LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK

(LOCF)

FOR

GEOGRAPHY

BA./B.Sc.(Hons.)

UNDERGRADUATE PROGRAMME
2020-21

DEPARTMENT OF GEOGRAPHY
FACULTY OF ENVIRONMENTAL SCIENCE
RAJIV GANDHI UNIVERSITY
RONO HILLS, DOIMUKH 791112

05/7/2021
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Preamble

The UGC committee constituted for preparing the Learning Outcomes Based Curriculum Framework for BA/BSc. Hons. Geography/ B.A/B.SC (PROGRAMME), has been accepted by the Board of Undergraduate Studies (BUGS), subsequently approved in the 33rd Academic Council Meeting July 8 2021 and 39th Executive Council Meeting held on June 10 2021 of Rajiv Gandhi University, Rono Hills Doimukh. RGU has made minor modification to give regional touch to the syllabus and uniform pattern of coding of the paper has done. The UGC Committee hereby suggests the curriculum for the students considering the global, national, regional, local issues and programs for better learning outcomes. The LOCF is designed to emphasize the teaching-learning process at the undergraduate (B.A./B.Sc) level to sensitize and train the students to develop a sound and systematic approach regarding mechanism and processes of natural and human activities. The focus is to help the students to understand the latest tools and techniques, which would help in giving focused and precise understanding of geographical phenomenon. The purpose is to enhance the capability of the students in perceiving, creating and analyzing sound geographical bases and concepts.

This Learning Outcome based Curriculum Framework is designed to emphasize the teaching and learning process at the undergraduate (B.A./ B.Sc) from teacher centric to student centric by strengthening the quality of teaching and learning in the present day real life scenario of global, regional and local level. It is considered learning as an activity of creativity of innovations and analyzing geographical phenomena. The committee prepared the major learning outcomes, which would help the students to understand and critically analyze various dimensions of the geographical issues.

The following objectives would be achieved:

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

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The Committee suggests that the following remarks may be taken in to consideration by the faculty members, departments/schools, Boards of studies in Geography Institutes/colleges and Universities, while incorporating the recommendations for utilization:

- The learning outcomes are designed in such a way to assist the students to understand the objectives of studying BA/BSc (H)/ in Geography, which is to understand, appreciate and critically evaluate and associate with various time and space aspects.
- It is paramount to consider here BA/BSc (H) in Geography under CBCS remains the point of reference for LOCF recommendations. As it is a field-based learning, all stakeholders may make suitable alterations with suitable justifications while preparing the courses, finalization of objectives keeping in view global, national, regional and local issues and challenges. Accordingly, BUGS of RGU has made minor modification. A paper on "Geography of North East Region: special Reference to Arunachal Pradesh" has been incorporated in order to enable the learners to the Geography of place where they stay.
- To this end, the themes, units in the LOCF documents are confirmative. Similarly the organization of themes/units should consider the spatial dimensions and references.
- The Organization of units/courses is worked into semesters/years considering the credit loads in a given semester with the ultimate end of outcomes of the courses /programs. However, it is essential to incorporate the courses applied in nature which focus attention of the students especially in the second and third years of the given courses.
- Learning outcomes are modifiable considering the social, cultural and physical heterogeneity of the country and time scales, accordingly, themes and text units are taken into account considering all the stakeholders.
- The understanding of the LOCF Committee of Geography is to have well defined and justifiable course outcomes and their realization at the end of the course and programs.
- The department/institute/college/university is expected to encourage the faculty to inculcate the best teaching skills with innovative ideas and methods to make students to learn subjects based on field knowledge and updated spatial information.

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PART 1

INTRODUCTION

Learning Outcomes based Curriculum Framework (LOCF) for Geography under CBCS

- **Introduction**

Geography has been broadly accepted as a bridge discipline between human and physical sciences. In the beginning, Geography focused on the physical aspects of the earth but the modern Geography is an all-encompassing discipline that seeks to understand the earth and all of its human and natural processes as integrating elements. Geography has emerged through time as a trans-disciplinary subject integrating the regional diversity with the concepts of the timing of space and the spacing of time. It provides broad, human and place-centered perspectives on the transformation of rural ecology to globalized urban landscape at different levels, from the local/regional/national to global. Geography is transformed through:

- Journey from Village Ecology to Urban Regional Studies
- Qualitative Techniques to Spatial Information Technology
- Global to Micro-level Community Perception Approach

It is essential to focus on the current socio-spatial problems, issues and challenges to make the students aware of the application of Geography to sort out the societal upcoming problems. It is also essential to rejuvenate the ancestral geographical knowledge to address the current local and global problems. In the light of exponential changes in the field of arts, science and technology, it is to be studied from multifaceted angles.

