दिल्लीविश्वविद्यालय
UNIVERSITY OF DELHI

Bachelor of Arts (Hons) Geography

(Effective from Academic Year 2019-20)

Revised Syllabus as approved by

Academic Council
Date: No:
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Applicable for students registered with Regular Colleges

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Learning Outcomes Based Curriculum Framework (LOCF) for B.A. (Hons.) Geography

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Preamble

The objective of anyprogramme at Higher Education Institute is to prepare their students for the society at large. The University of Delhi envisions all its programmes in the best interest of their students and in this endeavour it offers a new vision to all its Under-Graduate courses. It imbibes a Learning Outcome-based Curriculum Framework (LOCF) for all its Under Graduate programmes.

The LOCF approach is envisioned to provide a focused, outcome-based syllabus at the undergraduate level with an agenda to structure the teaching-learning experiences in a more student-centric manner. The LOCF approach has been adopted to strengthen students' experiences as they engage themselves in the programme of their choice. The Under-Graduate Programmes will prepare the students for both, academia and employability.

Each programme vividly elaborates its nature and promises the outcomes that are to be accomplished by studying the courses. The programmes also state the attributes that it offers to inculcate at the graduation level. The graduate attributes encompass values related to well-being, emotional stability, critical thinking, social justice and also skills for employability. In short, each programme prepares students for sustainability and life-long learning.

The new curriculum of B.A. (Hons) Geography offer following objectives:

1. To orient the students towards identification and analysis of various facets of geographic and geographical features and processes.
2. To develop students' aptitude for acquiring basic skills of carrying out field work.
3. To facilitate the students to learn skills of map making.
4. To guide students to learn the science and art of collecting, processing and interpreting the data.
5. To expose the students to the use of the updated technologies of remote sensing, GNSS, Geographical Information System (GIS) and GIScience.

1. INTRODUCTION

The Choice Based Credit System (CBCS) offers a uniform structure to the undergraduate curriculum. The B.A.Honours programme in Geography offers a choice of varied papers covering theoretical, practical and applied aspects of the discipline. It is designed to cover both traditional and contemporary framework of study, thus giving a wide scope to the learners to apply their knowledge and skills in real scenarios. Teaching-learning methods have also evolved from purely lecture mode to demonstrative techniques of knowledge enabling process.

The main objective is to develop an aptitude towards erudition that is rich in its content as well as it delivers the requirement of the present day society and industry. The curriculum has been carefully designed to include conceptual, practical, experiential and skill building component.

Each Course has three learning outcomes, five uniform contents and references incorporating a few Hindi books wherever possible.

1.1 Fundamentals: This curriculum also focuses on the understanding of core and fundamental branches of the discipline. These papers are specially designed to cater to foundation building of the students by imparting knowledge about the pillars of geography. It encompasses the evolution of the subject right from the experiences and understanding of travellers and explorers regarding space, place and people to the progression towards establishment of the discipline geography in social sciences. Care has been taken to cover all basic themes in geography. The classic and contemporary theories / models of the subject are incorporated in most papers. These core branches cover the two broad spectrums of physical and human geography, along with the interface branch of environmental studies.

1.2 Practical: To enrich the process of knowledge assimilation varied tools and technique oriented papers have also been incorporated in the curriculum. It includes traditional mapping concepts to digital and space based learning. There has been emphasis on use of sophisticated methods of data collection as well as data processing through exhaustive field work, use of basic statistics and Geographic Information System. The advantage of going for compulsory

fieldwork can train them to undertake research in future which is essential part of social science approach.

1.3 Application Oriented: In addition to this, the applied component has also been integrated in the syllabus for skill enhancement and capacity building. Laboratory and project based learning are important constituents of these papers. Hands on learning making use of various tools, equipment and softwares are essential mechanism for knowledge transfer. There has been focus on student centric education that involves an exploratory approach and gaining proficiency by learning both inside and outside their classrooms.

1.4 Regional Approach: In most of the papers regional dimensions are added through theoretical case studies and field excursions. Along with the global dimensions of the issues that are covered in syllabus papers like geography of India purely caters to regional and local approach to the understanding.

2. LEARNING OUTCOME – BASED APPROACH TO CURRICULUM PLANNING

The learning outcome is to prepare the students of BA/BSc Honours degree in Geography, to understand the development of the subject and delve around issues suited to the needs of the contemporary world. It covers a wide range of papers covering various themes and also maintains uniformity of structure across universities in the country. Geography being interdisciplinary in nature integrates learning derived from all basic and applied sciences/social sciences.

2.1 **Nature and Extent of Programme**

The Learning Outcomes-based Curriculum Framework (LOCF) for the B.A. (Honours) degree in Geography is intended to develop as per the requirements of the subject with emerging new domains of Geography. The framework allows for flexibility in programme design and course content along with maintaining a basic uniformity in structure in comparison with other universities across the country. The B.A. (Honours) Geography programme covers a wide range of fundamental and applied courses as well as courses of interdisciplinary nature. The core courses are designed to develop strong subject knowledge base in the student and apprise them with the applied aspects of this dynamic global

discipline. The programme offers a wide range of elective courses to the student to choose from. The syllabi include skill enhancement courses that prepare the student for a career in academia or industry.

2.2 **Aims of Bachelor degree programme in Geography**

The student is equipped to pursue higher studies in an institution of her/his choice, and to apply the skills learnt in the programme to solving practical societal problems. The student will also be ready to join the industry as trained workforce.

3. GRADUATE ATTRIBUTES

Some of the characteristic attributes of an Honors graduate in Geography include:

3.1 **Disciplinary Knowledge**: Students gains in-depth knowledge of basic and applied areas of geography. Core and discipline courses train them in fundamental branches of the subject. Technical and skill courses help them to learn tools and technics. Geography student gets a unique opportunity to experiment and observe on the field.

3.2 **Communication Skills**: Students develops effective communication skills through oral presentations, and group discussions on the subject content. Besides interviewing people, field surveys and public dealing with different cadre of people makes him/her confident in communication. The compiling, processing and analyzingthe information from the field;and presenting in the form of reports enhances written communication skills.

3.3 **Critical Thinking**: Geography subject creates scientific logic aptitude and approaches a problem through critical reasoning. The course content is enabled to stimulate the questioning capacity for what, where, who, when and how. The papers like Environmental Geography, Disaster Management, Global Economic System, Resource Management to name a few.

3.4 **Problem Solving**: The understanding about surroundings, the issues that concerns life, climate or to that matter water crisis etc makes students yearn to look for solutions. Geography discipline has the flair which connects to everyday living and survival thus generates problem solving aptitude.

3.5 **Analytical Reasoning**: The geography course teaches variety of tools, techniques and data handling which develop analytical reasoning to solve the issues. In fact the training in all these courses is meant to develop the analytical reasoning, mining the data from satellite images, aerial photographs and observations to arrive at interpretations and inferences.

3.6 **Research Related Skills**: The course content trains students to learn basic research design, data collection process, and ethics to conduct research work through field work. The specially developed course on research methodology and field work acquaint them to prepare questionnaires, selecting sample plans, identifying right kind of objectives,data collections methods, field exposure, mental mapping, reproducing the observations, analysis and finally to prepare reports.

3.7 **Cooperation/ Teamwork**: The course enables to develop skill to work with students ofdiverse backgrounds and cooperation on same topic will increase better understanding. The group assignments and presentations are essential elements in the course design that will inculcate the team spirits. The field excursions help develop great bonding; working and executing the plans on ground .They also learn to work as team in case any emergency with group member away from institution/home/or city.

3.8 **Scientific Reasoning**: Course will develop critical analysis of theories and models, raising critical questions about the theories and models, developing hypothesis and learning their testing. Many of the courses in geography are truly scientific in nature which will generate scientific reasoning aptitude and also skills to look towards new approaches.

3.9 **Reflective Thinking:** A graduate who successfully completes his/her course should be able to reflect on the assimilated knowledge so as to apply these skills at different levels. Whether they go for masters in pure or applied disciplines, it will inculcate a sense of understanding of the world to manage real world problems. Any teaching learning process is incomplete without clear refection of the theoretical, practical and applied knowledge of the subject. A degree in geography has ample scope in other field of studies too as the subject with its interdisciplinary approach helps the learners to think in a more comprehensive manner.

3.10 **Information and Digital Library:** The student of geography is always encouraged to explore beyond the basic textbooks. Besides availability of all types of reading material, a student needs to invest in learning and consulting from various open source library to expand the vista of their knowledge acquiring capability. Since it is a subject that does not completely rely on traditional text book oriented studies but has to delve deeper and research enough to keep pace with the ever-changing world. Thus the World Wide Web has proved to be very useful in keeping oneself apprised and continuously update ones knowledge base. The usage of open source software, tools and open access reading material are part of the curriculum which will train them for digital world.

3.11 **Self Directed Learning:** A graduate in the discipline of geography has to engage continuously in a learning process that can give a sense of direction to him/her. Different types of project work and field oriented papers encourages the pupil to take up self-directed task so as to widen their research horizon and ultimately look beyond the basic course book. Anyone with a mindset to move beyond the curriculum has to go for self-learning as the teaching content is fixed and defined. Under the supervision of the teacher one can easily involve themselves in fruitful learning. This will enable the students to take up task that is well understood and adapting themselves to the changing curriculum needs.

3.12 **Multicultural Competence:** Geography is a discipline which is not limited to any specific place or space. Its identity is based on multi-plural, multi-cultural and multi sited-ethnography. As a subject it emphasizes on regional and cultural studies which involves detailed understanding of places and perceptions. Also as a disciplinarian, it allows the learner to learn about both their own culture as well as those of their distant counterparts. This diversified knowledge also helps them to respect all fellows following varied community norms, traditions and practices. Field studies have been much helpful in introducing multicultural competencies to students of geography.

3.13 **Moral and ethical awareness**: In the age of fast technological changes and in the attempt to obtain an increased level of comforts. Today is the age in which the social order of the national state, class, ethnicity and traditional family needs more attention. In this scenario, Geography curriculum attempts to explain rights and duties not only towards working and fellow citizens but also towards nature and resources. The student will appreciate the balanced interactions, personal space, and common/community space. Geography will play its part in nurturing values and ethics in future citizens of the world.

3.14 **Leadership Readiness/ Quality**: A good leader needs to have the knowledge, rational thinking and ready to act at the time of need. Geography encourages to have descriptive and explanatory knowledge of one's surroundings and the globe as a whole, it develops rational thinking and prepares the students to think about alternative social, economic and environmental futures. So a geography student will be a good leader and will contribute in different capacities.

Lifelong learning: Lifelong learning is a seamless process of learning from primary education to higher levels and even during one's profession through formal or informal modes. The core of the Geography is the man-environment interaction, which remains

relevant for all at all stages of human life. So the basic knowledge and the tools Geographer learns help them in their future life and the process of learning will continue throughout life.

4. QUALIFICATION DESCRIPTION

The qualification description for B.Sc. (Honours) programme in Geography includes:

- Demonstration of exhaustive understanding of the basic concepts of Geography and an awareness of the emerging areas of the field.
- Acquisition of in-depth understanding of the applied aspects of Geographyas well as interdisciplinary subjects in everyday life.
- Improvement of critical thinking and skills facilitating.
- The application of knowledge gained in the field of Geography in the classroom to the practical solving of societal problems.
- Development of intellectual capabilities to get into further research in the discipline.
- Acquirement of practical laboratory skills, systematic research design and collection of experimental data.
- Exhibition of ability to quantitatively analyse the experimental data and writing project reports.
- Development of strong oral and written communication skills promoting the ability to present ideas and also team work spirits.

5. PROGRAMME LEARNING OUTCOMES IN COURSE

- The learning outcome is to prepare the students of BA/BSc Honours degree in Geography, to understand the development of the subject and delve around issues suited to the needs of the contemporary world. It covers a wide range of papers covering various themes and also maintains uniformity of structure across universities in the country.Geography being interdisciplinary in nature integrates learning derived from all basic and applied sciences/social sciences.
- Students of the BA/BSc Honours degree in Geography will learn to use geographic understanding of various sub fields such as physiography, resources, global economic systems, socio- cultural aspects, rural and urban milieu, environmental and disaster studies and mapping methods.
- They are trained to read and interpret maps, prepare transect charts and thematic atlas.
- They are also able to read and analyse weather phenomenon through weather maps and charts.
- Students will acquire scientific methodology of data handling, hypothesis generation, testing and analysis.
- After the completion of the course, students will also gain knowledge of various technological applications through study of Remote Sensing and Geographic Information Science.
- The curriculum also provides an opportunity to digitally produce maps and modelling applications.

- The students also learn hand on skills to prepare building disaster plans, community disaster preparedness and also awareness creation.
- They will also develop an understanding of global issues from economic, social, environmental and political perspectives, which has relevance in further studies all across the globe.
- They also develop effective communication skills, team work, travel exposure and zeal of investigation and exploration.
- The learners can greatly contribute to the subject through teaching, research and field oriented studies.
- The students will also be able to pursue a career in spatial planning, sustainable practices, environmental and resource management.
- The geography graduates will be well informed citizens who can play immense role in the civil society too. They will be able to pursue wide range of careers as planners, administrators, academicians, and managers.

6. CURRICULUM STRUCTURE

The Learning Outcome-based Curriculum framework is designed around CBCS and it is intended to provide greater opportunity and employability along with in-depth knowledge of the discipline. By the end of the completion of the programme the students will be equipped to pursue further their interest in the subject.

Table 1: Brief CBCS Course Structure for B.A. Honours Geography

S.N.	**COURSES**	**NO. OF PAPERS**	**CREDITS**	
			Theory +Tutorial	Total
A.	Core Courses (14 Papers of 6 credits each)	14	14x5 = 70 14x1 = 14	84
B.	Discipline Specific Elective Courses (4 Papers of 6 credits each)	4	4x5= 20 4x1= 4	24
C.	Skill Enhancement Courses (2 Papers of 4 credits each, no tutorials)	2	2x4=8	8
D.	Generic Electives Courses/Interdisciplinary (4 Papers of 6 credits each)	4	4x5= 20 4x1= 4	24
E.	Ability Enhancement Compulsory Courses (2 Papers of 4 credits each, no tutorials)	2	2x4=8	8
Total (A+B+C+D+E)		**26**		**148**

NOTE

1. For Theory courses : Theory and Tutorial (5+1/week)
2. For practical core courses 6 credits without tutorials. One credit is equivalent to two continuous hours.
3. For practical SEC courses 4 credits without tutorials. One credit is equivalent to two continuous hours.

Programme Duration

The BA/B.Sc. (Honours) programme will be of three years duration. Each year will be called an academic year and will be divided into two semesters. Thus there will be a total of six semesters. Each semester will consists of sixteen weeks.

Programme Design

The programme includes Core Courses (CC) and Elective Courses (EC). The core courses are all compulsory courses. There are three kinds of elective courses that includes Discipline-Specific Elective (DSE), Generic Elective (GE) and Skill Enhancement Course (SEC). In addition there are compulsory Ability Enhancement Courses (AEC).

To acquire a degree in Geography a student must study fourteen Core Courses, four Discipline Specific Electives, four Generic Electives, two Skill Enhancement Courses and two compulsory Ability Enhancement Courses. The Core Courses, Discipline-Specific Electives and Generic Electives are six-credit courses. The Skill Enhancement Courses are four-credit courses while the Ability Enhancement Courses are two credit-courses. **A student has to earn a minimum of 148 credits to get a degree in B.Sc. (H) Geography.**

a. The fourteen **Core Courses** are to be spread as, two courses each in I and II semesters; three courses each in semester III and IV; two courses each in semester V

Table 2: Semester-wise Distribution of Credits

Year	**Semester**	**Courses**	**Credits**
I	I	4	22
	II	4	22
II	III	5	28
	IV	5	28
III	V	4	24
	VI	4	24
Total		**26**	**148**

and VI. Each course will be of six credits which will involve theory papers (Lectures) of one hour duration five days a week, and one tutorial per paper per week. While practical papers will have six double periods of two hours duration. For practical papers one credit is equivalent to two hours of teaching. There are no tutorials for practical courses.The size of the practical group will be not more than 15 students.

b. There are eight **Discipline-Specific Electives Courses (DSEC**), the student must choose any two in each of the Semesters V and VI. These courses will be of six credits each (five theory classes and one tutorial) of one hour duration.
c. The students will undertake two **Skill Enhancement Courses**(SEC) of four credits each in Semesters III and IV,to be selected from the list of SEC courses offered. The SEC courses will be of four credits each comprising of practical papers only. For practical papers one credit is equivalent to two hours of teaching. There are no tutorials for practical courses. The size of the practical group will be not more than 15 students.
d. **Generic Elective** (GE) courses will be offered to the students of the BA/BSc Honours Geography by other departments of the college. The student will have the option to choose oneGE course each in Semesters I, II, III, and IV. The GEs will be of six credits each (five credits for theory and one credit for tutorial). The department of Geography will offer eight GE courses for students of other department.
e. **Ability Enhancement Courses** (AEC)/ will be of two kinds: AE Compulsory Course (AECC) and AE Elective Course (AEEC). "AECC" courses are the courses based upon the content that leads to Knowledge enhancement. They are mandatory for all disciplines with two papers:(i) Environmental Science, (ii) English/MIL Communication). "AEEC" courses are value-based and/or skill-based and are aimed at providing hands-on-training, competencies, skills, etc.

Table 3: Detailed CBCS Course Structure for B.A. Honours Geography

A. CORE COURSES

(14 Papers of 6 credits each)

S.N.	**Name of the Papers**	**Credits** (14x6=84)	**Credit Hours**		
			L	**T**	**P**
1	Geomorphology	6	5	1	-
2	Cartographic Techniques (Practical)	6	-	-	12
3	Human Geography	6	5	1	-
4	Thematic Cartography (Practical)	6	-	-	12
5	Climatology	6	5	1	-
6	Statistical Methods in Geography (Practical)	6	-	-	12
7.	Geography of India	6	5	1	-
8.	Economic Geography	6	5	1	-

9	Environmental Geography	6	5	1	-
10.	Field Work and Research Methodology (Practical)	6	-	-	12
11.	Regional Planning and Development	6	5	1	-
12.	Remote Sensing and GIS (Practical)	6	-	-	12
13.	Evolution of Geographical Thought	6	5	1	-
14.	Disaster Management based Project Work (Practical)	6	-	-	12

B. DISCIPLINE SPECIFIC ELECTIVES COURSES (ANY FOUR)

(4 Papers of 6 credits each)

S.N.	Name of the Papers	Credits (4x6=24)	Credit Hours		
			L	T	P
1.	Demography and Population Studies	6	5	1	-
2.	Hydrology and Soil Studies	6	5	1	-
3.	Urbanization and Urban System	6	5	1	-
4.	Agriculture and Food Security	6	5	1	-
5.	Geography of Health	6	5	1	-
6.	Introduction to Political Geography	6	5	1	-
7.	Biogeography and Biodiversity	6	5	1	-
8.	Geography of Social Wellbeing	6	5	1	-

C. SKILL ENHANCEMENT COURSES

(2 Papers of 4 credits each)

S.N.	Name of the Course	Credits (2x4=8)	Credit Hours		
			L	T	P
1.	Geographic Information System(Practical)	4	-	-	8
2.	Advanced Spatial Statistical Techniques	4	4	-	-
3.	Introduction to GIScience(Practical)	4	-	-	8
4.	Thematic Atlas(Practical)	4	-	-	8

D. GENERIC ELECTIVES COURSES/INTERDISCIPLINARY

(4 Papers of 6 credits each)

S.N.	Name of the Course	Credits (4x6=24)	Credit Hours		
			L	T	P
1.	Disaster Management	6	5	1	-
2.	Geography of Tourism and Pilgrimage	6	5	1	-
3.	Spatial Information Technology	6	5	1	-
4.	Coupled Human and Environment System	6	5	1	-
5.	Climate Change Vulnerability and Adaptation	6	5	1	-
6.	Rural Development	6	5	1	-
7.	Industrial Development	6	5	1	-
8.	Sustainable Resource Development	6	5	1	-

E. ABILITY ENHANCEMENT COMPULSORY COURSES

(2 Papers of 4 credits each)

S.N.	Name of the Course	Credits (4x2=8)	Credit Hours		
			L	T	P
1.	Art of Communication / MIL	4	4	-	-
2.	Environmental Studies	4	4	-	-

NOTE

4. For Theory courses : Theory and Tutorial (5+1/week)
5. For practical core courses 6 credits without tutorials. One credit is equivalent to two continuous hours.
6. For practical SEC courses 4 credits without tutorials. One credit is equivalent to two continuous hours.

Table 4: SEMESTER-WISE PLACEMENT OF COURSES						
Year	**Semester**	**AECC (2)**	**CC(14)**	**DSEC (4)**	**SEC (2)**	**GEC (4)**
I	I	Art of Communication/ MIL	Geomorphology Cartographic Techniques(Practical)			Disaster Management Or Geography of Tourism and Pilgrimage
	II	Environmental Studies	Human Geography Thematic Cartography (Practical)			Spatial Information Technology Or Coupled Human and Environment System
II	III		Climatology Statistical Methods in Geography (Practical) Geography of India		Geographic Information System (Practical) or Advanced Spatial Statistical Techniques	Climate Change Vulnerability and Adaptation Or Rural Development
	IV		Economic Geography Environmental Geography Field Work and Research Methodology (Practical)		Introduction to GIScience (Practical) or Thematic Atlas (Practical)	Industrial Development Or Sustainable Resource Development
III	V		Regional Planning and Development Remote Sensing and GIS (Practical)	Demography and Population Studies Or Hydrology and Soil Studies Urbanization and Urban System or Agriculture and Food Security		
	VI		Evolution of Geographical Thought Disaster Management based Project Work (Practical)	Geography of Health or Introduction to Political Geography Biogeography and Biodiversity Or Geography of Social Wellbeing		

SYLLABUS OF COURSES TO BE OFFERED

B.A. / B. Sc (Honours) Geography

Core Courses

Semester I

1. Geomorphology
2. Cartographic Techniques(Practical)

Semester II

3. Human Geography
4. Thematic Cartography (Practical)

Semester III

5. Climatology
6. Statistical Methods in Geography (Practical)
7. Geography of India

Semester IV

8. Economic Geography
9. Environmental Geography
10. Field work and Research Methodology (Practical)

Semester V

11. Regional Planning and Development
12. Remote Sensing and GIS (Practical)

Semester VI

13. Evolution of Geographical Thought
14. Disaster Management based Project Work(Practical)

Skill Enhancement Course (any 2)

Semester III

1. Geographic Information System(Practical)
2. Advanced Spatial Statistical Techniques

Semester IV

3. Introduction to GIScience (Practical)
4. Thematic Atlas (Practical)

Discipline Specific Elective Courses (any four)

Semester V
DSE-1

1. Demography and Population Studies
2. Hydrology and Soil Studies

DSE-2

3. Urbanization and Urban System
4. Agriculture and Food Security

Semester VI
DSE-3

5. Geography of Health
6. Introduction to Political Geography

DSE-4

7. Biogeography and Biodiversity
8. Geography of Social Wellbeing

Generic Elective Courses
Semester I

1. Disaster Management
2. Geography of Tourism and Pilgrimage

Semester II

1. Spatial Information Technology
2. Coupled Human and Environment System

Semester III

1. Climate Change Vulnerability and Adaptation
2. Rural Development

Semester IV

1. Industrial Development Sustainable
2. Resource Development

7.3. TEACHING-LEARNING PROCESS

- Classroom discussions and interactive learning.
- Audio visual presentation/ teaching methods.
- Presentation by students.
- Individuals/group training to work with software.
- Developing research skills through assignments/projects.
- Conduct theme based group activities.
- Developing Effective communication skills through group discussion.
- Beyond classroom teaching/learning through field excursions.
- Writing of reports/project.

