Semester Exam – 50 Marks = Total 100 Marks

Semester	Level of Teaching	Major Discipline (MJD)	Minor Discipline* (MID)	Internship/ Winter Project/ Summer Project	Total Credits
V	300	GEO-MJD - 8: Disaster Risk Reduction (4) GEO-MJD - 9: Hydrology & Oceanography (4) GEO-MJD - 10: Topographical Maps and Weather Maps (P#) (4)	GEO-MID-5(A): Political Science (Indian Constitution and UN) (4) GEO-MID-5(B): Human Rights (4) GEO-MID-5(C): Local Self Government in India (with special reference to A&N Islands) (4) **Choose any one**	GEO- MJD - 11: Summer Internship (4) (Students need to conduct the internship for 60 days during the ***summer holidays after Semester IV***) *The Report will be evaluated in the Vth Semester*	**20**
Hours of Teaching per week		6 + 6 + 6	6	6	**Total Teaching hours per week - 30**

*Students to choose any one streams of minor courses (Allied/ Specialization/ Elective)

For Practical Papers, the 6 hours per week class will consist of 4 hours of teaching and 2 hours of tutorials

Assessment for **Theory Papers** – Attendance – 5 Marks; Mid-Semester Exam (one only) – 20 Marks; End Semester Exam – 75 Marks = Total 100 Marks

Assessment for **Practical Papers** – Viva – 20 Marks; Record – 30 Marks; End Semester Exam – 50 Marks = Total 100 Marks

Semester	Level of Teaching	Major Discipline (MJD)	Minor Discipline* (MID)	Total Credits
VI	300	***GEO-MJD - 11: Summer Internship (Evaluation only)*** GEO-MJD - 12: Evolution of Geographical Thought (4) GEO-MJD - 13: Social Geography (4) GEO-MJD - 14: Gender Geography (4) GEO-MJD - 15: Map Projection (P#) (4)	GEO-MID-6(A): Leadership and Managerial Skills (4) GEO-MID-6(B): Basic Photographic Skills (P#) (4) GEO-MID-6(C): Problem Solving and Decision Making Skills (4) **Choose any one**	**20**
Hours of Teaching per week		6 + 6 + 6 + 6	6	**30**

*****Students to choose any one streams of minor courses (Allied/ Specialization/ Elective)

[#] For Practical Papers, the 6 hours per week class will consist of 4 hours of teaching and 2 hours of tutorials

Assessment for **Theory Papers** – Attendance – 5 Marks; Mid-Semester Exam (one only) – 20 Marks; End Semester Exam – 75 Marks = Total 100 Marks

Assessment for **Practical Papers** – Viva – 20 Marks; Record – 30 Marks; End Semester Exam – 50 Marks = Total 100 Marks

Semester	Level of Teaching	Major Discipline (MJD)	Minor Discipline* (MID)	Total Credits
VII	400	GEO-MJD - 16: Geography of Tourism (4) GEO-MJD - 17: Climate Change – Vulnerability & Adaptation (4) GEO-MJD - 18: Survey by Instruments and Field Visit (P#) (4)	GEO-MID-7(A): Development Economics (4) GEO-MID-7(B): World Geography (4) GEO-MID-7(C) Town Planning (4) **Choose any one** **AND** GEO-MID-8(A): Personality Development (4) GEO-MID-8(B): Entrepreneurship and Startup Management (4) GEO-MID-8(C): Culinary Skills (P#) (4) **Choose any one**	**20**
Hours of Teaching per week		6 + 6 + 6	6 + 6	**30**

*Students to choose any one streams of minor courses (Allied/ Specialization/ Elective)

For Practical Papers, the 6 hours per week class will consist of 4 hours of teaching and 2 hours of tutorials

Assessment for **Theory Papers** – Attendance – 5 Marks; Mid-Semester Exam (one only) – 20 Marks; End Semester Exam – 75 Marks = Total 100 Marks

Assessment for **Practical Papers** – Viva – 20 Marks; Record – 30 Marks; End Semester Exam – 50 Marks = Total 100 Marks

Semester	Level of Teaching	Major Discipline (MJD)	Dissertation/ Optional Papers	Total Credits
VIII	400	GEO-MJD - 19: Urban Geography (4) GEO-MJD - 20: Sustainability and Development (4)	GEO-RP: Research Project/ Dissertation (12) [Students who **scores 75% marks** and above in the first 6 Semesters and wish to undertake research at the UG level can choose a research stream in the 4th Year] **Or** GEO-MJD-21: Population Geography (4) GEO-MJD-22: Agriculture Geography (4) GEO-MJD-23: Political Geography (4)	**20**
Hours of Teaching per week		6 + 6	6 + 6 + 6	**30**

Assessment for **Theory Papers** – Attendance – 5 Marks; Mid-Semester Exam (one only) – 20 Marks; End Semester Exam – 75 Marks = Total 100 Marks

Assessment for **Practical Papers** – Viva – 20 Marks; Record – 30 Marks; End Semester Exam – 50 Marks = Total 100 Marks

Course Wise Scheme of Examination for B.Sc. Geography as per NEP 2020

A. Course Pattern (MAJOR) and Scheme of Examination for B.Sc. Geography Programme as per NEP 2020									
Semester	**Course Type**	**Course Name**	**Credits**	**Instruction hrs. per week**	**Total no. of hrs per Semester**	**Marks for the ESE[1]**	**Marks for IA[2] (Theory) & Record-Viva (Practical)**	**Total Marks**	**Duration of ESE (in hrs)**
I	GEO-MJD-1	Physical Geography	4	6	80	75	25	100	3
II	GEO-MJD-2	Human Geography	4	6	80	75	25	100	3
III	GEO-MJD-3	Geography of India	4	6	80	75	25	100	3
	GEO-MJD-4	Cartographic Techniques (P)	4	4+2	85	50	50	100	3
IV	GEO-MJD-5	Economic Geography	4	6	80	75	25	100	3
	GEO-MJD-6	Geomorphology	4	6	80	75	25	100	3
	GEO-MJD-7	Thematic Mapping (P)	4	4+2	85	50	50	100	3
V	GEO-MJD-8	Disaster Risk Reduction	4	6	80	75	25	100	3
	GEO-MJD-9	Hydrology and Oceanography	4	6	80	75	25	100	3
	GEO-MJD-10	Topographical Maps and Weather Maps (P)	4	4+2	85	50	50	100	3
	GEO-MJD-11	Summer Internship (Evaluation in Vth Sem)	4	Report and Presentation in the VIth Semester				100	-
VI	GEO-MJD-12	Evolution of Geographical Thought	4	6	80	75	25	100	3
	GEO-MJD-13	Social Geography	4	6	80	75	25	100	3
	GEO-MJD-14	Gender Geography	4	6	80	75	25	100	3
	GEO-MJD-15	Map Projection (P)	4	4+2	85	50	50	100	3
VII	GEO-MJD-16	Geography of Tourism	4	6	80	75	25	100	3
	GEO-MJD-17	Climate Change – Vulnerability & Adaptation	4	6	80	75	25	100	3
	GEO-MJD-18	Survey by Instruments and Field Visit (P)	4	4+2	85	50	50	100	3
VIII	GEO-MJD-19	Urban Geography	4	6	80	75	25	100	3
	GEO-MJD-20	Sustainability and Development	4	6	80	75	25	100	3

[1] ESE – End Semester Examination; [2] IA – Internal Assessment

B. Course Pattern (MINOR) and Scheme of Examination for B.Sc. Geography Programme as per NEP 2020									
Semester	**Course Type**	**Course Name**	**Credits**	**Instruction hrs. per week**	**Total no. of hrs per Semester**	**Marks for the ESE[1]**	**Marks for IA[2] (Theory) & Record-Viva (Practical)**	**Total Marks**	**Duration of ESE (in hrs)**
I (Choose any one)	GEO-MID-1(A)	History of India	4	6	80	75	25	100	3
	GEO-MID-1(B)	Basic Sociology	4	6	80	75	25	100	3
	GEO-MID-1(C)	Climatology	4	6	80	75	25	100	3
II (Choose any one)	GEO-MID-2(A)	Land Measurement and Division (P)	4	4+2	85	50	50	100	3
	GEO-MID-2(B)	Psychology	4	6	80	75	25	100	3
	GEO-MID-2(C)	Industrial Geography	4	6	80	75	25	100	3
III (Choose any one)	GEO-MID-3(A)	Computer Application	4	6	80	75	25	100	3
	GEO-MID-3(B)	Transport Geography	4	6	80	75	25	100	3
	GEO-MID-3(C)	Fundamentals of Geoinformatics (P)	4	4+2	85	50	50	100	3
IV (Choose any one)	GEO-MID-4(A)	Basic Content Writing Skills	4	6	80	75	25	100	3
	GEO-MID-4(B)	Disaster Management	4	6	80	75	25	100	3
	GEO-MID-4(C)	Natural Resource Management	4	6	80	75	25	100	3
V (Choose any one)	GEO-MID-5(A)	Political Science (Indian Constitution and UN)	4	6	80	75	25	100	3
	GEO-MID-5(B)	Human Rights	4	6	80	75	25	100	3
	GEO-MID-5(C)	Local Self Government in India (with special reference to A&N Islands)	4	6	80	75	25	100	3
VI (Choose any one)	GEO-MID-6(A)	Leadership and Managerial Skills	4	6	80	75	25	100	3
	GEO-MID-6(B)	Basic Photographic Skills (P)	4	4+2	85	50	50	100	3
	GEO-MID-6(C)	Problem Solving and Decision Making Skills	4	6	80	75	25	100	3
VII (Choose any one from GEO-MID-7 and one from GEO-MID-8)	GEO-MID-7(A)	Development Economics	4	6	80	75	25	100	3
	GEO-MID-7(B)	World Geography	4	6	80	75	25	100	3
	GEO-MID-7(C)	Town Planning	4	6	80	75	25	100	3
	GEO-MID-8(A)	Personality Development	4	6	80	75	25	100	3
	GEO-MID-8(B)	Entrepreneurship and Startup Management	4	6	80	75	25	100	3
	GEO-MID-8(C)	Culinary Skills (P)	4	4+2	85	50	50	100	3

[1] ESE – End Semester Examination; [2] IA – Internal Assessment

C. Course Pattern (MULTI-DISCIPLINARY) and Scheme of Examination for B.Sc. Geography Programme as per NEP 2020									
Semester	**Course Type**	**Course Name**	**Credits**	**Instruction hrs. per week**	**Total no. of hrs per Semester**	**Marks for the ESE[1]**	**Marks for IA[2]**	**Total Marks**	**Duration of Examination (in hrs)**
I	GEO-MLD-1	Basic Botany	3	3	45	75	25	100	3
II	GEO-MLD-2	Basic Zoology	3	3	45	75	25	100	3
III	GEO-MLD-3	Public Administration	3	3	45	75	25	100	3

[1] ESE – End Semester Examination; [2] IA – Internal Assessment

D. Course Pattern (Ability Enhancement courses (language)) and Scheme of Examination for B.Sc. Geography Programme as per NEP 2020									
Semester	**Course Type**	**Course Name**	**Credits**	**Instruction hrs. per week**	**Total no. of hrs per Semester**	**Marks for the ESE[1]**	**Marks for IA[2]**	**Total Marks**	**Duration of Examination (in hrs)**
I	GEO-AEC-1	English	2	3	45	75	25	100	3
II	GEO-AEC-4	MIL	2	3	45	75	25	100	3
III	GEO-AEC-5	English	2	3	45	75	25	100	3
IV	GEO-AEC-8	MIL	2	3	45	75	25	100	3

[1] ESE – End Semester Examination; [2] IA – Internal Assessment

E. Course Pattern (Skill Enhancement courses) and Scheme of Examination for B.Sc. Geography Programme as per NEP 2020									
Semester	**Course Type**	**Course Name**	**Credits**	**Instruction hrs. per week**	**Total no. of hrs per Semester**	**Marks for the ESE[1]**	**Marks for IA[2] (Theory) & Record-Viva (Practical)**	**Total Marks**	**Duration of Examination (in hrs)**
I (Choose any one)	GEO-SEC-1(A)	Simple Astronomical Calculations and Scale (P)	3	4+2	45	50	50	100	3
	GEO-SEC-1(B)	Sustainable Forest Resource Management	3	3	45	75	25	100	3
	GEO-SEC-1(C)	Geoinformatics for Forest Resource Management	3	3	45	75	25	100	3
II (Choose any one)	GEO-SEC-2(A)	Remote Sensing and GIS (P)	3	4+2	45	50	50	100	3
	GEO-SEC-2(B)	Geospatial Application for Disaster Management	3	3	45	75	25	100	3
	GEO-SEC-2(C)	Remote Sensing for Water Resource Management	3	3	45	75	25	100	3
III (Choose any one)	GEO-SEC-3(A)	Statistics for Geographers (P)	3	4+2	45	50	50	100	3
	GEO-SEC-3(B)	Basics of Cartography (P)	3	4+2	45	50	50	100	3
	GEO-SEC-3(C)	Geography of Andaman and Nicobar Islands	3	3	45	75	25	100	3

[1] ESE – End Semester Examination; [2] Internal Assessment

F. Course Pattern (Value- Added Courses) and Scheme of Examination for B.Sc. Geography Programme as per NEP 2020

Non-Audit Courses

Semester	Course Type	Course Name	Credits	Details of Assessment
I	GEO-VAC-1	Environmental Studies	2	Students to **visit places** of environmental degradation, climate change and pollution, waste dumping grounds, forest and wildlife and prepare **report** on the effective management of these environmental issues for sustainable development
	GEO-VAC-2	Understanding India	2	Theory/ Field Based
II	GEO-VAC-3	Health and Wellbeing	2	Theory/ Outdoor Activities **Sports and fitness activities** (Yoga/ Sports/ Games) will be organized outside the regular institutional working hours to prepare students physically and mentally for their personality development
	GEO-VAC-4	Digital Technology	2	**Classes** for awareness in Artificial Intelligence (AI), 3-D machining, big data analysis, machine learning, drone technologies, Deep learning and Cloud computing

G. Other courses (GEO-WP and GEO-RP)				
Semester	**Course Type**	**Course Name**	**Credits**	**Details of Assessment**
IV	GEO-WP *(Report will be evaluated in the IVth Sem)*	Community Engagement and Service – Generating solutions to real life problems	2	→ Winter project will be of 15 days → To be conducted in the winter break after the ***end of Semester III*** → Students will prepare a Report on the activities carried out → Total Credit for WP – 2 credits *The Report will be evaluated in IVth Semester*
VIII	GEO-RP **OR** GEO-MJD-21 GEO-MJD-22 GEO-MJD-23	Research Project/ Dissertation **OR** GEO-MJD-21: Population Geography GEO-MJD-22: Agriculture Geography GEO-MJD-23: Political Geography	12	100 Marks

SEMESTER WISE STRUCTURE OF CREDITS FOR

B.SC. GEOGRAPHY PROGRAMME AS PER THE NEP 2020

Course		Title of the Paper	Credits Allotted
SEMESTER-I			
GEO-MJD - 1	Compulsory	Physical Geography	04
GEO-MID-1(A) GEO-MID-1(B) GEO-MID-1(C)	Choose any one	History of India Basic Sociology Climatology	04
GEO-MLD-1	Compulsory	Basic Botany	03
GEO-AEC-1	Compulsory	English	02
GEO-SEC-1(A) GEO-SEC-1(B) GEO-SEC-1(C)	Choose any one	Simple Astronomical Calculation and Scales (P) Sustainable Forest Resource Management Geoinformatics for Forest Resource Management	03
GEO-VAC-1	Compulsory	Environmental Studies	02
GEO-VAC-2	Compulsory	Understanding India	02
Semester I Credits			**20 Credits**
SEMESTER-II			
GEO-MJD – 2	Compulsory	Human Geography	04
GEO-MID-2(A) GEO-MID-2(B) GEO-MID-2(C)	Choose any one	Land Measurement and Division (P) Psychology Industrial Geography	04
GEO-MLD-2	Compulsory	Basic Zoology	03
GEO-AEC-4	Compulsory	Modern Indian Language (Hindi/ Bangla/ Tamil/ Telegu)	02
GEO-SEC-2(A) GEO-SEC-2(B) GEO-SEC-2(C)	Choose any one	Remote Sensing & GIS (P) Geospatial Application for Disaster Management Remote Sensing for Water Resource Management	03
GEO-VAC-3	Compulsory	Health and Wellbeing	02
GEO-VAC-4	Compulsory	Digital Technology	02
Semester II Credits			**20 Credits**
Total Credits at the End of Year 1			**40 Credits**
Exit Option – Certificate			

Course		Title of the Paper	Credits Allotted
SEMESTER-III			
GEO-MJD - 3	Compulsory	Geography of India	04
GEO-MJD - 4	Compulsory	Cartographic Techniques (P)	04
GEO-MID-3(A) GEO-MID-3(B) GEO-MID-3(C)	Choose any one	Computer Application Transport Geography Fundamentals of Geoinformatics	04
GEO-MLD-3	Compulsory	Public Administration	03
GEO-AEC-5	Compulsory	English	02
GEO-SEC-3(A) GEO-SEC-3(B) GEO-SEC-3(C)	Choose any one	Statistics for Geographers (P) Basics of Cartography (P) Geography of Andaman and Nicobar Islands	03
Semester III Credits			**20 Credits**
SEMESTER-IV			
GEO-MJD – 5	Compulsory	Economic Geography	04
GEO-MJD – 6	Compulsory	Geomorphology	04
GEO-MJD – 7	Compulsory	Thematic Mapping (P)	04
GEO-MID-4(A) GEO-MID-4(B) GEO-MID-4(C)	Choose any one	Basic content writing skills Disaster Management Natural Resource Management	04
GEO-AEC-8	Compulsory	Modern Indian Language (Hindi/ Bangla/ Tamil/ Telegu)	02
GEO-WP	Compulsory	Community engagement and Service – Generating solutions to real life problems ***(To be conducted during the Winter-Break after Semester III)***	02
Semester IV Credits			**20 Credits**
Total Credits at the End of Year 2			**80 Credits**
Exit Option – Diploma			