It is important for the policy makers to consider the geo-spatial aspects with references to the location and in context of the best utilization of public utilities. It is further expected that if the above said spatial aspects are considered, it will certainly develop the lagging regions and people living therein.

2. Learning Outcomes based Approach to Curriculum Planning

Learning Outcomes based Curriculum Framework (LOCF) for Geography curriculum revision incorporates dynamic processes including fundamental and modern techniques, contemporary paradigms such as global initiatives like Sustainable Development Goals

(SDGs), Disaster Risk Reduction (DRR), Paris Climate Action and national initiatives like smart cities, Securities of food, water, energy, human health and livelihood, biodiversity, and disaster management. The approaches are to make geography more scientific and societal-need oriented that could be the panacea of India's developmental challenges. Geography uses scientific knowledge with the current focus that includes spatio-temporal analysis, skill development, GIScience, sustainable development and human security.

2.1 Nature and Extent of the B.A./B.Sc. (Hons.) Programme

Geography curriculum inculcates knowledge of essential concepts of Physical and Human Geography together with appropriate techniques using lectures, tutorials, group discussions, presentations, assignment evaluation, lab work and field visits. Thus, pedagogy process includes:

- Identifying and explaining the physical and cultural characteristics globally and processes at varied spatio-temporal contexts.
- Understanding human-environment and nature-society interactions as well as various global environmental challenges.
- Analysing geographic information by using geo-spatial technologies.
- Responding towards the global and national challenges and initiatives.

2.2 Aims of B.A./B.Sc. (Hons.) Programme

Four distinct and new learning outcomes have been incorporated from each Course such as:

- Appreciate the relevance of geographical knowledge to everyday life.
- Demonstrate the ability to communicate geographic information by utilising both lecture and practical exercises.
- Inculcate the ability to evaluate and solve geographical problems effectively.
- Demonstrate the skills in using geographical research tools including spatial statistics, cartography, remote sensing, GIS, IRNSS and GIScience.
- Based on the field knowledge and advanced technologies, the students should be able to understand the on-going geographical problems in different regions and levels with appropriate pragmatic solutions.

3. Graduate Attributes in Geography

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

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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

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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 comprehensivemanner.

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.

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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.

3.15 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.

The curriculum uses CBCS framework and organises under Core Course, Skill Enhancement Course, Elective - Discipline Specific and Elective - Generic Courses. The core courses cover key areas of geography about which all students should have basic knowledge. These courses are grouped as follows:

A. Theory – These courses build up the theoretical and conceptual foundations of geography.
B. Practical – Three courses on Statistical Techniques in Spatial Analysis; Remote Sensing and Geographical Information System, GIScience and Research Methods and Fieldwork in Geography will strengthen the methodological and practical foundations of geography.
C. Regional Approach – Such courses focus on World Geography, Geography of India / different states.
D. Application Oriented – This includes disaster management, climate change, tourism geography, health and wellbeing, etc.

Each Course has one objective, three learning outcomes, five uniform contents and reading list incorporating a few Hindi books also wherever possible.

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4. Qualification Description for B.A./B.Sc. (Hons.) Programme

The qualification descriptors for the B.A./B.Sc. (Hons.) programme in Geography shall have the learning attributes such as field knowledge, use of advance tools and techniques for better comprehension of space and society etc. It also involves awareness among the students regarding the issues of different regions and socio-cultural aspects. The main qualification descriptors for the Geography B.A./B.Sc. (Hons.) students are to develop the critical evaluation and understanding. Each Honour student in Geography should be able to;

- Demonstrate systematically geographical knowledge and understanding the theoretical as well as practical applications with understanding of various aspects.
- Demonstrate the ability to understand the significance of geographical aspects in relation to development of the regions and minimizing regional inequalities.
- Demonstrate the ability and geographical thinking critically regarding rural and urban spaces and their day to day problems with the application of geographical knowledge.
- Students have to demonstrate their geographical knowledge acquired in the class and apply the same in real world.
- Recognize the scope of geography in terms of exploring the career opportunities, employment and life-long engagement in teaching and utilise the knowledge for publication for the future academic endeavors.

The students have to develop the ability through the theoretical and practical means for realising the Sustainable Development Goals (SDG) both in rural and urban spaces to minimize the differentials in developmental aspects.