7.4. ASSESSMENT METHODS

Different methods will be applied to assess the students over the duration of the programme. These include written assignments and oral examinations, group discussions and presentations, problem-solving exercises, field study, experimental design planning, seminars, preparation and presentation of reports and practical record book.

All papers carry 100 marks. Each theory paper is divided into two parts: main examination and internal assessment of 75 and 25 marks respectively. For practical papers, 50 marks (25 marks for internal assessment and 25 marks for practical record file) is assessed through continuous evaluation to be done at college level and 50 marks end semester examination to be conducted by the internal and external examiner.

SYLLABUS B.A. (HONS.) GEOGRAPHY

1. Geomorphology

Course Objectives:

1. To understand the associations between geomorphologic landforms, concepts and processes.
2. To critically evaluate and connect information about geomorphic processes.
3. To provide a theoretical and empirical framework for understanding landscape evolution and the characteristics of individual types of geomorphic landscapes

Learning Outcomes:

After completion of this course, students will be able to

1. understand the functioning of Earth systems in real time and analyze how the natural and anthropogenic operating factors affects the development of landforms
2. distinguish between the mechanisms that control these processes
3. assess the roles of structure, stage and time in shaping the landforms, interpret geomorphological maps and apply the knowledge in geographical research.

Course Content:

1. Geomorphology: Nature, Scope and Approaches; Earth: Interior Structure and Isostasy.
2. Earth Movements: Plate Tectonics, Types of Folds and Faults, Earthquakes and Volcanoes.
3. Geomorphic Processes: Weathering, Mass Wasting, Cycle of Erosion (Davis and Penck).
4. Evolution of Landforms (Erosional and Depositional): Fluvial, Karst, Aeolian, Glacial, and Coastal.
5. Applied Geomorphology

References:

Essential:

1. Dayal, P. (1996). *A Text book of Geomorphology*. Patna, India: Shukla Book Depot
2. Huggett, R.J. (2007): *Fundamentals of Geomorphology*. New York, U.S.A.: Routledge.
3. Khullar, D.R. (2012). *Physical Geography*. New Delhi. India: Kalyani Publishers.
4. Strahler, A. H. and Strahler, A N. (2001): *Modern Physical Geography* (4/E). New York, U.S.A.: John Wiley and Sons, Inc.
5. Thornbury, W. D. (2004): *Principles of Geomorphology*. New York, U.S.A.: Wiley.

Suggestive:

1. Bloom, A. L. (2003). *Geomorphology: A Systematic Analysis of Late Cenozoic Landforms*, New Delhi, India: Prentice-Hall of India
2. Christopherson, R. W. and Birkeland, G. H. (2012). *Geosystems: An Introduction to Physical Geography* (8th edition). New Jersey, USA: Pearson Education.

3. Kale, V. S. and Gupta A. (2001). *Introduction to Geomorphology*. Hyderabad, India: Orient Longman.

4. Mal, Suraj, Singh, R.B. and Huggel, C. (2018). *Climate Change, Extreme Events and Disaster Risk Reduction*. Switzerland: Springer. pages 309.
5. Singh, S. (2009):*Bhautik Bhugolka Swaroop (Hindi).* Allahabad, India: PrayagPustak.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Geomorphology: Nature, Scope and Approaches; Earth: Interior Structure and Isostasy.	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
2	Earth Movements: Plate Tectonics, Types of Folds and Faults, Earthquakes and Volcanoes.	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/ Debates, classroom test.
3	Geomorphic Processes: Weathering, Mass Wasting, Cycle of Erosion (Davis and Penck).	Classroom Lectures, Tutorials, PPT	Assignments, Discussion/Debates, classroom test.
4	Evolution of Landforms (Erosional and Depositional): Fluvial, Karst, Aeolian, Glacial, and Coastal.	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates, classroom test.
5	Applied Geomorphology	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

Keywords: Geomorphology, Earth, Isostasy, Movements, Processes, Erosion, Landform

2. Cartographic Techniques (Practical)

Course Objectives:

1. Create professional and aesthetically pleasing maps through thoughtful application of cartographic conventions;
2. Develop an understanding of the concepts regarding scale, map projections to suit map purposes;
3. Better understand the techniques of interpretation of topographical and weather maps

Learning Outcome:

This is a practical, hands-on course; when you have completed it, you will be able to:

1. Explain how maps work, conceptually and technically and will be able to understand science and art of cartography

2. Recognize the benefits and limitations of some common map projections and their use.

3. Understand and perform interpretation of topographical maps and weather maps.

Course Content:

1. Cartography – Nature and Scope; Scales – Concept and application; Graphical Construction of Plain, Comparative and Diagonal Scales.
2. Map Projections – Classification, Properties and Uses; Merits and Demerits of Polar Zenithal, Stereographic, Bonne's and Mercator's Projections.
3. Profiles -Introduction to Cross and Longitudinal Profiles, Slope analysis using Wentworth's Method.
4. Topographical Maps- Interpretation.
5. Weather Maps- Interpretation

Practical Record:

A Project File in pencil comprising one exercise *each*, on scale, map projection, profile, slope, interpretation of topographic sheet, and weather maps.

References:

Essential:

1. Kraak, M.J. (2010). *Cartography: Visualization of Geospatial Data* (3rd edition). London. UK.: Pearson Education Ltd.
2. Misra, R.P. (2014). *Fundamentals of Cartography (*Second Revised and Enlarged Edition). New Delhi. India: Concept Publishing.
3. Monkhouse, F. J. and Wilkinson, H. R. (1973). *Maps and Diagrams*. London, India: Methuen.
4. Singh, R.L. &Dutta, P.K. (2012). *Prayogatmak Bhugol (Hindi),* Central Book Depot, Allahabad
5. Singh,Gopal. (1998). *Map Work and Practical Geography (4th Edition)*. Ahmedabad, India: Vikas Publishing House.

Suggestive:

1 Rhind, D. W. and Taylor D. R. F. (eds.) (1989). *Cartography: Past, Present and Future*. U.S.A.: Elsevier, International Cartographic Association.

2 Sarkar, A. (2015). *Practical geography: A systematic approach*. New Delhi, India: Orient Black Swan Private Ltd.

3 Sharma, J. P. (2010). *PrayogicBhugol(Hindi)*, Rastogi Publishers, Meerut.

4 Singh, R.L. and Singh R.P.B. (1999). *Elements of Practical Geography*, Kalyani Publishers, New Delhi.

5 Singh,R.L.,& Singh, Rana. P.B. (1991): *Prayogtmak Bhugolke Mool Tatva (Hindi)*, New Delhi. India: Kalyani Publishers.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6 : Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Nature and Scope, Concept and application, Graphical Construction	Classroom Lectures, Practical demonstration	Assignments, Hans-on exercise, classroom test.
2	Map Projections – Classification, Properties and Uses; Merits and Demerits	Classroom Lectures, Practical demonstration	Assignments, Hans-on exercise, classroom test.
3	Profiles-Introduction to Cross and Longitudinal Profiles.	Classroom Lectures, Practical demonstration	Assignments, Hans-on exercise, midterm examination.
4	Topographical Maps-Interpretation and Slope Analysis	Classroom Lectures, Practical demonstration	Assignments, Hans-on exercise, classroom test.

5	Interpretation of Weather Map	Classroom Lectures, Practical demonstration	Assignments, Hans-on exercise, classroom test, end semester examination.

Keywords: Cartography, Map Projections, Profiles, Topographical Maps

3. Human Geography

Course Objectives:

1. Various dimensions of human geography and cultural landscape.
2. Detailed analysis of population growth and distribution.
3. Understanding of the relationship between population and resource.

Learning Outcomes:

1. Detailed exposure of contemporary relevance of cultural landscape.
2. In-depth knowledge of space and society of cultural regions.
3. Understanding the settlement pattern and population resource relationship.

Course Content:

1. Human Geography: Definition, Scope and Principles; Contemporary Relevance, Understanding Cultural Landscape.
2. Population: Population Growth and Distribution; Population Composition; Malthusian and Demographic Transition Theories.
3. Space and Society: Cultural Regions; Race; Tribes, Religion and Language.
4. Settlements: Types of Rural Settlements; Classification of Urban Settlements; Trends and Patterns of World Urbanization.
5. Population-Resource Relationships: Ackerman's Population-Resource Regions and Regional Resource Development

References:

Essential:

1. Chandna, R.C. (2017). *Population Geography*. New Delhi, U.S.A.: Kalyani Publishers.
2. Daniel, P.A. and Hopkinson, M.F. (1989). *The Geography of Settlement*. London. UK: Oliver & Boyd.
3. Hussain, Majid. (2012). *Manav Bhugol,*. Jaipur. India: Rawat Publications.
4. Johnston, R., Gregory, D.,& Pratt, G., et al. (2008). *The Dictionary of Human*

Geography, Blackwell Publication.

5. Singh, R.B., (Ed.) (2015). *Urban Development Challenges, Risk and Resilience in Asian Mega Cities-Sustainable Urban Future of Emerging Asian Mega Region*, Tokyo, Japan: Springer. Pages 488, 2015.

Suggestive:

1 Hassan, M.I. (2005). *Population Geography*. Jaipur, India: Rawat Publications.

2 Jordan-Bychkov., et al. (2006). *The Human Mosaic: A Thematic Introduction to Cultural Geography.* New York, U.S.A.: W. H. Freeman and Company.

3 Kaushik, S.D. (2010). *ManavBhugol*. Meerut, India: Rastogi Publication

4 Maurya, S.D. (2012). *ManavBhugol*. Allahabad, India: ShardaPustakBhawan.

5 Rozenblat., Celine., Pumain., Denise and Velasquez., Elkin Eds. (2018). *International and Transnational Perspectives on Urban Systems.*Tokyo, Japan: Springer pages 393.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Method:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
I	Introduction to the basic concepts of Human geography	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions.
II	Detailed discussion of different theories related to human development	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions.
III	Deep understanding of cultural regions; race; tribes, religion and language	Classroom Lectures, PPTs, documentaries, discussions, fieldworks and tutorials.	Assignments, presentations, discussions.
IV	Detailed analysis of different types of settlement in rural as well as urban areas	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions and debates.
V	Understanding the regional resource development of India	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions and debates.

Keywords: Human Geography, Demographic Transition Theories, Cultural Regions, Space and Society, Settlement Patterns

4. Thematic Cartography (Practical)

Course Objectives:

1. Create thematic maps through thoughtful application of Cartographic conventions;
2. Enhance understanding of the concepts regarding thematic mapping techniques
3. Better understand preparation and interpretation of thematic maps

Learning Outcome:

This is a practical, hands-on course; when you have completed it, you will be able to:

1. Explain how maps work, conceptually and technically and will be able to understand science and art of cartography

2. Recognize the benefits and limitations of Diagrammatic Data Presentation.

3. Understand and perform interpretation of thematic maps.

Course Content:

1. Maps – Classification and Types; Principles of Map Design.
2. Diagrammatic Data Presentation – Line, Bar and Circle.
3. Thematic Mapping Techniques – Properties, Uses and Limitations; Areal Data - Choropleth, Dot, Proportional Circles; Point Data – Isopleths.
4. Cartographic Overlays – Point, Line and Areal Data.
5. Thematic Maps – Preparation and Interpretation.

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

References:

Essential:

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. Gupta K. K. and Tyagi V. C., 1992: Working with Maps, Survey of India, DST, New Delhi.
4. Mishra R. P. and Ramesh A., 1989: Fundamentals of Cartography, Concept, New
5. Sharma J. P., 2010: Prayogic Bhugol, Rastogi Publishers, Meerut.

Suggestive:

1. Singh R. L. and Singh R. P. B., 1999: Elements of Practical Geography, Kalyani PublishersRogerson, P.A.(2010) Statistical Methods in Geography,Sage Publications.
2. Slocum T. A., Mcmaster R. B. and Kessler F. C., 2008: Thematic Cartography and Geovisualization (3rd Edition), Prentice Hall.
3. Tyner J. A., 2010: Principles of Map Design, The Guilford Press.
4. Sarkar, A. (2015) Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi

5. Singh, L R & Singh R (1977): Manchitra or Pryaogatamek Bhugol , Central Book, Depot, Allahabad

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Method:

Unit No.	**Course Learning Outcomes**	**Teaching and Learning Activity**	**Assessment Tasks**
I	Maps – Classification and Types; Principles of Map Design.	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions.
II	Diagrammatic Data Presentation – Line, Bar and Circle.	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions.
III	Thematic Mapping Techniques	Classroom Lectures, PPTs, documentaries, discussions, fieldworks and tutorials.	Assignments, presentations, discussions.
IV	Cartographic Overlays – Point, Line and Areal Data	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions and debates.

V	Thematic Maps – Preparation and Interpretation.	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions and debates.

Keywords: Maps, Thematic Mapping, Cartographic Overlays

5.Climatology

Course Objectives:

1. Various dimensions of climatology like structure and composition.
2. Detailed analysis of global atmospheric pressure and wind system.
3. Understanding of the concept of oceanic topography.

Learning Outcomes:

1. Detailed exposure of climatology and oceanic relief features.
2. In-depth knowledge of upper atmospheric conditions and cyclonic features.
3. Understanding the characteristics of climatic regions.

Course Content:

1. Atmospheric Composition and Structure: Variation with Altitude, Latitude and Season; Insolation and Temperature: Factors and Distribution, Heat Budget, Temperature Inversion.
2. Atmospheric Pressure and Winds: Planetary Winds, Forces affecting Winds, General Circulation of Air, Jet Streams;
3. Atmospheric Moisture: Evaporation, Humidity, Condensation, Fog and Clouds, Precipitation Types, Stability and Instability;
4. Cyclones: Tropical Cyclones, Temperate Cyclones, Monsoon - Origin and Mechanism.
5. Climatic Regions.

References:

Essential:

1. Barry, R. G., and Chorley, R. J. (2009). *Atmosphere, Weather and Climate (9th Edition.* New York, USA: Routledge.
2. Critchfield, H. J. (1987). *General Climatology*, New Delhi, India: Prentice-Hall of India.
3. Lal, D. S. (2006). *Jalvayu Vigyan (Hindi).* Allahabad, India: Prayag Pustak Bhavan,
4. Oliver J. E. and Hidore J. J., 2002: Climatology: An Atmospheric Science, Pearson Education, New Delhi.
5. Strahler, A.N. (1987). *Modern Physical Geography*. New York and Singapore: John Wiley and Sons.

Suggestive:

1. Gupta, L.S. (2000). *JalvayuVigyan(Hindi)* ,Delhi, India: Madhyam Karyanvay Nidishalya
2. Lutgens, F. K. Tarbuck E. J. and Tasa D., (2009). *The Atmosphere: An Introduction to Meteorology*. Englewood Cliffs, New Jersey, USA: Prentice-Hall.
3. Singh, M. Singh, R.B. and Hassan, M.I. (Eds.). (2014). *Climate Change and Biodiversity. Proceedings of IGU Rohtak Conference*, Volume 2. Advances in Geographical and Environmental Studies, Springer.
4. Singh, S. (2009). *JalvayuVigyan(Hindi).* Allahabad, India: PrayagPustakBhawan.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 6: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Method:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
I	Introduction to the basic concepts of climatology and oceanography	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions.
II	Detailed discussion of global wind pattern and atmospheric conditions	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions.
III	Deep understanding of cyclonic storms of different regions	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions.
IV	Atmospheric Moisture and Cyclones	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions and debates.
V	Climatic Regions	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions and debates.

Key words: Climatology, Oceanography, Cyclone, Wave, Salinity.

6. Statistical Methods in Geography (Practical)

Course Objectives

1. The concept of quantitative information in general and Geographical data in particular. The importance of data analytics. The ways data is collected or data is taken from different sources. The sampling methods' application for data collection purposes.
2. The ways to handle the collected data through classification, tabulation and stigmatization. The data presentation using graphical and diagrammatic ways.
3. To calculate different averages on data and to identify the variations in data.
4. To compute relations and impacts among the data series.
5. The concept of probability particularly normal curve.

Learning Outcomes:

The following will be the outcomes of this course, student shall be able:

1. To differentiate between qualitative and quantitative information.
2. To know the nature of various data , different sources and methods of data collection.

3. To apply sampling methods for data collection.
4. To classify, summarize and produce various types of data tabulations.
5. To present data through graphical and diagrammatic formats.
6. To apply different forms of averages, their relevance on descriptive data and geographical descriptive data as well.
7. To analyze the variations in spatial and non-spatial data.
8. To study the associations and cause/effect or impact from the data series
9. To use the concept of probability mainly the normal distribution.

Course Content:

6. Use of Data in Geography: Geographical Data Matrix, Significance of Statistical Methods in Geography; Sources of Data, Scales of Measurement (Nominal, Ordinal, Interval, Ratio)
7. Tabulation and Descriptive Statistics: Frequency Distribution Table, Cross Tabulation, Graphical Presentation of Data (Bar diagram, Histograms, Frequency Curve and Cumulative Frequency Curves), Measurement of Central Tendencies (Mean, Median and Mode), Measurement of Partitions (Deciles, Quartiles and Percentiles), Dispersion (Standard Deviation, Variance and Coefficient of Variation).Centro-graphic Techniques (Geographic Centre, Mean Centre of Population, Median points and Median Centre (based on Minimum Aggregate Distance Traveled), and Distance Deviation from the Mean Centre.
8. Sampling: Purposive, Random, Systematic and Stratified.
9. Theoretical Distribution: Concept of Probability Distribution (theory only), Normal Distribution (Its Characteristics and Application of Area Under Normal Curve)
10. Correlation: Rank Correlation and Product Moment Correlation, Simple Regression and Mapping of Residuals from Regression

Practical Record File: Each student will submit a record containing five exercises:

1. Construct a data matrix of about (100 x 10) with each row representing an areal unit (districts or villages or towns) and about 10 columns of relevant attributes of the areal units.

2. Based on the above table, a frequency table, measures of central tendency and dispersion would be computed and interpreted for any two attributes, Plot mean centre for population and standard distance deviation on the selected map for the spatial units.

3. Histograms and frequency curve would be prepared on the entire data set and attempt to fit a normal curve and interpreted for one or two variables.

4. From the data matrix a sample set (20 Percent) would be drawn using, random - systematic and stratified methods of sampling and locate the samples on a map with a short note on methods used.

5. Based on of the sample set and using two relevant attributes, a scatter and regression line would be plotted and residual from regression would be mapped with a short interpretation

References:

Essential:

6. Berry B. J. L. and Marble D. F. (eds.). (1968). *Spatial Analysis – A Reader in Geography*. U.S.A.: Prince-Hall.
7. Ebdon D. (1977). *Statistics in Geography: A Practical Approach*. Oxford, UK.: Blackwell
8. Hammond P. and McCullagh P. S. (1978): *Quantitative Techniques in Geography: An Introduction*. UK: Oxford University Press.
9. King L. S. (1969). *Statistical Analysis in Geography*. U.S.A.: Prentice-Hall.
10. Pal S. K. (1998): *Statistics for Geoscientists*, New Delhi, India: Tata McGraw Hil.
11. Silk J. (1979). *Statistical Concepts in Geography*. London, UK.: Allen and Unwin.

Suggestive:

6. Harris, R. and Jarvis, C. (2011). *Statistics for Geography and Environmental Science*. London, UK.: Pearson Education Ltd.
7. Rogerson, P.A.(2010) Statistical Methods in Geography,Sage Publications.
8. Shinha, I. (2007). *Sankhyiki bhugol*. New Delhi, India: Discovery Publishing House.
9. Walfford,Nigel (2011) Practical Statistics for Geographers and Earth Scientists, Wiley-Blackwell.
10. Yeates M., 1974: *An Introduction to Quantitative Analysis in Human Geography*. New Delhi, India.: McGraw Hill

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Method:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
I	Use of Data in Geography	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions.
II	Tabulation and Descriptive Statistics	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions.
III	Sampling: Purposive, Random, Systematic and Stratified	Classroom Lectures, PPTs, documentaries, discussions, fieldworks and tutorials.	Assignments, presentations, discussions.
IV	Theoretical Distribution: Concept of Probability Distribution (theory only), Normal Distribution	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions and debates.
V	Correlation: Rank Correlation and Product Moment Correlation, Simple Regression and Mapping of Residuals from Regression	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions and debates.

Keywords: Statistical Methods, Tabulation, Descriptive Statistics, Sampling, Theoretical Distribution, Correlation

7. Geography of India

Course Objectives:

1. Various dimensions of the geographical features of India and their spatial distribution.
2. Detailed analysis of economic resources of India
3. Understanding of regional divisions of India.

Learning Outcome:

1. Detailed exposure to the human and physical features of India.
2. In-depth knowledge of different resource base of India.
3. Understanding socio-cultural base of India.

Course Content:

4. Physical: Location, Physiographic Divisions, Climate: characteristics and classification; Soil and Natural vegetation
5. Population: Distribution and Growth, Structure; Social: Distribution of Population by Race, Caste, Religion, Language, Tribes and their Correlates.
6. Regionalisation of India: Physiographic (R. L. Singh), Socio-Cultural (Sopher), Economic (Sengupta)
7. Economic: Mineral and Power Resources: Distribution and Utilization of Iron Ore, Coal, Petroleum, Gas; Agricultural Production of Rice, Wheat, Cotton and Sugarcane;
8. Spatial Patterns of Industrial Development: Automobile and Information Technology

References:

Essential:

1. Majid, H. (2009). *Geography of India*. Delhi, India: Tata McGraw Hill Education Private Ltd.
2. Nag, P. and Sengupta, S., (1992). *Geography of India*. Delhi, India: Concept Publishing.
3. Sdyasuk Galina and P Sengupta (1967) Economic Regionalization of India, Census of India.
4. Singh R. L. (1971). *India: A Regional Geography*, National Geographical Society of India.
5. Singh, Gopal, (1976). *A Geography of India*. Delhi, India: Atma Ram.
6. Sopher, David E. An Exploration of India: Geographical Perspective on Society and Culture. Cornell University Press.Ithaca,New York
7. Spate O.H.K. and Learmonth A.T.A., 1967: *India and Pakistan: A General and Regional Geography*, Methuen.
8. Tiwari, R.C.(2007) Geography of India. Prayag Pustak Bhawan, Allahabad.

Suggestive:

1. Sharma, T. C. and Coutinho O., (1997). *Economic and Commercial Geography of India*. Delhi, India: Vikas Publishing.
2. Sharma, T.C. (2013). *Economic Geography of India*. Jaipur, India: Rawat Publication.
3. Singh Surender and Saroha Jitender (2018) Geography of India (Second Edition), Access Publishing, New Delhi
4. Singh, R. B. and Prokop, Pawel.(2016). *Environmental Geography of South Asia.* Japan : Springer.
5. Tirtha, R. (2002) *Geography of India.* Jaipur & New Delhi., India: Rawat Publs.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6 : Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8 **:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Method:

Unit No.	**Course Learning Outcomes**	**Teaching and Learning Activity**	**Assessment Tasks**
I	Physical Setting – Location, Structure and Relief, Drainage, Climate	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions.
II	Population – Size and Growth since 1901, Population Distribution, Literacy, Sex Ratio.	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions.
III	Settlement System - Rural Settlement Types and Patterns, Urban Patterns	Classroom Lectures, PPTs, documentaries, discussions, fieldworks and tutorials.	Assignments, presentations, discussions.
IV	Resource Base – Livestock, Power, Minerals	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions and debates.

V	Economy – Agriculture, Industries, Transportation Modes	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions and debates.