Course		Title of the Paper	Credits Allotted
SEMESTER-V			
GEO-MJD - 8	Compulsory	Disaster Risk Reduction	04
GEO-MJD - 9	Compulsory	Hydrology & Oceanography	04
GEO-MJD - 10	Compulsory	Topographical Maps and Weather Maps (P)	04
GEO-MJD - 11	Compulsory	Summer Internship *(Will be evaluated in VIth Sem)*	04
GEO-MID-5(A) GEO-MID-5(B) GEO-MID-5(C)	Choose any one	Political Science (Indian Constitution and UN) Human Rights Local Self Government in India (with special reference to A&N Islands)	04
Semester V Credits			**20 Credits**
SEMESTER-VI			
GEO-MJD – 12	Compulsory	Evolution of Geographical Thought	04
GEO-MJD – 13	Compulsory	Social Geography	04
GEO-MJD – 14	Compulsory	Gender Geography	04
GEO-MJD – 15	Compulsory	Map Projection (P)	04
GEO-MID-6(A) GEO-MID-6(B) GEO-MID-6(C)	Choose any one	Leadership and Managerial Skills Basic Photographic Skills (P) Problem Solving and Decision Making Skills	04
Semester VI Credits			**20 Credits**
End of Year 3			**120 Credits**
Exit Option – UG Degree in B.Sc. Geography			

Course		Title of the Paper	Credits Allotted
SEMESTER-VII			
GEO-MJD - 16	Compulsory	Geography of Tourism	04
GEO-MJD - 17	Compulsory	Climate Change – Vulnerability and Adaptation	04
GEO-MJD - 18	Compulsory	Survey by Instruments and Field Visit (P)	04
GEO-MID-7(A) GEO-MID-7(B) GEO-MID-7(C)	Choose any one	Development Economics World Geography Town Planning	04
GEO-MID-8(A) GEO-MID-8(B) GEO-MID-8(C)	Choose any one	Personality Development Entrepreneurship and Startup Management Culinary Skills (P)	04
Semester VII Total			**20 Credits**
SEMESTER-VIII			
GEO-MJD – 19	Compulsory	Urban Geography	04
GEO-MJD – 20	Compulsory	Sustainability and Development	04
GEO-RP **OR** GEO-MJD – 21 GEO-MJD – 22 GEO-MJD – 23	Choose any one	Research Project/ Dissertation **OR** Population Geography Agriculture Geography Political Geography	12 **OR** (04 X 3 = 12)
Semester VIII Total			**20 Credits**
End of Year 4			**160 Credits**
Exit Option – UG Degree (Honours)/ UG Degree (Honours with Research) in Geography			

SEMESTER – I

GEO-MJD-1: PHYSICAL GEOGRAPHY

Total Credit: 4

Total Lectures: 80

Max. Marks= 100

(Internal Assessment [IA]=25 + End Semester Examination [ESE]=75)

Course Objective and Outcome: To define the concepts in Physical Geography. To introduce various concept to understand cycles of the solid Earth surface. To understand the dynamic nature of the Earth's surface various processes and landforms. After the completion of this course, students should be able to understand the concepts of Physical Geography and be able to explain the essential principles of it.

Unit	Topics
Unit I	Earth: Interior of Earth; Isostasy; Origin of earth – Laplace, Chamberlin, Jean & Jeffery
Unit II	Earth Movements: Plate Tectonics; Types of Folds and Faults; Earthquakes and Volcanoes (Types and Distribution)
Unit III	Geomorphic Processes: Weathering; Mass Wasting; Cycle of Erosion (Davis and Penck)
Unit IV	Evolution of Landforms (Erosional and Depositional): Fluvial, Aeolian, Glacial, Sea-waves and Underground water

Reading List

1. Bloom A. L., 2003: *Geomorphology: A Systematic Analysis of Late Cenozoic Landforms*, Prentice-Hall of India, New Delhi.
2. Bridges E. M., 1990: *World Geomorphology*, Cambridge University Press, Cambridge.
3. Christopherson, Robert W., (2011), Geosystems: *An Introduction to Physical Geography,* 8 Ed., Macmillan Publishing Company
4. Kale V. S. and Gupta A., 2001: *Introduction to Geomorphology*, Orient Longman, Hyderabad.
5. Knighton A. D., 1984: *Fluvial Forms and Processes*, Edward Arnold Publishers, London.
6. Richards K. S., 1982: *Rivers: Form and Processes in Alluvial Channels*, Methuen, London.
7. Selby, M.J., (2005), *Earth's Changing Surface,* Indian Edition, OUP
8. Skinner, Brian J. and Stephen C. Porter (2000), *The Dynamic Earth: An Introduction to physical Geology,* 4th Edition, John Wiley and Sons
9. Thornbury W. D., 1968: *Principles of Geomorphology*, Wiley.
10. Gautam, A (2010): *Bhautik Bhugol*, Rastogi Punlications, Meerut
11. Tikkaa, R N (1989): *Bhautik Bhugol ka Swaroop*, Kedarnath Ram Nath, Meerut
12. Singh, S (2009): *Bhautik Bhugol ka Swaroop*, Prayag Pustak, Allahabad
13. Singh, S. (2020) *Physical Geography,* Allahabad

GEO-MID-1(A): HISTORY OF INDIA

Total Credit: 4

Total Lectures: 80

Max. Marks= 100 (IA=25+ESE=75)

Course Objective and Outcome: This course aims to impart knowledge of Indian culture through Ancient, Medieval and modern Indian history. It includes themes around social, cultural, intellectual and technological developments in Indian history. After completion of the course, students should be able to understand the roots and changes in the Indian Culture from ancient to modern times.

Unit	Topics
Unit I	Ancient Indian History: Vedic and Post-Vedic Culture; Rise of Buddhism and Jainism; Education system and important Centres; Art & Architecture; Scientific Achievements
Unit II	Medieval Indian History: Rise of Bhaktism and Sufism; Education system and important Centres of Learning; Medieval Indian Art & Architecture
Unit III	Modern Indian History: Western Ideas and Indian Responses; Colonial art & Architecture
Unit IV	Socio-religious Reforms-Reformation and Revivalism; Tribes of India and their habitat

Reading List

1. Basham, A.L. 1989. *The Wonder that was India*, Delhi
2. Chandra, S, 2009: *History of Medieval India: Part 1*, New Delhi
3. Chandra, S, 2009: *History of Medieval India: Part 2*, New Delhi
4. Chandra, B, 2016, *India's Struggle for Independence*, New Delhi
5. E.H. Carr: *What is History?* London.
6. Kosambi, D.D. 1975. *An Introduction to the Study of Indian History*. Bombay.
7. Kosambi, D.D. 1975. *The Culture and Civilization of Ancient India*. Delhi.
8. Majumdar, R.C. 1994. *Ancient India*. Delhi
9. Majumdar, R.C. 1996. *The Vedic Age*. Mumbai
10. Majumdar, R.C., 1922, *Corporate Life in Ancient India*, Calcutta
11. Thapar, Romila. 1984. *Ancient Indian Social History*. Hyderabad.

GEO-MID-1(B): BASIC SOCIOLOGY

Total Credit: 4

Total Lectures: 80

Max. Marks= 100 (IA=25+ESE=75)

Course Objective and Outcome: The course is designed to introduce and acquaint the learners with the rudiments of sociology besides unravelling its scope and subject matter to them. The course seeks to enable learners to understand the inter-disciplinary nature of the subject viz-a-viz other social sciences. Upon completing the course, the students are expected to be well versed with the basic sociological terminology and social processes and will be able to relate the theoretical inputs with the actual their day-to-day discourses. Collectively, the course is expected to provide a solid foundation for the beginners to pursue higher studies in Sociology.

Unit	Topics
Unit I	Introduction: Nature, Definition and Subject Matter; Emergence and Development of Sociology; Sociology and its relation with other Social Sciences: Anthropology, Geography, Psychology, Economics and History
Unit II	Basic Concepts: Society, Community and Association; Social Groups: Primary, Secondary and Reference; Norms, Values, Status and Role
Unit III	Social Institutions: Family and Marriage, Kinship, Religion
Unit IV	Social Processes: Social Change, Socialization, Social Control

Reading List

1. Giddens. A., 2006 15th Ed.). *Sociology*. London: Oxford University Press.
2. Bierstadt. R. 1974. *The Social Order*, New York: McGraw Hill,
3. Horton. P.B. and CM. Hunt. 1985. *Sociology* New York: McGraw Hill.
4. Bottomore L.B 1972 *Sociology: A guide a problems and literature*. Bombay George Allen and Unwin (India).
5. Harlambous. M. 1998. *Sociology: Themes and perspectives*. New Delhi Oxford University Press.
6. Inkeles. Alex 1987; *What is Sociology*, New Delhi Prentice Hall of India.
7. John-on. Harry M. 1995. *Sociology: A Systematic introduction*. New Delhi: Allied Publishers

GEO-MID-1(C): CLIMATOLOGY

Total Credit: 4

Total Lectures: 80

Max. Marks= 100 (IA=25+ESE=75)

Course Objective and Outcome: This course aims to define the field of climatology and components of the climate system; to introduce various dimensions of climatology such as atmosphere, global atmospheric pressure, temperature, wind system, atmospheric moisture and its types and atmospheric disturbances

Unit	Topics
Unit I	Composition and Structure of atmosphere – Variation with Altitude, Latitude and Season; Insolation– Factors and Distribution, Heat Budget, Temperature Inversion
Unit II	Atmospheric Pressure and Winds – Planetary Winds, Forces affecting Winds, General Circulation, Jet Streams
Unit III	Atmospheric Moisture – Evaporation, Humidity, Condensation, Fog and Clouds, Precipitation Types, Air Mass, Climatic Regions (Koppen)
Unit IV	Cyclones and Related Phenomena- Cyclone, Anti cyclone, Tornado, Water Spouts

Reading List

1. Barry R. G. and Carleton A. M., 2001: *Synoptic and Dynamic Climatology*, Routledge, UK.
2. Barry R. G. and Corley R. J., 1998: *Atmosphere, Weather and Climate*, Routledge, New York.
3. Critchfield H. J., 1987: *General Climatology*, Prentice-Hall of India, New Delhi
4. Lutgens F. K., Tarbuck E. J. and Tasa D., 2009: *The Atmosphere: An Introduction to Meteorology*, Prentice-Hall, Englewood Cliffs, New Jersey.
5. Oliver J. E. and Hidore J. J., 2002: *Climatology: An Atmospheric Science*, Pearson Education, New Delhi.
6. Trewartha G. T. and Horne L. H., 1980: *An Introduction to Climate*, McGraw-Hill.
7. Gupta L S(2000): Jalvayu Vigyan, Hindi Madhyam Karyanvay Nidishalya, Delhi Vishwa Vidhyalaya, Delhi
8. Lal, D S (2006): Jalvayu Vigyan, Prayag Pustak Bhavan, Allahabad
9. Vatal, M (1986): Bhautik Bhugol, Central Book Depot, Allahabad
10. Singh, S (2009): Jalvayu Vigyan, Prayag Pustak Bhawan, Allahabad

GEO-MLD-1: BASIC BOTANY

Total Credit: 3

Total Lectures: 45

Max. Marks= 100 (IA=25+ESE=75)

Course Objective and Outcome: This course will provide an understanding on plant cells, major plant groups and plant ecology and diversity. On successful completion of the course, students will be able to understand – the cell and its types with emphasis on plant cells; the major groups of plants; the concept of ecology and biodiversity and the importance of plants and their role in human life.

Unit	Topics
Unit I	Cell and Anatomy: Introduction to cell and its types - Prokaryotes and Eukaryotes; Study of plant cells; Introduction to tissues - simple and complex; Study of Leaf - monocot and dicot; Structure and function of flower
Unit II	Ecology and Plant Diversity: Five Kingdom concept; Study of major groups - Bacteria, Algae, Fungi, Bryophytes, Pteridophytes, Gymnosperm and Angiosperm (only general characteristics) Concepts of ecology; Structure and function of ecosystem; Trophic organization - food chain and food web; Ecological pyramid; Ecosystem types in India; Case study of any one of the following in relation to Andaman and Nicobar Islands - forest ecosystem, aquatic ecosystem (marine or freshwater) and mountain ecosystem. Concept of biodiversity hotspot
Unit III	Plants and Human Affairs: Important vascular plants and products used as food, textiles and medicines, oils and perfumes; Spices of Andaman & Nicobar Islands; Study of harmful plants; Advantages and disadvantages of genetically modified plants

Reading List

1. Campbell NA, Reece JB (2008) Biology, 8th edition, Pearson Benjamin Cummings, San Francisco.
2. Evert RF, Eichhorn SE (2012) Raven Biology of Plants, 8th edition, New York, NY: W.H. Freeman and Company.
3. Singh V, Pandey PC, Jain DK (2001) A Text Book of Botany. Meerut, UP: Rastogi and Co.
4. Odum EP (2005) Fundamentals of ecology. Cengage Learning India Pvt. Ltd., New Delhi. 5th edition.
5. Ambasht and Ambasht (2002) A text book of Plant Ecology. CBS publisher and Distributors.

GEO-SEC-1(A): SIMPLE ASTRONOMICAL CALCULATIONS AND SCALES (Practical)

Total Credit: 3

Total Lectures: 45

Max. Marks= 100 (RECORD+VIVA=50+ESE=50)

Course Objective and Outcome: To familiarize students with the basic shape and size of the earth and the time zones of the world. After completion of the course, students should be able to understand the configuration of the earth and time calculations across the world

Unit	Topics
Unit I	Measurement of shape and size of the Earth with past and present development; Calculation of radius of the Earth; Study of the graticules
Unit II	Determination of time and calculation of local time using Sun Dial and with regards to GMT and IST; Calculation of time of sunrise and sunset
Unit III	Time Zones - World time zones; History of time zones of India; Concept day-savings

Practical Record: A Project File in pencil, comprising one exercise *each*, on each topic

Reading List

1. Khullar, D.R. (2016): *Essentials of Practical Geography*, Academic Publishing Co, Jalandhar.
2. Maltiar, K.K. and Maltiar, (Mrs) S.R.(2022): *Concepts of Cartography*, Remote Sensing and GIS, Rajesh Publications, New Delhi.
3. Misra, R.P. et al (2014): *Fundamentals of Cartography*, 2nd Revised Edition, Concept Publishing Company, New Delhi.
4. Robinson, A.H.et al (2010): *Elements of Cartography*, Wiley India, New Delhi.
5. Saha, P. and Basu, P. (2014): *Advanced Practical Geography*, Books and Allied (P) Ltd., Kolkata
6. Sarkar, Ashis (2015): *Practical Geography – A Systematic Approach*, Orient Black Swan, New Delhi.
7. Singh, L.R. (2006): *Fundamentals of Practical Geography*, Sharda Pustak Bhawan, Allahabad.
8. Sinha, M.M.P. and Bala, Seema (2021): *Advanced Cartography and Practical Geography*, Rajesh Publications, New Delhi.

GEO-SEC-1(B): SUSTAINABLE FOREST RESOURCE MANAGEMENT

Total Credit: 3

Total Lectures: 45

Max. Marks= 100 (IA=25+ESE=75)

Course Objective and Outcome: The course provides an introduction to past forestry practices as well as current trends in silviculture and sustainable forestry. The course explores the multitude of ecological and societal values that forests provide and are managed for. After completion of this course the students will understand the importance of the myriad of natural and cultural factors affecting forest ecosystem health including soils, climate, topography, ecological succession, as well as both abiotic and biotic disturbances. They will also recognize the effects of past forest management on current local forest conditions.

Unit	Topics
Unit I	Forest structure and its components, Tree and the forest, Eco-physiology of tree growth, factors of the locality, bioclimate and microclimate effect, forest ecosystem concept, stand dynamics-forest succession, classification of world's forest vegetation, forest types and their distribution
Unit II	Definition and scope of Forest management. Principles of forest management and their applications. General definitions – management and administrative units, felling cycle, cutting section. Classification of Silviculture Systems – Clear Felling, Shelterwood system, Selection system, Accessory system and Coppice system. Choice of silviculture system. Definitions – Growing stock, Yield
Unit III	History of forestry in India. Working Plan – definition, objects and necessity, preparation of working plan. Joint forest management – concept and methodology; Case studies from India. Regional forestry and products. Abiotic and biotic disturbances. Criteria and indicator for Sustainable Forest Management

Reading List

1. Champman, G.W. and Allan, T.G. (1978) Establishment Techniques for Forest Plantation, F.A.O. Forestry Paper No. 8, Rome FAO
2. Khanna, L.S. (1999) Principles and Practice of Silviculture, Milton Book Company, Dehradun
3. Lal, J.B. (2007) Forest Management: Classical Approach and Current Imperatives. Natraj Publishers, Dehradun
4. Osmaston, F.C. (1984) Management of Forests. IBD Publication, Dehradun
5. Ram Prakash (2006). Forest Management. IBD Publication, Dehradun
6. Ram Prakash and L.S. Khanna (1991) Theory and Practice of Silviculture systems. IBD Publication, Dehradun
7. Smith, David M. (1989) The Practice of Silviculture. IBD Publication, Dehradun

GEO-SEC-1(C): GEOINFORMATICS FOR FOREST RESOURCE MANAGEMENT

Total Credit: 3

Total Lectures: 45

Max. Marks= 100 (IA=25+ESE=75)

Course Objective and Outcome: The course aims to prepare the students for successful career in Geospatial Industries with special focus on forest resource management. On successful completion of the programme, students will acquire basic knowledge of Geoinformatics and will be able to use the geospatial data to interpret, analyse and report results in the field of forest resource management. Students will be able to identify and map different forest types, detect problems of forest area and device management plan based on the varied data acquired through the technology.