5. The Programme Learning Outcomes B.A./B.Sc. (Hons.) Programme

The programme learning outcomes relating to B.A./B.Sc. (Hons.) Programme in geography:

- Demonstrating the understanding of basic concepts in geography.
- Demonstrating the coherent and systematic knowledge in the discipline of geography to deal with current issues and their solution.
- Display an ability to read and understand maps and topographic sheets to look at the various aspects on the space.
- Cultivate ability to evaluate critically the wider chain of network of spatial aspects from global to local level on various time scales as well.
- Recognize the skill development in Geographical studies programme as part of career avenues in various fields like teaching, research and administration.

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It is also suggested that after the completion of B.A./B.Sc. (Hons.) Programme, students should be able to demonstrate the knowledge obtained in such way so that they can explore the employability options and service to the society.

5.1 Learning Outcomes

Three distinct and new learning outcomes have been incorporated from each course such as to:

1. Understand the relevance of geographical knowledge to everyday life.
2. Getting the ability to communicate geographic information utilizing both lecture and practical exercises.
3. Inculcate the ability to evaluate geographical problems effectively.
4. Exhibit the skill in using geographical research tools including spatial statistics, cartography, remote sensing, GIS, IRNSS and GIScience.

5.2 Course Level Learning Outcomes

The course level learning outcomes includes:

1. Basic Concept: The fundamental concepts and philosophical foundation of each course need to be discussed.

2. **Understanding Landscape:** An understanding of landscape at different levels needs to be discussed and understood for a thorough knowledge of spatial dimensions.

3. Understanding Ecosystem Structure and Potential: To comprehend the dynamic dimensions of human and ecosystem relationships.

4. Human Perception and Behaviour: Learning human perception and behaviour to acquire the geographical knowledge evolved over time, is essential to improve decision making process.

5. Identification of Critical Problems and Issues: Detection and identification of the critical problems and spatial issues are essential for sustainable development.

6. Field Based Knowledge: Field based knowledge is essential to understand the ground reality, spatial patterns and processes.

7. Spatial Tools and Techniques: The basics and applications of spatial tools and techniques are essential to make the studies more scientific and applicable.

8. **Statistical Techniques:** Use of statistical tools and techniques is essential for precise and objective geographic analysis and interpretation of complex phenomena.
9. **Applied Dimensions:** Identification of the critical problems and spatial issues form the core of the modern geography for various applications and decision making, including

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Resources, Environment & Disaster Management, Land Use Planning, and Urban and Regional Development together with Climate Change Mitigation and Adaptation, etc.

10. **Case Study based Analysis:** There is a need to understand the specificities of the problems in specific areas for their in depth comprehension and solution. The case studies are essential, especially to find out the solutions to the lagging regions for their solutions based on first hand information.
11. **Public Policy and Management:** Spatial aspects and dimensions are the integral parts in the policy making for sustainable regional development. Geographical knowledge needs to be inculcated for application and solutions of the various local, regional and national problems.
12. **Communication Skills:** Communication through models, maps, images and other geographical tools form the sound base for the dissemination of geographical information.

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1. Course-Level Learning Outcomes Matrix

Outcomes	Core Subjects													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Basic Concept	x	X	X	X	X	X	X	x	x	x	x	X	X	X
Understanding Landscape	x	X	X				X		X	X	X	X	X	X
Understanding Ecosystem structure and Potential			X		X		X	X	X	X	X	X		X
Human Perception and Behaviour			X				X	X	X			X	X	X
Identificationof Critical Problems and Issues	X		X		X	X	X	X	X	X	X	X		X
Field Based Knowledge		X		X	X					X	x	X		X
Spatial Tools and Techniques		X		X		X				X		X		X
Statistical Techniques		X		X		X				X		X		X
Applied Dimensions	X	X	X	X	X	X		X	X	X	X	X		X
Case Study based Analysis		X	X		X	X			X	X	X	X		X
Public Policy and Management					X	X	X	X	X	X	X	X		X
Communication Skills	x	X	X	X	X	X	X	X	X	X	x	X	X	X

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7. GEOGRAPHY COURSE OUTCOMES AND SDGs

The global community has adopted the Sustainable Development Goals to ensure holistic and multifaceted development of human societies across the world. These goals adopted in 2015 were an ambitious upgradation of millennium development goals.