Keywords: Human geography, Demography, Resources, Society, Region

8. Economic Geography

Course Objectives:

1. To understand the concept and spatial distribution of economic activities in the world.
2. To analyse the factors affecting the economics activity focusing on Von Thunen and Weber theory.
3. To describe in the details the regionalization of different economic activities.

Learning Outcome:

After learning, students should be able to:

1. Distinguish to different types of economic activities and their utilities.
2. Appreciate the factors responsible for the location and distribution of activities.
3. Examine the significance and relevance of theories in relation to the location of different economic activities

Course Content:

1. Introduction to Global Economic System: Concept and Classification of Economic Activities.
2. Economic Theories: Agriculture (Von Thunen); Industry (Weber's theory).
3. Primary Activities: Agriculture, Precision agriculture, Forestry, Fishing and Mining.
4. Secondary Activities: Manufacturing (Cotton Textile, Iron and Steel), Concept of Manufacturing Regions, Special Economic Zones and Technology Parks.
5. Tertiary Activities: Transport, Trade and Services.

References:

Essential:

1. Bagchi-Sen, S. and Smith, H. L. (2006). *Economic Geography: Past, Present and Future*. UK: Taylor and Francis.
2. Clark, Gordon L.; Feldman, M.P. and Gertler, M.S., eds. (2000). *The New Oxford Handbook of Economic Geography*. UK: Oxford Press.

3. Coe, N. M., Kelly P. F. and Yeung H. W. (2007). *Economic Geography: A Contemporary Introduction*. USA: Wiley-Blackwell.
4. Knox, P. & Marston, S. (2013). *Human Geography: Places and Regions in Global Context*, 6th Edition. New Delhi, India: Pearson Education.
5. Siddhartha, K. (2013). *Economic Geography*, KisalayaPublicationsPvt. Ltd., New Delhi.

Suggestive:

1. Combes, P., Mayer T. and Thisse, J. F. (2008). *Economic Geography: The Integration of Regions and Nations*, Princeton University Press.
2. Knowles, R. &Wareing, J. (2004). *Economic and Social Geography Made Simple*, Rupa& Co., Kolkata.
3. Prithwish, R. (2014). *Economic Geography - A study of Resources*. Kolkata, India: New Central Book Agency.
4. Saxena, H.M. (2013). *Economic Geography.* Jaipur, India: Rawat Publications
5. Willington, D. E. (2008). *Economic Geography*, New Delhi, India: Read Books.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7 : Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Method

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Introduction to Global Economic System: Concept and classification of economic activities.	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
2	Theories: Agriculture (Von Thunen); Industry (Weber's theory).	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/ Debates, classroom test.
3	Primary Activities: Agriculture, Precision agriculture, Forestry, Fishing and Mining.	Classroom Lectures, Tutorials, PPT	Assignments, Discussion/Debates, classroom test.
4	Secondary Activities: Manufacturing (Cotton Textile, Iron and Steel), Concept of Manufacturing Regions, Special Economic Zones and Technology Parks.	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates, classroom test.
5	Tertiary Activities: Transport, Trade and Services.	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

Keywords: Global, Economic, Activities, Theory, Primary, Secondary, Tertiary

9. Environmental Geography

Course Objectives:

1. Various dimensions of environment and natural resource management.
2. Detailed analysis of concept, structure and functions.
3. Understanding of the concept of appraisal and conservation of Environment and Natural Resources.

Learning Outcome:

1. Detailed exposure of human – environment relationship.
2. In-depth knowledge of environmental issues in tropical, temperate and polar ecosystems.
3. Understanding the environmental programmes and policies at local as well as global level.

Course Content:

1. Introduction to Natural Resource and Environment: Basic Concept; Human-Environment Relationships- Resource Use and abuse, Concept of resource curse
2. Ecosystem: Concept, Structure and Functions; Ecosystem services and ecological footprints.
3. Natural Resource: Concept (Zimmermann), Classification, Utilization, Problems and Management of Land, Water, forest and energy resources.
4. Environmental Issues in Tropical, Temperate and Polar Ecosystems. Global environmental issues: Impacts on land, soil, water, climate and atmosphere, biodiversity loss; and human health
5. Appraisal and Conservation of Environment and Natural Resources and Sustainable Resource Development, Environmental Programmes and Policies – Global, National and Local levels. Management of Environment and Resources: Principle of conservation, restoration and sustainable alternatives; Importance of EIA.

References:

Essential:

1. Chandna, R. C. (2002). *Environmental Geography*. Ludhiana, India: Kalyani.
2. Cunninghum, W. P. and Cunninghum, M. A. (2004). *Principals of EnvironmentalScience: Inquiry andApplications*. Delhi: Tata Macgraw Hill.
3. Odum, E. P. et al. (2005). *Fundamentals of Ecolog.* India: Ceneage Learning
4. Singh, R.B., and Hietala, R. (Eds.) (2014). *Livelihood security in Northwestern Himalaya: Case studies from changing socio-economic environments in Himachal Pradesh, India. Advances in Geographical and Environmental Studies*. USA: Springer

5. Singh, Savindra.,(2001). *Paryavaran Bhugol (Hindi),*Allahabad, India: Prayag Pustak Bhawan.

6. Singh,R.B., Prokop**,** Pawel (Eds.) (2016). *Environmental Geography of South Asia*.Tokyo, Japan: Springer.

Suggestive:

1 Goudie, A. (2001). *The Nature of the Environment*, Oxford, UK: Blackwell.

2 Holechek, J. L. C., Richard, A., Fisher, J. T. and Valdez, R. (2003). *Natural Resources: Ecology, Economics and Policy*. New Jersey, USA: Prentice Hall.

3 Mitchell, B. (1997). *Resource and Environmental Management*. England: Longman Harlow.

4 Saxena, H.M. (2012). *Environmental Studies*. Jaipur, India: Rawat Publications.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Method:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
I	Introduction to the basic concepts of environment and NRM	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions.
II	Detailed discussion of conceptual framework of different ecosystems	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions.
III	Deep understanding of environmental issues of different regions	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions.
IV	Detailed analysis of different issues related to environmental conservation	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions and debates.
V	Understanding the different policies related to conservation of environment at local as well as global level	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions and debates.

Keywords: Natural resource management, Ecosystem, Environment, Biosphere reserve, United nation

10. Field Work and Research Methodology (Practical)

Course Objectives:

1. Various dimensions of field work and its role in geographical studies..
2. Detailed analysis of different field techniques.
3. Understanding of the report writing and field tools.

Learning Outcome:

1. Detailed exposure of new geographical landscape as study area.
2. In-depth knowledge of different field techniques.
3. Understanding the field ethics and different tools of field study.

Course Content:

1. Field Work In Geographical Studies – Role, Value, Data and Ethics of Field-Work; Defining the Field and Identifying the Case Study – Rural / Urban / Physical / Human / Environmental.

2. Data Collection: Type and Sources of Data; Methods of Collection; Data Analysis: Qualitative Data Analysis; Quantitative Data Analysis; Data Representation Techniques.
3. Field Techniques – Merits, Demerits and Selection of the Appropriate Technique; Observation (Participant / Non Participant), Questionnaires (Open/ Closed / Structured / Non-Structured); Interview with Special Focus Group Discussions; Space Survey (Transects and Quadrants, Constructing a Sketch)
4. Use of Field Tools – Collection of Material for Physical and Socio-Economic Surveys.
5. Designing the Field Report – Aims and Objectives, Methodology, Analysis, Interpretation and Writing the Report.

Practical Record:

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 10 days.
3. The word count of the report should be about 8000 to 12,000 excluding figures, tables, photographs, maps, references and appendices.
4. One copy of the report on A 4 size paper should be submitted in soft binding.

References:

Essential:

1. Creswell, J., (1994). *Research Design: Qualitative and Quantitative Approaches.* UK: Sage Publications.
2. Dikshit, R. D. (2003). *The Art and Science of Geography: Integrated Readings*. New Delhi, India: Prentice-Hall of India.
3. Mukherjee, Neela. (1993). *Participatory Rural Appraisal: Methodology and Application.* Delhi, India: Concept Publs. Co.
4. Robinson, A. (1998). *Thinking Straight and Writing That Way*. In Pryczak, F. and Bruce, R. P. eds.. *Writing Empirical Research Reports: A Basic Guide for Students of the Social and Behavioural Sciences*. Los Angeles, USA: Routlege.
5. Special Issue on "Doing Fieldwork" *The Geographical Review* 91:1-2 (2001).

Suggestive:

1. Evans, M. (1988). *Participant Observation: The Researcher as Research Tool*. In Eylesand, J and D. Smith (eds). *Qualitative Methods in Human Geography*. Cambridge, UK: Polity.
2. Mukherjee, N. (2002). *Participatory Learning and Action: with 100 Field Methods*. Delhi, India: Concept Publs. Co.
3. Stoddard, R. H. (1982). *Field Techniques and Research Methods in Geography*. USA: Kendall/Hunt.
4. Wolcott, H. (1995). *The Art of Fieldwork*. CA, USA: Alta Mira Press.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Method:

Unit No.	**Course Learning Outcomes**	**Teaching and Learning Activity**	**Assessment Tasks**
I	Introduction to the role and value of field study	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions. fieldwork
II	Detailed discussion on selection of field area and its exposure	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions. fieldwork

III	Deep understanding of field techniques and statistical methods	Classroom Lectures, PPTs, documentaries, discussions, fieldworks and tutorials.	Assignments, presentations, discussions. fieldwork
IV	Detailed analysis of primary survey and field ethics	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions and debates.fieldwork
V	Understanding the different parameters of field report	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions and debates, fieldwork

Keywords: Field study, Technique, Methods, Survey, Ethics

11. Regional Planning and Development

Course Objectives:

1. To understand the concept of Region and Regional Planning.
2. To familiarize the students with Theories and Models for Regional Planning.
3. To develop understanding about concept of Development, Sustainable Development and different programmes and policies.

Learning Outcome:

After studying, students will be able to:

1. Conceptualize the Regional Planning and its theories.
2. Get the overview of Sustainable Regional Development.
3. Have sound knowledge to Sustainable Development Policies and Programmes.

Course Content:

1. Definition of Region, Evolution and Types of Regional planning: Formal, Functional, and Planning Regions and Regional Planning;
2. Choice of a Region for Planning: Regionalization of India for Planning (Agro Ecological Zones)
3. Theories and Models for Regional Planning: Growth Pole Model of Perroux; Myrdal, Hirschman, Rostow and Friedmann;
4. Sustainable Development: Concept of Development and Underdevelopment; Efficiency-Equity Debate: Definition, Components and Sustainability for

Development. Indicators (Economic, Social and Environmental).

5. Sustainable Development Policies and Programmes: Rio+20; Goal-Based Development; Principles of Good Governance.

References:

Essential:

1. Agyeman, Julian, Robert, D. Bullard and Bob,Evans. (Eds.) (2003). *Just Sustainabilities: Development in an Unequal World*. London: Earthscan. (Introduction and conclusion.).
2. Anand, Subhash.,(2011). *Ecodevelopment : Glocal Perspectives*. New Delhi, India: Research India Press.
3. Friedmann, J. and Alonso W. (1975). *Regional Policy - Readings in Theory and Applications*. Massachusetts, USA: MIT Press.
4. Misra, R. P., Sundaram, K.V., and Rao, V.L.S. (1974). *Regional Development planning in India*. Delhi, India: Vikas Publishing House.
5. Peet, R. (1999). *Theories of Development*. New York, USA: The Guilford Press.

Suggestive:

1. Ayers, Jessica, and David D. (2010). *Climate change adaptation and development I: the state of the debate*. UK: Progress in Development Studies *10(2): 161-168.* SAGE.
2. Baker, Susan., (2006). *Sustainable Development*. Milton Park, Abingdon, Oxon; New York, N.Y.: Routledge. (Chapter 2, "*The concept of sustainable development*").
3. Gore C. G. (1984). *Regions in Question: Space, Development Theory and Regional Policy*. London, UK: Methuen.
4. Haynes J. (2008). *Development Studies*. London: Polity Short Introduction Series.
5. Johnson E. A. J. (1970). *The Organization of Space in Developing Countries*, Massachusetts , USA: MIT Press.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Method:

Unit No.	**Course Learning Outcomes**	**Teaching and Learning Activity**	**Assessment Tasks**
I	Definition of Region, Evolution and Types of Regional planning	Classroom Lectures, PPTs, discussions and tutorials.	Assignments, presentations, discussions.
II	Regionalization of India for Planning	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions.
III	Theories and Models for Regional Planning	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions.
IV	Sustainable Development	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions and debates.
V	Sustainable Development Policies and Programmes	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions and debates.

Keywords: Region, Regional Planning, Regionalization, Sustainable Development

12. Remote Sensing and GIS (Practical)

Course Objectives:

1. The course aim is to give basic technical knowledge and practical experience in digital remote sensing.
2. Knowledge and practical experience in handling satellite images focusing on hands-on experience of image pre-processing, enhancement and classification;
3. Better understand the techniques for the study of land use land cover and urban study.

Learning Outcome:

This is a practical, hands-on course; when you have completed it, you will be able to:

1. Explain principles of remote sensing, different satellite systems and sensors;
2. Perform image pre-processing, enhancement and classification and interpretation of satellite images;
3. Apply Image preprocessing for land use land cover and urban studies;

Course Content:

Unit 1. Remote Sensing and GIS: Definition and Components, Development, Platforms and Types

Unit 2. Aerial Photography and Satellite Remote Sensing: Principles, Types and Geometry of Aerial Photograph; Principles of Remote Sensing, EMR Interaction with Atmosphere and Earth Surface; Satellites (Landsat and IRS) and Sensors.

Unit 3. GIS Data Structures: Types (spatial and Non-spatial), Raster and Vector Data Structure

Unit 4. Image Processing (Digital and Manual) and Data Analysis: Pre-processing (Radiometric and Geometric Correction), Enhancement (Filtering); Classification (Supervised and Un-supervised), Geo-Referencing; Editing and Output; Overlays

Unit 5. Interpretation and Application of Remote Sensing and GIS: Land use/ Land Cover, Urban Sprawl Analysis; Forests Monitoring

Practical Record: A project file consisting of 5 exercises using open source software on above topic.

References:

Essential:

2. Bhatta, B. (2008). *Remote Sensing and GIS*. New Delhi, India: Oxford University Press.
3. Campbell J. B. (2007). *Introduction to Remote Sensin*g. UK: Guildford Press
4. Jensen, J. R. (2005). *Introductory Digital Image Processing: A Remote Sensing Perspective*. USA: Pearson Prentice-Hall.
5. Lillesand T. M., Kiefer R. W. and Chipman J. W. (2004). *Remote Sensing and Image Interpretation*. USA: Wiley. (Wiley Student Edition).

6. Singh R. B. and Murai S. (1998). *Space-informatics for Sustainable Development.* UK: Oxford and IBH Pub.
7. Wolf P. R. and Dewitt B. A., 2000: Elements of Photogrammetry: With Applications in GIS, McGrawHill.

Suggestive:

1. Chauniyal, D.D. (2010). *Sudur Samvedan evam Bhogolik Suchana Pranali*. Allahabad, India: Sharda Pustak Bhawan.
2. Li, Z., Chen, J. and Batsavias, E. (2008). *Advances in Photogrammetry, Remote Sensing and Spatial Information Sciences*. London, UK: CRC Press, Taylor and Francis.
3. Mukherjee, S. (2004). *Textbook of Environmental Remote Sensing*. Delh, India: Macmillan.
4. Nag P. and Kudra, M. (1998). *Digital Remote Sensing*. Delhi, India: Concept.
5. Sarkar, A. (2015). *Practical geography: A systematic approach*. Delhi, India: Orient Black Swan Private Ltd.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6 : Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Definition and Components	Classroom Lectures, Practical demonstration	Assignments, Hans-on exercise, classroom test.
2	Aerial Photography and Satellite Remote Sensing	Classroom Lectures, Practical demonstration	Assignments, Hans-on exercise, classroom test.
3	GIS Data Structures.	Classroom Lectures, Practical demonstration	Assignments, Hans-on exercise, midterm examination.
4	Image Processing (Digital and Manual) and Data Analysis	Classroom Lectures, Practical demonstration	Assignments, Hans-on exercise, classroom test.
5	Interpretation and Application of Remote Sensing and GIS	Classroom Lectures, Practical demonstration	Assignments, Hans-on exercise, classroom test, end semester examination.

Keywords: Satellite Remote Sensing, GIS, Land Use Land Cover, Urban Studies.

13. Evolution of Geographical Thought

Course Objectives:

1.Understanding historical evolution of geographic thought

2.Detailed analysis of different paradigms in geography

3.Evaluating the contemporary trends in geographical studies

Learning Outcomes:

1. In depth understanding about the evolution of geographical thought
2. Detailed knowledge about the paradigms and debates in the geographical studies.
3. Understanding of recent traditions in geography

Course Content:

1. **Paradigms** in Geography
2. **Pre-Modern** – Early Origins of Geographical Thinking with reference to the Classical and Medieval Philosophies.
3. **Modern** – Evolution of Geographical Thinking and Disciplinary Trends in Germany, France, Britain, United States of America.
4. **Debate**s – Environmental Determinism and Possibilism, Systematic and Regional, Ideographic and Nomothetic.
5. **Trends** – Quantitative Revolution and its Impact, Behaviouralism, Systems Approach, Radicalism, Feminism; Towards Post Modernism – Changing Concept of Space in Geography, Geography in India, Future of Geography.

References:

Essential:

1. Bhat, L.S. (2009). *Geography in India* (Selected Themes). Delhi, India: Pearson.
2. Hartshone, R. (1959). *Perspectives of Nature of Geography*. UK: Rand MacNally and Co.
3. Harvey, David. (1969). *Explanation in Geography*, London, UK: Arnold.
4. Holt-Jensen, A. (2011). *Geography: History and Its Concepts: A Students Guide*. UK: SAGE.
5. Johnston, R. J., (1997). *Geography and Geographers, Anglo-American Human Geography since (1945)*. London, UK: Arnold.
6. Kapur, A. (2001). *Indian Geography Voice of Concern*. Delhi, India: Concept Publications.

Suggestive:

1. Dikshit, R. D. (1997). *Geographical Thought: A Contextual History of Ideas*. Delhi, India: Prentice– Hall India.
2. Martin Geoffrey J. (2005). *All Possible Worlds: A History of Geographical Ideas*, UK: Oxford.
3. Singh, R.B. (2016). *Progress in Indian Geography*. New Delhi, India: Indian National Science Academy.
4. Sudeepta, A. (2015). *Fundamentals of Geographical Thought*. Delhi, India: Orient black swan private limited.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Method:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
I	Understanding the paradigms in geography	Classroom Lectures, PPTs, discussions, and debates	Assignments, Tests, Presentations
II	Detailed discussion on the Classical and Medieval Geographic traditions	Classroom Lectures, PPTs, discussions, and debates	Assignments, Tests, Presentations
III	Evaluating the contribution of modern schools in geography	Classroom Lectures, PPTs, discussions, and debates	Assignments, Tests, Presentations
IV	In-depth discussions about the debates in geography	Classroom Lectures, PPTs, discussions, and debates	Assignments, Tests, Presentations
V	Understanding the post-modern trends in geography	Classroom Lectures, PPTs, discussions, and debates	Assignments, Tests, Presentations

Keywords: Paradigm, Tradition, Schools, Debate, Postmodernism

14.Disaster Management based Project Work (Practical

Course Objectives:

1. Understanding the basic concepts of disaster management
2. Detailed analysis about the different types of disasters in India
3. Evaluating the various dimensions of disaster management through field works

Learning Outcomes:

1. In depth understanding about the various disasters in the country
2. It will provide thorough understanding about the human responses to the disasters
3. It will give an in-depth knowledge about the disasterscapes through fieldworks

Course Content:

1. Introduction to Disaster Management: Basic concepts; Disaster Management Cycle: components and stages; Community Based Disaster Management
2. Flood and Drought
3. Cyclone and Hailstorms
4. Earthquake and Volcanoes
5. Landslides
6. Human Induced Disasters: Fire Hazards, Chemical, Industrial accidents

(Practical Record: Project work to be based on any two of the above topics of their Choice. First should be field-based case study and second should be local / college-based.)

References:

Essential:

1. Government of India. (2011). *Disaster Management in India*. Delhi, India: Ministry of Home Affairs.
2. Government of India. (2008). *Vulnerability Atlas of India*. New Delhi, India: Building Materials & Technology Promotion Council, Ministry of Urban Development, Government of India
3. Kapur, A. (2010). *Vulnerable India: A Geographical Study of Disasters*. Delhi, India: Sage Publication.
4. Modh, S. (2010). *Managing Natural Disaster: Hydrological, Marine and Geological Disasters*. Delhi, India: Macmillan.
5. Ramkumar, M. (2009). *Geological Hazards: Causes, Consequences and Methods of Containment*. New Delhi, India: New India Publishing Agency.

Suggestive:

1 Savindra, S. and Jeetendra, S. (2013): *Disaster Management*. Allahabad, India: Pravalika Publications.

2 Singh Jagbir. (2007). *Disaster Management Future Challenges and Oppurtunities* 2007. Publisher- New Delhi, India : I.K. International Pvt. Ltd.

3 Singh, R. B. (ed.) (2006). *Natural Hazards and Disaster Management: Vulnerability and Mitigation*. New Delhi, India: Rawat Publications,.

4 Singh, R.B. (2005). *Risk Assessment and Vulnerability Analysis*. New Delhi , India: IGNOU. Chapter 1, 2 and 3

5 Stoltman, J.P., et al. (2004). *International Perspectives on Natural Disasters*. Dordrecht, the Netherlands: Kluwer Academic Publications.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Method:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
I	Introduction to the basic concepts in disaster management	Classroom Lectures, PPTs, discussions, and Fieldwork	Assignments, Tests, Presentations, Project Report
II	Detailed discussion on the natural disasters in India	Classroom Lectures, PPTs, discussions, and Fieldwork	Assignments, Tests, Presentations, Project Report
III	Understanding the implications of natural disasters in India	Classroom Lectures, PPTs, discussions, and Fieldwork	Assignments, Tests, Presentations, Project Report
IV	In-depth assessment of the causes and impacts of manmade disasters	Classroom Lectures, PPTs, discussions, and Fieldwork	Assignments, Tests, Presentations, Project Report
V	In-depth observation on the management strategies for disasters from micro to macro levels	Classroom Lectures, PPTs, discussions, and Fieldwork	Assignments, Tests, Presentations, Project Report

Keywords: Disaster, Management, India, Impacts, Strategies

B. DISCIPLINE CENTRIC ELECTIVES (ANY FOUR)

1 Demography and Population Studies

Course Objectives:

1. It introduces the basic concepts of population Geography to the students.
2. An understanding of the importance and need of Demographic data.
3. Spatial understanding of population dynamics.

Learning Outcomes:

1. This paper would bring an understanding of Population Geography along with relevance of Demographic data.
2. The students would get an understanding of distribution and trends of population growth in the developed and less developed countries, along with population theories.
3. The students would get an understanding of the dynamics of population.
4. An understanding of the implications of population composition in different regions of the world.
5. An appreciation of the contemporary issues in the field of population studies

Course Contents:

Contents:

1. Nature and scope of Population Geography and its relation to Demography. Demographic data requirement and its relevance. Population Censuses across the world. Indian Census: various heads under which data is available in the Census of India.
2. Population distribution: determinants and world pattern; Population Growth: past, present trends and future projections of population in the world and its relation to Demographic Transition Theory; Malthusian perspective on population.
3. Population Composition: Age-Sex composition; Rural and Urban composition: literacy
4. Population Dynamics: Fertility, Mortality and Migration-Measures, determinants and implications.
5. Contemporary Issues: Ageing of Population, Declining Sex Ratio; Demographic Dividend.