Unit	Topics
Unit I	Satellite remote sensing and recent developments in geomatics Spatial and spectral resolution of different data products and applications. Geo-referencing of topo-sheets and satellite imageries, Satellite Image Interpretation, Digital Image Processing (DIP)-image registration, image enhancement, classification, supervised and unsupervised classification.
Unit II	Remote Sensing softwares; Application of Remote Sensing in forest resource management-landuse and land cover mapping, vegetation mapping and change detection, forest biomass and carbon mapping and monitoring, forest damage assessment (pests and diseases, mining, fire), forest fire risk zonation and mapping, Watershed delineation and mapping. Use of GPS in forest inventory.
Unit III	GIS for the collection, storage and spatial analysis for geo-referenced forest resources data and information. Integration of spatial data analysis systems with knowledge-based systems and/ or simulation systems for the development of information/decision support systems for forest management. GIS application in FRM.

Reading List

1. Bolstad P. 2005. *GIS Fundamentals: A first text on Geographic Information Systems*, Second Edition. White Bear Lake, MN: Eider Press.
2. Campbell JB and Randolph HW. 2011. *Introduction to Remote Sensing*. Fifth Edition, The Guild Press, New York.
3. Chang K. 2007. *Introduction to Geographic Information System*, 4th Edition. McGraw Hill.
4. Elangovan N. 2006. *GIS Fundamentals, applications and implementation*. New India Publ. Agncy, New Delhi
5. Harvey and Francis. 2008. *A Primer of GIS, Fundamental geographic and cartographic concepts*. The Guilford Press.
6. Joseph G. 2005. *Fundamentals of Remote Sensing*, Second edition. Universities Press
7. Reddy AM. 2014. *Text book of Remote Sensing and Geographic Information System*. 4th edition, BS Publication, Hyderabad.

SEMESTER – II

GEO-MJD-2: HUMAN GEOGRAPHY

Total Credit: 4

Total Lectures: 80

Max. Marks= 100 (IA=25+ESE=75)

Course Objective and Outcome: This course aims to understand the basics concepts of human geography and study population attributes and dynamic nature of it. Students will learn how human, physical, and environmental components of the world interact. Students will be familiarized with economic processes such as globalization, trade and their impacts on economic, cultural and social activities. Understand population dynamics.

Unit	Topics
Unit I	Introduction: Defining Human Geography; Major Themes, (Determinism, Possibilism, Neo-determinism)
Unit II	Emergence of man, Race of mankind
Unit III	Settlements: Types of Rural Settlements; Classification of Urban Settlements; Trends and Patterns of World Urbanization
Unit IV	Population-Resource Relationship (Population problems of developed & developing countries

Reading List

1. Chandna, R.C. (2010) Population Geography, Kalyani Publisher.
2. Hassan, M.I. (2005) Population Geography, Rawat Publications, Jaipur
3. Daniel, P.A. and Hopkinson, M.F. (1989) The Geography of Settlement, Oliver & Boyd, London.
4. Johnston R; Gregory D, Pratt G. et al. (2008) The Dictionary of Human Geography, Blackwell Publication.
5. Jordan-Bychkov et al. (2006) The Human Mosaic: A Thematic Introduction to Cultural
6. Geography. W. H. Freeman and Company, New York.
7. Kaushik, S.D. (2010) Manav Bhugol, Rastogi Publication, Meerut.
8. Maurya, S.D. (2012) Manav Bhugol, Sharda Pustak Bhawan. Allahabad.
9. Hussain, Majid (2012) Manav Bhugol. Rawat Publications, Jaipur.

GEO-MID-2(A): LAND MEASUREMENT AND DIVISION (Practical)

Total Credit: 4

Total Lectures: 80

Max. Marks= 100 (RECORD+VIVA=50+ESE=50)

Course Objective and Outcome: The course aims to familiarize students with area measurement using measuring instruments. Students will be able to measure distance by chain and tape and plane table. The course will enable students to perform basic surveying work and division of land.

Unit	Topics
Unit I	Surveying: definition, types
Unit II	Plane Table Survey: Radiation and Intersection method
Unit III	Chain and tape survey, Field Book and Calculation of Area
Unit IV	Division of Land in 2, 3 or 5 parties

Reading List

1. Dent, B. D., Torguson, J. S., and Holder, T. W. (2008) *Cartography: Thematic Map Design* (6th Edition). Mcgraw-Hill Higher Education.
2. Gupta, K. K. and Tyagi, V. C. (1992) *Working with Maps*. Survey of India, DST, New Delhi.
3. Kraak, Menno-Jan & Ormeling, Ferjan (2003) *Cartography: Visualization of Geospatial Data.* Prentice Hall, New Jersey.
4. Mishra, R. P. and Ramesh, A. (1989) *Fundamentals of Cartography*. Concept Publishing Company, New Delhi.
5. Sharma J. P. (2010) *Prayogic Bhugol*. Rastogi Publishers, Meerut.
6. Singh, R.L. and Singh, Rana P.B. (2005) *Elements of Practical Geography* (Revised Edition). Kalyani Publishers, New Delhi

GEO-MID-2(B): PSYCHOLOGY

Total Credit:4

Total Lectures: 80

Max. Marks= 100 (IA=25+ESE=75)

Course objective and outcome: The course is designed to provide the student a basic understanding of the psychology of human behaviour. The students will be familiarized to concepts, terminology, principles, and theories in psychology. This will help students to know the sources and processes of development of modern scientific psychology and develop a scientific temperament in studying and understanding human behaviour.

Unit	Topics
Unit I	Introducing Psychology: Concept and definition of psychology, Roots of psychology, Psychology as a scientific discipline. Key Perspectives in Psychology: Behavioral, Cognitive, Humanistic, Psychodynamic, and Socio-cultural.
Unit II	Methods in Psychology: Nature, advantages and limitations of Natural Observation, Survey and Case Study, Experimental and Correlational methods.
Unit III	Biological Bases of Behaviour: Structure and functions of the neurons, Communication within and between neurons, Chemical regulation of the endocrine glands. Structure and functions of the Central nervous system and Autonomic nervous system
Unit IV	States of Mind: Nature of consciousness; changes in consciousness- sleep-wake schedules. Extended states of Consciousness - Hypnosis, Meditation and Hallucinations

Reading List

1. Baron, R. A. (2002). *Psychology* (5th Edition), New Delhi: Pearson Education.
2. Feldman, R.S. (2004). *Understanding Psychology* (6th Edition), New Delhi, Tata-McGraw Hill. Hilgard & Atkinson (2003). *Introduction to Psychology* (14th Edition), Thomson Learning Inc.
3. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). *Explorations of Human Nature and Strength: Practicals in Psychology*, Divya Prakashani, Samantarapur, Bhubaneswar.
4. Morgan, C.T., King, R.A., Weisz, J.R., & Schopler, J. (2008). *Introduction to Psychology* (7th edition) Bombay: Tata-McGraw Hill.

GEO-MID-2(C): INDUSTRIAL GEOGRAPHY

Total Credit:4

Total Lectures: 80

Max. Marks= 100 (IA=25+ESE=75)

Course Objective and Outcome: To introduce the nature, development and significance of manufacturing and its links with the world economy; to understand the location of major manufacturing activities with the support of various industrial location theories and models; to discuss the problems and impact of manufacturing industries with respect to relocations, environmental pollution and occupational health and industrial hazard.

Unit	Topics
Unit I	Nature, scope and significance of the Industrial geography; Approaches to study industrial geography; Development of industrial geography.
Unit II	Manufacturing industries: Factors affecting location of industries and their relative significance, Classification of industries, world distribution and changing spatial patterns in the world - Iron and steel, Textiles-cotton and Petro-chemical.
Unit III	Theories of industrial location: Weber and Losch; Industrial regions- concept and methods of delineation; Industrial regions of India; Special Economic Zones (SEZ) in India: concept, distribution and significance.
Unit IV	Evolution of industries in India; Locational factors and distribution of industries in India - Iron and steel, Textiles and Petro-chemical; Manufacturing industries: role in economy and development; impact of manufacturing industries on environment; Globalization and its impact on industrial sector.

Reading List

1. Berry, B.J.L. et al. (1976) *Geography of Economic System*. Prentice Hall, Englewood Cliff.
2. Estall, R.C. and Buchanan R.C. (1963). *Industrial Activity and Economic Geography*. Hutchinson University Library, London.
3. Llyod, P.E. and Dicken. (1978) *Location in Space*. Harper & Row, London.
4. Shukla, S.K. (1979) *Location of Industries*. Sahitya Ratnalaya, Kanpur.
5. Singh, M.B. (1985) *Industrial Development in India*. Lotus, Varanasi,
6. Sinha, B.N. (1972) *Industrial Geography of India*. The World Press, Calcutta.

GEO-MLD-2: BASIC ZOOLOGY

Total Credit:3

Total Lectures: 45

Max. Marks= 100 (IA=25+ESE=75)

Course Objective and Outcome: The objective of the paper is to understand biodiversity, habitat, adaptation organization of animals and their economic importance. At the end of the course the students will understand the significance of animals in the biosphere and their economic importance and need for the conservation of their habitats

Unit	Topics
Unit I	General classification of Animal Kingdom – general characteristics of Invertebrate, Chordata and Vertebrata. Parasites of human – Plasmodium, Tapeworm. Vector and vector control – mosquitoes
Unit II	Economic importance of insects – honey bee, silk worm. Economic importance of Mollusca – pearl oysters, shells. Fish culture
Unit III	Geographical distribution of animals; Land and aquatic animals; Corals and coral reefs; Importance and threats to biodiversity

Reading List

1. Arumugam N. (2017). *Developmental Zoology*, Saras Publication, Nagarcoil, Tamilnadu.
2. Ghosh, K.C. and Manna, B. (2015): *Practical Zoology*, New Central Book Agency, Kolkata
3. Nair NC, Leelavathy S, SoundaraPandian N and Arumugam N. (2013). *A Text Book of Invertebrates*, Saras Publication Nagercoil, Tamilnadu.
4. Thangamani A, Prasannakumar S, Narayanan LM, Arumugam N. (2013). *A Text Book of Chordates*, Saras Publication, Nagercoil, Tamilnadu.

GEO-SEC-2(A): REMOTE SENSING AND GIS (Practical)

Total Credit:3

Total Lectures: 45

Max. Marks= 100 (RECORD+VIVA=50+ESE=50)

Course objective and outcome: To congregate the basic concepts and fundamentals of remote sensing and GIS. To create a firm basis for successful integration of remote sensing in any field of application. After the completion of the course, the students acquire employable skills in remote sensing and GIS. Students will be able to handle and process the satellite images for understanding of the various fields of applications of this technology.

Unit	Topics
Unit I	Remote Sensing: Definition and Development; Platforms and Types; Aerial Photography: Principles, Types and Geometry (Photogrammetry); Satellite Remote Sensing: principles, EMR interaction with atmosphere and Earth Surface; Application of Remote Sensing: Land Use/ Land Cover
Unit II	Geographical Information System (GIS): Definition and Components; GIS Data Structures: Types (spatial and Non-spatial), Raster and Vector Data Structure; GIS Data Analysis: Input; Geo-referencing; Editing, Output, Query, Overlays
Unit III	Application of GIS**:** Land Use Mapping; Urban Sprawl Analysis; Forests Monitoring

Practical Record: A Project File in pencil, comprising one exercise *each*, on each topic

Reading List

1. Burrough, P.A., and McDonnell, R.A. (2000) Principles of Geographical Information System-Spatial Information System and Geo-statistics. Oxford University Press
2. Chauniyal, D.D. (2010) Sudur Samvedan evam Bhogolik Suchana Pranali, Sharda Pustak Bhawan, Allahabad
3. Heywoods, I., Cornelius, S and Carver, S. (2006) An Introduction to Geographical Infromation system. Prentice Hall.
4. Jha, M.M. and Singh, R.B. (2008) Land Use: Reflection on Spatial Informatics Agriculture and Development, New Delhi: Concept.
5. Nag, P. (2008) Introduction to GIS, Concept India, New Delhi.
6. Campbell J. B., 2007: *Introduction to Remote Sensing*, Guildford Press
7. Joseph, G. 2005: *Fundamentals of Remote Sensing*, United Press India.
8. Lillesand T. M., Kiefer R. W. and Chipman J. W., 2004: *Remote Sensing and Image Interpretation*, Wiley. (Wiley Student Edition).
9. Rees W.G (2001): Physical principles of Remote Sensing, Cambridge University.
10. Wolf P.R. and Dewitt B.A (2000): Elements of Photogrammetry with Application in GIS, McGraw-Hill.

GEO-SEC-2(B): GEOSPATIAL APPLICATION FOR DISASTER MANAGEMENT

Total Credit:3

Total Lectures: 45

Max. Marks= 100 (IA=25+ESE=75)

Course Objective and Outcome: The course aims to prepare the students for successful career in Geospatial Industries with special focus on disaster management. By the end of this course, students will gain a detailed understanding of disaster management as an application domain for geospatial science. They will be able to produce effective analyses, project reports, and proposals to support geospatial research and development, implementation, or training activities in disaster management.

Unit	Topics
Unit I	**Introduction to Disasters:** Disasters: Definition and Classification – Hydrological and geological disasters, characteristics crisis and consequences – Role of Government administration, University research organization and NGO's – International disaster assistance – Sharing technology and technical expertise.
Unit II	**Space Science Input in Disaster Management:** Remote sensing in Hazard evaluation - Zonation - Risk assessment - Damage assessment- Land use planning and regulation for sustainable development –Communication satellite application, Network- Use of Internet - Warning system - Post disaster review - Case studies.
Unit III	**Emergency Planning using spatial and non-spatial data:** Information systems management - Spatial and non-spatial data bank creation – Operational emergency management - Vulnerability analysis of infrastructure and settlements – Pre-disaster and post disaster planning for relief operations - Potential of GIS application in development planning - Disaster management plan - Case studies.

Reading List

1. Bell, F.G. (1999) Geological Hazards: Their assessment, avoidance and mitigation. E & FN SPON Routledge, London.
2. Bhattacharya, Tushar (2012), Disaster Science and Management, McGraw Hill India Education Pvt Ltd..
3. David Alexander. (1993) Natural Disasters, UCL Press, London, Research Press, New Delhi.
4. Government of India (2005) Disaster Management Act 2005, New Delhi.
5. Government of India (2009) National Disaster Management Policy, New Delhi.
6. Gupta, Anil K and Sreeja S, Nair. (2011) Environmental Knowledge for Disaster Risk Management, NIDM, New Delhi.
7. Kapur Anu (2010) Vulnerable India: A Geographical study of Disasters, IIAS and sage Publishers, New Delhi.
8. Singhal, J.P. (2010), Disaster Management, Laxmi Publications

GEO-SEC-2(C): REMOTE SENSING FOR WATER RESOURCE MANAGEMENT

Total Credit:3

Total Lectures: 45

Max. Marks= 100 (IA=25+ESE=75)

Course Objective and Outcome: This is an introductory course in remote sensing (RS) for water resource management. The scope of this course is to provide a foundation in basic principles of remote sensing for water resource management with focus on specific aspects of the hydrological cycle (e.g. precipitation, evaporation, soil moisture, groundwater, etc) and water related disasters (e.g. floods, droughts, etc.).

Unit	Topics
Unit I	**Remote Sensing:** Physics of remote sensing, electromagnetic radiation (EMR), Interaction of EMR with atmosphere, earth surface, soil, water and vegetation; Remote sensing platforms – Monitoring atmosphere, land and water resources - LANDSAT, SPOT, ERS, IKONOS and others, Indian Space Programme.
Unit II	**Image Interpretation:** Introduction to image interpretation; Introduction to multispectral imagery; Visualizing multispectral imagery; Analysing multispectral imagery 1: Image classification; Analysing multispectral imagery 2: Multispectral indices.
Unit III	**Water Resources Applications:** Spatial data sources – 4M GIS approach water resources system – Thematic maps - Rainfall-runoff modelling – Groundwater modelling – Water quality modelling - Flood inundation mapping and Modelling – Drought monitoring – Cropping pattern change analysis –Performance evaluation of irrigation commands. Site selection for artificial recharge - Reservoir sedimentation

Reading List

1. Lillesand, T.M. and Kiefer, R.W., *Remote Sensing and Image Interpretation* III Edition. John Wiley and Sons, New York. 1993.
2. Burrough P.A. and McDonnell R.A., *Principles of Geographical Information Systems*,. Oxford University Press. New York. 1998.
3. Ian Heywood Sarah, Cornelius and Steve Carver. *An Introduction to Geographical Information Systems*. Pearson Education. New Delhi, 2002.

SEMESTER – III

GEO-MJD-3: GEOGRAPHY OF INDIA

Total Credit: 4

Total Lectures: 80

Max. Marks= 100 (IA=25+ESE=75)

Course Objective and Outcome: The course aims to familiarize students with various dimensions of the physical, cultural and socio-economic landscape of India and their spatial distribution. After completion of this course students will have in-depth knowledge of the physical diversity of India, its resource and socio-cultural diversity and the important current issues faced by India.

Unit	Topics
Unit I	Physical Setting: Space relationship of India with neighbouring countries; Structure and relief; Drainage system and watersheds; Physiographic regions; Climate: Indian monsoons and rainfall patterns; Tropical cyclones and western disturbances; Soil and Natural vegetation
Unit II	Resources: Biotic and marine resources, Forest and wildlife resources and their conservation; Mineral Resources: Ores of Iron, Copper, aluminium, manganese and mica; Power Resources: Coal, petroleum and natural gas, Energy crisis
Unit III	Human Resources: Distribution and Population Dynamics and their socio-economic implications: Density and growth; Age and Sex structure, Religious structure; Literacy and occupational structure; Urbanization and migration
Unit IV	Contemporary Issues: Ecological issues: environmental pollution; Deforestation, desertification, and soil erosion, population explosion and food security; Regional disparities in economic development; Globalisation and Indian economy

Reference list

1. Gopal Krishan (2017). *The Vitality of India: A Regional Perspective*. Rawat Publication, Jaipur.
2. Khullar, D.R. (2020). *India A Comprehensive Geography*. Kalyani Publishers, Ludhiana.
3. Majid, H. (2020). *Geography of India*. McGraw Hill Education (India) Private Ltd.
4. Mamoria, C. B. and Mishra, J. P. (2021). *Bharat ka Bhugol*. Sahitya Bhawan Publication, Agra.
5. Sharma, T.C. (2013). *Economic Geography of India*. Rawat Publication, Jaipur.
6. Singh, Gopal (2010). *Geography of India*. Atma Ram and Sons.
7. Singh, S. and Saroha, J. (2019). *Bharat ka Bhugol*. CL Media (P) Ltd, New Delhi.
8. Tirtha, R. (2004) *Geography of India*. Rawat Publications, Jaipur
9. Tiwari, R. C. (2019). *Bharat ka Bhugol*. Pravalika Publication, Allahabad.
10. Tiwari, R. C. (2019). *Geography of India*. Pravalika Publication, Allahabad.

GEO-MJD-4: CARTOGRAPHIC TECHNIQUES (Practical)

Total Credit: 4

Total Lectures: 80

Max. Marks= 100 (RECORD+VIVA=50+ESE=50)

Course Objective and Outcome: The course aims at emphasizing effective visual thinking and visual communication with maps. This course covers design principles and techniques for creating maps with contemporary mapping tools. Successful completion of this course will signify mastery in map production for communication and research; Students will be trained in making, analysing, critiquing, and sharing high-quality maps.

Unit	Topics
Unit I	Cartography – History and Importance of cartography
Unit II	Scales – Concept and application; Graphical Construction of Plain, Comparative and Diagonal Scales
Unit III	Mapping terrain – Contours; Profiles – Serial, Superimposed, Projected, Composite, Longitudinal and Transverse
Unit IV	Mapping Climatic data – Hythergraph, Climograph, Isopleth

Practical Record: A Project File in pencil, comprising one exercise *each*, on each topic

Reading List

1. Anson R. and Ormelling F. J., 1994: *International Cartographic Association: Basic Cartographic Vol.* Pregmen Press.
2. Gupta K.K. and Tyagi, V. C., 1992: *Working with Map*, Survey of India, DST, New Delhi.
3. Mishra R.P. and Ramesh, A., 1989: *Fundamentals of Cartography*, Concept, New Delhi.
4. Monkhouse F. J. and Wilkinson H. R., 1973: *Maps and Diagrams*, Methuen, London.
5. Robinson A. H., 2009: *Elements of Cartography*, John Wiley and Sons, New York.
6. Sharma J. P., 2010: *Prayogic Bhugol*, Rastogi Publishers, Meerut.
7. Singh R. L. and Singh R. P. B., 1999: *Elements of Practical Geography*, Kalyani Publishers.
8. Sarkar, A. (2015) Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi
9. Singh R L & Rana P B Singh(1991) Prayogtmak Bhugol ke Mool Tatva, Kalyani Publishers, New Delhi
10. Sharma, J P (2010) Prayogtmak Bhugol ki Rooprekha, Rastogi Publications, Meerut
11. Singh, R L & Dutta, P K (2012) PrayogatmakBhugol, Central Book Depot, Allahabad

GEO-MID-3(A): COMPUTER APPLICATION

Total Credit: 4

Total Lectures: 80

Max. Marks= 100 (IA=25+ESE=75)

Course Objective and Outcome: The objective of the paper is to generate qualified manpower in the area of information technology (IT) which will enable such person to work seamlessly at any office whether government or private or for future entrepreneur in the field of IT.

Unit	Topics
Unit I	Introduction to computer system: Characteristics of computers, Input, Output, Storage units, CPU, Computer System. Computer organization: CPU – Processor speed, Cache, Memory, RAM, ROM, Booting, Memory. Storage Devices: Secondary Storage Device, Mass Storage Device. Windows OS: Windows introduction, User Interface, Windows Settings, Advanced Windows.
Unit II	Office Tools – Word Processing, Spreadsheet, Presentation
Unit III	Internet usage – www and web browsers, web browsing software, surfing the internet, basics of electronic mail, using emails, document handling. Network definition, Common terminologies: LAN, WAN, Node, Host, Workstation, bandwidth; Network Components: Servers, clients, communication media
Unit IV	Multimedia and Applications - Uses of Multimedia – Introduction to making multimedia – Multimedia skills. Multimedia hardware and software. Basic software tools – 3-D modelling and animation tools. Image editing tools – Animation, video and digital movie tools. Making instant multimedia – Multimedia authoring tools. Multimedia Building Blocks – Text – Sound – Multimedia System Sounds – MIDI versus Digital Audio – Digital Audio – Making MIDI Audio – Audio File Formats – Production tips - Images – Animation - Video.

Reading List

1. ITL Education Solutions Limited, *Introduction to Information Technology*, Pearson Education India; 2 edition, 2012.
2. Norton, Peter Norton, *Introduction to Computers*, 7th edition, Tata McGraw Hill Publication, 2017

GEO-MID-3(B): TRANSPORT GEOGRAPHY

Total Credit: 4

Total Lectures: 80

Max. Marks= 100 (IA=25+ESE=75)

Course Objective and Outcome: The course aims at providing an introduction to the concepts and methods of transportation geography. The students will be familiar with concepts of transportation and spatial structure (organization), transportation and economy, urban transportation, logistics, and transportation planning.

Unit	Topics
Unit I	Nature, scope, significance and development of transport geography; Factors associated with development of transport system; physical, economic, social cultural and institutional; Regional variations in transport density; traffic flow and regional interaction.
Unit II	Urban transportation – evolution of urban transport, the urban transport problems and potential solutions, transit in Indian metropolitan cities (with special reference to Delhi, Mumbai, Chennai and Kolkata);
Unit III	Rail transport – Indian Railways: the establishment, History and Growth of Indian Railways, Role of Indian Railways in India's Economy, Problems of Indian Railway.
Unit IV	Impact of different aspects of transport on spatial equilibrium of location; problem of location and regional development; Problems of urban transportation: transportation and environmental degradation; vehicular pollution and congestion; alternative to transport system in Mega-cities

Reading List

1. Taaffe, E. J., Gauthier, H.L., and O'Kelly, M.E., 1996, *Geography of Transportation* (2nd edition), Prentice Hall.
2. Rodrigue, Jean-Paul, Comtois, Claude, and Slack, Brian, 2008, *The Geography of Transport Systems*, Routledge, Taylor & Francis Group
3. Saxena, H. M., 2005 *Transport Geography*. Rawat, Jaipur
4. Brian Hoyle and Richard Knowles (eds). 1998. *Modern Transport Geography* , 2nd ed.

GEO-MID-3(C): FUNDAMENTALS OF GEOINFORMATICS

Total Credit: 4

Total Lectures: 80

Max. Marks= 100 (IA=25+ESE=75)

Course Objective and Outcome: The course focuses on the fundamentals of Remote Sensing, Geographical Information System, and Global Positioning System by introducing the concept, techniques, hardware and software used in collection, processing and analysis of geospatial data. Students will get familiar with these theoretical concepts and apply these in the real world.

Unit	Topics
Unit I	Introduction to Remote Sensing, definition, development and recent trends; Concept of black body, EMR and Sources of EMR interaction with matter, law of radiation, reflectance, transmittance and absorption, atmospheric window Spectral Signatures; Remote Sensing Systems, Sensors and Platforms, and application;
Unit II	Introduction to photo products and digital products Image quality, Resolutions; Elements of Image Interpretation, Interpretation of Satellite images Ground Truth Collection, Visual Interpretation, Accuracy Assessment; Introduction to GIS and History and development, Components and Applications trends of GIS;
Unit III	Data type, structure, Spatial and attribute, point, line, polygon- arc, nodes, vertices, and topology. Attribute data, sources and types; Data processing systems, input and output devices, editing and attributing and linking;
Unit IV	Introduction to GPS, History of Positioning System GPS System Description, Error Sources & Receiver; Introduction to DGPS and Total Station, GPS Performance and Policy Applications; Functionality, uses and errors rectification Mapping with GPS and TPS, data linking and transformation; Introduction to open source GIS

Reading List

1. Burrough, P.A. and McDonnell, R.A. (1998) *Principles of geographical information systems*. Oxford University Press, Oxford.
2. Campbell, J.B. (2002). *Introduction to remote sensing*, 3rd ed., The Guilford Press.
3. Heywood, I., Cornelius, S., and Carver, S. (2006) *An Introduction to Geographical Information Systems*. Prentice Hall. 3rd edition.
4. Lillesand, T.M.; R.W. Kiefer, and J.W. Chipman (2003). *Remote sensing and image interpretation*, 5th ed., Wiley.
5. Nag P and Kudrat M *Digital Remote Sensing* New Delhi: Concept Publishing
6. Richards, J.A.; and X. Jia (2006). *Remote sensing digital image analysis: an introduction*, 4th ed., Springer.
7. Thurston, J., Poiker, T.K. and J. Patrick Moore. (2003) *Integrated Geospatial Technologies: A Guide to GPS, GIS, and Data Logging*. Hoboken, New Jersey: Wiley.

GEO-MLD-3: PUBLIC ADMINISTRATION

Total Credit: 3

Total Lectures: 45

Max. Marks= 100 (IA=25+ESE=75)

Course Objective and Outcome: The course introduces the students to the conceptual and empirical elements of Public Administration. The students will understand the nuances of administration at different levels of government. Students will be able to appreciate and analyse public policies and programmes and participate in the governance as a civically engaged member of the society.

Unit	Topics
Unit I	Meaning, Nature and Scope of Public Administration; Its relationship with other disciplines; Evolution of Public Administration – Woodrow Wilson, Henri Fayol, Kautilya and Max Weber
Unit II	Public Administration in India; Enactment of the Indian Constitution; State and Union Territories – Government of Union Territories Act 1963; Ministry of Home Affairs and supervision of Union Territory Administration; Role and position of Lieutenant Governors; Changing trends in UT Administration in Puducherry and Andaman and Nicobar Islands.
Unit III	Public Administration – then and now; Public Administration pre and post 1991; Emerging Issues in Indian Public Administration; Changing Role of District Collector; Civil Servants-Politician relationship; The RTI Act of 2005; Decentralization; Public-Private Partnership.

Reading List

1. Avasthi & Maheshwari (2012) *Public Administration*, Lakshminarayana Agarwal, Agra.
2. Arndt Christian and Charles Oman (2006) *Uses and Abuses of Governance Indicators*, OECD, Paris.
3. Bhattacharya, Mohit (2013), *New Horizons of Public Administration*, Jawahar Publishers, New Delhi.
4. Donald Menzel and Harvey White (eds) (2011) *The State of Public Administration: Issues, Challenges and Opportunities*, New York, M.E.
5. Henry, Nicholas (2006) *Public Administration and Public Affairs*, Prentice Hall of India, New Delhi.
6. Frank J. Goodnow, *Politics and Administration: A Study in Government*, Transaction Publishers, New York, 2003.
7. O'Leary, Rosemary et al (2010) *The Future of Public Administration around the World: The Minnowbrook Perspective*, George Town, University Press, D.C.
8. Martin Albrow (1970) *Bureaucracy*, MacMillan, London.
9. UN, Department of Economic and Social Affairs, *Development Administration: Current Approaches and Trends in Public Administration for Development*, New York, UN, 1975.
10. Wilson Woodrow, 'The Study of Administration' *Political Science Quarterly* 2 (June 1987).

GEO-SEC-3(A): STATISTICS FOR GEOGRAPHERS (Practical)

Total Credit: 3

Total Lectures: 45

Max. Marks= 100 (RECORD+VIVA=50+ESE=50)

Course Objective and Outcome: This course gives a basic introduction to the fundamental concepts and methods of statistics. Students will learn the basic concepts of types of data, data production, sample. Students will be able to do the calculation of basic descriptive statistics such as percentages, mean, median and mode.

Unit	Topics
Unit I	Use of Data in Geography: Geographical Data Matrix, Significance of Statistical Methods in Geography; Sources of Data
Unit II	Tabulation and Descriptive Statistics: Frequencies (Deciles, Quartiles), Cross Tabulation, Central Tendency (Mean, Median and Mode, Dispersion (Standard Deviation, Variance and Coefficient of Variation)
Unit III	Sampling: Purposive, Random, Systematic and Stratified; Theoretical Distribution: Probability and Normal Distribution**.** Association and Correlation: Rank Correlation, Product Moment Correlation, and Simple Regression

Practical Record: Student needs to submit a practical record of one exercise from each topic

Reading List

1. Berry B. J. L. and Marble D. F. (eds.): *Spatial Analysis – A Reader in Geography*.
2. Ebdon D., 1977: *Statistics in Geography: A Practical Approach*.
3. King L. S., 1969: *Statistical Analysis in Geography*, Prentice-Hall.
4. Mahmood A., 1977: *Statistical Methods in Geographical Studies,* Concept.
5. Sarkar, A. (2013) Quantitative geography: techniques and presentations. Orient Black Swan Private
6. Ltd., New Delhi
7. Silk J., 1979: *Statistical Concepts in Geography*, Allen and Unwin, London.
8. Yeates M., 1974: *An Introduction to Quantitative Analysis in Human Geography*, McGraw Hill, New
9. York. Shinha, Indira (2007) Sankhyiki bhugol. Discovery Publishing House, New Delhi

GEO-SEC-3(B): BASICS OF CARTOGRAPHY (Practical)

Total Credit: 3

Total Lectures: 45

Max. Marks= 100 (RECORD+VIVA=50+ESE=50)

Course Objective and Outcome: This course offers a broad introduction to cartography, surveying the science, art, and ethics of making and using maps. Students will learn to analyze geospatial data, design appealing graphics, and use them to tell effective and ethical visual stories. By the end of the semester, students are expected to understand map design principles and key cartographic concepts, obtain necessary skills (technical and artistic) to make effective and appealing maps, and practice critical thinking in map interpretation and design.

Unit	Topics
Unit I	**The Study of Cartography –** Nature and scope of cartography; Maps, Classification and uses – use of Thematic Cartography; Forms of Representation; Development of Cartography; The Earth as a Cartographic Problem - shape, size and dimension – co-ordinate systems; Plane, spherical and rectangular; Geographic Co-ordinate System;
Unit II	**Cartographic Design** – Map Design and Layout – components of map design – constraints in map design; Map data: Collection and classification – compilation and generalization of map information – compilation processes – principles of generalisation; Map Data and Complication and Generalization of Map; Map Symbolization - point, line and area symbols – qualitative and quantitative method; Typography and lettering of the map; elements of typographic design – methods of lettering – geographical names and others;
Unit III	**Map Reproduction** –Map reproduction, printing and non-printing processes – limited copy methods – xerography – diffusion transfer – photographic print – single sensitized layer – multiple sensitized layers – Interpol systems. Digital original: Hard copy – soft copy – methods for many copies.

Reading List

1. Robinson, H. et al. (1995) *Elements of Cartography Students friend*, 4th Ed.John Wiley, New York.
2. Misra, R.P. and Ramesh A. (1989) *Fundamentals of Cartography*, Concept Publishing, Delhi.
3. Monkhouse, F.J. and Wilkinson, H.R. (1971) *Maps and Diagram*, Meuthun & Co., London

GEO-SEC-3(C): GEOGRAPHY OF ANDAMAN AND NICOBAR ISLANDS

Total Credit: 3

Total Lectures: 45

Max. Marks= 100 (IA=25+ESE=75)

Course objective and outcome: The aim of the course is to bring geographical awareness about Andaman and Nicobar Islands among the students. The students will learn about the physical and human parameters that has determined the growth and development of these islands. The course will familiarise the students with the diversity of these islands, its associated problems and prospects

Unit	Topics
Unit I	Andaman and Nicobar Islands – An introduction; Physical setting – Location, size and extent; Geological history; Origin; Relief features, climate, soils, drainage and natural vegetation
Unit II	Resources of Andaman and Nicobar Islands – Natural Resources – Forest; Land; Marine; Human Resources – Island-wise distribution of Population, population density, male-female ratio, workforce, dependency ratio; Aboriginal tribes – distribution and numbers
Unit III	Economy of Andaman and Nicobar Islands – Silviculture (Forestry), Agriculture, Fisheries, Industries, Trade and Commerce, Tourism. Andaman and Nicobar Administration – Structure of governance; Problems – Environmental degradation, loss of biodiversity, water scarcity, unemployment. Disasters in Andaman and Nicobar Islands

Reading List

1. Andaman and Nicobar Administration. 2004. *Disaster Management Plan for Andaman and Nicobar Islands*. Port Blair.
2. Andaman Public Works Department. 2009. *Draft Master Plan for Port Blair Planning Area*, 2028, Port Blair: A&N Administration (accessed 10 November 2010).
3. Biswas, S.K. 2009. *Colonization and Rehabilitation in Andaman and Nicobar Islands.* Delhi: Abhijeet Publications.
4. Dhingra, K. 2005. *The Andaman and Nicobar Islands in the Twentieth Century: A Gazetteer.* New Delhi: Oxford University Press.
5. Directorate of Economics and Statistics. 2006. *Islandwise Statistical Handbook 2006*, Port Blair: Andaman and Nicobar Administration.
6. Directorate of Economics and Statistics. 2008. *Economic Survey of Andaman and Nicobar Islands*, Port Blair: Andaman and Nicobar Administration.
7. Directorate of Economics and Statistics. 2022. *Basic Statistics 2021-22,* Port Blair: Andaman and Nicobar Administration.
8. Tripathi, P. 2018. *The Vulnerable Andaman and Nicobar Islands: A Study of Disasters and Response.* Routledge

SEMESTER – IV

GEO-MJD-5: ECONOMIC GEOGRAPHY

Total Credit: 4

Total Lectures: 80

Max. Marks= 100 (IA=25+ESE=75)

Course Objective and Outcome: This course aims to help students understand the concept of economic and commercial geography. It helps to understand the activities of man in relation to various resources and to appreciate the importance of natural resources and economic activities. At the end of this course the students will be able to apply knowledge in the distribution process of natural resources and economic activities.