References:

Essential:

1. Barrett, H. R. (1995). *Population Geography*. UK: Oliver and Boyd.
2. Bhende, A. and Kanitkar, T. (2000). *Principles of Population Studies*. India: Himalaya Publishing House.
5. Chandna, R.C. (2006). *JansankhyaBhugol*. Delhi, India: Kalyani Publishers.

6. Chandna,R.C. (2006). *Geography of Population*. Ludhiana, India: Kalyani Publishers.
7. Clarke, J. I., (1965). *Population Geography*. Oxford, UK: Pergamon Press.

Suggestive:

1 Debjani,Roy. *Population Geography*. Kolkata, India: Books and Allied Private Limited.
2 Jones, H. R., (2000). *Population Geography,* 3rd ed. London, UK: Paul Chapman.
3 Lutz, W., Warren, C. S. and Scherbov, S. (2004). *The End of the World Population Growth in the 21st Century*. UK: Earthscan
4 Maurya, S. D. (2009). *Jansankya Bhugol*. Allahabad, India: Sharda Putak Bhawan.
5 Newbold, K. B. (2009). *Population Geography: Tools and Issues*. NY, USA: Rowman and Littlefield Publishers.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Method:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
I	Nature and scope of Population Geography and its relation to Demography	Classroom Lectures, PPTs, discussions, and Fieldwork	Assignments, Tests, Presentations, Project Report
II	Population distribution	Classroom Lectures, PPTs, discussions, and Fieldwork	Assignments, Tests, Presentations, Project Report
III	Population Composition: Age-Sex composition; Rural and Urban composition: literacy	Classroom Lectures, PPTs, discussions, and Fieldwork	Assignments, Tests, Presentations, Project Report
IV	Population Dynamics: Fertility, Mortality and Migration-Measures, determinants and implications.	Classroom Lectures, PPTs, discussions, and Fieldwork	Assignments, Tests, Presentations, Project Report
V	Contemporary Issues: Ageing of Population, Declining Sex Ratio; Demographic Dividend.	Classroom Lectures, PPTs, discussions, and Fieldwork	Assignments, Tests, Presentations, Project Report

Keywords: Population, Demography, Fertility, Projection, Migration, etc.

2. Hydrology and Soil Studies

Course Objectives

1. To understand the basics of hydrological regime
2. to explain the integrated concept of water resource management
3. to describe the basic characteristics of soil resource

Learning Outcomes

After studying this course, students will be able to:

1. Understand the basic components of hydrological cycle and learn best practices of integrated watershed management,
2. Explain various components of water balance and management of river basins,
3. Identify different types of soil, distribution and management of soil resources.

Course Content:

1. Hydrological Cycle: Systems approach in hydrology, Components of hydrological cycle: precipitation, interception, evaporation, evapo-transpiration, infiltration, percolation, run-off and over land flow, ground water-table, flow of water in aquifers;

2. Water Balance of River Basins: Inter- relationships between components of water balance: water balance equation, concept of potential and actual evapo-transpiration, soil moisture storage, water deficit and water surplus, Characteristics of river basins: basin parameters, river network, discharge, runoff, inter-flow and base-flow.

3. Water Resource Management: Integrated water resource management: watershed delineation, conjunctive, use of ground-water and management strategies with case studies, Water harvesting, artificial recharge of ground-water, River Water Disputes: nature of dispute, sharing principles, river linkages, solution with case studies

4. Soil Resource: Properties of soil, soil water balance, soil profile, soil forming processes, Soil classification systems, orders and distribution of soil

5. Soil Resource Management: Utilisation of soil resource; soil erosion, estimation of soil losses, Problems, treatment and management of soil resource.

References:

Essential:

1. Andrew. D.W., and Stanley, T. (2004). *Environmental Hydrology*, 2nd edition. USA: Lewis Publishers, CRC Press.
2. Fetter, C.W. (2005). *Applied Hydrogeology*. New Delhi, India: CBS Publishers & Distributors.
3. Karanth, K.R. (1988). *Ground Water: Exploration, Assessment and Development.* New Delhi, India:- Tata- McGraw Hill.
4. Lyon, J.G. (2003). *GIS for Water Resource and Watershed Management*, NY, USA: Taylor and Francis.
5. 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.
6. Strahler A. and Strahler A. (2008). *Physical Geography: Science and Systems of the Physical Environment*. New York , USA: John Wiley & Sons.

Suggestive:

1. Rao, K.L. (1982). *India's Water Wealth*,2nd edition. Delhi, India: Orient Longman.
2. Reddy, K. Ramamohan, VenkateswaraRao,B, Sarala, C. (2014). *Hydrology and Watershed Management*. India: Allied Publishers.
3. Singh, V. P. (1995). *Environmental Hydrology*. The Netherlands: Kluwar Academic Publications.
4. Tideman, E.M. (1999). *Watershed management - Guidelines for Indian Conditions*. Delhi, India: Omega Scientific Publishers.
5. Todd, D.K. (1959). *Ground water Hydrology*. New Delhi, India: Wiley India Edition.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Method:

Unit No.	**Course Learning Outcomes**	**Teaching and Learning Activity**	**Assessment Tasks**
I	Hydrological Cycle	Classroom Lectures, PPTs, discussions, and Fieldwork	Assignments, Tests, Presentations, Project Report
II	Water Balance of River Basins	Classroom Lectures, PPTs, discussions, and Fieldwork	Assignments, Tests, Presentations, Project Report
III	Water Resource Management	Classroom Lectures, PPTs, discussions, and Fieldwork	Assignments, Tests, Presentations, Project Report
IV	Soil Resource	Classroom Lectures, PPTs, discussions, and Fieldwork	Assignments, Tests, Presentations, Project Report

V	Soil Resource Management	Classroom Lectures, PPTs, discussions, and Fieldwork	Assignments, Tests, Presentations, Project Report

Keywords: Hydrological Cycle, Water Balance, Soil Resource , Resource Management

3 Urbanization and Urban System

Course Objectives:

1. To introduce the students with concepts and approach to studying the urban geography.
2. To study with patterns and functional attributes of urban places.
3. To analyze the urban contemporary issues focusing on Indian mega cities.

Learning Outcome

After studying, students will be able to:

1. Understand the fundamentals and patterns of urbanization process
2. Learn the functional classification of cities and central place theories.
3. Know contemporary problems of Delhi, Mumbai, Kolkata and Chennai.

Course Content:

1 Urban studies in Geography: Introduction, nature, scope and approaches.

2 Concept of urban system, Patterns of Urbanization in developed and developing countries

3 Functional classification of cities: Quantitative and Qualitative Methods; Ashok Mitra's classification

4 Cities and Central Place Theory: Christaller

5 Urban Issues: problems of housing, slums, civic amenities (water and transport); Case studies of Delhi, Mumbai, Kolkata, Chennai.

References:

Essential:

1. Fyfe, N. R. and Kenny, J. T. (2005). *The Urban Geography Reade.* London, UK: Routledge.
2. Knox, P. L., and McCarthy, L. (2005). *Urbanization: An Introduction to Urban Geography*. New York, USA: Pearson Prentice Hall.
3. Pacione, M. (2009). *Urban Geography: A Global Perspective*. UK Taylor and Francis.
4. Ramachandran, R., (1989). *Urbanisation and Urban Systems of India*. New delhi, India: Oxford University Press.
5. Singh, R.B., (Ed.) (2015). *Urban development, challenges, risks andresilience in Asian megacitie.* Japan: Advances in Geographical and Environmental Studies, Springer

Suggestive:

1. Kaplan, D. H., Wheeler, J. O. and Holloway, S. R. (2008). *Urban Geography*. NY, USA: John Wiley.
2. Knox, P. L., and Pinch, S. (2006). *Urban Social Geography: An Introduction*, NY, USA: Prentice-Hall.
3. Sassen, S. (2001). *The Global City: New York, London and Tokyo*. USA: Princeton University Press.
4. Sharma, V.R. and Chadrakanta. (2019). *Making Cities Resilient*. Delhi, India: Springer.
5. Sharma, P. and Rajput, S. (Eds.) (2017). *Sustainable Smart Cities in India; Challenges and Future Perspectives*. Delhi, India: Springer.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Urban geography: Introduction, nature, scope and approaches.	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
2	Patterns of Urbanisation in developed and developing countries	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/ Debates, classroom test.
3	Functional classification of cities: Quantitative and Qualitative Methods	Classroom Lectures, Tutorials, PPT	Assignments, Discussion/Debates, classroom test.
4	Cities and central place theory: Christaller and Losch	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates, classroom test.
5	Urban Issues: problems of housing, slums, civic amenities (water and transport); Case studies of Delhi, Mumbai,	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
	Kolkata, Chennai.		

Keywords: Urban geography, Urbanisation, Functional classification, central place theory, Urban Issues

4 Agriculture and Food Security

Course Objectives:

1. To understand the concept of land use/land cover classification and determinants of agriculture.
2. To familiarize the students with agriculture regions of India and various types of agriculture system in India.
3. To analyze the food security along with various agricultural revolutions and government policies in India.

Learning Outcome:

After studying, students will be able to:

1. Conceptualize the agriculture and its determinants.
2. Get the overview of Indian and World agriculture regions and systems.
3. Have sound knowledge of agriculture revolutions and food security

Course Content

1. Defining the Field: Introduction, nature and scope; Land use/ land cover definition and classification.
2. Determinants of Agriculture: Physical, Technological and Institutional
3. Agricultural Regions of India: Agro-climatic, Agro-ecological & Crop Combination Regions.
4. Agricultural Systems of the World (Whittlesey's classification) and Agricultural Land use model (Von Thunen, modification and relevance).
5. Food Security: Concept, approaches, pattern, Indian revolution and government policies.

References:

Essential:

1. Basu, D.N., and Guha, G.S. (1996). *Agro-Climatic Regional Planning in India*, Vol.I& II. New Delhi, India: Concept Publication.
2. Bryant, C.R., Johnston, T.R, (1992): *Agriculture in the City Countryside*. London, UK: Belhaven Press.
3. Burger, A. (1994). *Agriculture of the World*. Avebury, UK: Aldershot,
4. Grigg, D.B. (1984). *Introduction to Agricultural Geography*. London, UK: Hutchinson.
5. Hussain, M. (1996). *Systematic Agricultural Geography*, Jaipur, India: Rawat Publications.

Suggestive:

1. Ilbery, B. W. (1985). *Agricultural Geography: A Social and Economic Analysis*. UK: Oxford University Press.
2. Mohammad, N. (1992). *New Dimension in Agriculture Geography*, Vol. I to VIII. Delhi, India: Concept Pub.
3. Roling, N.G., and Wageruters, M.A.E. (ed.). (1998). *Facilitating Sustainable Agriculture.* Cambridge, UK: Cambridge University Press.
4. Shafi, M. (2006). *Agricultural Geography*. Delhi, India: Doring Kindersley India Pvt. Ltd.
5. Tarrant, J. R. (1973). *Agricultural Geography*, Devon, UK: David and Charles.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Defining the Field: Introduction, nature and scope; Land use/ land cover definition and classification	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
2	Determinants of Agriculture: Physical, Technological and Institutional	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/ Debates, classroom test.
3	Agricultural Regions of India: Agro-climatic, Agro-ecological & Crop Combination Regions.	Classroom Lectures, Tutorials, PPT	Assignments, Discussion/Debates, classroom test.
4	Agricultural Systems of the World (Whittlesey's classification) and Agricultural Land use model (Von Thunen, modification and relevance).	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates, classroom test.
5	Food Security: Concept, approaches, pattern, Indian revolution and government policies	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

Keywords: Agriculture, Agricultural Regions, Agricultural Systems, Food Security

5 Geography of Health

Course Objectives:

1. Various dimensions of health geography and its linkages with environment.
2. Detailed analysis of environment and health quality and exposure to risk.
3. Understanding of the relationship between climate change and human health.

Learning Outcome:

1. Detailed exposure of health geography and environment.
2. In-depth knowledge of health risk and exposure.
3. Understanding the impact of climate change and human health.

Course Content:

1. Health: Definition; linkages with environment, development and health; driving forces in health and environmental trends - population dynamics, urbanization, poverty and inequality.
2. Pressure on Environmental Quality and Health: Human activities and environmental pressure land use and agricultural development; industralisation; transport and energy.
3. Exposure and Health Risks: Air pollution; household wastes; water; housing; workplace.
4. Health and Disease Pattern in Environmental Context with special reference to India, Types of Diseases and their regional pattern (Communicable and Lifestyle related diseases).
5. Climate Change and Human Health: Impact of climate change on health and disease; nutrition and food security.

References:

Essential:

1. Avon, Joan, L. and Jonathan, A, Patzed. (2001). *Ecosystem Changes and Public Health*. USA: Baltimin, John Hopling Unit Press(ed).
2. Bradley,D. (1977). *Water, Wastes and Health in Hot Climates*, USA: John Wiley Chichesten.
3. Christaler, G. and Hristopoles, D. (1998). *Spatio-Temporal Environment Health Modelling*. Boston, USA: Kluwer Academic Press.
4. Cliff, A.D. and Peter,H. (1988). *Atlas of Disease Distributions*. Oxford, UK: Blackwell Publishers.
5. Rais, Akhtar. (Ed.) (1990). *Environment and Health Themes in Medical Geography*. Delhi, India: Ashish Publishing House.

Suggestive:

1. Gatrell, A. and Loytonen, (1998). *GIS and Health*. London, UK: Taylor and Francis Ltd.
2. Harpham T. and Tanner, M.,(eds) (1995). *Urban Health in Developing Countries; Progress and Prospects*. London , UK: Routledge.
3. Hazra, J. (1997). *Health Care Planning in Developing Countries*. Calcutta, India: University of Calcutta.
4. Moeller, Dade, wed. (1993). *Environmental Health*, Cambridge, USA: Harward Univ. Press.
5. Narayan, K.V. (1997). *Health and Development Inter-Sectoral Linkages in India*. Jaipur, Rawat Publications.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7 : Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	**Course Learning Outcomes**	**Teaching and Learning Activity**	**Assessment Tasks**
I	Introduction to the basic concepts of health geography and environment	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions.
II	Detailed discussion of health quality and climate change	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions.
III	Deep understanding of different types of pollution and health risk	Classroom Lectures, PPTs, documentaries, discussions, fieldworks and tutorials.	Assignments, presentations, discussions.
IV	Detailed analysis of health disease and their pattern	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions and debates.
V	Understanding the relationship between climate change and health	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions and debates.

Keywords: Health, Climate change, Pollution, Disease, Risk

6. Introduction to Political Geography

Course Objectives:

1. To critically understand the concepts of state, nation and nation state,
2. To develop the linkages between electoral geography and political geography
3. To interpret the politics of displacement focusing on Dams and SEZ.

Course Learning Outcomes:

After studying, students will be able to:

1. Learn the concept of nation and state and geopolitical theories.
2. Understand the different dimensions of electoral geography and resource conflicts.
3. Have sound knowledge of politics of displacement, focusing on dams and SEZ

Course Content:

1. Introduction: Concepts, Nature and Scope.
2. 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)
3. Electoral Geography – Geography of Voting, Geographic Influences on Voting pattern, Geography of Representation, Gerrymandering.
4. Political Geography of Resource Conflicts – Water Sharing Disputes, Disputes and Conflicts Related to Forest Rights and Minerals.
5. Politics of Displacement: Issues of relief, compensation and rehabilitation: with reference to Dams and Special Economic Zones

References:

Essential:

1. Adhikari, S. (2013). *Political Geography of India*. Allahabad, India: Sharda Pustak Bhawan.
2. Agnew, J. (2002). *Making Political Geography*. London, UK: Arnold.
1. Cox, K. R., Low M. and Robinson J. (2008). *The Sage Handbook of Political Geography*. USA: Sage Publications.
2. Gallaher, C., et al, (2009). *Key Concepts in Political Geography*. USA: Sage Publications.
3. Glassner, M. (1993). *Political Geography*. USA: Wiley.

Suggestive:

1. Cox, K. (2002). *Political Geography: Territory, State and Society*. USA: Wiley-Blackwell
2. Jones, M. (2004). *An Introduction to Political Geography*: UK: Space, Place and Politics, Routlede.
3. Painter, J. and Jeffrey, A. (2009). *Political Geography*. USA: Sage Publications.
4. Taylor, P. and Flint, C. (2000). *Political Geography*. UK: Pearson Education.
5. Verma, M. K. (2004). *Development, Displacement and Resettlement*. Delhi, India: Rawat Publications.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Introduction: Concepts, Nature and Scope.	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
2	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)	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/ Debates, classroom test.
3	Electoral Geography – Geography of Voting, Geographic Influences on Voting pattern, Geography of Representation, Gerrymandering.	Classroom Lectures, Tutorials, PPT	Assignments, Discussion/Debates, classroom test.
4	Political Geography of Resource Conflicts – Water Sharing Disputes, Disputes and Conflicts Related to Forest Rights and Minerals.	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates, classroom test.
5	Politics of Displacement: Issues of relief, compensation and rehabilitation: with reference to Dams and Special Economic Zones.	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

Keywords: State, Nation, Electoral, Political, Geography, Resource, Conflict, Displacement

7 Biogeography and Biodiversity

Course Objectives:

1. Various dimensions of biogeography and biodiversity.
2. Detailed analysis of energy cycles and their function.
3. Understanding of the concept of ecological succession and floral faunal biodiversity.

Learning Outcome:

1. Detailed exposure of biogeography and biodiversity.
2. In-depth knowledge of circulation of atmospheric cycles.
3. Understanding the climatic patterns and classification.

Course Content:

1. Introduction to Bio-geography: Nature, scope, and components.
2. Energy in the earth-atmosphere system; Circulations within the atmosphere.
3. World Climatic Patterns (Koppen)
4. Evolution of major groups of floral and faunal provinces.
5. Ecological successions: stages and climax.

References:

Essential:

1. Bhattacharyya, N.N. (2003). *Biogeography.* New Delhi, India: Rajesh Publications.
2. Hoyt, J.B. (1992). *Man, and the Earth*. USA: Prentice Hall.
3. Huggett, R.J. (1998). *Fundamentals of Biogeography*, USA: Routeldge
4. Lal, D. S. (2003). *Climatology*.Allahabad, India: ShardaPustakBhawan.
5. Mal, Suraj., and Singh, R.B. (Eds.) (2009). *Environmental Change and Biodiversity*. Jaipur, India: Rawat Publication.
6. Singh, R.B. (Eds) (2009). *Biogeography and Biodiversity*. Jaipur, India: Rawat Publication.

Suggestive:

1. Clarke, G. L. (1967). *Elements of ecology*. New York, USA: John Wiley Pub.
2. Haden-Guest, S., Wright, J. K. and Teclaff, E. M. (1956). *World Geography of Forest Resources*. New York, USA: Ronald Press Co.
3. Mathur, H.S. (1998). *Essentials of Biogeography*. Jaipur, India: Anuj Printers.
4. Singh,Savindra. (2015). *Paryawaran Bhoogol (Hindi)*. Allahabad, India: Prayag Pushtak Bhawan,.
5. Sivaperuman, Chandrakasan et al. (2018). *Biodiversity and Climate Change Adaptation in Tropical Islands*. London, UK: Academic Press.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
I	Introduction to the basic concepts of biogeography and its scope	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions.
II	Detailed discussion of earth atmosphere system and cycles	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions.
III	Deep understanding of global climatic pattern and classification	Classroom Lectures, PPTs, documentaries, discussions, fieldworks and tutorials.	Assignments, presentations, discussions.
IV	Detailed analysis of evolution of floral and faunal communities	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions and debates.
V	Understanding the ecological succession and climax of geographical regions	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions and debates.

Keywords: Biogeography, Cycles, Climate, Flora, Succession

8. Geography of Social Wellbeing

Course Objectives:

1. To familiarise the student with the theoretical foundations and conceptual grounding of unique geography of social well-being.
2. To appreciate the roles of geographic factors in socio-cultural diversity and well-being.
3. To analyse in details the social wellbeing, problems and welfare programmes and policies.

Learning Outcomes:

After studying, students will be able to:

1. Get Knowledge of the geography of social well-being and social diversity.
2. Appraise the key concepts of social geography in regional context; geographic factors underlying patterns of social well-being and inclusive development.
3. Explain the social problems and the welfare programs and policies.

Course Content:

1. Geography of Social Wellbeing: Concept, Origin, Nature and Scope.
2. Social Diversity: Caste, Class, Religion, Race and Gender and their Spatial distribution
3. Social Wellbeing and Inclusive Development: Concept and Components – Healthcare, Housing and Education.
4. Social Geographies of Inclusion and Exclusion, Slums, Gated Communities, Communal Conflicts and Crime.
5. Social welfare program and policies.

References:

Essential:

1. Ahmed, A. (1999). *Social Geography*. Jaipur, India: Rawat Publications.
2. Casino, V. J. D., Jr. (2009). *Social Geography: A Critical Introduction*. USA: Wiley Blackwell.
3. Cater, J. and Jones, T. (2000). *Social Geography: An Introduction to Contemporary Issues*. UK: Hodder Arnold.
4. Holt, L. (2011). *Geographies of Children, Youth and Families: An International Perspective.* UK: Taylor & Francis.
5. Panelli, R. (2004). *Social Geographies: From Difference to Action*. USA: Sage.
6. Smith, D. M. (1977).*Human geography: A Welfare Approach*. UK: Edward

Arnold.

Suggestive:

1. *Introducing Social Geographies.* UK: Oxford University Press.
2. Rachel, P., Burke, M., Fuller, D., Gough, J., Macfarlane, R. and Mowl, G. (2001).
3. Smith, S. J., Pain, R., Marston, S. A., Jones, J. P. (2009). *The SAGE Handbook of Social Geographies*. USA: Sage Publications.
4. Sopher, David. (1980). *An Exploration of India.* Ithasa, USA: Cornell University Press.
5. Valentine, G. (2001). *Social Geographies: Space and Society*. USA: Prentice Hall.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Geography of Social Wellbeing: Concept, Origin, Nature and Scope.	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
2	Social Diversity: Caste, Class, Religion, Race and Gender and their Spatial distribution	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/ Debates, classroom test.
3	Social Wellbeing and Inclusive Development: Concept and Components – Healthcare, Housing and Education.	Classroom Lectures, Tutorials, PPT	Assignments, Discussion/Debates, classroom test.
4	Social Geographies of Inclusion and Exclusion, Slums, Gated Communities, Communal Conflicts and Crime.	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates, classroom test.
5	Social welfare program and policies.	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

Keywords: Wellbeing, Diversity, Inclusion, Exclusion, Development, Welfare

A. GENERIC ELECTIVE COURSES (ANY FOUR)

1. Disaster Management

Course Objectives

1. Understanding the basic concepts of disaster management.
2. Detailed analysis about the different types of disasters in India.
3. Evaluating the role of institutional frameworks to mitigate the disasters in the country.

Course Learning Outcomes:

1. In depth understanding about the various disasters in the country.
2. It will provide thorough understanding about the human responses to the disasters.
3. It will highlight the responses and mitigation measures to both natural and manmade disasters.