Unit	Topics
Unit I	Introduction: Concept and classification of economic activity; Factors Affecting location of Economic Activity with special reference to Agriculture (Von Thunen theory), Industry (Weber's theory)
Unit II	Primary Activities: Subsistence and Commercial agriculture, forestry, fishing and mining
Unit III	Secondary Activities: Manufacturing (Cotton Textile, Iron and Steel), Concept of Manufacturing Regions, Special Economic Zones and Technology Parks
Unit IV	Tertiary Activities: Transport, Trade and Services, & Quaternary activities

Reading List

1. Alexander J. W., 1963: *Economic Geography*, Prentice-Hall Inc., Englewood Cliffs, New Jersey.
2. Coe N. M., Kelly P. F. and Yeung H. W., 2007: *Economic Geography: A Contemporary Introduction*, Wiley-Blackwell.
3. Hodder B. W. and Lee Roger, 1974: *Economic Geography*, Taylor and Francis.
4. Combes P., Mayer T. and Thisse J. F., 2008: *Economic Geography: The Integration of Regions and Nations*, Princeton University Press.
5. Wheeler J. O., 1998: *Economic Geography*, Wiley.
6. Durand L., 1961: *Economic Geography*, Crowell.
7. Bagchi-Sen S. and Smith H. L., 2006: *Economic Geography: Past, Present and Future*, Taylor and
8. Francis.
9. Willington D. E., 2008: *Economic Geography*, Husband Press.
10. Clark, Gordon L.; Feldman, M.P. and Gertler, M.S., eds. 2000: The *Oxford.*

GEO-MJD-6: GEOMORPHOLOGY

Total Credit: 4

Total Lectures: 80

Max. Marks= 100 (IA=25+ESE=75)

Course Objective and Outcome: The objective of this course is to introduce the concepts in geomorphology in adequate manner, surface relief features and to understand various aspects of their growth and evolution on earth. The course will provide an understanding of the conceptual and dynamic aspects of landform development. Students will also learn the relevance of applied aspects of geomorphology in various fields.

Unit	Topics
Unit I	Concepts. Recent observations on some fundamental concepts of geomorphology; Concept of time: cyclic, graded and steady state
Unit II	Concept of morphogenetic regions; Concept of dynamic equilibrium; Recent trends in Geomorphology
Unit III	Drainage Basin & related aspects. Drainage-basin as geomorphic unit: morphometric laws; Denudation and morphochronology and dating of landscapes; development and evolution of hill slope
Unit IV	Application in various fields. Geomorphic hazards and mitigation measures; Geomorphology and economic deposits; Geomorphology in engineering construction; Geomorphology in ground water studies; Soils and geomorphology

Reading List

1. Ahmed, E., 1985. *Geomorphology*. Kalyani Publishers, New Delhi.
2. Bloom. A. L. 1998/ 2001. *Geomorphology*. Third Edition. Prentice Hall of India, New Delhi.
3. Chorley, R.J. et al 1984. *Geomorphology*. Methuen, London.
4. Dayal, P. 1994. *A Text Book of Geomorphology*. Kalyani Publs., New Delhi.
5. Fairbridge, R.W. (Ed.) 1968. *Encyclopaedia of Geomorphology*.
6. Jog, S. R. , ed. 1995. *Indian Geomorphology* (2 vols.). Rawat Publs., Jaipur & New Delhi.
7. Kale, Vishwas and Gupta, Avijit 2001. *Introduction to Geomorphology*. Orient Longman, Hyderabad.
8. King, C.A.M., 1966. *Techniques in Geomorphology*. Edward Arnold, London.
9. Singh, Savindra, 1982. *Geomorphology*. Basundhara Prakashan, Gorakhpur.
10. Thornbury, W.D., 1954. *Principles of Geomorphology*. J. Wiley, New York.
11. Wooldridge, S.W. and Morgan, R.S. 1959. *The Physical Basis of Geography. An Outline of Geomorphology*. Longman, London.

GEO-MJD-7: THEMATIC MAPPING (Practical)

Total Credit: 4

Total Lectures: 80

Max. Marks= 100 (RECORD+VIVA=50+ESE=50)

Course Objective and Outcome: This course enables students to harness their ability of understanding and reading of maps and develop their cartographic skills thereby helping them to create maps on their own by transforming of data into a map. This course aims to help the students understand the various techniques of thematic mapping, how to evaluate and show the distribution of data on any geographical unit.

Unit	Topics
Unit I	Map Scale, Types
Unit II	Map classification and Types; Principles of Map Design
Unit III	Diagrammatic Data Presentation – Line, Bar and Circle
Unit IV	Thematic Mapping Techniques – Properties, Uses and Limitations; Areal Data -- Choropleth, Dot, Point Data – Isopleths

Practical Record: A Thematic Atlas should be prepared on a specific theme with five plates of any state in India.

Reading List

1. Cuff J. D. and Mattson M. T., 1982: *Thematic Maps: Their Design and Production*, Methuen Young Books
2. Dent B. D., Torguson J. S., and Holder T. W., 2008: *Cartography: Thematic Map Design* (6th Edition), Mcgraw-Hill Higher Education
3. Kraak M.-J. and Ormeling F., 2003: *Cartography: Visualization of Geo-Spatial Data*, Prentice-Hall.
4. Sharma J. P., 2010: *Prayogic Bhugol*, Rastogi Publishers, Meerut.
5. Singh R. L. and Singh R. P. B., 1999: *Elements of Practical Geography*, Kalyani Publishers.
6. Sarkar, A. (2015) Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi
7. Singh, L R & Singh R (1977): Manchitra or Pryaogatamek Bhugol , Central Book, Depot, Allahabad
8. Bhopal Singh R L and Duttta P K (2012) Prayogatama Bhugol, Central Book Depot, Allahabad.

GEO-MID 4(A): BASIC CONTENT WRITING SKILLS

Total Credit:4

Total Lectures: 80

Max. Marks= 100 (IA=25+ESE=75)

Course Objective and Outcome: With the world going digital, the demands of the job market have changed and content writing has emerged as a lucrative and promising career. A content writer can work from home and need not report to office. No specialised degree in literature or mass media is required to become a content writer. Exposure and preparing students for a lucrative employment activity is the basic objective of this course. Students with certificate in this course stands a better chance in global competency. This bridges the gap between academia and industry.

Unit	Topics
Unit I	**Introduction to content writing:** Importance and purpose of content writing; Categories of documents; Content Writing Process and Guidelines
Unit II	**Essential of good Writing:** Content Writing Essentials – ABCD of content writing; Basic Principles of AP Style (Associated Press Style Book); Basic English Usage & Vocabulary building; Overcoming grammar problems
Unit III	**Writing for Digital Media and Social Media:** Writing for digital media vs. print media; Understanding the basics of social media; Understanding social media content writing; Contents of news sites; Writing Blogs (Health, Fitness, Travel, Political, Social Events etc.); Qualities, roles and responsibilities of web journalist and content writers; Non-fiction writing (Essays, Reports), Advertising, Newspapers; Writing blogs, case studies, white papers; Corporate Communications
Unit IV	**Plagiarism laws in Content Writing:** What is plagiarism, rules on plagiarism; How to write plagiarism-free copies

Reading List

1. Web Resources: https://www.entrepreneur.com/article/247908
   https://www.locationrebel.com/b2b-writing/
2. https://wordpress.com/support/prevent-content-theft/
   https://blog.unisquareconcepts.com/content-writing/what-is-plagiarism-why-is-itimportant-for-blog-writing/
3. https://www.mindler.com/blog/how-to-become-a-content-writer-in-india/
   https://www.clearvoice.com/blog/10-types-content-writers-us

GEO-MID 4(B): DISASTER MANAGEMENT

Total Credit:4

Total Lectures: 80

Max. Marks= 100 (IA=25+ESE=75)

Course Objective and Outcome: The course is intended to provide basic conceptual understanding of disasters; to understand the various approaches of disaster management and to build skills to respond to disasters. The students will be able to differentiate between the conceptual dimensions of disasters; understand the mechanism of disaster management and be an active participant in case of a disaster.

Unit	Topics
Unit I	Definitions – Hazards and Disasters, Risk and Vulnerability; Classification of Disasters – Natural and Man-made disasters [earthquakes, floods drought, landside, land subsidence, cyclones, volcanoes, tsunami, avalanches, global climate extremes. Man-made disasters: Terrorism, gas and radiations leaks, toxic waste disposal, oil spills, forest fires].
Unit II	Study of Important disasters Earthquakes and its types, magnitude and intensity, seismic zones of India, major fault systems of India plate, flood types and its management, drought types and its management, landside and its managements case studies of disasters in Sikkim (e.g) Earthquakes, Landside). Social Economics and Environmental impact of disasters.
Unit III	Mitigation and Management techniques of Disaster – Basic principles of disasters management, Disaster Management cycle, Disaster management policy, National and State Bodies for Disaster Management, Early Warming Systems, Building design and construction in highly seismic zones, retrofitting of buildings.
Unit IV	Training, awareness program and project on disaster management Training and drills for disaster preparedness, Awareness generation program, Usages of GIS and Remote sensing techniques in disaster management, Mini project on disaster risk assessment and preparedness for disasters with reference to disasters in Sikkim and its surrounding areas.

Reading list

1. Disaster Management Guidelines, GOI-UND Disaster Risk Program (2009-2012)
2. Damon, P. Copola, (2006) *Introduction to International Disaster Management*, Butterworth Heineman.
3. Gupta A.K., Niar S.S and Chatterjee S. (2013) *Disaster management and Risk Reduction, Role of Environmental Knowledge*, Narosa Publishing House, Delhi.
4. Murthy D.B.N. (2012) *Disaster Management*, Deep and Deep Publication PVT. Ltd. New Delhi.
5. Modh S. (2010) *Managing Natural Disasters*, Mac Millan publishers India LTD
6. Kapur, A. (2010) *Vulnerable India: A Geographical Study of Disasters*, Sage Publication, New Delhi.

GEO-MID 4(C): NATURAL RESOURCE MANAGEMENT

Total Credit:4

Total Lectures: 80

Max. Marks= 100 (IA=25+ESE=75)

Course Objective and Outcome: This course is intended to provide a view of the nature of Earth's resources, their generation, extraction and impact of human activities on earth's environment. To provide a better understanding on effective management strategies and give a critical insight of the major sustainability issues. Students will be able to define the major formative processes behind natural resource and will be able to discuss the integrated nature of human activities, environmental values, ecological processes and sustainable resource management.

Unit	Topics
Unit I	Introduction: Resource and reserves; Resource - Degradation; Conservation; Availability and Factors influencing its availability; Land resources; Water resources; Energy resources; Human impact on natural resources; Ecological, social and economic dimension of resource management.
Unit II	Natural resources and conservation: Forest resources, water resources: soil resources: food resources: green revolution. Non-renewable energy resources: Oil, Natural gas, Coal: environmental impacts of non-renewable energy consumption; impact of energy consumption on global economy; application of green technology; future energy options and challenges.
Unit III	Renewable energy resources: Energy efficiency; life cycle cost; cogeneration; solar energy: Hydropower: Nuclear power: Tidal energy; Wave energy; Ocean thermal energy conversion (OTEC); Geothermal energy; energy from biomass; bio-diesel.
Unit IV	Resource management: Approaches in resource management: Integrated resource management strategies; concept of sustainability science: different approach towards sustainable development and its different constituents; sustainability of society, resources and framework; sustainable energy strategy; principles of energy conservation; Indian renewable energy programme.

Reading list

1. Craig, J.R., Vaughan. D.J. & Skinner. B.J. 1996. *Resources of the Earth: Origin, Use, and Environmental Impacts* (2nd edition). Prentice Hall, New Jersey.
2. Freeman, A.M. 2001. *Measures of value and Resources: Resources for the Future*. Washington
3. Freeman, A.M. 2003. *Millennium Ecosystem Assessment: Conceptual Framework*. Island Press.
4. Ginley, D.S. & Cahen, D. 2011. *Fundamentals of Materials for Energy and Environmental Sustainability*. Cambridge University Press.
5. Klee, G.A. 1991. *Conservation of Natural Resources*. Prentice Hall Publication.
6. Owen, O.S, Chiras, D.D, & Reganold, J.P. 1998. *Natural Resource Conservation – Management for Sustainable Future* (7th edition). Prentice Hall.

GEO-WP: COMMUNITY ENGAGEMENT AND SERVICE

Total Credit:2

Community engagement and Service – Generating solutions to real life problems

Winter project will be of 15 days to be conducted in the ***winter break after the end of Semester III***. Students will prepare a Report on the activities carried out for award of 2 credits

The Report will be evaluated in IVth Semester.

1. Each student will prepare an individual report based on primary and secondary data collected during field work
2. The duration of the field work should not exceed 15 days
3. The word count of the report should be between 1500 to 2000 words
4. One copy of the report on A4 size paper should be submitted in soft binding

SEMESTER – V

GEO-MJD-8: DISASTER RISK REDUCTION

Total Credit: 4

Total Lectures: 80

Max. Marks= 100 (ICA=25+ESE=75)

Course Objective and Outcome: The course aims to provide basic conceptual understanding of disasters and its relationships with development, and to appreciate various approaches of Disaster Risk Reduction (DRR) and the relationship between vulnerability, disasters, disaster prevention and risk reduction. The course will enhance awareness of Disaster Risk Management as institutional processes in India and will build skills to respond to disasters.

Unit	Topics
Unit I	Disasters: Hazards, Risk, Vulnerability; and Disasters: Definition and Concepts
Unit II	Disasters in India: Causes, Impact, Distribution and Mapping; Floods; Droughts; Earthquakes and Cyclones
Unit III	Human induced disasters: Causes, Impact, Distribution and Mapping
Unit IV	Disaster Risk Reduction: Mitigation and Preparedness, NDMA and NIDM; Community – Based Disaster Management; Do's and Don'ts during disasters

Reading List

1. Government of India. (1997) *Vulnerability Atlas of India*. New Delhi, Building Materials & Technology Promotion Council, Ministry of Urban Development, Government of India.
2. Kapur, A. (2010) *Vulnerable India: A Geographical Study of Disasters*, Sage Publication, New Delhi.
3. Singh, R.B. (2005) *Risk Assessment and Vulnerability Analysis*, IGNOU, New Delhi. Chapter 1, 2 and 3
4. Singh, R. B. (ed.), (2006) *Natural Hazards and Disaster Management: Vulnerability and Mitigation*, Rawat Publications, New Delhi.
5. Sinha, A. (2001). *Disaster Management: Lessons Drawn and Strategies for Future*, New United Press, New Delhi.
6. Stoltman, J.P. et al. (2004) *International Perspectives on Natural Disasters,* Kluwer Academic Publications. Dordrecht.
7. Singh Jagbir (2007) "*Disaster Management Future Challenges and Opportunities*", 2007. Publisher-I.K. International

GEO-MJD-9: HYDROLOGY AND OCEANOGRAPHY

Total Credit: 4

Total Lectures: 80

Max. Marks= 100 (ICA=25+ESE=75)

Course Objective and Outcome: The course aims to focus on the fundamental hydrological components for environmental measurements. It also aims to brings out the elementary physical and chemical components of oceanography. Students will be able to apply concepts and instruments for the measurement of different hydrological parameters. Students will be able to understand and explain about the causes and consequences of different marine issues and hazards.

Unit	Topics
Unit I	Hydrological Cycle: Systems approach in hydrology, human impact on the hydrological cycle; Precipitation, interception, evaporation, evapo-transpiration, infiltration, ground-water, run off and over land flow; Hydrological input and output
Unit II	River Basin and Problems of Regional Hydrology: Characteristics of river basins, basin surface run-off, measurement of river discharge
Unit III	Ocean Floor Topography and Oceanic Movements – Waves, Currents and Tides; Ocean Salinity and Temperature – Distribution and Determinants
Unit IV	Coral Reefs and Marine Deposits and Ocean Resources: Types and Theories of Origin; Biotic, Mineral

Reading List

1. Andrew. D. ward and Stanley, Trimble (2004): Environmental Hydrology, 2nd edition, Lewis Publishers, CRC Press.
2. Singh, Vijay P. (1995): Environmental Hydrology. Kluwar Academic Publications, The Netherlands.
3. Anikouchine W. A. and Sternberg R. W., 1973: *The World Oceans: An Introduction to Oceanography*, Prentice-Hall.
4. Kershaw S., 2000: *Oceanography: An Earth Science Perspective*, Stanley Thornes, UK.
5. Sharma R. C. and Vatal M., 1980: *Oceanography for Geographers*, Chaitanya Publishing House, Allahabad.
6. Singh, M., Singh, R.B. and Hassan, M.I. (Eds.) (2014) Landscape ecology and water management. Proceedings of IGU Rohtak Conference, Volume 2. Advances in Geographical and Environmental Studies, Springer

GEO-MJD-10: TOPOGRAPHICAL MAPS AND WEATHER MAPS (Practical)

Total Credit: 4

Total Lectures: 80

Max. Marks= 100 (RECORD+VIVA=50+ESE=50)

Course Objective and Outcome: To develop the skill of map interpretation through identification of physical and cultural features, using conventional signs. To familiarize students with the weather conditions prevailing in India during summer and winter season. Students should be able to understand the importance and uses of maps and the relationships of the features in topographical and weather maps.

Unit	Topics
Unit I	Introduction to Topographical Maps
Unit II	Interpretation of Survey of India's Topgraphical sheets - Physical (Relative Relief, Drainage Density, Average Slope using Wentworth Method) & Cultural (Settlement, Road Network and Transect Chart)
Unit III	Introduction to Weather Maps
Unit IV	Interpretation of Weather Maps for three seasons – pre-Monsoon, Monsoon and post-Monsoon

Practical Record: A Project File in pencil, comprising one exercise *each*, on each topic

Reading List

1. Anson R. and Ormelling F. J., 1994: *International Cartographic Association: BasicCartographic Vol.* Pregmen Press.
2. Gupta K.K. and Tyagi, V. C., 1992: *Working with Map*, Survey of India, DST, New Delhi.
3. Mishra R.P. and Ramesh, A., 1989: *Fundamentals of Cartography*, Concept, New Delhi.
4. Monkhouse F. J. and Wilkinson H. R., 1973: *Maps and Diagrams*, Methuen, London.
5. Rhind D. W. and Taylor D. R. F., (eds.), 1989: *Cartography: Past, Present and Future*, Elsevier, International Cartographic Association.
6. Robinson A. H., 2009: *Elements of Cartography*, John Wiley and Sons, New York.
7. Sharma J. P., 2010: *Prayogic Bhugol*, Rastogi Publishers, Meerut.
8. Singh R. L. and Singh R. P. B., 1999: *Elements of Practical Geography*, Kalyani Publishers.
9. Sarkar, A. (2015) Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi
10. Singh, R L & Dutta, P K (2012) PrayogatmakBhugol, Central Book Depot, Allahabad

GEO-MJD-11: SUMMER INTERNSHIP

Total Credit: 4

Max. Marks= 100 (Report [70] + Viva voce [30])

Summer internship will be initiated during summer holidays (60 days) after Semester IV.

The student will prepare a report based on the internship training, and will be evaluated before the mid-Semester (Vth Semester) examination.

The report should not exceed 3000 words.

Each student should strictly follow the format given below for Summer Internship Project

Format for Summer Internship Project

1. Front Page
2. Certificate of Completion (Department)
3. Certificate of Completion (Institute/ Company)
4. Student's Declaration
5. Acknowledgements
6. Table of Contents
7. Basic overview of the Institute/ Company
8. History
9. Mission and Vision, etc
10. Management
11. Products
12. Comparison with other departments
13. Learning Outcome/ Take-away
14. Appendix – Weekly overview of internship activity – Day wise

1st Week	**Date**	**Day**	**Work Done**
	DD/MM/YY	Monday	
		Tuesday	
		Wednesday	
		Thursday	
		Friday	
		Saturday	

GEO-MID-5(A): POLITICAL SCIENCE (INDIAN CONSTITUTION AND THE UN)

Total Credit: 4

Total Lectures: 80

Max. Marks= 100 (ICA=25+ESE=75)

Course Objective and Outcome: The course aims to acquaint students with Indian Constitution and its evolution. The course is designed to provide an overview of evolution of the Indian constitution, which would help students in understanding Indian political system. It will also apprise student about the UN.

Unit	Topics
Unit I	Stages of Constitutional Development, Making of The Constituent Assembly; Philosophy of Indian Constitution, Citizenship; Fundamental Rights, Fundamental Duties, Directive Principles of State Policy
Unit II	Machinery of the Government – Union Executive & Union Legislature President, Cabinet, Prime Minster Lok Sabha and Rajya Sabha, Speaker;
Unit III	State Executive& Legislature: Powers and Functions of the Governor & Chief Minister, The Legislative Assembly, The Legislative Council; Judiciary: Composition, Powers & Jurisdiction Of Supreme Court, High Court, District Court
Unit IV	The United Nations – Need and Importance of the UN, Legal Framework of the UN and Specialized Agencies of the UN; Structural Aspects of the UN – UN General Assembly, The Security Council, The Economic and Social Council, The Trusteeship Council, The Secretariat, The International Court of Justice

Reading List

1. Basu D. (2012) '*Introduction to the Constitution of India*' Lexis Nexis. NewDelhi
2. Bhargava (ed.) '*Politics & Ethics of the Indian Constitution*' Oxford University Press New Delhi
3. Biswal Tapan (2017) '*Bharatiya Shasan Samvaidhanik Loktantraaur Rajneetik Prakriya*' Orient Blackswan New Delhi
4. Chaube S. (2009) *'The Making & working of the Indian Constitution*' National Book Trust, New Delhi
5. Ghosh Peu (2012) '*Indian Government & Politics*' PHI Learning Pvt. Ltd. New Delhi
6. Singh M.P. & Sexena Rekha (2008) '*Indian Politics: Contemporary Issues and Concerns*' Prentice Hall of India Pvt. Ltd. New Delhi
7. Alger, Chadwick F. (2006), *The United Nations System: A Reference Handbook,* ABC-CLIO: London.
8. Baehr, Peter R. and Gordenker, Leon (2005), *United Nations: Reality and Ideal*, 4th ed. Palgrave, Basinstoke, pp.125-145.

GEO-MID-5(B): HUMAN RIGHTS

Total Credit: 4

Total Lectures: 80

Max. Marks= 100 (ICA=25+ESE=75)

Course Objective and Outcome: This paper intends to arm the student with basic understanding Human Rights and national and international laws in the context of relationship between human rights and laws, and protection and promotion of human rights in Indian context.

Unit	Topics
Unit I	**Concepts:** Human Rights Law, Human Rights and International Law, International Humanitarian Law (IHL), War and Law, International Committee of the Red Cross (ICRC), Refugee law, International Human Rights Law. **UDHR**: Universal Declaration of Human Rights, International Covenants on ICCPR and ICECR, ICERD, CEDAW, UNCRC
Unit II	**Indian Constitution:** Equality Before Law and Equality of Opportunity, Freedom of belief, Expression and Solidarity rights, Dissent, Cyber Crime, State& Cyber security. Fundamental Rights and Directive Principles of State Policy, Fundamental Duties.
Unit III	**Acts, Commissions and Committees:** Civil Rights Act, 1955, Child Rights Act 2005, Human Rights Act,1993, Anti-Terrorism Act, 1967; Role of Commissions and Committees for the protection and Promotion of Human Rights through NHRC, NCM, NCW National Commission for SCs and STs
Unit IV	**Implementation:** Human Rights and Role of NGOs Tribal Laws in India and Tribal Conventions on Rights of Indigenous People Worldwide Human Rights and the Rule of Law in India; **Corruption:** Human Rights Dimension

Reading List

1. Khosla, Madhav, et al. 2016. *The Oxford Handbook of the Indian Constitution*. New Delhi: OUP
2. Bhargava (ed.) '*Politics & Ethics of the Indian Constitution*' Oxford University Press New Delhi
3. https://www.india.gov.in/topics/law-justice
4. Benegal, Shyam. 2014. *Samvidhan*. Rajya Sabha TV
5. AK. Ray, *Human Rights UN*

GEO-MID-5(C): LOCAL SELF GOVERNMENT IN INDIA (WITH SPECIAL REFERENCE TO A&N ISLANDS)

Total Credit: 4

Total Lectures: 80

Max. Marks= 100 (ICA=25+ESE=75)

Course Objective and Outcome: The paper is the study of Panchayathi Raj and Urban Local Government system in detail. Its aim is to understand the Local Politics and Duties of the Local governing bodies.

Unit	Topics
Unit I	Local self-government in India – Importance of local self-government, challenges for local self-government institutions in India: Gender, Caste, and Class dimensioned, Diversity of local structures-financial Constraints, Administrative constraints, political Constraints.
Unit II	Evolution of local Self Government – Pre-independence Period and Post-Independence Period; Community Development Programme, Balwantarai Mehta Committee and Ashok Mehta Committee.
Unit III	73rd and 74th Amendments – Provisions, Features and Importance; Rural Local Bodies – Gram Panchayat – Composition, Powers and Functions, Panchayat Samity – Composition, Powers and Functions, Zilla Parishad – Composition, Powers and Functions; Urban Local Bodies: Nagar Palika – Composition, Powers and Functions, Municipal Council and Corporation – Composition, Powers and Functions
Unit IV	Local self-government bodies of Andaman and Nicobar Islands

Reading List

1. S.R Maheshwari *Local Government in India*, Lakshmi Narayan Agarwal, Agra, 1984.
2. Abdual Aziz, *Decentralised Planning*, the Karnataka Experiment, Sage New Delhi, 1992.
3. Amitav Mukherjeee. *Decentralisation: Panchayat Raj in the Nineties*, Vikas, New Delhi1994.
4. Bhattacharya, Mohit, *Management of Urban Local Government in India*, Uppal Book Store, New Delhi, 1976.
5. Encyclopaedia of Social Sciences. *Municipal Government*.The Macmillan Company, New York, 1953.

SEMESTER – VI

GEO-MJD-12: EVOLUTION OF GEOGRAPHICAL THOUGHT

Total Credit: 4

Total Lectures: 80

Max. Marks= 100 (ICA=25+ESE=75)

Course Objective and Outcome: The course focuses on the understanding of core and fundamental branches of the discipline, Geography. This course is specially designed to examine the historical and philosophical development of modern geography and geographical knowledge. It explores geographical thinking and disciplinary trends of various parts in the world, dualisms and debates, man-nature relationship and paradigm.

Unit	Topics
Unit I	Basic Frame and Concepts. Man-Environment interaction: New Environmentalism; Concepts: Space, place, environment, time, and spatial organisation; Region, and regional typology; Culture and Cultural landscape
Unit II	Modern Approaches. Quantitative revolution and challenges; Philosophy and Geography: contributions of — Vidal de la Blache, and Carl Sauer; Humanistic & Phenomenological Geography — contributions of Yi-Fu Tuan; Literary geography: landscape as text
Unit III	Contemporary Trends. Qualitative paradigm; Behavioural revolution — Perception and cognition, mental maps; Marxism/ Radicalism and Welfare Approach; Modernism vs. Postmodernism; Poststructuralism and Postcolonialism
Unit IV	Indian Geography: Base & Trends. Impact of postcolonialism and Gandhism on Indian geography;

Reading List

1. Daniels, Peter; Bradshaw, Michael et al. 2000. *Human Geography. Issues for the 21st Century*. Prentice Hall, London.
2. Dikshit, R. D. 2001. *Geographical Thought. A Critical History of Ideas. Prentice-Hall of India*, New Delhi. (in English and Hindi).
3. Harvey, David 1969. *Explanations in Geography*. Arnold, London.
4. Harvey, Milton E. et al. 2002. *Themes in Geographic Thought*. Rawal Publ., Jaipur & New Delhi.
5. Johnston, R. et al. 2003. *The Dictionary of Human Geography*. Blackwell, Oxford. 5th ed.
6. Johnston, R.J. 2000. *Geography and Geographers*. 4th ed., Edward Arnold, London.
7. Kapur, Anu, ed. 2001. *Indian Geography – Voice of Concern*. Concept Publ. Co., New Delhi.
8. Peet, Richard 1998. *Modern Geographical Thought*. Blackwell, Oxford.
9. Singh, R. L. and Singh, Rana P.B., eds. 1990. Literature and Humanistic Geography. *National Geog. Soc. of India*, B.H.U., Varanasi, Pub. 37.
10. Singh, R. L. and Singh, Rana P.B., eds. 1992. The Roots of Indian Geography: Search and Research. *National Geog. Soc. of India*, B.H.U., Varanasi, Pub. 39.
11. Tuan, Yi-Fu 1977. *Space and Place. The Perspective of Experience.* Edward Arnold, London.

GEO-MJD-13: SOCIAL GEOGRAPHY

Total Credit: 4
Total Lectures: 80
Max. Marks= 100 (ICA=25+ESE=75)

Course Objective and Outcome: The course focuses on the scientific study of the relationship of society and space (spatial components). social geography is an analysis of social phenomena expressed in space. The students will gain insight into how societal processes determine space and its structures and how spatial conditions determine the existence of societies.

Unit	Topics
Unit I	Social Geography: Concept, Origin, Nature and Scope
Unit II	Peopling Process of India: Technology and Occupational Change; Migration
Unit III	Social Categories: Caste, Class, Religion, Race and Gender and their Spatial distribution
Unit IV	Geographies of Welfare and Wellbeing: Concept and Components – Healthcare, Housing and Education; Social Geographies of Inclusion and Exclusion, Slums, Gated Communities, Communal Conflicts and Crime

Reading List

1. Ahmed A., 1999: *Social Geography*, Rawat Publications.
2. Casino V. J. D., Jr., 2009) *Social Geography: A Critical Introduction*, Wiley Blackwell.
3. Cater J. and Jones T., 2000: *Social Geography: An Introduction to Contemporary Issues*, Hodder Arnold.
4. Holt L., 2011: *Geographies of Children, Youth and Families: An International Perspective,* Taylor & Francis.
5. Panelli R., 2004: *Social Geographies: From Difference to Action*, Sage.
6. Rachel P., Burke M., Fuller D., Gough J., Macfarlane R. and Mowl G., 2001: *Introducing Social Geographies,* Oxford University Press.
7. Smith D. M., 1977: *Human geography: A Welfare Approach*, Edward Arnold, London.
8. Smith D. M., 1994: *Geography and Social Justice*, Blackwell, Oxford.
9. Smith S. J., Pain R., Marston S. A., Jones J. P., 2009: *The SAGE Handbook of Social Geographies*, Sage Publications.
10. Sopher, David (1980): *An Exploration of India*, Cornell University Press, Ithasa
11. Valentine G., 2001: *Social Geographies: Space and Society*, Prentice Hall

GEO-MJD-14: GENDER GEOGRAPHY

Total Credit: 4
Total Lectures: 80
Max. Marks= 100 (ICA=25+ESE=75)

Course Objective and Outcome: This course provides an introduction to gender and geography; more specifically, to feminist geography in theory and in practice. The students will examine how the social construction of difference shapes the conditions and experiences of men, women (and others) in diverse geographic contexts. The students will also learn how the constructions and meanings of categories of gender/sexuality are created and how they intersect with other categories of difference (race or age, for example) in ways that produce, and are produced by, spaces at different scales.

Unit	Topics
Unit I	Growth and evolution of the gender geography; its connotation; traditional concept of interdependence between men and women; emergence of patriarchy and capitalism and post- modern feminist movement;
Unit II	Gender based demographic structure; gender gaps in infant mortality rates; maternal mortality rate; female infanticide; gender and longevity gap- their spatial variations
Unit III	Male-Female involvement in Economic and Social Activities; multiple roles of women in land, water and forest resource management; Involvement of women in household activities, agriculture, mining, construction, industry, service and informal sectors
Unit IV	Gender gaps in social and public life: education, wage differentials in economic activities, health care and nutrition; Scope for bridging gender gap: empowerment of women and education, economic opportunities, access to reproductive health services, involvement in decision making processes in development and environmental management

Reading list

1. Mcdowell Linda, (1999): *Gender, Identity and Place*, Polity Press, U.K.
2. Raju, Saraswati. and Bagchi, Dipika. (1998): *Women and Work in South Asia: Regional Patterns and Perspectives*, Routledge
3. Mcdowell, Linda, and Sharp, Joanne P. (1997); *Space, Gender and Knowledge*, Arnold, U.K.
4. Kabeer, Naila. (1999): *Reversed Realities*, O.U.P, U.K.
5. Harison, S. and Pratt, G. (1995): *Gender, Work and Space*, Routledge, U.K. and U.S.A.
6. Massey, D. (1994): *Space, Place and Gender*, University of Minnisota Press, U.S.A.
7. Shiva, Vandana. (1988): *Staying Alive; Women, Ecology and Development*, Zed Books, U.K.
8. Banerjee, N. (1985): *Women Workers in the Unorganised Sector*, Sangam Books, Hyderabad, India.
9. Momsen Janet, (2004) (2010, 2nd edn.), Gender and Development, Routledge.
10. Haleth Afshar, (1991), *Women Development and Survival in the Third World*, Longman, London.

GEO-MJD-15: MAP PROJECTION (Practical)

Total Credit: 4
Total Lectures: 80
Max. Marks= 100 (RECORD+VIVA=50+ESE=50)

Course Objective and Outcome: The main aim of this paper is to develop the students in understanding the components of grid, graticules and how to compute and draw different projections.

Unit	Topics
Unit I	Map Projection: Definition, significance and types. Choices of map projections
Unit II	Construction, properties, merits, demerits and uses of Conical Projections: Conical Projection with two standard parallels, Polyconic Projection and Bonne's Projection
Unit III	Construction, properties, merits, demerits and uses of Zenithal Projections: Gnomonic, Stereographic, Orthographic, Equidistant and Equal Area Projection
Unit IV	Construction, properties, merits, demerits and uses of Cylindrical Projections: Simple Cylindrical Projection, Cylindrical Equal Area Projection and Mercator's Projection. Conventional Projections: Molleweide's Projection and International Projection

Practical Record: A Project File in pencil, comprising one exercise *each*, on each topic

Reading List

1. Misra R.P and A Ramesh (2002) *Fundamentals of Cartography*. Concept Publishing House, New Delhi.
2. Sharma J.P (2008) *Prayogik Bhugol*, Rastogi Publications, Meerut.
3. Singh, G (2005) *Map work and Practical Geography*, Vikas Publishing House, New Delhi.
4. Singh, L.R (2006) *Fundamentals of Practical Geography*, Sharda Pustak Bhawan, Allahabad.
5. Singh R.L and R.B.P Singh (2000) *Elements of Practical Geography*, Kalyani Publishers, New Delhi.
6. Tiwari, R.C and Tripati, S (2007), *Abhinav Prayothmak Bhugol*, Prayag Pustak Bhawan, Allahabad.
7. Yadav, Hiralal (2010) *Prayogathmak Bhugol*, Radha Publications, New Delhi.

GEO-MID-6(A): LEADERSHIP AND MANAGERIAL SKILLS

Total Credit: 4
Total Lectures: 80
Max. Marks= 100 (ICA=25+ESE=75)

Course Objective and Outcome: The course examines various leadership models and understand and assess their skills, strengths and abilities that affect their personal leadership style and can create a leadership vision. The students will be able to learn and demonstrate a set of practical skills such as time management, self-management, handling conflicts, and team leadership; Understand the basics of entrepreneurship and develop business plans, allocate available funds judiciously, maintain an account of current expenses, and plan for savings and investments.