Course Content:

1. Disasters: Definition and Concepts; Risk and Vulnerability; Classification
2. Disasters in India: (a) Flood: Causes, Impact, Distribution and Mapping; Landslide: Causes, Impact, Distribution and Mapping; Drought: Causes, Impact, Distribution and Mapping
3. Disasters in India: (b) Earthquake and Tsunami: Causes, Impact, Distribution and Mapping; Cyclone: Causes, Impact, Distribution and Mapping.
4. Manmade disasters: Causes, Impact, Distribution and Mapping
5. Response and Mitigation to Disasters: Mitigation and Preparedness, Institutional Framework including functioning of NDMA and NIDM; Indigenous Knowledge and Community-Based Disaster Management; Do's and Don'ts During andPost Disasters.

References:

Essential:

1. Government of India, (2008): *Vulnerability Atlas of India*. New Delhi, India: Building Materials & Technology Promotion Council, Ministry of Urban

Development, Government of India.

2. Govt. of India. (2011). *Disaster Management in India*. New Delhi, India: Ministry of Home Affairs.
3. Kapur, A. (2010). *Vulnerable India: A Geographical Study of Disasters*. Delhi, India: Sage Publication.
4. Modh, S. (2010). *Managing Natural Disaster: Hydrological, Marine and Geological Disasters*. Delhi, India: Macmillan.
5. Singh, R. B. (ed.), (2006). Nat*ural Hazards and Disaster Management: Vulnerability and Mitigation*. New Delhi, India: Rawat Publications.
6. Singh, R.B. (2005). *Risk Assessment and Vulnerability Analysis*. Delhi, India: IGNOU. Chapter 1, 2 and 3

Suggestive:

1. Pandey, B. W. (2002). *Geo-environmental Hazards in Himalaya*. New Delhi, India: Mittal Publication.
2. Singh, J. (2019). *Disaster Management: A Data Analysis Approaches*. Delhi, India: Research India Press.
3. Sinha, A. (2001). *Disaster Management: Lessons Drawn and Strategies for Future*. Delhi, India: New United Press.
4. Stoltman, J.P., et al. (2004): *International Perspectives on Natural Disasters*. Dordrecht , The Netherlands: Kluwer Academic Publications.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8: Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
I	Introduction to the basic concepts in disaster management	Classroom Lectures, PPTs, discussions, and debates	Assignments, Tests, Presentations
II	Detailed discussion on the natural disasters in India	Classroom Lectures, PPTs, discussions, and debates	Assignments, Tests, Presentations
III	Understanding the implications of natural disasters in India	Classroom Lectures, PPTs, discussions, and debates	Assignments, Tests, Presentations
IV	In-depth assessment of the causes and impacts of manmade disasters	Classroom Lectures, PPTs, discussions, and debates	Assignments, Tests, Presentations
V	In-depth observation on the management strategies for disasters from micro to macro levels	Classroom Lectures, PPTs, discussions, and debates	Assignments, Tests, Presentations

Keywords: Disaster, Cloudburst, India, Impacts, Strategies

2. Geography of Tourism and Pilgrimage

Course Objective:

1. To Understand the various dimensions of geography of tourism and pilgrimage,.
2. To make aware the students with national and international trends and patterns of tourism with its impacts.
3. To critically evaluates the infrastructure in tourism in India focusing with having case studies along with the reviewing the tourism policy in country.

Learning Outcome:

After studying, students will be able to:

1. Equip with a basic understanding of nature and scope, trends and patterns of various types of tourisms.
2. Have sound knowledge on geographical, environmental and socio-cultural aspects of tourism in India.
3. Apply the principles of Geo-tourism and analyse the prospects and problems associated with pilgrimage tourism.

Course Content:

1. Scope and Nature: Concept of tourism geography, Inter- Relations of Tourism, Recreation and Leisure; Geographical Parameters of Tourism by Robinson.
2. Types: Nature Tourism, Cultural Tourism, Medical Tourism, Pilgrimage; Contemporary Types: Eco-Tourism, Sustainable Tourism, Meetings Incentives Conventions and Exhibitions (MICE), Space tourism.
3. Recent Trends and Patterns of Tourism: International and Regional; Domestic (India)
4. Impact of Tourism: Economy; Environment; Society using case Studies of Mountain, Desert and Coastal Areas.
5. Tourism in India: Tourism Infrastructure and hospitality Industry; National Tourism Policy.

References:

Essential:

1. Alan, A. Lew, (2017). *New Research Paradigms in Tourism Geography*, Routledge.
2. Boniface,B. and Cooper,C(2005)The Geography of Travel and Tourism,Butterworth.
3. Dhar, P.N. (2006). *International Tourism: Emerging Challenges and Future Prospects.* New Delhi, India: Kanishka
4. Hall, M., and Stephen, P. (2006). *Geography of Tourism and Recreation* –

Environment, Place and Space. London , UK: Routledge.

5. Kamra, K. K., and Chand, M. (2007). *Basics of Tourism: Theory, Operation and Practise*. Pune, India: Kanishka Publishers.
6. Robinson, H. A. (1996). *Geography of Tourism,* London, UK: Macdonald and Evans.

Suggestive:

1. Milton, D. (1993). *Geography of World Tourism.* NY, USA: Prentice. Hall.
2. Nelson, V., (2017): *An Introduction to the Geography of Tourism*, NY, USA: Rowman& Littlefield.
3. Page, S. J. (2011). *Tourism Management: An Introduction*. USA: Butterworth-Heinemann.
4. Raj, R. and Nigel, D. (2007). *Morpeth Religious Tourism and Pilgrimage Festivals Management: An International perspective by CABI*. USA: Cambridge.
5. Widawski, K., and Wyrzykowski, J. (2017). *The Geography of Tourism of Central and Eastern European Countries*, Switz: Springer.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Scope and Nature: Concepts and Issues, Tourism, Recreation and Leisure Inter- Relations; Geographical Parameters of Tourism by Robinson.	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
2	Trends and Patterns: Nature Tourism, Cultural Tourism, Medical Tourism, Pilgrimage, Geo- tourism.	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/ Debates, classroom test.
3	Recent Trends of Tourism: International and Regional; Domestic (India); Eco-Tourism, Sustainable Tourism, Meetings Incentives Conventions and Exhibitions (MICE)	Classroom Lectures, Tutorials, PPT	Assignments, Discussion/Debates, classroom test.
4	Impact of Tourism: Economy; Environment; Society	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates, classroom test.
5	Tourism in India: Tourism Infrastructure; Case Studies of Himalaya, Desert and Coastal Areas; National Tourism Policy	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

Keywords: Tourism, Parameters, Trends, Patterns, Infrastructure, Case Studies, Policy

3. Spatial Information Technology

Course Objectives:

1. The main objective of this course is to give students an insight on the concepts of spatial information technology.
2. The paper discusses the concept, historical developments, functioning and application of spatial information technology in detail.

Learning Outcome:

Upon successful completion of the course, the students:

1. will be familiar with the concept, components of SIT.
2. will gained knowledge on various data sources, structures, and their interpolation and modeling.
3. will acquire in-depth knowledge of various functions applied in SIT.
4. will gather detailed information on the application of SIT in various fields of mapping

Course Content:

1. Introduction: Definitions, Concept, Components and Historical Development
2. Spatial Information/Data: Web data sources; Registration and projection; Data types structures; Data interpolation and modeling
3. Working on spatial information system: Data creation with GIS software's, making layers, data editing and cleaning, spatial and non-spatial data linking, extracting information
4. Functions of Spatial Information System: Overlay Analysis; Buffer Analysis, Network Analysis.
5. Application of Spatial Information Technology for sustainable development

References:

Essential:

1. D. Tomlin. (1990). *Geographic Information Systems and Cartographic Modeling*. USA: Prentice-Hall, Englewood Cliffs, NJ, ISBN 0-13-350927-3.

2. Esperança and Samet, H. (1997). *An overview of the SAND spatial database system, to appear in Communications of the ACM.* (http://www.cs.umd.edu/~hjs/pubs/sandprog.ps.gz)
3. G. Hjaltason and Samet, H. *Ranking in Spatial Databases in Advances in Spatial Databases —4th Symposium*, SSD'95, M. J. Egenhofer and J. R. Herring, Eds., Lecture Notes in Computer Science 951
4. Heywood, I., Comelius, S., and Carver, S. (1988). *An Introduction to Geographical Information Systems*. New York , USA: Addison Wiley Longmont.
5. Kumar, Dilip., Singh, R.B**.,** and Kaur, Ranjeet. (2019). *Spatial Information Technology for Sustainable Development Goals*. Delhi, India: Springer.

Suggestive:

1. Samet, H. (1990). *Applications of Spatial Data Structures: Computer Graphics, Image Processing, and GIS*. USA: Addison-Wesley, Reading, MA, ISBN 0-201- 50300-0.
2. Samet, H. (1990). *The Design and Analysis of Spatial Data Structures*. USA: Addison- Wesley, Reading, MA, ISBN 0-201-50255-0.
3. Samet, H. (1995). *Spatial Data Structures in Modern Database Systems: The Object Model, Interoperability, and Beyond*, W. Kim, Ed., USA: Addison-Wesley/ACM Press, 361-
4. http://www.cs.umd.edu/~hjs/pubs/kim.ps
5. http://www.cs.umd.edu/~hjs/pubs/kim2.ps

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week6 : Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Introduction: Definitions, Concept and Historical Development	Classroom Lectures, Practical demonstration	Assignments, PPT, classroom test.
2	Spatial Information/Data	Classroom Lectures, Practical demonstration	Assignments, Hans-on exercise, practical lesson
3	Working on spatial information system	Classroom Lectures, PPT	Assignments, midterm examination.
4	Functions of Spatial Information System	Classroom Lectures, Practical demonstration	Assignments, Hans-on exercise, practical lesson
5	Application of Spatial Information Technology for sustainable development	Classroom Lectures, Practical demonstration	Assignments, classroom test, end semester examination.

Keywords: Spatial Information Technology, Spatial data, Spatial Information System

4. Coupled Human and Environment System

Course Objectives:

1. Various dimensions of concepts, components and theories of coupled human environment system.
2. Detailed analysis of different biogeochemical cycles.
3. Understanding of the concept of lowland and highland interaction.

Learning Outcome:

1. Detailed exposure of climate change and related issues.
2. In-depth knowledge of interactions and impact between human and natural systems.
3. Understanding the management and policies related to human and environment system.

Course Content:

1. Concepts, components and theories of coupled human environment system.
2. Biogeochemical cycles: Interactions and impact between human and natural systems.
3. Global and regional case studies: Himalaya-Ganga system; Atmosphere-water system; Surface and ground water and Coastal-water interaction.
4. Integrated Assessment of Vulnerability Risk; Resilience and Sustainability.
5. Management, Governance and Policies.

References:

Essential:

1. Clarke, G. L. (1967). *Elements of ecology*. New York, USA: John Wiley Pub.
2. Haden-Guest, S., Wright, J. K., and Teclaff, E. M. (1956). *World Geography of Forest Resources*. New York, USA: Ronald Press Co.
3. Hoyt, J.B. (1992). *Man, and the Earth*. USA: Prentice Hall.
4. Lapedes, D.N. (1974). *Encyclopaedia of Environmental Science (eds.).* USA: McGraw Hill.
5. Parmesan, C., Yohe, G. (2003). *A globally coherent fingerprint of climate change impacts across natural systems*. UK: Nature, 421 (6918), 37–42.
6. Singh, R.B., Schickhoff, U., and Mal, Suraj. (2016). *Climate Change, Glacier*

Response and Vegetation Dynamics in the Himalaya. Switzerland: Springer.

7. Trewartha G. T. (1980). *An Introduction to Climate*. NY, USA: McGraw Hill Company.

Suggestive:

1. Singh Savindra., (2015). *ParyawaranBhoogol (Hindi)*. Allahabad, India: PrayagPushtakBhawan.
2. Singh, R.B., Prokop, Pawel., (Eds.) (2016). *Environmental Geography of South Asia*. Tokyo, Japan : Springer.
3. Sivaperuman, Chandrakasan. et al. (2018). *Biodiversity and Climate Change Adaptation in Tropical Islands*. London, UK: Academic Press.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
I	Introduction to the basic concepts of human environment system	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions.
II	Detailed discussion of different biogeochemical cycles	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions.
III	Deep understanding of case studies from different altitude and regions	Classroom Lectures, PPTs, documentaries, discussions, fieldworks and tutorials.	Assignments, presentations, discussions.
IV	Detailed analysis of assessment of vulnerability risk; resilience and sustainability	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions and debates.
V	Understanding the management and policies related to human environment system	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions and debates.

Keywords: Environment, Cycles. Region, Sustainability, Management

5. Climate Change Vulnerability and Adaptation

Course Objectives:

1. Various dimensions of climate change and adaptability.
2. Detailed analysis of vulnerability and its impacts.
3. Understanding of the concept of mitigation and planning.

Learning Outcome:

1. Detailed exposure of climate change and related issues.
2. In-depth knowledge of vulnerability of flora and fauna.
3. Understanding the impact of climate change and its planning.

Course Content:

1. Climate Change: Understanding Climate Change; Green House Gases and Global Warming; Global Climatic Assessment- IPCC
2. Climate Change and Vulnerability: Physical Vulnerability; Economic Vulnerability; Social Vulnerability
3. Impact of Climate Change: Agriculture and Water; Flora and Fauna; Human Health
4. Adaptation and Mitigation: Global Initiatives with Particular Reference to South Asia.
5. The Climate Change Policy Framework: Global Initiatives UNFCCC and COPs; National and Local Action Plan on Climate Change

References:

Essential:

1. 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*. NY, USA: Cambridge University Press, Cambridge, United Kingdom and New York.

2. Sen, Roy, S., and Singh, R.B., (2002). *Climate Variability, Extreme Events and Agricultural Productivity in Mountain Regions*. Delhi, India: Oxford & IBH Pub.
3. 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
4. Singh, R.B., Mal,Suraj, and Huggel, C. (2018). *Climate Change, Extreme Events and Disaster Risk Reduction*. Switzerland : Springer, , pages 309.

Suggestive:

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.* NY, USA: Cambridge University Press, Cambridge, United Kingdom and New York.
2. OECD. (2008). *Climate Change Mitigation: "What do we do?"*(Organisation and Economic Co-operation and Development).
3. UNEP. (2007). *Global Environment Outlook: GEO4: Environment for Development*. Nairobi, Kenya: United Nations Environment Programme.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week6 : Mid-Semester Examinations

Week7 : Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
I	Introduction to the basic concepts of climate change and its science	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions.
II	Detailed discussion of different types of vulnerability	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions.
III	Deep understanding of climate change impacts on different sectors	Classroom Lectures, PPTs, documentaries, discussions, fieldworks and tutorials.	Assignments, presentations, discussions.
IV	Detailed analysis of different adaptation and mitigation strategies	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions and debates.
V	Understanding the different policies related to climate change at local as well as global level	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions and debates.

Keywords: Climate change, Vulnerability, Adaptation, Mitigation, Policy

6. Rural Development

Course Objectives

1. The main objectives of this course is to give students an insight into the concepts , approaches and planning process related to rural development in India.

2. The students will learn the rural economic base, rural development process and provision of services in rural areas.

Learning Outcomes

Upon successful completion of the course, the students:

1. Will be acquainted with the need and approaches to rural development,
2. Will gain knowledge on rural economic base especially about the significance of development of non-farm sector in rural areas,
3. Will have in-depth knowledge of pre and post-independence period of rural development,
4. Will be sensitized to understand the relevance of access to services like health, education in rural areas.

Course Content:

1. Define Rural Development, Need for Rural Development, Approaches to Rural Development.
2. Rural Economic Base- Panchayati Raj System, Agriculture Sector development, Importance of Non-Farm Sector Development in rural areas, Concept and Importance of non-farm sector in rural areas and difference with the farm sector, Programmes and Policies for non-farm sector, Cottage and Small Scale Industries, Agro Industries, Case Study with reference to the above sections.
3. Phases of Rural Development in India: Rural Development in pre-Independence India, Martandan Experiment, Sriniketan Experiment, Gurgaon Experiment, Gandhian Approach, Bhoodan and Gramdan Movement.
4. Rural Development in India- Post Independence: Government approaches through Five Year Plans with special reference to the changing focus on, Area based Approach, Target Group Approach,Integrated Rural Development Approach
5. Provision of Services: Access to Elementary education in rural areas, Access to Primary Health Care in rural India, Micro Credit, PURA.

References:

Essential:

1. Anand, Subhash. (2013). *Dynamics of Rural Development*. Delhi, India: Research India Press.
2. Krishnamurthy, J. (2000). *Rural Development - Problems and Prospects.* Jaipur, India: Rawat Publs.
3. Singh, R.B. (1985): *Geography of Rural Development*. New Delhi, India: Inter India.
4. Misra, R. P. (ed.) (1985). *Rural Development: Capitalist and Socialist Paths*, Vol. 1. New Delhi, India: Concept.
5. Ramachandran, H., and Guimaraes, J.P.C. (1991). *Integrated Rural Development in Asia–Leaning fromRecent Experience.* New Delhi, India: Concept Publishing.

Suggestive:

1. Gilg, A. W. (1985). *An Introduction to Rural Geography.* London, UK: Edwin Arnold.
2. Lee, D. A. and Chaudhri, D. P., (eds.) (1983). *Rural Development and State*. London, UK: Methuen.
3. Palione, M. (1984). *Rural Geography*. London, UK: Harper and Row.
4. Robb, P. (1983). *Rural South Asia: Linkages, Change and Development*. UK: Curzon Press.
5. UNAPDI. (1986). *Local Level Planning and Rural Development: Alternative Strategies*.New Delhi, India: (United Nations Asian & Pacific Development Institute, Bangkok), Concept Publs. Co.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	**Course Learning Outcomes**	**Teaching and Learning Activity**	**Assessment Tasks**
I	Define Rural Development, Need for Rural Development, Approaches to Rural Development.	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions.
II	Rural Economic Base- Panchayati Raj System, Agriculture Sector development etc.	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions.
III	Phases of Rural Development in India	Classroom Lectures, PPTs, documentaries, discussions, fieldworks and tutorials.	Assignments, presentations, discussions.
IV	Rural Development in India- Post Independence	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions and debates.
V	Provision of Services: Access to Elementary education in rural areas, Access to Primary Health Care in rural India, Micro Credit, PURA	Classroom Lectures, PPTs, documentaries, discussions and tutorials.	Assignments, presentations, discussions and debates.

Keywords: Rural Development, Panchayati Raj System, Non-Farm Sector, Provision of Services

7. Industrial Development

Course Objective:

1. To understand the nature of industrial geography and appreciate the importance of Industrial Development
2. To analyze the industrial regions and associated impacts of industrialization and challenges.
3. To critical evaluate the industrial policy of India.

Learning Outcome:

After Studying, Students will be able to:

1. Acquaint with the nature and scope of Industrial geography and theories of location of industries.
2. Classify the typology of Industries and understand the physical, cultural, economic and demographic aspects with reference to mega industrial complexes of India.
3. Assess the impacts of industrialization and industrial policy on India.

Course Content:

1. Nature and Scope of Industrial Geography
2. Types, Geographical Characteristics and Location of Industries (Weber's Theory): Small and Medium Industries, Heavy Industries, Coal and Iron based industries, Rural based Industries, Footloose Industry.
3. Mega Industrial Complexes: National Capital Region, Mumbai-Pune Industrial Region, Bengaluru-Chennai Industrial Region and Chota Nagpur Industrial Region
4. Impact of Industrialisation in India: Environmental; Social and Economic
5. Industrial Policy of India.

References:

Essential:

1. Gunnar,A. (1967). *Geography of Manufacturing*. NJ, USA: Prentice Hall
2. Leong, G.C. (1997). *Human and economic geography*. NY, USA: Oxford University Press.
3. Miller, E. (1962). *Geography of Manufacturing.* NJ, USA: Prentice Hall.
4. Pathak, C. R. (2003). *Spatial Structure and Processes of Development in India*. Kolkata, India: Regional Science Assoc.
5. Sharma, T.C. (2013). *Economic Geography of India*. Jaipur: Rawat Publication.
6. Singh, J. (2003). *India - A Comprehensive & Systematic Geography*. Gorakhpur, India: Gyanodaya Prakashan,

Suggestive:

1. Thoman, R.S., Conkling E.C., and Yeates. M.H. (1968). *Geography of Economic Activity*. NY, USA: McGraw Hill Book Company.
2. Tirtha, R. (2002). *Geography of India.* Jaipur & New Delhi: Rawat Publ.
3. Tiwari, R.C. (2007). *Geography of India*. Allahabad, India: Prayag Pustak Bhawan.
4. Truman, A. H., and John W. A. (2000). *Economic Geography.* New Delhi, India: Prentice Hall of India Ltd.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Nature and Scope of Industrial Geography	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
2	Types, Geographical Characteristics and Location of Industries (Weber's Theory): Small and Medium Industries, Heavy Industries: Coal and Iron based industries, Rural based Industries, Footloose Industry.	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/ Debates, classroom test.
3	Mega Industrial Complexes: National Capital Region, Mumbai-Pune Industrial Region, Bengaluru-Chennai Industrial Region and Chota Nagpur Industrial Region.	Classroom Lectures, Tutorials, PPT	Assignments, Discussion/Debates, classroom test.
4	Impact of Industrialisation in India: Environmental; Social and Economic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates, classroom test.
5	Industrial Policy of India	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

Keywords: Industries, Types, Location, Complexes, Impact, Policy

8. Sustainable Resource Development

Course Objective:

1. To learn the concepts related with Sustainable development and its role in reducing poverty and inequality in the world.
2. To get updated knowledge of Millennium Development Goals & Sustainable Development Goals.
3. To critically evaluate the global policies and programmes for sustainable development.

Learning Outcome:

After Studying, Students will be able to

1. Understand the basic concept of sustainable resource development and differentiate between the Millennium development goals and Sustainable development goals.
2. Assess the issues associated with the Inclusive Development.
3. Explain the sustainable development policies and programmes

Course Content:

1. Sustainable Development and Sustainability: Definition, Components and Limitations
2. The Millennium Development Goals: Experiences, India's Effort, Performance and Strategies.
3. Sustainable Resource Development: Water Sustainability in Arid Regions, Forest Sustainability in Mountain Regions, Marine Resource Sustainability, Resources and Sustainable Cities.
4. Inclusive Development: Poverty and Inequality; Education (The role of higher education in sustainable resource development), Health: The Challenges of Universal Health Coverage; Climate Change: Policies and Global Cooperation for Climate Change
5. 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; CDM.

References:

Essential:

1. Agyeman, J., Robert D. B., and Bob, E. (Eds.) (2003). *Just Sustainabilities: Development in an Unequal World.* London, UK: Earthscan. (Introduction and conclusion.).
2. Ayers, Jessica and David,Dodman. (2010). *Climate change adaptation and development I: the state of the debate*. USA: Sage, Progress in Development Studies 10(2): 161-168.

3. Baker, Susan. (2006). *Sustainable Development.* New York, N.Y.: Routledge.
4. Brosius, P. (1997). *Endangered forest, endangered people: Environmentalist representations of indigenous knowledge.* Human Ecology 25: 47-69.
5. Singh, R.B. (Ed.) (2001): *Urban Sustainability in the Context of Global Change*. Science Pub., Inc., New Delhi, India: Enfield (NH), USA and Oxford & IBH Pub.