Unit	Topics
Unit I	Understanding Leadership and its Importance; Traits and Models of Leadership; Key characteristics of an effective leaders; Learning through Biographies; Ethics and Conduct - Importance of ethics, Ethical decision making; Personal and professional moral codes of conduct, Creating a harmonious life
Unit II	Basic Managerial Skills - Planning for effective management, Recruiting and retaining talent, Delegation of tasks, learn to coordinate, Conflict management; Self-management Skills - Understanding self-concept, Developing self-awareness, Self-examination, Self-reflection and Introspection, Self-regulation;
Unit III	Basics of Entrepreneurship - Meaning of entrepreneurship, Classification and types of entrepreneurships, Traits and competencies of entrepreneur; Creating Business Plan – Problem identification and idea generation, Idea validation, Pitch making
Unit IV	Innovative Leadership; Emotional and social intelligence; Synthesis of human and artificial intelligence; Design Thinking – Key elements of design thinking: - Discovery - Interpretation - Ideation - Experimentation – Evolution; Budgeting; Saving and Investing - Advantages of saving money, Concept of present and future value of money

Reading List

1. Brown, T. 2012. *Change by Design*. New York: Harper Business.
2. Chandra, P. 2017. *Financial Management: Theory & Practice*. 9th edition. New York: McGraw Hill Education.
3. Dawkins, E.R. 2016. *52 Weeks of Self Reflection — Your Guided Journal of Self Reflection*. Chicago: A B Johnson Publishing.
4. Goleman, D. 1995. *Emotional Intelligence*. New Delhi: Bloomsbury Publishing India Private Limited.
5. Kalam, A.P.J. 2003. *Ignited Minds: Unleashing the Power within India*. New Delhi: Penguin Books India.
6. Kurien, V., and Salve, G. 2012. *I Too Had a Dream*. New Delhi: Roli Books Private Limited.
7. McCormack, M.H. 1986. *What They Don't Teach You at Harvard Business School: Notes from A Street-Smart Executive*. New York: Bantham.

GEO-MID-6(B): BASIC PHOTOGRAPHIC SKILLS (Practical)

Total Credit: 4
Total Lectures: 80
Max. Marks= 100 (RECORD+VIVA=50+ESE=50)

Course Objective and Outcome: The course will open an avenue for the students to explore career options and individual ventures in Photojournalism, which is a specialized and developing area in the media landscape. Students will be able to define the process, uses, principles and advantages of digital photography and learn the related concepts. They will be able to handle DSLR Cameras, compose and shoot in different lighting conditions and make photo feature on specific topics.

Unit	Topics
Unit I	Introduction to Photography & Camera – Basics of Photography, Principles of Camera Obscura, Working of Camera. Understanding various types of Cameras & its Parts (Including pinhole, compact camera, Polaroid Camera, T.L.R, S.L.R D.S.L.R camera)
Unit II	Handling Cameras – Proper way of holding a DSLR Camera. (Battery, Card, Lenses); Handling accessories- Tripod, Base Plate, Camera flash, etc.; Auto Manual Focus use, Vertical vs. Horizontal
Unit III	Exposure Triangle (Aperture, Shutter, ISO); Auto White Balance, Auto Focus Types of shots & Angle
Unit IV	Photoshop basics & Mobile Apps -Overview of software- Image size and resolution Tools (Selections tools, move tools Painting tools: Intro, paint bucket Gradient pattern; Pen Tools, Eraser tools, etc tools; Intro to layers; The tax type tool, Blending option (Layer Style); Colour correction.

Practical Assignment:

Assignment 1 (Based on Unit I): Students will submit an assignment based on analysis of 5 photographs from the Mobile Phone.

Assignment 2 (Based on Unit II): Students will submit Hardcopies of 6 photographs of different exposures.

Assignment 3 (Based on Unit IV): Students will submit photo essay of any Beats Consisting 10-15 photographs (printed on photo paper). Each photo should have a suitable caption.

Reading List

1. The Darkroom Cookbook; Anchell, Stephen G.
2. Practical photography; Freeman, John
3. Visual Communication: Images with messages by Paul Martin Lester
4. Focal Press: Basic Photography by Michael Langford
5. The History of Photography: As Seen Through the Spira Collection, S.F. Spira

GEO-MID-6(C): PROBLEM SOLVING AND DECISION MAKING SKILLS

Total Credit: 4
Total Lectures: 80
Max. Marks= 100 (ICA=25+ESE=75)

Course Objective and Outcome: The course is designed for students to identify types of people-based problems and to apply strategic thinking techniques in order to come up with new ideas and approaches in addressing problems and issues faced at work by senior managers. The course aims to encourage creativity and innovation, and apply ideas by providing practical problem-solving training by introducing creative thinking models and strategies to review existing perspective and considering alternative methods.

Unit	Topics
Unit I	Introduction to Problem Solving at work - Meaning of a "problem"**,** Categorizing problems**,** Problem solving**,** Reactive and proactive approach to problem solving
Unit II	Affinity diagrams for applying problem solving technique **-** What is an affinity diagram? When to use affinity diagrams**,** Creating affinity diagrams**,** Brainstorming
Unit III	Using histograms- Interrelationship diagrams to identify area for problem solving, What is an interrelationship diagram, When to use interrelationship diagrams, Creating inter relationship diagrams, Cause and effect diagrams, Scatter diagrams
Unit IV	Prioritization matrix developed for problem solving - What is a prioritization matrix, When to use prioritization matrix, How to use prioritization matrix, Criteria for prioritization chart; Pareto charts

Reading List

1. *Stop Guessing: The 9 Behaviors of Great Problem Solvers* by Nat Greene
2. *Think Smarter: Critical Thinking to Improve Problem-Solving and Decision-Making Skills* by Michael Kallet

SEMESTER – VII

GEO-MJD-16: GEOGRAHY OF TOURISM

Total Credit: 4

Total Lectures: 80

Max. Marks= 100 (ICA=25+ESE=75)

Course Objective and Outcome: As Tourism is the fastest growing industry in the world and its study encompasses over a wide array of course subjects. This course will enable the students to have deeper understanding of tourism in all its dimensions. On successful completion of this course, students will be able to know the importance of travel geography, will be able to understand the existence and location of tourist spots and will be able to identify new tourist spots

Unit	Topics
Unit I	Scope and Nature: Concepts and Issues, Tourism, Recreation and Leisure Inter-Relations; Geographical Parameters of Tourism by Robinson.
Unit II	Type of Tourism: Nature Tourism, Cultural Tourism, Medical Tourism, Pilgrimage
Unit III	Recent Trends of Tourism: International and Regional; Domestic (India); Eco-Tourism, Sustainable Tourism, Meetings Incentives Conventions and Exhibitions (MICE); Impact of Tourism: Economy; Environment; Society
Unit IV	Tourism in India: Tourism Infrastructure; Case Studies of Himalaya, Desert and Coastal Areas; National Tourism Policy, Andaman Islands: Factor influencing tourism, Structure, Mode of transport, Major tourist spots.

Reading List

1. Dhar, P.N. (2006) *International Tourism: Emerging Challenges and Future Prospects*. Kanishka, New Delhi.
2. Hall, M. and Stephen, P. (2006) *Geography of Tourism and Recreation – Environment, Place and Space*, Routledge, London.
3. Kamra, K. K. and Chand, M. (2007) *Basics of Tourism: Theory, Operation and Practise*, Kanishka Publishers, Pune.
4. Page, S. J. (2011) *Tourism Management: An Introduction*, Butterworth-Heinemann- USA. Chapter 2.
5. Raj, R. and Nigel, D. (2007) *Morpeth Religious Tourism and Pilgrimage Festivals Management: An International perspective* by, CABI, Cambridge, USA, www.cabi.org.
6. *Tourism Recreation and Research Journal*, Center for Tourism Research and Development, Lucknow
7. Singh Jagbir (2014) "*Eco-Tourism*" Published by - I.K. International

GEO-MJD-17: CLIMATE CHANGE – VULNERABILITY AND ADAPTATION

Total Credit: 4

Total Lectures: 80

Max. Marks= 100 (ICA=25+ESE=75)

Course Objective and Outcome: This course aims to help the students understand climate change, origin of greenhouse gases, global warming, impact of climate change on agriculture, water, flora and fauna; human health. It also helps students to understand climate change vulnerability assessment and concepts and skills to mitigate measures concerning climatic hazards

Unit	Topics
Unit I	Science of Climate Change: Understanding Climate Change; Green House Gases and Global Warming; Global Climatic Assessment – IPCC
Unit II	Climate Change and Vulnerability: Physical Vulnerability; Economic Vulnerability; Social Vulnerability
Unit III	Impact of Climate Change: Agriculture and Water; Flora and Fauna; Human Health
Unit IV	Adaptation and Mitigation: Global Initiatives with particular reference to South Asia; National Action Plan on Climate Change; Local Institutions (Urban Local Bodies, Panchayats)

Reading List

1. IPCC. (2007) Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change.
2. IPCC (2014) *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
3. IPCC (2014) *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
4. OECD. (2008) *Climate Change Mitigation: What Do we Do?* Organisation and Economic Cooperation and Development.
5. UNEP. (2007) *Global Environment Outlook: GEO4: Environment for Development*, United Nations Environment Programme.
6. Singh, M., Singh, R.B. and Hassan, M.I. (Eds.) (2014) *Climate change and biodiversity:* Proceedings of IGU Rohtak Conference, Volume 1. Advances in Geographical and Environmental Studies, Springer
7. Sen Roy, S. and Singh, R.B. (2002) *Climate Variability, Extreme Events and Agricultural Productivity in Mountain Region*s, Oxford & IBH Pub., New Delhi

GEO-MJD-18: SURVEY BY INTRUMENTS AND FIELD VISIT (Practical)

Total Credit: 4

Total Lectures: 80

Max. Marks= 100 (RECORD+VIVA=50+ESE=50)

Course Objective and Outcome: The aim of this paper is to abreast students with surveying instruments and field work to get basic awareness about how to conduct a research. The students will also get a chance to mingle with the rural and urban environment. The students will comprehend how geographical survey and field work has to be conducted. The students will learn to prepare questionnaire for fieldwork and design the field report.

Unit	Topics
Unit I	Prismatic Compass Survey – Open and closed traverse; correction of bearing, correction in interior angle
Unit II	Plane Table Survey – Basic Principles of Plane Table Surveying, Plane Table Survey with Intersection and Resection
Unit III	Total Station in Surveying – Uses and Applications
Unit IV	Field Visit - Defining the Field and Identifying the Case Study – Rural / Urban / Physical/ Human/ Environmental; Field Techniques – Merits, Demerits and Selection of the Appropriate Technique; Observation (Participant / Non Participant), Questionnaires (Open/ Closed/ Structured/ Non-Structured); Interview with Special Focus on Focused Group Discussions; Space Survey (Transects and Quadrants, Constructing a Sketch); Use of Field Tools – Collection of Material for Physical and Socio-Economic Surveys; Designing the Field Report – Aims and Objectives, Methodology, Analysis, Interpretation and Writing the Report.

Practical Record

1. Each student will prepare an individual report consisting of exercise of Prismatic Compass, Plane Table and Total Station
2. Each student will prepare an individual report based on primary and secondary data collected during field work. The duration of the field work should not exceed 10 days.

Reading List

1. Creswell J., 1994: *Research Design: Qualitative and Quantitative Approaches* Sage Publications.
2. Evans M., 1988: "Participant Observation: The Researcher as Research Tool" in *Qualitative Methods in Human Geography*, eds. J. Eyles and D. Smith, Polity.
3. Mukherjee, Neela 2002. Participatory Learning and Action: with 100 Field Methods. Concept Publs. Co., New Delhi
4. Robinson A., 1998: "*Thinking Straight and Writing That Way*", in *Writing Empirical Research Reports: A Basic Guide for Students of the Social and Behavioural Sciences*, eds. by F. Pryczak and R. Bruce Pryczak, Publishing: Los Angeles.
5. Special Issue on "Doing Fieldwork" *The Geographical Review* 91:1-2 (2001).
6. Stoddard R. H., 1982: *Field Techniques and Research Methods in Geography*, Kendall/Hunt.

GEO-MID-7(A): DEVELOPMENT ECONOMICS

Total Credit: 4
Total Lectures: 80
Max. Marks= 100 (ICA=25+ESE=75)

Course Objective and Outcome: This course introduces students to the basics of development economics, with in-depth discussions of the concepts of development, growth, poverty, inequality, as well as the underlying political institutions.

Unit	Topics
Unit I	History of mainstream and heterodox thinking about growth, poverty, inequality and human development; Economic Growth Models. Harrod-Domar and Solow models, long-term growth trends; New Growth Theory. Human capital, technology, social reproduction, and institutions
Unit II	Human Development and Capabilities; Consequences of growth – ends and means of development, human development and capabilities approach; Rural and Urban linkages. Role of agriculture; structural shifts; migration
Unit III	Inequality - Definition and measurement approaches; concept including intrinsic and instrumental concerns; instrumental role for economic growth; empirical trends since the 1970s. Poverty - Conceptual approaches; definitions and measures; empirical trends. Employment - Employment and poverty; Standard theory of labour market; Policy prescriptions – flexible labour market and alternative approaches; Informal sector work.
Unit IV	International Trade; Sustainability – Political Economics of the Environment

Reading List

1. A. Banerjee, R. Benabou, D. Mookerjee (eds.): *Understanding Poverty*, Oxford University Press (2006)
2. P. Bardhan: *Awakening Giants, Feet of Clay: Assessing the Economic Rise of China and India*, Oxford University Press (2010)
3. K. Basu: *The Oxford Companion to Economics in India*, Oxford University Press (2007)
4. Deaton: *The Great Escape: Health, Wealth and the Origins of Inequality*, Princeton University Press (2013)
5. D. Ray: *Development Economics*, Princeton University Press (1998)
6. Sen: *Development as Freedo*m, Oxford University Press (2000)
7. M. Todaro, S. Smith: *Economic Development*, Pearson (2015)

GEO-MID-7(B): WORLD GEOGRAPHY

Total Credit: 4
Total Lectures: 80
Max. Marks= 100 (ICA=25+ESE=75)

Course Objective and Outcome: focuses on the relationships among people, places, and environments that result in geographic patterns on the earth. The students will use geographic methods to compare and analyse landforms, climates, and natural resources, as well as cultural, political, economic, and religious characteristics of the world regions. The course enables students to geographically understand and appreciates the connections among people, places, and environments and solve problems in the contemporary world.

Unit	Topics
Unit I	Themes of World Geography – physical and human geography, location of natural resources, their impact on economic activities, ethnic conflicts and environmental issues
Unit II	Geography of the Americas (North America and South America)
Unit III	Geography of Europe; Geography of Australia and Oceania
Unit IV	Geography of Africa; Geography of Asia

Reading list

1. Boehm, R.G. (2016). *World Geography*. Bothell, WA: McGraw Hill Education.
2. DeBlij and Muller *Geography: Realms, Regions, and Concepts,* 10th Edition Publisher: John Wiley and Sons.
3. Jarrett, Mark, et.al. *Mastering the TEKS in World Geography*. New York: Jarrett Publishing Company, 2012.
4. *National Geographic World Atlas*

GEO-MID-7(C): TOWN PLANNING

Total Credit: 4
Total Lectures: 80
Max. Marks= 100 (ICA=25+ESE=75)

Course Objective and Outcome: The course aims at familiarizing students with the need and importance of town planning. The students will be able to design townships by utilizing the resources to develop its economy as well as livability conditions to ensure good transportation, health care, and judicial system.

Unit	Topics
Unit I	Definitions of town and country planning, Orthodoxies of planning, sustainability and rationality in planning, Components of sustainable urban and regional development. Planning History.
Unit II	Basic elements of the city, Concepts of space, time, scale of cities; Town planning in ancient India medieval, renaissance, industrial and post-industrial cities; Concepts of landmark, axis, orientation; Contribution of individuals to city planning. Lewis Mumford, Patric Geddes and Peter Hall. Theories of urbanization including Concentric Zone Theory, Sector Theory, Multiple Nuclei Theory, Land use and land value theory of William Alonso; Ebenezer Howard's Garden City Concept; Green Belt Concept.
Unit III	City as an organism: a spatial, physical, social, economic and political entity; City as a political statement (New Delhi, Chandigarh, Washington D.C., Brazilia etc.); The dynamics of the growing city. Impact of industrialization and urbanization. Metropolis and Megalopolis; Generic and paracentric cities.
Unit IV	Emerging Concepts: Global City, inclusive city, Safe city, etc. City of the future, future of the city; shadow cities, divided cities; Models of planning: Advocacy and Pluralism in Planning; Systems approach to planning: rationalistic and incremental approaches, mixed scanning and middle range planning, advocacy planning and action planning, equity planning; Types of Development Plans; Goal formulation, objective, scope, limitations; Plan making process, planning methodology and case studies. Smart City Mission; Sustainable Smart Cities; Critique of Master-plans of selected cities – Delhi, Mumbai, Bengaluru, Chennai, Port Blair

Reading list

1. *Text Book of Town Planning* by G. K. Bandopadhyaya
2. *Urban and Regional Planning* by Peter Hall
3. *Geography of Settlements* by F. S. Hudson, Macdonald and Evans Ltd. Estover,
4. *Model state zoning enabling law and model zoning regulations by India*. Town and Country Planning Organisation. (TCPO) New Delhi

GEO-MID-8(A): PERSONALITY DEVELOPMENT

Total Credit: 4
Total Lectures: 80
Max. Marks= 100 (ICA=25+ESE=75)

Course Objective and Outcome: The world today is very competitive and has many challenges overwhelming individuals. A course in personality development will help students, the young adults to develop soft-skills for handling the tough situation in the life ahead. Students will be able to identify their unique traits or qualities that will enhance their self-confidence, spoken skills as well as language skills.

Unit	Topics
Unit I	**Introduction to Personality Development:** The concept of personality - Dimensions of personality – Theories of Freud & Erickson; Significance of personality development. 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; SWOT analysis
Unit II	**Attitude & Motivation:** Attitude - Concept - Significance - Factors affecting attitudes - Positive attitude – Advantages –Negative attitude- Disadvantages - Ways to develop positive attitude - Differences between personalities having positive and negative attitude. Concept of motivation - Significance – Internal and external motives - Importance of self- motivation- Factors leading to de-motivation
Unit III	**Self-esteem:** Term self-esteem - Symptoms - Advantages - Do's and Don'ts to develop positive self-esteem – Low self- esteem - Symptoms - Personality having low self-esteem - Positive and negative self-esteem. Interpersonal Relationships – Defining the difference between aggressive, submissive and assertive behaviours – Lateral thinking
Unit IV	**Other Aspects of Personality Development:** Body language - Problem-solving - Conflict and Stress Management - Decision-making skills - Leadership and qualities of a successful leader – Character building -Team-work – Time management Work**,** ethics, Good manners and etiquette

Reading list

1. Hurlock, E.B (2006). *Personality Developme*nt, 28th Reprint. New Delhi: Tata McGraw Hill.
2. Stephen P. Robbins and Timothy A. (2014), *Organizational Behavior 16th Edition:* Prentice Hall.
3. Andrews, Sudhir. *How to Succeed at Interviews*. 21st (rep.) New Delhi.Tata McGraw-Hill 1988.
4. Heller, Robert *Effective leadership. Essential Manager* series. Dk Publishing, 2002
5. Hindle, Tim. *Reducing Stress. Essential Manager series*. Dk Publishing, 2003
6. Lucas, Stephen. *Art of Public Speaking*. New Delhi. Tata - Mc-Graw Hill. 2001
7. Mile, D.J. *Power of positive thinking*. Delhi. Rohan Book Company, (2004).
8. Pravesh Kumar. *All about Self- Motivation*. New Delhi. Goodwill Publishing House. 2005.
9. Smith, B. *Body Language*. Delhi: Rohan Book Company. 2004

GEO-MID-8(B): ENTREPREUNERSHIP AND START-UP MANAGEMENT

Total Credit: 4
Total Lectures: 80
Max. Marks= 100 (ICA=25+ESE=75)

Course Objective and Outcome: The course aims to teach students the conceptual background of business and entrepreneurship that will develop and fortify entrepreneurial quality among students. Students will be able to develop small and medium scale enterprises in order to generate employment at the same time have industrial ownership. Students will also be able to understand the merits and demerits of becoming an entrepreneur.

Unit	Topics
Unit I	Business: Concept, Meaning, Features, Stages of development of business and importance of business. Classification of Business Activities. Meaning, Characteristics. Importance and Objectives of Business Organization, Evolution of Business Organisation. Difference between Industry and Commerce and Business and Profession, Modern Business and their Characteristics.
Unit II	Promotion of Business: Considerations in Establishing New Business. Qualities of a Successful Businessman. Forms of Business Organisation: Sole Proprietorship, Partnership, Joint Stock Companies & Co-operatives and their Characteristics, relative merits and demerits, Difference between Private and Public Company, Concept of One Person Company.
Unit III	Plant Location: Concept, Meaning, Importance, Factors Affecting Plant Location. Alfred Weber's and Sargent Florence's Theories of Location. Plant Layout –: Meaning, Objectives, Importance, Types and Principles of Layout. Factors Affecting Layout. Size of Business Unit–: Criteria for Measuring the Size and Factors Affecting the Size. Optimum Size and factors determining the Optimum Size.
Unit IV	Business Combination: Meaning, Characteristics, Objectives, Causes, Forms and Kinds of Business Combination. Rationalisation: Meaning, Characteristics, Objectives, Principles, Merits and demerits, Difference between Rationalisation and Nationalisation.

Reading List

1. Gupta, C.B., "*Business Organisation*", Mayur Publiction, (2014).
2. Singh, B.P., Chhabra, T.N., "*An Introduction to Business Organisation & Management*", Kitab Mahal, (2014).
3. Sherlekar, S.A. & Sherlekar, V.S, "*Modern Business Organization & Management Systems Approach",* Mumbai, Himalaya Publishing House, (2000).
4. Bhusan Y. K., "*Business Organization*", Sultan Chand & Sons.
5. Prakash, Jagdish, "*Business Organistaton and Management*", Kitab Mahal Publishers (Hindi and English)

GEO-MID-8(C): CULINARY SKILLS

Total Credit: 4
Total Lectures: 80
Max. Marks= 100 (ICA=25+ESE=75)

Course Objective and Outcome: The aim of the course is to introduce the students to the basic culinary skills required to work in a professional kitchen. At the end of the course, the student will have the ability to evaluate the changes in food products, their preparations, relate with culinary terminology and compare the use of different equipment and tools according to the requirements.

Unit	Topics
Unit I	**Introduction to the food service industry:** Historical changes in the food industry, Evolution of food and food preparation, Famous Chefs in the evolution of gastronomy, Direct and indirect food providers, External aspects of operations, Product flow
Unit II	**Kitchen Organization:** Hierarchy, Kitchen equipment and tools, Safety, health, hygiene and uniform, Ergonomics, Production systems in the kitchen, Culinary terminology
Unit III	**Preliminary preparation techniques I:** Ingredient knowledge and Cooking methods: (1) Moist heat methods (steaming, boiling, blanching and braising); (2) Dry heat methods (frying, roasting and confit); Vegetables (varieties, characteristics, pre-preparation and cooking)**;** Meats and poultry (varieties, characteristics, pre-preparation and cooking)**;** Fish and Shellfish (varieties, characteristics, pre-preparation and cooking)
Unit IV	**Preliminary preparation techniques II:** Basics stocks: White stock, brown stock, fumet and veg stock; Soups and their classifications: Clear soups, cream soups, cold soups and international soups; Cold sauces, hot sauces and Mother sauces: Vinaigrette and mayonnaise, Béchamel and Velouté and their derivatives, Espagnole and derivatives, Hollandaise and derivatives, Tomato sauce and derivatives; Preparation of salads, sandwiches and hors d'oeuvres.

Reading List

1. Wayne Gisslen, *Professional Cooking*, Wiley, 2015, latest available Edition
2. Thangam E. Phillip, *Modern Cookery*, Volume 1, Orient Black Swan Ptl, latest available Edition
3. Thangam E. Phillip, *Modern Cookery*, Volume 2, Orient Black Swan Ptl, latest available Edition
4. Helena Caldon et al, *The Cooks Book of Ingredients*, DK 2010, latest available Edition
5. Larousse Gastronomique, *Hachette*, latest available Edition

SEMESTER – VIII

GEO-MJD-19: URBAN GEOGRAPHY

Total Credit: 4

Total Lectures: 80

Max. Marks= 100 (ICA=25+ESE=75)

Course Objective and Outcome: This paper aims to develop deeper understanding of urban geography focussing on establishing in-depth knowledge on spatial and temporal bases of urban studies; physical, social, cultural and economic set-up of urban centres with special reference to India. This helps the students to understand, analyse and interpret the morphology of urban centres and also to learn the significance of human activities, physical-biological and cultural phenomenon, both spatial and temporal.

Unit	Topics
Unit I	Urban geography: Introduction, Origin of Urbanisation, Urban Morphology, major aspect of Urbanisation
Unit II	Functional classification of cities: Quantitative and Qualitative Methods
Unit III	Urban Issues: problems of housing, slums, civic amenities (water and transport)
Unit IV	Patterns of Urbanisation in developed and developing countries – Case studies of Delhi, Mumbai, Kolkata, Chennai, Chandigarh and Port Blair with reference to Land use and Urban Issues

Reading List

1. Fyfe N. R. and Kenny J. T., 2005: *The Urban Geography Reader*, Routledge.
2. Hall T., 2006: *Urban Geography*, Taylor and Francis.
3. Kaplan D. H., Wheeler J. O. and Holloway S. R., 2008: *Urban Geography*, John Wiley.
4. Knox P. L. and McCarthy L., 2005: *Urbanization: An Introduction to Urban Geography*, Pearson Prentice Hall New York.
5. Ramachandran R (1989): Urbanisation and Urban Systems of India, Oxford University Press, New Delhi
6. Singh, R.B. (Ed.) (2015) Urban development, challenges, risks and resilience in Asian megacities. Advances in Geographical and Environmental Studies, Springer.

GEO-DSC-20: SUSTAINABILITY AND DEVELOPMENT

Total Credit: 4

Total Lectures: 80

Max. Marks= 100 (ICA=25+ESE=75)

Course Objective and Outcome: This course introduces students on the defining role of the concept and approaches of sustainable development in contemporary world taking into account all inclusive outcome indicators of development. The students will acquire the ability to understand significance of the concept and its defining role, will be able to distinguish the patterns of regional development of the world and the need for sustainable development plan suitable to different ecosystem.

Unit	Topics
Unit I	Sustainable Development: Definition, Components, Limitations and Historical Background. The Millennium Development Goals: National Strategies and International Experiences.
Unit II	Sustainable Regional Development: Need and examples from different Ecosystems.
Unit III	Inclusive Development: Education; Health; Climate Change; the role of higher education in sustainable development, the human right to health, poverty and disease, the challenges of universal health coverage, policies and global cooperation for climate change.
Unit IV	Sustainable Development Policies and Programmes: the proposal for SDGs at Rio+20; Illustrative SDGs; Goal-Based Development; Financing for Sustainable Development; Principles of Good Governance; National Environment Policy, CDM (Clean Development mechanism)

Reading List

1. Agyeman, Julian, Robert D. Bullard and Bob Evans (Eds.) (2003) *Just Sustainabilities: Development in an Unequal World*. London: Earthscan
2. Ayers, Jessica and David Dodman (2010) "Climate change adaptation and development I: the state of the debate". *Progress in Development Studies* 10 (2): 161-168
3. Baker, Susan (2006) *Sustainable Development*. Milton Park, Abingdon, Oxon; New York, N.Y.: Routledge
4. Brosius, Peter (1997) "Endangered forest, endangered people: Environmentalist representations of indigenous knowledge", *Human Ecology* 25: 47-69
5. Lohman, Larry (2003) "*Re-imagining the population debate*". Corner House Briefing 28
6. Martínez-Alier, Joan et al (2010) "Sustainable de-growth: Mapping the context, criticisms and Future prospects of an emergent paradigm" *Ecological Economics* 69: 1741-1747
7. Merchant, Carolyn (Ed.) (1994) *Ecology. Atlantic Highlands*, N.J: Humanities Press
8. Osorio, Leonardo et al (2005) "Debates on sustainable development: towards a holistic view of reality". *Environment, Development and Sustainability* 7: 501-518
9. Robbins, Paul (2004) *Political Ecology: A Critical Introduction*. Blackwell Publishing
10. Singh, R.B. (Eds.) (2001) *Urban Sustainability in the Context of Global Change*, Science Pub., Inc., Enfield (NH), USA and Oxford & IBH Pub., New Delhi.

GEO-RP: RESEARCH PROJECT/ DISSERTATION (Practical)

Total Credit: 12

Total Lectures: 20

Max. Marks= 100 (Report [70] + Viva voce [30])

Course Objective and Outcome: The course allows the student to explore a narrow topic in greater depth than a traditional module. The student works with a single supervisor chosen from their departmental faculty, and this individual provides guidance and support throughout the course of the research. The aim of the research project is to test the independent research skills students have acquired during their time at college. The students learn to do research and present their finding independently. The course is very helpful for students who would pursue academics as a career.

Students who **scores 75% marks** and above in the first 6 Semesters and wish to undertake research at the UG level can choose a research stream in the 4th Year

1. The students may select some of the following themes for their project.
   i. Land-use/ Land cover Analysis
   ii. Water Sources
   iii. Settlement Studies
   iv. Agricultural Studies
   v. Health Studies
   vi. Infrastructure Studies
   vii. Forest Studies
   viii. Marine Resource
   ix. Disasters
   x. Climate Change

2. The Project should be printed and should not exceed 5000 words.
3. Project work must include quality maps, diagrams and flowcharts wherever required.

Above work has to be done in consultation with the faculty-in-charge.

Viva-Voce will be conducted at the end of Semester VIII

OR

Students have to take the following papers in lieu of Research Project

GEO-MJD-21: Population Geography

GEO-MJD-22: Agriculture Geography

GEO-MJD-23: Political Geography

GEO-MJD-21: POPULATION GEOGRAPHY

Total Credit: 4

Total Lectures: 80

Max. Marks= 100 (ICA=25+ESE=75)

Course Objective and Outcome: This course introduces students to the spatial distribution of population with causative factors. It also deals with various theories and concepts related with population and makes them aware of various kinds of demographic problems. After the completion of the course, Students will be able to understand the distribution of population and its problems, understand population policies & its importance

Unit	Topics
Unit I	Defining the Field – Nature and Scope; Sources of Data with special reference to India (Census, Vital Statistics and NSS).
Unit II	Population Size, Distribution and Growth – Determinants and Patterns; Theories of Growth – Malthusian Theory and Demographic Transition Theory.
Unit III	Population Dynamics: Fertility, Mortality and Migration – Measures, Determinants and Implications. Population Composition and Characteristics – Age-Sex Composition; Rural and Urban Composition; Literacy.
Unit IV	Contemporary Issues – Ageing of Population; Declining Sex Ratio; HIV/AIDS

Reading List

1. Barrett H. R., 1995: *Population Geography*, Oliver and Boyd.
2. Bhende A. and Kanitkar T., 2000: *Principles of Population Studies*, Himalaya Publishing House.
3. Chandna R. C. and Sidhu M. S., 1980: *An Introduction to Population Geography*, Kalyani Publishers.
4. Clarke J. I., 1965: *Population Geography*, Pergamon Press, Oxford.
5. Jones, H. R., 2000: *Population Geography,* 3rd ed. Paul Chapman, London.
6. Lutz W., Warren C. S. and Scherbov S., 2004: *The End of the World Population Growth in the 21st Century*, Earthscan
7. Newbold K. B., 2009: *Population Geography: Tools and Issues*, Rowman and Littlefield Publishers.
8. Pacione M., 1986: *Population Geography: Progress and Prospect*, Taylor and Francis.
9. Wilson M. G. A., 1968: *Population Geography*, Nelson.
10. Panda B P (1988): Janasankya Bhugol, M P Hindi Granth Academy,Bhopal
11. Maurya S D (2009) Jansankya Bhugol, Sharda Putak Bhawan, Allahabad
12. Chandna, R C (2006), Jansankhya Bhugol, Kalyani Publishers, Delhi.

GEO-MJD-22: AGRICULTURE GEOGRAPHY

Total Credit: 4

Total Lectures: 80

Max. Marks= 100 (ICA=25+ESE=75)

Course Objective and Outcome: The course aims to introduce the students to the basic principles and concepts in Agriculture Geography and to acquaint with the applications of Agriculture Geography in different areas and development. Students will be able to understand various parameters of agriculture in India and the world.

Unit	Topics
Unit I	Defining the Field: Introduction, nature and scope; Land use/ land cover definition and classification.
Unit II	Determinants of Agriculture: Physical, Technological and Institutional.
Unit III	Agricultural Regions of India: Agro-climatic, Agro-ecological & Crop Combination Regions.
Unit IV	Agricultural Systems of the World (Whittlesey's classification) and Agricultural Land use model (Von Thuenen, modification and relevance); Agricultural Revolutions in India: Green, White, Blue, Pink

Reading List

1. Basu, D.N., and Guha, G.S., 1996: *Agro-Climatic Regional Planning in India*, Vol.I & II, Concept Publication, New Delhi.
2. Bryant, C.R., Johnston, T.R, 1992: *Agriculture in the City Countryside*, Belhaven Press, London.
3. Burger, A., 1994: *Agriculture of the World*, Aldershot, Avebury.
4. Grigg, D.B., 1984: *Introduction to Agricultural Geography*, Hutchinson, London.
5. Ilbery B. W., 1985: *Agricultural Geography: A Social and Economic Analysis*, Oxford University Press.
6. Mohammad, N., 1992: *New Dimension in Agriculture Geography*, Vol. I to VIII, Concept Pub., New Delhi.
7. Roling, N.G., and Wageruters, M.A.E.,(ed.) 1998: *Facilitating Sustainable Agriculture*, Cambridge University Press, Cambridge.
8. Shafi, M., 2006: *Agricultural Geography*, Doring Kindersley India Pvt. Ltd., New Delhi
9. Singh, J., and Dhillon, S.S., 1984: *Agricultural Geography*, Tata McGraw Hill, New Delhi.
10. Tarrant J. R., 1973: *Agricultural Geography*, David and Charles, Devon.

GEO-MJD-23: POLITICAL GEOGRAPHY

Total Credit: 4

Total Lectures: 80

Max. Marks= 100 (ICA=25+ESE=75)

Course Objective and Outcome: The course examines states emergence with an emphasis on how internal and external forces work centripetally and centripetally on the integrity of state territories. It aims to develop an appreciation for the effects of boundaries on economic, political, and social processes and familiarize students with the relevant details theoretical concepts and challenges underpinning the study of geography and politics.

Unit	Topics
Unit I	Introduction: Concepts, Nature and Scope of Political Geography
Unit II	State, Nation and Nation State – Concept of Nation and State, Attributes of State – Frontiers, Boundaries, Shape, Size, Territory and Sovereignty, Concept of Nation State; Geopolitics; Theories (Heartland and Rimland)
Unit III	Electoral Geography – Geography of Voting, Geographic Influences on Voting pattern, Geography of Representation, Gerrymandering.
Unit IV	Political Geography of Resource Conflicts – Water Sharing Disputes, Disputes and Conflicts Related to Forest Rights and Minerals; Politics of Displacement: Issues of relief, compensation and rehabilitation: with reference to Dams and Special Economic Zones

Reading List

1. Cox K. R., Low M. and Robinson J., 2008: *The Sage Handbook of Political Geography*, Sage Publications.
2. Cox K., 2002: *Political Geography: Territory, State and Society*, Wiley-Blackwell
3. Gallaher C., et al, 2009: *Key Concepts in Political Geography*, Sage Publications.
4. Glassner M., 1993: *Political Geography*, Wiley.
5. Jones M., 2004: *An Introduction to Political Geography: Space, Place and Politics*, Routledge.
6. Mathur H M and M M Cernea (eds.) Development, Displacement and Resettlement – Focus on Asian Experience, Vikas, Delhi
7. Painter J. and Jeffrey A., 2009: *Political Geography*, Sage Publications.
8. Taylor P. and Flint C., 2000: *Political Geography*, Pearson Education.
9. Hodder Dick, Sarah J Llyod and Keith S McLachlan (1998), *Land Locked States of Africa and Asia* (vo.2), Frank Cass.