Suggestive:

1. Lohman, Larry. (2003). *Re-imagining the population debate*. UK: Corner House Briefing.
2. Martínez-Alier, Joan. (2010). *Sustainable de-growth: Mapping the context, criticisms and future prospects of an emergent paradigm*. Ecological Economics 69: 1741-1747.
3. Merchant, Carolyn. (Ed.). (1994):*Ecology. Atlantic Highlands*, N.J., USA: Humanities Press. (Introduction, pp 1-25.)
4. Osorio, Leonardo., et al. (2005). *Debates on sustainable development: towards a holistic view of reality*. Switzertland: Environment, Development and Sustainability 7: 501-518.
5. Robbins, Paul. (2004). *Political Ecology: A Critical Introduction*. UK: Blackwell Publishing.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Sustainable Resource Development: Definition, Components and Limitations	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
2	The Millennium Development Goals: National Strategies and International Experiences	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/ Debates, classroom test.
3	Sustainable Regional Development: Need and examples from different Ecosystems.	Classroom Lectures, Tutorials, PPT	Assignments, Discussion/Debates, classroom test.
4	Inclusive Development: Poverty and Inequality; Education, Health; Climate Change: The role of higher education in sustainable resource development; The Challenges of Universal Health Coverage,	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates, classroom test.
5	Inclusive Development: Poverty and Inequality; Education, Health; Climate Change: The role of higher education in sustainable resource development; The Challenges of Universal Health Coverage,	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

Keywords: Sustainable, Resource, Development, MDGs, SDGs, Inclusive, Policies, Programmes

SKILL ENHANCEMENT COURSES

1. Geographical Information System (Practical)

Course Objectives:

1. The course aim is to give basic understanding of concept of GIS, its definitions and components;
2. To gain working experience geographical data collection using GPS;
3. To do analysis and application of geographical data in land use, urban sprawl, and forest study.

Learning Outcome:

This is a practical, hands-on course; when you have completed it, you will be able to:

1. Develop basic understanding and hands-on on GIS software and GPS ;
2. Understand GIS Data Structures and GIS Data Analysis ;
3. Apply GIS for natural resource management, urban and land use land cover study;

Course Content:

1. Geographical Information System (GIS): Definition and Components.
2. Global Positioning System (GPS): Principles and Uses.
3. GIS Data Structures: Types (spatial and Non-spatial), Raster and Vector Data Structure.
4. GIS Data Analysis: Input; Geo-Referencing; Editing, Output and Query; Overlays.
5. Application of GIS: Land Use Mapping; Urban Sprawl Analysis; Forests Monitoring.

Practical Record:

A project file consisting of 5 exercises on using any GIS Software on above mentioned themes.

References:

Essential:

1. Bhatta, B. (2010). *Analysis of Urban Growth and Sprawl from Remote Sensing*, Berlin, Germany: Springer.

2. Burrough, P.A., and McDonnell, R.A. (2000). *Principles of Geographical Information System-Spatial Information System and Geo-statistics*. UK: Oxford University Press

3. Gomarasca, M. A. (2009). *Basics of Geomatics.* NY, USA: Springer Science.

4. Heywoods, I., Cornelius, S and Carver, S. (2006). *An Introduction to Geographical Information system.* NJ, USA: Prentice Hall.

5. Singh, R.B. and Murai, S. (1998). *Space Informatics for Sustainable Development*. New Delhi, India: Oxford and IBH.

Suggestive:

1. Chauniyal, D.D. (2010). *Sudur Samvedanevam Bhogolik Suchana Pranal.* Allahabad, India: Sharda Pustak Bhawan.

2. Jha, M.M. and Singh, R.B. (2008). *Land Use: Reflection on Spatial Informatics Agriculture and Development,* New Delhi: Concept.

3. Kumar, Dilip, Singh, R.B. and Kaur, R. (2019). *Spatial Information Technology for Sustainable Development Goals* .New Delhi, India: Springer.

4. Nag, P. (2008). *Introduction to GIS.* New Delhi, India: Concept India.

5. Sarkar, A. (2015) *Practical geography: A systematic approach*. New Delhi, India: Orient Black Swan Private Ltd.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6 : Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Geographical Information System (GIS): Definition and Components	Classroom Lectures, Practical demonstration	Assignments, PPT, classroom test.
2	Global Positioning System (GPS): Principles and Uses.	Classroom Lectures, Practical demonstration of using GIS Softwares	Assignments, Hans-on exercise in GIS environment, practical lesson
3	GIS Data Structures: Types (spatial and Non- spatial), Raster and Vector Data Structure.	Classroom Lectures, Practical demonstration using GIS softwares	Assignments, Hans-on exercise, midterm examination.
4	GIS Data Analysis: Input; Geo-Referencing; Editing, Output and Query; Overlays.	Classroom Lectures, Practical demonstration using GIS softwares	Assignments, Hans-on exercise, practical lesson
5	Application of GIS: Land Use Mapping; Urban Sprawl Analysis; Forests Monitoring.	Classroom Lectures, Lectures on case study of different applications	Assignments, classroom test, end semester examination.

Keywords: GIS, Global Positioning System (GPS), GIS Data Structures, Data Analysis, Application of GIS

2. Advanced Spatial Statistical Techniques

Course Objectives:

1. Understanding the application of statistical data in the spatial analysis.
2. Detailed analysis of statistical techniques in geographical study
3. Understanding of statistical applications to analyse both spatial and non-spatial data

Learning Outcomes:

1. In depth understanding about the use of quantitative data in the geographical studies
2. Detailed knowledge of statistical techniques to analyse the quantitative data
3. Understanding of statistical software package to enhance the students with quantitative analysis

Course Content:

1. Statistics and Statistical Data: Spatial and non-spatial; indices of inequality and disparity.
2. Probability theory, probability density functions with respect to Normal, Binomial and Poisson distributions and their geographical applications.
3. Sampling: Sampling plans for spatial and non-spatial data, sampling distributions; sampling estimates for large and small samples tests involving means and proportions.
4. Correlation and Regression Analysis: Rank order correlation and product moment correlation; linear regression, residuals from regression, and simple curvilinear regression; Introduction to multi-variate analysis.
5. Time Series Analysis: Time Series processes; Smoothing time series; Time series components.

Note: Any Statistical Software Package (SPSS, MS Excel, R, etc.) may be used for practice.

References:

Essential:

1. Bart, James, E, and Gerald, M. Barber. (1996). *Elementary Statistics for Geographers*. London, UK: The Guieford Press.
2. Cressie, N.A.C. (1991). *Statistics for Spatial Analysis*. New York, USA: Wiley
3. Eldon, D. (1983). *Statistics in Geography: A Practical Approach*. London, UK: Blackwell.
4. Gregory, S., (1978). *Statistical Methods and the Geographer (4th Edition)*. London, UK: Longman.Haining, R.P. (1990). *Spatial Data Analysis in the Social*

and Environmental Science. Cambridge, UK: Cambridge University Press.

5. Hammond, R. and McCullagh, P.S. (1974). *Quantitative Techniques in Geography: An Introduction.* Oxford, UK: Clarendan Press.

Suggestive:

1. Mathews, J.A. (1987). *Quantitative and Statistical Approaches to Geography: A Practical Manual*. Oxford, UK: Pergamon.
2. Mc Grew, Jr. and Cahrles, B. M. (1993). *An Introduction to Statistical Problem Solving in Geography*. New Jersey, USA: W.C. Brocan Publishers.
3. Rogerson, P. A. (2001). *Statistical Methods for Geography*. New Delhi, India: Sage Publications.
4. Yeates, M. (1974). *An Introduction to Quantitative Analysis in Human Geography*. New York, USA: McGrawhill.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
I	Understanding the basics of statistical data	Classroom Lectures, PPTs, discussions, and Software Application	Assignments, Class Exercises, Software Exercises, Project report
II	Detailed discussion on the Probability theory	Classroom Lectures, PPTs, discussions, and Software Application	Assignments, Class Exercises, Software Exercises, Project report
III	Thorough explanations on sampling plans for spatial-and non-spatial data analysis	Classroom Lectures, PPTs, discussions, and Software Application	Assignments, Class Exercises, Software Exercises, Project report
IV	Understanding of Correlation and regression analysis	Classroom Lectures, PPTs, discussions, and Software Application	Assignments, Class Exercises, Software Exercises, Project report
V	In-depth explanation of time series analysis and its significance in geographical studies	Classroom Lectures, PPTs, discussions, and Software Application	Assignments, Class Exercises, Software Exercises, Project report

Keywords: Statistics, Probability, Sampling, Regression, Series

3. Introduction to GIScience (Practical)

Course Objectives:

5. The course aim is to give basic understanding of concept of GIScience, its definitions and components;
6. To gain working experience collecting data, preparing and handling geographical data;
7. To do analysis and application of geographical data for land use, urban and forest mapping.

Learning Outcome:

This is a practical, hands-on course; when you have completed it, you will be able to:

3. Trace and know evolution of GIS and GIScience and roles of various intuitions in data sharing ;
4. Perform preparing different maps integrating spatial and no-spatial data;
5. Professionally do interpretations and analysis of land use land cover maps;

Course Contents:

1. Evolution of GIScience, Institutions and GI data sharing, GIS: Definition and Components
2. Global Positioning System (GPS) – Principles and Uses
3. GIS Data Structures: Types (spatial and Non-spatial), Raster and Vector Data Structure.
4. GIS Data Analysis: Input; Geo-Referencing; Editing, Query
5. Application of GIS: Land Use Mapping; Urban Sprawl Analysis; Forests Monitoring

Practical Record: A project file consisting of 5 exercises on using any GIS Software on above mentioned themes.

References:

Essential:

1. Bhatta, B. (2010. *Analysis of Urban Growth and Sprawl from Remote Sensing*. Berlin Heidelberg, Germany: Springer.
2. Burrough, P.A., and McDonnell, R.A. (2000). *Principles of Geographical Information System-Spatial Information System and Geo-statistics*. UK: Oxford University Press
3. Chauniyal, D.D. (2010). *Sudur Samvedanevam Bhogolik Suchana Pranali*. Allahabad, India: ShardaPustakBhawan.
4. Jha, M.M. and Singh, R.B. (2008). *Land Use: Reflection on Spatial Informatics Agriculture and Development*. Delhi, India: Concept Publishing.
5. Kumar, D, Singh, R.B. and Kaur, R. (2019). *Spatial Information Technology for Sustainable Development Goals*. Delhi, India: Springer.

Suggestive:

1. Heywoods, I., Cornelius, S and Carver, S., (2006). *An Introduction to Geographical Information syste.* New Jersey, USA: Prentice Hall.
2. Nag, P. (2008). *Introduction to GIS*. New Delhi, India: Concept India.
3. Sarkar, A. (2015). *Practical geography: A systematic approach*. New Delhi, India: Orient Black Swan Private Ltd.
4. Singh, R.B. and Murai, S., (1998). *Space Informatics for Sustainable Development*. New Delhi, India: Oxford and IBH.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Evolution of GIScience, Institutions and GI data sharing, GIS: Definition and Components	Classroom Lectures, Practical demonstration	Assignments, classroom test.
2	Global Positioning System (GPS) – Principles and Uses	Classroom Lectures, Practical demonstration of using GPS in the field	Assignments, Hans-on exercise in the field with GPS, classroom test.
3	GIS Data Structures: Types (spatial and Non-spatial), Raster and Vector Data Structure	Classroom Lectures, Practical demonstration using GIS softwares	Assignments, Hans-on exercise, midterm examination.
4	GIS Data Analysis: Input; Geo-Referencing; Editing, Query	Classroom Lectures, Practical demonstration using GIS softwares	Assignments, Hans-on exercise, classroom test.
5	Application of GIS: Land Use Mapping; Urban Sprawl Analysis; Forests Monitoring	Classroom Lectures, Lectures on case study of different applications	Assignments, classroom test, end semester examination.

Keywords: GIScience, Global Positioning System, GIS Data Structures, Application of GIS

4. Thematic Atlas (Practical)

Course Objectives:

1. Create professional and aesthetically pleasing maps through thoughtful application of principles of map design;
2. Develop hands on skill of diagrammatic representation of geographical data;
3. Better understand thematic map techniques, its cartographic representation and Interpretation

Learning Outcome:

This is a practical, hands-on course; when you have completed it, you will be able to:

1. Explain principles of map design and skill development for diagrammatic data presentation

2. Apply thematic mapping techniques for presentation of geographic data.

3.Skillfully preparation and interpretation of thematic maps.

Course Content:

1.Maps – Classification and Types; Principles of Map Design.

2.Diagrammatic Data Presentation – Line, Bar and Circle.

3.Thematic Mapping Techniques – Properties, Uses and Limitations; Areal Data - Choropleth, Dot, Proportional Circles; Point Data – Isoline.

4.Cartographic Overlays – Point, Line and Areal Data.

5.Thematic Maps – Preparation and Interpretation.

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

References:

Essential:

1. Cuff, J. D. and Mattson, M. T. (1982). *Thematic Maps: Their Design and Production*. London, UK: Methuen Young Books
2. Dent, B. D., Torguson, J. S., and Holder, T. W. (2008). *Cartography: Thematic Map*

Design (6th Edition). New Jersey, USA: McGraw Hill Higher Education.

3. Kraak, M.J. and Ormeling, F. (2003). *Cartography: Visualization of Geo-Spatial Data*. New Jersey, USA: Prentice-Hall.
4. Singh, L. R,& Singh. R., (1977). *Manchitra or Pryaogatamek Bhugol (Hindi)*. Allahabad, India: Central Book Depot.
5. Singh, R. L, and Duttta, P. K. (2012). *Prayogatama Bhugol*. Allahabad, India: Central Book Depot.

Suggestive:

1. Mishra, R. P. and Ramesh, A., (1989): *Fundamentals of Cartography*. Delhi, India: Concept.
2. Sarkar, A. (2015). *Practical geography: A systematic approach*. Delhi, India: Orient Black Swan Private Ltd.
3. Sharma, J. P. (2010). *Prayogic Bhugol (Hindi)*. Meerut, India: Rastogi Publishers.
4. Singh, R. L. and Singh, R. P. B. (1999). *Elements of Practical Geography*. New Delhi, India: Kalyani Publishers.
5. Tyner, J. A. (2010). *Principles of Map Design*. USA: The Guilford Press.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Maps – Classification and Types; Principles of Map Design.	Classroom Lectures, Practical demonstration	Assignments, Hans-on exercise, classroom test.
2	Diagrammatic Data Presentation – Line, Bar and Circle	Classroom Lectures, Practical demonstration	Assignments, Hans-on exercise, classroom test.
3	Thematic Mapping Techniques – Properties, Uses and Limitations; Areal Data -- Choropleth, Dot, Proportional Circles; Point Data – Isopleths	Classroom Lectures, Practical demonstration	Assignments, Hans-on exercise, midterm examination.
4	Cartographic Overlays – Point, Line and Areal Data	Classroom Lectures, Practical demonstration	Assignments, Hans-on exercise, classroom test.
5	Thematic Maps – Preparation and Interpretation	Classroom Lectures, Practical demonstration	Assignments, Hans-on exercise, classroom test, end semester examination.

Keywords: Maps, Thematic Mapping, Cartographic Overlays

B.A (Programme) Geography Discipline --- LOCF

Introduction:

The Choice-based credit system (CBCS) offers flexibility of programme structure while ensuring that the student gets a strong foundation in the subject and gains in-depth knowledge of all aspects of the field. The Learning outcomes-based curriculum framework is designed around the CBCS and is intended to suit the present day needs of the student in terms of securing their path towards higher studies or employment.

Program Duration:

The B.A (programme) Geography will be of three years duration. Each year will be called an academic year and will be divided into two semesters. Thus, there will be a total of six semesters. Each semester will consist of sixteen weeks.

Design of Program:

- The teaching-learning will involve theory classes (Lectures) of one hour duration. The curriculum will be delivered through various methods including chalk and talk, PowerPoint presentations, audio, video tools, E-learning/E-content, field trips, seminars (talks by experts), workshops, projects,, Quiz, models and class discussions.

- The assessment broadly will comprise of Internal Assessment (Continuous Evaluation) and End Semester Examination. Each theory paper will be of 100 marks with 25% marks for Internal Assessment and 75% for End Semester examination. The internal assessment will be based on assignment, oral presentation, project, attendance, mid semester examination.

Programme Structure:

- The programme will consist of both six-credit courses and four-credit courses. All six credit courses (throry) will comprise of theory classes (five credits) and tutorial (one credit). Four credit courses will comprise of theory classes (four credits)

- For theory classes one credit indicates one hour lecture per week. The programme includes Core Courses (CC) and elective courses. The core courses are all compulsory courses. There are three kinds of elective courses: Discipline-Specific Elective (DSE), Generic Elective (GE) and Skill Enhancement Course (SEC). In addition there are two compulsory Ability Enhancement Courses (AEC).

- To acquire a degree in B.A (Prog) a student must study one more discipline course, along with Geography (four Core Courses and two Discipline Specific Elective courses in each discipline). Besides, the student has to study two Generic Electives, two Skill Enhancement Courses and two compulsory Ability Enhancement Courses. Geography Department offers four different Skill Enhancement Courses which are offered in last four (III, IV, V and VI

semesters) semesters. The Department also offers two different Generic Elective papers which are offered in last two (V and VI semesters) semesters. The Core Courses, Discipline-Specific Electives and Generic Electives are six-credit courses. The Skill Enhancement Courses are of four-credit courses while the Ability Enhancement Courses are of zero credit-courses. A student has to earn a minimum of…… credits to get a degree in B.A (Prog) Geography.

STRUCTURE OF B.A. & B.Sc (Programme) IN GEOGRAPHY

Note: *For the structure of* **B.A. & B.Sc (Programme)** *in Geography, the Committee has followed the number of credits per course as suggested in the CBCS document, that is, six credits per Core Course.*

A. Core: (**4Geography**),(**4DSC- 2**)and (**4English/MIL**) (12x6= **72 Credits)**
B. Ability Enhancement Compulsory Course (AECC) **(2**x4= **8Credits)**
C. Skill Enhancement Course (SEC) (**4**) (4x4=**16Credits)**
D. Discipline Specific Elective (DSE) (**2Geography**)& (**2DSE- 2**) (4x6= **24Credits**)
E. Generic Elective(**2**)(2x6=**12Credits)**

GRAND TOTAL (A+B+C+D+E): Total Courses:**24**
Total Credits: (72+8+16+24+12=132**)**

A. CORE COURSE (4) Geography

Serial No	Title of the Course	Credits: 6 credits per course. Total 24 (credits distribution to be decided by institutions as per UGC/CBCS guidelines).	L+T
1.	Physical Geography	6	5+1= 6
2	Human Geography	6	5+1= 6
3	General Cartography	6	5+1= 6
4	Environmental Geography	6	5+1= 6

B. Ability Enhancement Compulsory Course (AECC)			
	Course Title	Credits **4** cr (credit distribution to be decided by institutions as per CBCS guidelines).	Distribution of Credit Hours **4** [Note: There can be different options depending upon the pedagogical and assessment weightage distribution]
1	Art of Communication/ MIL	4	4x1 = 4
2	Environmental Studies	4	4x1 = 4

6. C. Skill Enhancement Course (SEC)(2)			
	Course Title	Credits 4 (2x2) 2 credit per course. (Credit) distribution to be decided by institutions as per CBCS guidelines).	Distribution of Credit Hours
1	Regional Planning and Sustainable	4	4x1 = 4
	Development		
2	Fundamentals of Remote Sensing and GPS/GNSS	4	4x1 = 4

3	Field Techniques and Surveying Methods	4	4x1 =4
4	Introduction to GIScience	4	4x1 = 4

7. D. Discipline Specific Elective DSE(2)			
	Course Title	Credits 12 (2x6)	Credit Hours L T O [To be devised by the institutions]
1	8. Geography of India 9. or World Economic Geography	6	5+1 =6
2	10. Disaster Risk Reduction or Geography of Tourism	6	5+1= 6
E. Generic Elective (2)			
	Course Title	Credits 12 (2x6)	Credit Hours L T O
1	Disaster Management	6	5+1 = 6
2	Climate Change Vulnerability and Mitigation	6	5+1= 6
Note: 1. *Universities/Institutions/Departments may wish to add more courses against categories marked C, D and E, depending upon the availability of specialists*			

and other required resources.
2. Any major deviation from category A is likely to impact the very philosophy of LOCF in Geography.

Choice Based Credit System B.A. / B.BSc(Programme) Geography

11.	**Core Course (12) (6 credits per course)**	**Ability Enhancement Compulsory Course (AECC) (2)**	**Skill Enhancement Course (SEC)(2)**	**Discipline Specific Elective (DSE)(2)**	**Generic Elective (GE) (2)**
I	English/MIL-1 PhysicalGeography DSC-2A	(English/ MIL Communication) / Environmental Science			
II	English/MIL-1 Human Geography DSC- 2 B	Environmental Science/ (English/MIL Communication)			
II	English/MIL-2 General Cartography DSC- 2 C		Regional Planning and Sustainable Development		
IV	English/MIL Environmental Geography DSC- 2 D		Fundamentals of Remote Sensing and GPS/GNSS	.	

V			Field Techniques and Surveying Methods	Geography of India or World Economic Geography DSE-2 A	Disaster Management
V I			Introduction to GIScience	Disaster Risk Reduction OR Geography of Tourism DSE-2 B	Climate Change Vulnerability And Mitigation

Graduate Attributes

1. Disciplinary Knowledge – Students will know about patterns and processes of Man-environment relationship in the context of places. It will also help to understand cause and effect factors of this relationship for the mutual benefit of humanity and the natural environment.
2. Communication Siklls – It will enhance the communication skill through mapping in the form of paper and digital images, display and analyse the information about people and environment. Geographical study will enhance the oral communication through presentation and to written communication through report writing of geographical phenomena.
3. Critical Thinking – Students will analyse the facts, organising the Phenomena, evaluating the arguments and making the decision that can help to solve and understand critically the problem of society and environment.
4. Problem solving – Students will develop problem solving skills through geographical knowledge which will help in decision making process. Choosing the best alternative of particular phenomena.

5. Anlytical Reasoning – The study of geography gives opportunity to see the relationship relationally and apply the geographical knowledge to evaluate outcome and design the possible solution.
6. Research Related Skills – During the field work study, student will learn data collection, organising and analysing date, interpretation and draw generalisation and inferences of geographical study.
7. Cooperation / Team Work – Students are involved in collecting, analysing, evaluating, applying information to solve the issues which will generate cooperation and team work among students which will create constructive work by sharing each other's view points and reaching consensus.
8. Scientific Reasoning – Geography students are able to develop scientific reasoning through mapping skills, Google map, Google earth as well as ordinance survey maps and integrate such skills into the learning of geographical issues in the curriculum.
9. Reflective Thinking – Geographical knowledge provides the ability to students to reflect critically about the images of people, place and environment using ICT tools.
10. Information and Digital Literacy – Geography is one curricular area that has gained from digital literacy which will contribute to develop the ICT capabilities in regard to data handling, data processing and data interpretation.
11. Self Directed Learning – Geography encompasses diverse concern of society by including wide range of contents drawn from other disciplines of social sciences which will enhance the reflective thinking about the various components of social science on their own awareness.
12. Multicultured competence – Geography Students will have a cluster of related abilities including power of analysis and synthesis which will help in decision support system in a specific spatial contest.
13. Moral and Ethical Awareness – Geography Students heave moral and ethical awareness to the problem/issues which the world is facing today ex. Global warming, food security, various disasters. And they understand the judicious utilisation of resources as well as the need for conservation of natural environment.
14. Leadership Readiness/Quality – Filed work in Geography have important contribution to develop a leadership quality because every Geography students is entitled to have a exposure to fieldwork experience.

15. Lifelong Learning – Learning process in geography sharpen their observation and identification of an issues in a specific area, collect and present data analysis and finally identify possible solution and strategies. Thus the Geographer has important contribution to make Geography real.

Programme Learning Outcome:

After completion of undergraduate programs in geography, students will be able to :

- Ability to interpret and analyze various concepts and theories.
- Analyze the earth as an integrated human- environment system by examining changing interactions at different spatial and temporal scales.
- To understand the subject matter of various branches of physical and human geography.
- To analyze geographical data and interpret its significance within the context of human-environment relations.
- Communicate geographical concepts and data effectively using oral, written and visual forms.
- Contribute effectively to pursue innovative solutions to human – environment problems.
- Investigate complex real world challenges using appropriate concepts, methods, and tools from one or more geographical sub-disciplines.
- Explain Societal relevance of geographical knowledge and and apply it to real world human – environmental issues.
- Development of strong oral and written communication skills using the concepts and knowledge acquired.
- Demonstration of the ability to work independently or as part of a team.
- Students of the B.A (prog) Geography will learn to use scientific logic as they explore a wide range of contemporary subjects spanning various aspects of Physical, Human, Regional, Environmental, economic, cartographic aspects of Geography.
- Students will appreciate the Geographical diversity of events, phenomenon, resources, and development and be able to describe/explain the processes involved.
- Students will gain knowledge of various interactions taking place in the environment along with the major issues.
- Graduates of the B.A (programme) Geography will be informed citizens who can understand and evaluate the impact of new research discoveries in Geographical subfields and will be able to pursue a wide range of careers, including teacher cartographer, technical assistant, GIS Analyst, demographer, travel & tourism Planner, statistical analyst, product sale executive, Town planner, regional planning, community development Scientist, GIS Expert, Teaching/research and civil services.

Teaching-Learning Process:

- The B.A (Programme) Geography aims to make the student proficient in Geography and its sub- fields through the transfer of knowledge in the classroom as well as in the field. In the classroom this will be done through blackboard and chalk lectures, charts, PowerPoint presentations, and the use of audio-visual resources that are available on the internet.
- An interactive mode of teaching will be used. The student will be encouraged to participate in discussions.

- Emphasis on application of the concepts is particularly important keeping in mind the practical nature of the subject.
- The problem- solving approach will be adopted whenever suitable.
- The students will participate in local field trips that will facilitate his/her understanding to gain applied and practical aspects of the programme.

Assessment Methods:

The students will be assessed over the duration of the programme by different methods. This includes assignments, projects, presentations, written examinations and, records of problem – solving exercises and preparation of field – reports. The wide range of assessment methods will help to assess skills and knowledge of different individual learner and we will be able to achieve above teaching – learning outcomes of programme.

B.A./B.Sc (Programme) Geography

Core Course (4 Compulsory courses)

Semester I

1. Physical Geography

Semester II

2. Human Geography

Semester III

3. General Cartography

Semester IV

4. Environmental Geography

8.

Skill Enhancement Course (2 Compulsory courses)

Semester III

1. Regional Planning and Sustainable Development

Semester IV

2. Fundamentals of Remote Sensing and GPS/GNSS

Semester V

3. Field Techniques and Surveying Methods

Semester VI

4. Introduction to GI Science

9.

Discipline Specific Elective Papers (2 Compulsory courses)

Semester V

1. Geography of India
2. World Economic Geography

Semester VI

3. Disaster Risk Reduction
4. Geography of Tourism

10.

Generic Elective (2)

Semester V

1. Disaster Management

Semester VI

2. Climate Change Vulnerability and Mitigation

B.A. /B.Sc (Programme) Geography Core Course (4 Compulsory Courses)

1. Physical Geography

Course Objectives:

1) This course shall introduce definition and scope of physical geography.
2) This paper shall elucidate the characteristics of atmosphere, lithosphere, and the fluvial cycle of erosion.
3) This course shall provide detailed understanding related to hydrosphere and its related processes.

Learning Outcomes:

1) This paper shall enable the students to understand the basic concepts, definition and scope of physical geography.
2) This course shall enable the students to comprehend the dynamics of atmosphere, lithosphere and fluvial erosion cycle.
3) Students shall be well-versed with hydrological processes, ocean bottom relief, tides and currents.

Course Contents:

1. Physical Geography – Definition and Scope, Components of Earth System.
2. Atmosphere – Heat Balance, Global Circulation Pattern, Tropical Cyclones, Monsoon-Theory of Origin (Thermal and Dynamic), Rainfall pattern of Indian Monsoon, Climatic Classification (Koppen).
3. Lithosphere – Internal Structure of Earth based on Seismic Evidence, Plate Tectonics-Concept, Types of plate boundaries and its Associated Features.
4. Erosion and Weathering– Fluvial Cycle of Erosion given by W.M Davis and associated landforms, Weahering-Definition and Types.
5. Hydrosphere – Hydrological Cycle-Component and Processes, Ocean Bottom Relief Features, Tides-Types and Origin and Currents-Types and factors of their formation.

References:

Essential:

1. Conserva H. T. (2004). *Illustrated Dictionary of Physical Geography*. USA: Author House.
2. Garrett N. (2000). *Advanced Geography*. USA: Oxford University Press.
3. Goudie, A. (1984). *The Nature of the Environment: An Advanced Physical Geography*.Oxford, UK: Basil Blackwell Publishers.
4. Hamblin, W. K. (1995). *Earth's Dynamic System*. New Jersey, USA: Prentice Hall.
5. Strahler A. N. and Strahler A. H. (2008). *Modern Physical Geograph.* New York, USA:

John Wiley& Sons.

Suggestive:

1. Gabler R. E., Petersen J. F. and Trapasso, L. M. (2007). *Essentials of Physical Geography* (8th Edition). USA: Thompson, Brooks/Cole.
2. Gupta S.L, Bhu-Akriti Vigyan, Directorate of Hindi Medium Implientation, Delhi 1992
3. Husain M. (2002). *Fundamentals of Physical Geography.* Jaipur, India: Rawat Publications.
4. Monkhouse, F. J. (2009). *Principles of Physical Geography*. Kolkata, India: Platinum Publishers.
5. Singh, S. (2019). *Bhotik Bhugol* (10th Edition). Allahabad, India: Prayag Pustak Bhawan,

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6 : Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	**Course Learning Outcomes**	**Teaching and Learning Activity**	**Assessment Tasks**
1	Physical Geography – Definition and Scope, Components of Earth System	Classroom lectures and tutorials	Assignments, PPT, classroom test.

2	Atmosphere – Heat Balance, Global Circulation Pattern, Tropical Cyclones, Monsoon, Climatic Classification (Koppen).	Classroom lectures and tutorials	Assignments, PPT, classroom test.
3	Lithosphere – Internal Structure of Earth based on Seismic Evidence, Plate Tectonics and its Associated Features.	Classroom lectures and tutorials	Assignments, PPT, classroom test.
4	Fluvial Cycle of Erosion – Davis and Penck.	Classroom lectures and tutorials	Assignments, PPT, classroom test.
5	Hydrosphere – Hydrological Cycle, Ocean Bottom Relief	Classroom lectures and tutorials	Assignments, classroom test, end
	Features, Tides and Currents.		semester examination.

Keywords: Physical geography, atmosphere, lithosphere, cycle of erosion, hydrosphere, ocean relief, tides, currents.

2. Human Geography

Course Objectives:

1. This course shall introduce definition, nature, major subfields and relevance of human geography.
2. This paper shall elucidate about space and society, cultural regions, race, religion and language.
3. This course shall provide detailed understanding related to world population growth, population theory and settlement patterns.

Learning Outcomes:

1) This paper shall enable the students to understand the basic concepts, nature and relevance of human geography.
2) This course shall enable the students to appreciate the interrelationships between space and society, characteristics of cultural regions, race, religion and language.
3) Students shall be well-versed with the world population growth patterns, demographic transition theory, settlement patterns and urbanization process.

Course Contents:

1. Definition, Nature, Major Subfields, Contemporary Relevance.
2. Space and Society: Cultural Regions; Race; Religion and Language
3. Population: Population Growth and Demographic Transition Theory.
4. World Population Distribution and Composition (Age, Gender and Literacy).
5. Settlements: Types and Patterns of Rural Settlements; Classification of Urban Settlements; Trends and Patterns of World Urbanization

References:

Essential:

2. Chandna, R.C. (2010). *Population Geography*. India: Kalyani Publisher.
3. Daniel, P.A. and Hopkinson, M.F. (1989). *The Geography of Settlement*. London, UK: Oliver & Boyd.
4. Johnston R; Gregory D, Pratt G. et al. (2008). *The Dictionary of Human Geography*. New Jersey, USA: Blackwell Publication.
5. Jordan-Bychkov et al. (2006) The Human Mosaic: A Thematic Introduction to Cultural Geography. W. H. Freeman and Company, New York.
6. Kaushik, S.D. (2010). *Manav Bhugol.*Meerut, India: Rastogi Publication.

Suggestive:

1. Ghosh, S. (2015). *Introduction to settlement geography*. Kolkata, India: Orient Black Swan Private Ltd.
2. Hussain, M. (2012). *Manav Bhugol*. Jaipur, India: Rawat Publications.
3. Maurya, S.D. (2012). *Manav Bhugol*. Allahabad, India: Sharda Pustak Bhawan.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	**Course Learning Outcomes**	**Teaching and Learning Activity**	**Assessment Tasks**
1	Definition, Nature, Major Subfields, Contemporary Relevance.	Classroom lectures and tutorials	Assignments, PPT, classroom test.
2	Space and Society: Cultural Regions; Race; Religion and Language	Classroom lectures and tutorials	Assignments, PPT, classroom test.
3	Population: Population Growth and Demographic Transition Theory.	Classroom lectures and tutorials	Assignments, PPT, classroom test.
4	World Population Distribution and Composition (Age, Gender and Literacy).	Classroom lectures and tutorials	Assignments, PPT, classroom test.

5	Settlements: Types and Patterns of Rural Settlements; Classification of Urban Settlements; Trends and Patterns of World Urbanization	Classroom lectures and tutorials	Assignments, classroom test, end semester examination.

Keywords: Human geography, cultural regions, religion, language, race, demographic transition theory, settlement patterns, urbanization.

3. General Cartography

Course Objectives:

1. Create professional and aesthetically pleasing maps through thoughtful application of Cartographic conventions;
2. Develop an understanding of the concepts regarding scale, map projections to suit map purposes;
3. Better understand the techniques of interpretation of topographical and weather maps

Learning Outcome:

This is a practical, hands-on course; when you have completed it, you will be able to:

4. Explain how maps work, conceptually and technically and will be able to understand science and art of cartography

5. Recognize the benefits and limitations of some common map projections and their use.

6. Understand and perform interpretation of topographical maps and weather maps.

Course Content:

6. Cartography – Nature and Scope; Scales – Concept and application; Graphical Construction of Plain, Comparative and Diagonal Scales.
7. Map Projections – Classification, Properties and Uses; Merits and Demerits of Polar Zenithal, Stereographic, Bonne's and Mercator's Projections.
8. Profiles-Introduction to Cross and Longitudinal Profiles.
9. Topographical Maps- Interpretation and Slope Analysis (Wentworth's method).
10. Interpretation of Weather Maps

Practical Record:

A Project File in pencil comprising one exercise *each*, on scale, map projection, interpretation of topographic sheet and weather maps.

References:

Essential:

1. Kraak, M.J. (2010). *Cartography: Visualization of Geospatial Data* (3rd edition). London, UK: Pearson Education Ltd.
2. Misra, R.P. (2014). *Fundamentals of Cartography (*Second Revised and Enlarged Edition). Delhi, India: Concept Publishing.
3. Monkhouse, F. J. and Wilkinson, H. R. (1973). *Maps and Diagrams*. London, UK: Methuen.
4. Rhind, D. W. and Taylor D. R. F., (eds.) (1989): *Cartography: Past, Present and Future*. Netherlands: Elsevier, International Cartographic Association.
5. Sarkar, A. (2015). *Practical geography: A systematic approach*. New Delhi, India: Orient Black Swan Private Ltd.
6. Singh,G. (1998). *Map Work and Practical Geography (4th Edition)*. Ahmedabad, India: Vikas Publishing House.

Suggestive:

1. Sharma, J. P., (2010). *PrayogicBhugol(Hindi)*. Meerut, India: Rastogi Publishers.
2. Singh, R.L. &Dutta, P.K., (2012). *Prayogatmak Bhugol (Hindi)*. Allahabad, India: Central Book Depot
3. Singh, R.L. and Singh R.P.B. (1999). *Elements of Practical Geography*. New Delhi, India: Kalyani Publishers.
4. Singh, R.L., and Singh, R.P.B. (1991). *Prayogtmak Bhugolke Mool Tatva (Hindi)*. New Delhi, India: Kalyani Publishers.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Nature and Scope, Concept and application, Graphical Construction	Classroom Lectures, Practical demonstration	Assignments, Hans-on exercise, classroom test.
2	Map Projections – Classification, Properties and Uses; Merits and Demerits	Classroom Lectures, Practical demonstration	Assignments, Hans-on exercise, classroom test.
3	Profiles-Introduction to Cross and Longitudinal Profiles.	Classroom Lectures, Practical demonstration	Assignments, Hans-on exercise, midterm examination.
4	Topographical Maps-Interpretation and Slope Analysis	Classroom Lectures, Practical demonstration	Assignments, Hans-on exercise, classroom test.
5	Interpretation of Weather Map	Classroom Lectures, Practical demonstration	Assignments, Hans-on exercise, classroom test, end semester examination.

Keywords: Cartography, Map Projections, Profiles, Topographical Maps

4. Environmental Geography

Course Objectives:

1) This course shall introduce the basic concepts and approaches of environmental geography.
2) This paper shall elucidate about human-environmental relationship, environmental programs and their management.
3) This course shall provide detailed understanding related to environmental programmes and policies with specific reference to New Environmental Policy of India.

Learning Outcomes:

1) This paper shall enable the students to understand basic concepts and approaches related to environmental geography.
2) This course shall enable the students to comprehend about human-environment relationship, and different environmental problems and its management.
3) Students shall be well-versed with the analysing the environmental programmes and policies.

Course Contents:

1. Environmental Geography: Concepts and Approaches; Ecosystem – Concept and Structure; Ecosystem Functions.
2. Human-Environment Relationship in Equatorial, Desert, Mountain and Coastal Regions.
3. Environmental Problems and Management: Air Pollution; Biodiversity Loss; Solid and Liquid Waste.
4. Environmental Programmes and Policies: Developed Countries; Developing Countries.
5. New Environmental Policy of India; Government Initiatives.

References:

Essential:

1. Casper J.K. (2010). *Changing Ecosystems: Effects of Global Warming.* New York, USA: Infobase Pub.
2. Hudson, T. (2011). *Living with Earth: An Introduction to Environmental Geology*. Delhi, India: PHI Learning Private Limited.
3. Miller, G.T. (2007). *Living in the Environment: Principles, Connections, and Solutions*. Belmont, Australia: Brooks/ Cole Cengage Learning.
4. Singh, R.B. (1993) *Environmental Geography*. Delhi, India: Heritage Publishers.
5. UNEP. (2007). *Global Environment Outlook: GEO4: Environment For Development, United Nations Environment Programme*. UK: University Press, Cambridge.

Suggestive:

1. Singh, R.B. and Hietala, R. (Eds.) (2014). *Livelihood security in Northwestern*

Himalaya: Case studies from changing socio-economic environments in Himachal Pradesh, India. Advances in Geographical and Environmental Studies. Tokyo, Japan: Springer
2. Singh, Savindra 2001. *Paryavaran Bhugol.* Allahabad, India: Prayag Pustak Bhawan.
3. Wright R. T. and Boorse, D. F. (2010). *Toward a Sustainable Future*. Delhi, India: PHI Learning Pvt Ltd.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Environmental Geography: Concepts and Approaches; Ecosystem – Concept and Structure; Ecosystem Functions.	Classroom lectures and tutorials	Assignments, PPT, classroom test.
2	Human-Environment Relationship in Equatorial, Desert, Mountain and Coastal Regions.	Classroom lectures and tutorials	Assignments, PPT, classroom test.
3	Environmental Problems and Management: Air Pollution; Biodiversity Loss; Solid and Liquid Waste.	Classroom lectures and tutorials	Assignments, PPT, classroom test.
4	Environmental Programmes and Policies: Developed Countries; Developing Countries.	Classroom lectures and tutorials	Assignments, PPT, classroom test.
5	New Environmental Policy of India; Government Initiatives.	Classroom lectures and tutorials	Assignments, classroom test, end semester examination.

Keywords: Environmental Geography, Ecosystem functions, Environmental management, Environmental Policies.

Skill Enhancement Course (2 Compulsory Courses)

1. Regional Planning and Sustainable Development

Course Objectives:

1. This course shall introduce basic concepts, need and types of regional planning.
2. This paper shall introduce the characteristics and process of delineation of planning regions based on selected parameters.
3. This course shall provide theoretical perspective on the models of regional planning and selected case studies of regional planning models.

Learning Outcomes:

1) This paper shall enable the students to understand the basic concepts and types of regional planning.
2) This course shall enable the students to analyze various characteristics and parameters used for delineating the planning regions.
3) Students shall be well-versed with models of regional planning and appreciate the relevance of the case studies of regional planning.

Course Contents:

1. Concept, Need and Types of Regional Planning.
2. Characteristics and Delineation of Planning Region.
3. Regionalization of India for Planning (Agro Ecological Zones).
4. Models for Regional Planning: Growth Pole Theory; Core Periphery Model and Growth Foci Concept in Indian Context.
5. Backward Regions and Regional Plans- Special Area Development Plans in India; DVC- The Success Story and the Failures; NITI Aayog.

References:

Essential:

1. Blij H. J. De. (1971). *Geography: Regions and Concepts*. USA: John Wiley and Sons.
2. Claval P.l. (1998). *An Introduction to Regional Geography*. Oxford and Massachusetts. Blackwell Publishers,
3. Friedmann J. and Alonso W. (1975). *Regional Policy - Readings in Theory and Applications*. Massachusetts, USA: MIT Press.
4. Gore C. G. (1984). *Regions in Question: Space, Development Theory and Regional Policy*. London, UK: Methuen.
5. Gore C. G., Köhler G., Reich U-P. and Ziesemer T. (1996). *Questioning Development;*

Essays on the Theory, Policies and Practice of Development Intervention. Marburg, Germany: Metropolis- Verlag.

Suggestive:

1. Haynes J. (2008). *Development Studies*. USA: Polity Short Introduction Series.
2. Johnson E. A. J. (1970) *The Organization of Space in Developing Countries*. Massachusetts, USA: MIT Press.
3. Peet R. (1999). *Theories of Development*. New York, USA: The Guilford Press.
4. UNDP. (2001-04). *Human Development Report.* New York, USA: Oxford University Press.
5. World Bank. (2001-05). *World Development Report.* New York, USA: Oxford University Press.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Concept, Need and Types of Regional Planning	Classroom lectures and tutorials	Assignments, PPT, classroom test.
2	Characteristics and Delineation of Planning Region	Classroom lectures and tutorials	Assignments, PPT, classroom test.
3	Regionalization of India for Planning (Agro Ecological Zones)	Classroom lectures and tutorials	Assignments, PPT, classroom test.
4	Models for Regional Planning	Classroom lectures and tutorials	Assignments, PPT, classroom test.
5	Backward Regions and Regional Plans- Special Area Development Plans in India	Classroom lectures and tutorials	Assignments, classroom test, end semester examination.

Keywords: Regional Planning, Regionalization, Growth Pole, Core-Periphery Model, Growth Foci, Backward Regions and Regional Plans.

2. Fundamentals of Remote Sensing and GPS/GNSS

Course Objectives:

1) This course shall introduce the basic concepts of remote sensing.
2) This paper shall elucidate about aerial photography, its basic principles and types, satellite remote sensing.
3) This course shall provide detailed understanding related to interpretation and application of remote sensing, GPS/GNSS.

Learning Outcomes:

1) This paper shall enable the students to understand fundamental issues related to remote sensing, its development and types.
2) This course shall enable the students to comprehend about aerial photography, satellite remote sensing, EMR and sensors
3) Students shall be well-versed with the interpretation and applications of remote sensing, and GPS/GNSS.

Course Contents:

1. Remote Sensing: Definition, Development, Platforms and Types.
2. Aerial Photography: Principles, Types and Geometry.
3. Satellite Remote Sensing: Principles, EMR Interaction with Atmosphere and Earth Surface; Satellites (Landsat and IRS) and Sensors.
4. Interpretation and Application of Remote Sensing: Land use/ Land Cover.
5. Global Positioning System (GPS) – Principles and Uses

References:

Essential:

1. Campbell J. B. (2007). *Introduction to Remote Sensing*, Guildford Press.
2. Jensen J. R. (2004) *Introductory Digital Image Processing: A Remote Sensing Perspective*, Prentice Hall.
3. Joseph, G. (2005). *Fundamentals of Remote Sensing*. Delhi, India: United Press India.
4. Lillesand T. M., Kiefer R. W. and Chipman J. W. (2004). *Remote Sensing and Image Interpretation*, Wiley. (Wiley Student Edition).
5. Nag P. and Kudra, M., 1998: *Digital Remote Sensing*, Concept, New Delhi.

Suggestive:

1. Rees W. G., 2001: *Physical Principles of Remote Sensing*, Cambridge University Press.
2. Singh R. B. and Murai S., 1998: *Space-informatics for Sustainable Development*, Oxford and IBH Pub.
3. Wolf P. R. and Dewitt B. A., 2000: *Elements of Photogrammetry: With Applications in GIS*, McGraw-Hill.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	**Course Learning Outcomes**	**Teaching and Learning Activity**	**Assessment Tasks**
1	Remote Sensing: Definition, Development, Platforms and Types.	Classroom lectures and tutorials	Assignments, PPT, classroom test.
2	Aerial Photography: Principles, Types and Geometry.	Classroom lectures and tutorials	Assignments, PPT, classroom test.
3	Satellite Remote Sensing: Principles, EMR Interaction with Atmosphere and Earth Surface; Satellites (Landsat and IRS) and Sensors.	Classroom lectures and tutorials	Assignments, PPT, classroom test.
4	Interpretation and Application of Remote Sensing: Land use/ Land Cover.	Classroom lectures and tutorials	Assignments, PPT, classroom test.

5	Global Positioning System (GPS) – Principles and Uses	Classroom lectures and tutorials	Assignments, classroom test, end semester examination.

Keywords: Remote sensing, Aerial Photography, EMR, Sensors, GPS, GNSS.

3. Field Techniques and Surveying Methods

Course Objectives:

1) This course shall introduce the basic concepts in field work in geographical studies.
2) This paper shall elucidate about defining the field and identifying the case studies, field techniques.
3) This course shall provide detailed understanding related to questionnaire development and preparation of the field report.

Learning Outcomes:

1) This paper shall enable the students to understand fundamental concepts and issues related to field work in geographical studies.
2) This course shall enable the students to comprehend about field work and field techniques.
3) Students shall be well-versed with the development of questionnaire and writing the field report.

Course Contents:

1. Field Work in Geographical Studies – Role, Value and Ethics of Field-Work.
2. Defining the Field and Identifying the Case Study – Rural / Urban / Physical / Human / Environmental.
3. Field Techniques – Merits, Demerits and Selection of the Appropriate Technique; Observation (Participant / Non Participant).
4. Questionnaires (Open/ Closed / Structured / Non-Structured); Interview with Special Focus on Focused Group Discussions; Space Survey (Transects and Quadrants, Constructing a Sketch).
5. Designing the Field Report – Aims and Objectives, Methodology, Analysis, Interpretation and Writing the Report.

References:

Essential:

1. Creswell J. (1994). *Research Design: Qualitative and Quantitative Aproaches.* California, USA: Sage Publications.
2. Dikshit, R. D. (2003). *The Art and Science of Geography: Integrated Readings*. Delhi, India: Prentice-Hall of India.
3. Evans M. (1988) Participant Observation: The Researcher as Research Tool. In *Qualitative Methods in Human Geography*, (eds). J. Eyles and D. Smith, Polity. Mukherjee, Neela 1993. Participatory Rural Appraisal: Methodology and Application. New Delhi, India: Concept Publs. Co.
4. Mukherjee, N. (2002). *Participatory Learning and Action: with 100 Field Methods*. Delhi, India: Concept Publs. Co.
5. 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.

Suggestive:

1. Special Issue on "Doing Fieldwork" *The Geographical Review* 91:1-2 (2001).
2. Stoddard R. H. (1982). *Field Techniques and Research Methods in Geography*. USA: Kendall/Hunt.
3. Wolcott, H. (1995). *The Art of Fieldwork.*CA, USA: Alta Mira Press.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	**Course Learning Outcomes**	**Teaching and Learning Activity**	**Assessme nt Tasks**
1	Field Work in Geographical Studies – Role, Value and Ethics of Field-Work.	Classroom lectures and utorials	Assignments, PPT, classroom test.
2	Defining the Field and Identifying the Case Study – Rural / Urban / Physical / Human / Environmental.	Classroom lectures and utorials	Assignments, PPT, classroom test.
3	Field Techniques – Merits, Demerits and Selection of the Appropriate Technique; Observation (Participant / Non Participant).	Classroom lectures and utorials	Assignments, PPT, classroom test.

4	Questionnaires (Open/ Closed / Structured / Non-Structured); Interview with Special Focus on Focused Group Discussions; Space Survey (Transects and Quadrants, Constructing a Sketch).	Classroom lectures and utorials	Assignments, PPT, classroom test.
5	Designing the Field Report – Aims and Objectives, Methodology, Analysis, Interpretation and Writing the Report.	Classroom lectures and utorials	Assignments, classroom test, end semester examination.

Keywords: Field Work, Field Techniques, Questionnaire, Report writing, Geographical Studies.

4. Introduction to GIScience

Course Objectives:

1. The course aim is to give basic understanding of concept of GIScience, its definitions and principles;
2. To gain working experience collecting data, preparing and handling geographical data;
3. To do analysis and application of geographical data resource management and land use land cover study.

Learning Outcome:

This is a practical, hands-on course; when you have completed it, you will be able to:

1. Develop basic understanding of GIScience and roles of various intuitions in data sharing ;
2. Perform preparing different maps integrating spatial and no-spatial data;
3. Learn and use GIS for natural resource management, urban and land use land cover study;

Course Content:

1. Geographical Information System (GIS): Definition, Components and Principles.
2. GIS Data Structures: Types (Spatial and Non-spatial), Raster and Vector Data Structure.
3. GIS Data Analysis: Input; Geo-Referencing; Editing and Output; Overlays.
4. Application of GIS in Natural Resource Management.
5. Application of GIS in Urban Sprawl, Land use/Land-cover.

Practical Record: A project file consisting of 5 exercises on using any GIS Software (free software like QGIS, AGIS etc.) on above mentioned themes.

References:
Essential:

1. Bhatta, B. (2010) Analysis of Urban Growth and Sprawl from Remote Sensing, Springer, Berlin Heidelberg.
2. Burrough, P.A., and McDonnell, R.A. (2000) Principles of Geographical Information

System-Spatial Information System and Geo-statistics, Oxford University Press, Oxford.

3. Chauniyal, D.D. (2010) SudurSamvedanevamBhogolikSuchanaPranali, ShardaPustakBhawan, Allahabad.
4. Heywoods, I., Cornelius, S and Carver, S. (2006) An Introduction to Geographical Information system. Prentice Hall, New Jersey.
5. Singh, R.B. and Murai, S. (1998). *Space Informatics for Sustainable Development*. Delhi, India: Oxford and IBH.

Suggestive:

1 Nag, P. (2008). *Introduction to GIS*. Delhi, India: Concept India.

2 Sarkar, A. (2015). *Practical Geography: A Systematic Approach.* Delhi, India: Orient Black Swan Private Ltd.

3 Jha, M.M. and Singh, R.B. (2008). *Land Use: Reflection on Spatial Informatics Agriculture and Development*. Delhi, India: Vedams eBooks (P) Ltd.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Geographical Information System (GIS): Definition, Components and Principles	Classroom Lectures, Practical demonstration	Assignments, classroom test.
2	GIS Data Structures: Types (Spatial and Non- spatial), Raster and Vector Data Structure.	Classroom Lectures, Practical demonstration of using GIS Softwares	Assignments, Hans-on exercise in GIS environment, practical lesson
3	GIS Data Analysis: Input; Geo-Referencing; Editing and Output; Overlays	Classroom Lectures, Practical demonstration using GIS softwares	Assignments, Hans-on exercise, midterm examination.
4	Application of GIS in Natural Resource Management	Classroom Lectures, Lectures on case study of different applications	Assignments, classroom test.
5	Application of GIS in Urban Sprawl, Land use/Land-cover	Classroom Lectures, Lectures on case study of different applications	Assignments, classroom test, end semester examination.

Keywords: GIScience, GIS Data Structures, Application of GIS

Discipline Specific Elective Papers (2 Compulsory Courses)

1. Geography of India

Course Objectives:

1) This course shall introduce the physical geography of India.
2) This paper shall elucidate about population trends and composition, and settlement system in India
3) This course shall provide detailed understanding related to resource base and economic systems in India.

Learning Outcomes:

1) This paper shall enable the students to understand the physical geography of India.
2) This course shall enable the students to comprehend the trends and composition of population change in India.
3) Students shall be well-versed with the existing resource base and the economic systems in India.

Course Contents:

1. Physical Setting – Location, Structure and Relief, Drainage, Climate.
2. Population – Size and Growth since 1901, Population Distribution, Literacy, Sex Ratio.
3. Settlement System - Rural Settlement Types and Patterns, Urban Pattern.
4. Resource Base – Livestock (cattle and fisheries), Power (coal, and hydroelectricity), Minerals (iron ore and bauxite).
5. Economy – Agriculture (Rice, Wheat, Sugarcane, Groundnut, Cotton); Industries (Cotton Textile, Iron-Steel, Automobile), Transportation Modes (Road and Rail).

References:

Essential:

1. Hussain M. (1992). G*eography of India.* New Delhi, India: Tata McGraw Hill Education.
2. Mamoria C. B. (1980). *Economic and Commercial* G*eography of India*. India: Shiva Lal Agarwala.
3. Miller F. P., Vandome A. F. and McBrewster J. (2009). *Geography of India: Indo-Gangetic Plain, Thar Desert, Major Rivers of India, Climate of India, Geology of India*. USA: Alphascript Publishing.
4. Nag P. and Sengupta S. (1992). G*eography of India*. New Delhi, India: Concept Publishing.
5. Pichamuthu C. S. (1967). *Physical Geography of India*. New Delhi, India: National Book Trust.

Suggestive:

1. Sharma T. C. and Coutinho O. (1997) *Economic and Commercial Geography of India*. India: Vikas Publishing.
2. Singh Gopal. (1976). *A Geography of India*. India: Atma Ram.
3. Singh, S. and Saroha, J. (2018). *Geography of India (Second Edition)*. Delhi, India: G K Publications (C.L Educate)
4. Spate O. H. K. and Learmonth A. T. A. (1967). *India and Pakistan: A General and Regional Geography*. London, UK: Methuen.
5. Rana, T.S. (2015). *Diversity of India*. Delhi, India: R.K. Books, Delhi.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	**Course Learning Outcomes**	**Teaching and Learning Activity**	**Assessment Tasks**
1	Physical Setting – Location, Structure and Relief, Drainage, Climate.	Classroom lectures and tutorials	Assignments, PPT, classroom test.

2	Population – Size and Growth since 1901, Population Distribution, Literacy, Sex Ratio.	Classroom lectures and tutorials	Assignments, PPT, classroom test.
3	Settlement System - Rural Settlement Types and Patterns, Urban Pattern.	Classroom lectures and tutorials	Assignments, PPT, classroom test.
4	Resource Base – Livestock (cattle and fisheries), Power (coal, and hydroelectricity), Minerals (iron ore and bauxite).	Classroom lectures and tutorials	Assignments, PPT, classroom test.
5	Economy – Agriculture (Rice, Wheat, Sugarcane, Groundnut, Cotton); Industries (Cotton Textile, Iron-Steel, Automobile), Transportation Modes (Road and Rail).	Classroom lectures and tutorials	Assignments, classroom test, end semester examination.

Keywords: Geological structure, Relief, Climate, Population Growth, Population Composition, Settlement Systems, Resource Base, Agriculture, Industries, India.

2. World Economic Geography

Course Objectives:

1) This course shall introduce basic concepts and approaches related to economic geography.
2) This paper shall introduce the fundamental locational theories, postulates, and their relevance in the contemporary period.
3) This course shall provide a detailed understanding about different forms of economic activities and its geographical patterning.

Learning Outcomes:

1) This paper shall enable the students to understand the basic concepts and approaches of doing the economic geography.
2) This course shall enable the students to appreciate the spatial perspective on the locational theories of economic activities in general.
3) Students shall be acquainted with different forms of economic activities and its geographical dimensions in detail.

Course Contents:

1. Definition, Approaches and Fundamental Concepts of Economic Geography; Patterns of Development.
2. Locational Theories – Agriculture (Von Thunen) and Industrial (Weber).
3. Primary Activities – Intensive Subsistence Farming, Commercial Grain Farming, Plantation, Commercial Dairy Farming, Commercial Fishing, and Mining (ironore, coal and petroleum).
4. Secondary Activities – Cotton Textile Industry, Petro-Chemical Industry, Major Manufacturing Regions.
5. Tertiary and Quaternary Activities – Modes of Transportation, Patterns of International Trade, and Information and Communication Technology Industry.

References:

Essential:

1. Alexander J. W. (1963). *Economic Geography*. New Jersey, USA: Prentice-Hall Inc.
2. Bagchi-Sen S. and Smith H. L. (2006). *Economic Geography: Past, Present and Future*. UK: Taylor and Francis.
3. Coe N. M., Kelly P. F. and Yeung H. W. (2007). *Economic Geography: A Contemporary Introduction*, USA: Wiley-Blackwell.
4. Combes P., Mayer T. and Thisse J. F. (2008). *Economic Geography: The Integration of Regions and Nations*. USA: Princeton University Press.
5. Durand L. (1961). *Economic Geography*. USA: Crowell.

Suggestive:

1. Hodder B. W. and Lee R. (1974). *Economic Geography*. UK: Taylor and Francis.
2. Wheeler J. O., 1998: *Economic Geography*. USA: Wiley.
3. Willington D. E., 2008: *Economic Geography*. UK: Husband Press.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	**Course Learning Outcomes**	**Teaching and Learning Activity**	**Assessment Tasks**
1	Definition, Approaches and Fundamental Concepts of Economic Geography; Patterns of Development.	Classroom lectures and tutorials	Assignments, PPT, classroom test.
2	Locational Theories – Agriculture (Von Thunen) and Industrial (Weber)	Classroom lectures and tutorials	Assignments, PPT, classroom test.
3	Primary Activities	Classroom lectures and tutorials	Assignments, PPT, classroom test.
4	Secondary Activities	Classroom lectures and tutorials	Assignments, PPT, classroom test.

5	Tertiary and Quaternary Activities	Classroom lectures and tutorials	Assignments, classroom test, end semester examination.

Keywords: Economic Geography, Locational Theories, Primary Activities, Secondary Activities, Tertiary and Quaternary Activities

3. Disaster Risk Reduction

Course Objectives:

1) This course shall introduce the basic concepts related to disaster risk reduction.
2) This paper shall elucidate about disasters in India.
3) This course shall provide detailed understanding related to human induced disasters, and disaster risk reduction programmes and initiatives.

Learning Outcomes:

1) This paper shall enable the students to understand basic concepts and issues related to disaster risk reduction.
2) This course shall enable the students to comprehend about causes, impact, distribution and mapping of disasters in India.
3) Students shall be well-versed with the analysing the programmes and policies related to disaster risk reductions.

Course Contents:

1. Disaster; Hazards, Risk, Vulnerability and Disasters: Definition and Concepts.
2. Disasters in India: (a) Causes Impact, Distribution and Mapping: Flood and Drought.
3. Disasters in India: (b) Causes, Impact, Distribution and Mapping: Earthquake and Cyclone.
4. Human induced disasters: Causes, Impact, Distribution and Mapping.
5. Disaster Risk Reduction: Mitigation and Preparedness, NDMA and NIDM; Community-Based Disaster Management; Do's and Don'ts During Disasters

References:

Essential:

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*. Delhi, India: Sage Publication.

3. Modh, S. (2010). *Managing Natural Disaster: Hydrological, Marine and Geological Disaster*s. Delhi: Macmillan.

4. Singh, R.B. (2005). *Risk Assessment and Vulnerability Analysis*. IGNOU, New Delhi. Chapter 1, 2 and 3

5. Singh, R. B. (ed.), (2006). *Natural Hazards and Disaster Management: Vulnerability and Mitigatio.* Delhi, India: Rawat Publications

Suggestive:

1 Sinha, A. (2001). *Disaster Management: Lessons Drawn and Strategies for Future*. New United Press, New Delhi.

2 Stoltman, J.P. et al. (2004) International Perspectives on Natural Disasters, Kluwer Academic Publications. Dordrecht.

3 Singh, J. (2007) Disaster Management Future Challenges and Oppurtunities. New Delhi, India: I.K. International Pvt. Ltd. S-25.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	**Course Learning Outcomes**	**Teaching and Learning Activity**	**Assessme nt Tasks**
1	Disaster; Hazards, Risk, Vulnerability and Disasters: Definition and Concepts.	Classroom lectures and utorials	Assignments, PPT, classroom test.

2	Disasters in India: (a) Causes Impact, Distribution and Mapping: Flood and Drought.	Classroom lectures and utorials	Assignments, PPT, classroom test.
3	Disasters in India: (b) Causes, Impact, Distribution and Mapping: Earthquake and Cyclone.	Classroom lectures and utorials	Assignments, PPT, classroom test.
4	Human induced disasters: Causes, Impact, Distribution and Mapping.	Classroom lectures and utorials	Assignments, PPT, classroom test.
5	Disaster Risk Reduction: Mitigation and Preparedness, NDMA and NIDM; Community-Based Disaster Management; Do's and Don'ts During Disasters	Classroom lectures and utorials	Assignments, classroom test, end semester examination.

Keywords: Disaster Risk Reduction, Hazard, Risk, Vulnerability, Human induced disasters, Mitigation and Preparedness, NDMA, NIDM.

4. Geography of Tourism

Course Objectives:

1) This course shall introduce basic concepts, nature, and scope of geography of tourism.
2) This paper shall elucidate about types of tourism and recent trends of tourism.
3) This course shall provide detailed understanding related to impact of tourism in general, and tourism experiences and prospects in particular.

Learning Outcomes:

1) This paper shall enable the students to understand the basic concepts, nature and relevance of geography of tourism.
2) This course shall enable the students to comprehend the types of tourism and emerging trends of tourism.
3) Students shall be well-versed with the impact of tourism on economy, society and environment and its experiences in the Indian context.

Course Contents:

1. Concepts, Nature and Scope; Inter-Relationships of Tourism, Recreation and Leisure; Geographical Parameters of Tourism by Robinson.
2. Type of Tourism: Nature Tourism, Cultural Tourism, Medical Tourism, Pilgrimage
3. Recent Trends of Tourism: International and Regional; Domestic (India); Eco-Tourism, Sustainable Tourism, Meetings, Incentives, Conventions and Exhibitions (MICE)

4. Impact of Tourism: Economy; Environment; Society
5. Tourism in India: Tourism Infrastructure; Case Studies of Himalaya, Desert and Coastal and Heritage; National Tourism Policy

References:
Essential:

1. Dhar, P.N. (2006). *International Tourism: Emerging Challenges and Future Prospects*. Delhi: Kanishka.
2. Hall, M. and Stephen, P. (2006). *Geography of Tourism and Recreation – Environment, Place and Space*. London, UK: Routledge.
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*. USA Butterworth-Heinemann. Chapter 2.
5. Raj, R. and Nigel, D. (2007). *Morpeth Religious Tourism and Pilgrimage Festivals Management: An International perspective* . USA: CABI, Cambridge, www.cabi.org.

Suggestive:

1 Singh, J. (2014). *Eco-Tourism*. Delhi: I.K. International Pvt. Ltd.
2 Tourism Recreation and Research Journal, Center for Tourism Research and Development, Lucknow

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Concepts, Nature and Scope; Inter-Relationships of Tourism, Recreation and Leisure; Geographical Parameters of Tourism by Robinson.	Classroom lectures and tutorials	Assignments, PPT, classroom test.
2	Type of Tourism: Nature Tourism, Cultural Tourism, Medical Tourism, Pilgrimage	Classroom lectures and tutorials	Assignments, PPT, classroom test.
3	Recent Trends of Tourism: International and Regional; Domestic (India); Eco- Tourism, Sustainable Tourism, Meetings, Incentives, Conventions and Exhibitions (MICE)	Classroom lectures and tutorials	Assignments, PPT, classroom test.
4	Impact of Tourism: Economy; Environment; Society	Classroom lectures and tutorials	Assignments, PPT, classroom test.
5	Tourism in India: Tourism Infrastructure; Case Studies of Himalaya, Desert and Coastal and Heritage; National Tourism Policy	Classroom lectures and tutorials	Assignments, classroom test, end semester examination.

Keywords: Geography of Tourism, Nature Tourism, Cultural Tourism, Medical Tourism, Pilgrimage, National Tourism Policy.

Generic Elective (GE)

1. Disaster Management

Course Objectives:

1) This course shall introduce the basic concepts related to disaster management.
2) This paper shall elucidate about disasters in India.
3) This course shall provide detailed understanding related to human induced disasters, and response and mitigation of disasters.

Learning Outcomes:

1. This paper shall enable the students to understand basic concepts and issues related to disaster management.
2. This course shall enable the students to comprehend about causes, impact, distribution and mapping of disasters in India.
3. Students shall be well-versed with the analysing the response and mitigation of disasters.

Course Contents:

4. Hazards, Risk, Vulnerability and Disasters: Definition and Concepts.
5. Disasters in India: (a) Causes, Impact, Distribution and Mapping: Flood, Landslide, Drought.
6. Disasters in India: (b) Causes, Impact, Distribution and Mapping: Earthquake, Tsunami and Cyclone.
7. Human induced disasters: Causes, Impact, Distribution and Mapping.
8. Response and Mitigation to Disasters: Mitigation and Preparedness, NDMA and NIDM; Indigenous Knowledge and Community-Based Disaster Management; Do's and Don'ts During Disasters

References:

Essential:

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*. Delhi, India: Sage Publication.
3. Modh, S. (2010) Managing Natural Disaster: Hydrological, Marine and Geological Disasters, Macmillan, Delhi.
4. Singh, R. B. (ed.). (2006). *Natural Hazards and Disaster Management: Vulnerability and Mitigation*. India: Rawat Publications.
5. Singh, R.B. (2005) *Risk Assessment and Vulnerability Analysis*. Delhi, India: IGNOU. Chapter 1, 2 and 3

Suggestive:

1. Sinha, A. (2001). *Disaster Management: Lessons Drawn and Strategies for Future*. Delhi, India: New United Press.
2. Stoltman, J.P. et al. (2004*). International Perspectives on Natural Disasters.* Dordrecht, The Netherlands: Kluwer Academic Publications.
3. Singh, J. (2007). *Disaster Management Future Challenges and Oppurtunities.* New Delhi, India : I.K. International Pvt. Ltd.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	**Course Learning Outcomes**	**Teaching and Learning Activity**	**Assessme nt Tasks**
1	Hazards, Risk, Vulnerability and Disasters: Definition and Concepts.	Classroom lectures and utorials	Assignments, PPT, classroom test.
2	Disasters in India: (a) Causes, Impact, Distribution and Mapping: Flood, Landslide, Drought.	Classroom lectures and utorials	Assignments, PPT, classroom test.

3	Disasters in India: (b) Causes, Impact, Distribution and Mapping: Earthquake, Tsunami and Cyclone.	Classroom lectures and utorials	Assignments, PPT, classroom test.
4	Human induced disasters: Causes, Impact, Distribution and Mapping.	Classroom lectures and utorials	Assignments, PPT, classroom test.
5	Response and Mitigation to Disasters: Mitigation and Preparedness, NDMA and NIDM; Indigenous Knowledge and	Classroom lectures and utorials	Assignments, classroom test, end semester
	Community-Based Disaster Management; Do's and Don'ts During Disasters		examination.

Keywords: Disaster Management, Hazard, Risk, Vulnerability, Human induced disasters, Disaster Mitigation and Preparedness, NDMA, NIDM.

2. Climate Change Vulnerability and Mitigation

Course Objectives:

1. The course aim is to give basic understanding of concept Science of Climate Change;
2. It will also help in developing understanding about various Impacts of Climate Change on Agriculture and Water; Flora and Fauna; Human Health ;
3. This course is also oriented to deliver knowledge on Adaptation and Mitigation of climate impacts and to know institutional role.

Learning Outcome:

This is a practical, hands-on course; when you have completed it, you will be able to:

9. Understand basics of Science of Climate Change ;
10. Understand different types of vulnerability ;
11. Dwell upon the issues of adaptation and mitigation;

Course Content:

1. Science of Climate Change: Understanding Climate Change; Green House Gases and Global Warming; Global Climatic Assessment - IPCC
2. Climate Change and Vulnerability: Physical Vulnerability; Economic Vulnerability; Social Vulnerability
3. Impacts of Climate Change: Agriculture and Water; Flora and Fauna; Human Health
4. Adaptation and Mitigation: Global Initiatives with Particular Reference to South Asia.
5. National Action Plan on Climate Change; Local Institutions (Urban Local Bodies, Panchayats)

References:

Essential:

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*. Cambridge, UK: Cambridge University Press.

2. 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, UK: Cambridge University Press.
3. Malhotra, Nitasha andSen, Shyamoli, 2018: Climatology, R.K. Books, New Delhi.
4. Sen Roy, S. and Singh, R.B. (2002). *Climate Variability, Extreme Events and Agricultural Productivity in Mountain Regions*. New Delhi, India: Oxford & IBH Pub.
5. 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.* Basel: Springer

Suggestive:

1 OECD. (2008). *Climate Change Mitigation: What Do we Do?* Organisation and Economic Co-operation and Development (www.oecd.org/env/cc).
2 Palutik, J. P., Vander Linden, P. J. and Hanson, C. E. (eds.), Cambridge University Press, Cambridge.
3 UNEP. (2007). *Global Environment Outlook: GEO4: Environment for Development.* Nairobi, Kenya: United Nations Environment Programme.

Teaching Learning Plan

Week 1: Unit I

Week 2: Unit I

Week 3: Unit II

Week 4: Unit II

Week 5: Unit III

Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** Unit III

Week 9: Unit IV

Week 10: Unit IV

Week 11: Unit V

Week 12: Unit V

Assessment Methods:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Science of Climate Change.	Classroom lectures and utorials	Assignments, PPT, classroom test.
2	Climate Change and Vulnerability.	Classroom lectures and utorials	Assignments, PPT, classroom test.
3	Impacts of Climate Change.	Classroom lectures and utorials	Assignments, PPT, classroom test.
4	Adaptation and Mitigation	Classroom lectures and utorials	Assignments, PPT, classroom test.
5	National Action Plan on Climate Change	Classroom lectures and utorials	Assignments, classroom test, end semester examination.

Keywords: Science of Climate Change, Vulnerability, Adaptation and Mitigation, National Action Plan on Climate Change