The Indian Geographical community aims to harness the trans-disciplinary nature of the subject and link it with sustainable development goals through a range of multi-dimensional core and elective papers

7.1. B.A. (HONS) GEOGRAPHY- CORE PAPERS: CONTRIBUTION TOWARDS SDGs

B.A. (Hons) Geography

	SDG 1 No Poverty	SDG 2 Zero Hunger	SDG 3 Good Health & Wellbeing	SDG 4 Quality Education	SDG 5 Gender Equality	SDG 6 Clean Water & Sanitation	SDG 7 Affordable & Clean Energy	SDG 8 Decent Work & Economic Growth	SDG 9 Industry Innovation & Infrastructure	SDG 10 Reduced Inequalities	SDG 11 Sustainable Cities & Communities	SDG 12 Responsible Consumption & Production	SDG 13 Climate Action	SDG 14 Life Below Water	SDG 15 Life on Land	SDG 16 Peace, Justice and Strong Institutions	SDG 17 Partnerships for the Goals
Geomorphology														X	X		
Cartographic Techniques (Practical)				X													
Geography of Human and Cultural Landscape					X											X	X
Statistical Methods in Geography (Practical)													X				
Climatology and Oceanography													X	X	X		
Fundamentals of Remote Sensing (Practical)				X					X				X				
Geography of India											X	X	X				
Introduction to Global Economic System								X	X	X	X	X					
Environment and Natural Resource Management	X	X	X			X	X									X	X
Geographical Information System (Practical)				X					X				X				
Regional Planning and Sustainable Development	X	X	X		X	X										X	X
Field Techniques, Surveying and Research Methods (Practical)				X													
Evolution of Geographical Thought				X													
Disaster Management Project Work (Practical)													X				

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7.2. B.A. (HONS) GEOGRAPHY- ELECTIVE PAPERS: CONTRIBUTION TOWARDS SDGs.

Geography Electives

	SDG 1 No Poverty	SDG 2 Zero Hunger	SDG 3 Good Health & Wellbeing	SDG 4 Quality Education	SDG 5 Gender Equality	SDG 6 Clean Water & Sanitation	SDG 7 Affordable & Clean Energy	SDG 8 Decent Work & Economic Growth	SDG 9 Industry Innovation & Infrastructure	SDG 10 Reduced Inequalities	SDG 11 Sustainable Cities & Communities	SDG 12 Responsible Consumption & Production	SDG 13 Climate Action	SDG 14 Life Below Water	SDG 15 Life on Land	SDG 16 Peace, Justice and Strong Institutions	SDG 17 Partnerships for the Goals
Demography and Population Studies				X	X												
Hydrology and Soil Studies														X	X		
Urbanization and Urban System			X			X	X	X	X	X	X	X					
Agriculture and Food Security	X	X											X				
Geography of Health			X			X				X	X						
Political Geography				X									X			X	X
Biogeography													X	X	X		
Geography of Social Wellbeing	X	X			X												
Disaster Management													X			X	X
Geography of Tourism and Pilgrimage								X	X								
Geospatial Information Technology				X							X		X				
Coupled Human and Environment System										X		X				X	X
Climate Change Vulnerability and Adaptation		X											X		X	X	X
Rural Development	X	X	X			X	X	X		X							
Industrial Development								X	X	X		X					
Sustainable Resource Development			X		X						X	X					
Digital Remote Sensing (Practical)				X					X				X				
Spatial Statistical Techniques				X									X				
Introduction to GIScience (Practical)									X				X				
Thematic Atlas				X													

8. (a) Teaching Learning Processes

Learning Outcomes based Curriculum Framework (LOCF) for geography incorporates dynamic processes including fundamental and modern techniques, contemporary paradigms such as global initiatives like Sustainable Development Goals (SDGs), Disaster Risk Reduction (DRR), Paris Climate Action and national initiatives like smart cities, food security, water security, energy security, biodiversity, disaster management, human health and wellbeing and livelihood security. The approaches are to make geography more scientific and societal-need oriented that could be the panacea of India's development. Geography uses scientific knowledge with the present focus that includes spatio-temporal analysis, skill development, GIScience, sustainable development and human security.

Learning is a challenging, engaging, and enjoyable activity. Learners should be encouraged to engage in a rigorous process of learning and self-discovery by adopting a highly focused and yet flexible approach to education. Each day learners should be encouraged to focus on key areas of the course and spend time on learning the course fundamentals and their application in life and society. In teaching and learning pedagogy, there should be a shift from domain or conclusions based approach to the experiential or process based approach.

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Geography curriculum inculcates knowledge of essential concepts of physical and human geography together with appropriate techniques using lectures, tutorials, group discussion, presentation, assignment evaluation, lab work and field visits. Thus, pedagogy process includes:

- Identifying and explaining the physical and cultural characteristics globally and processes at varied spatio-temporal contexts.
- Understanding human-environment and nature-society interactions as well as various global environmental challenges.
- Analysing geographic information by using geo-spatial technologies.
- Responding towards the global and national initiatives.

Broad framework for teaching in the class includes:

1. Theory courses should have 6 hours per week for courses carrying 6 credits.
2. Tutorial group of each theory course should have a group size of 15 students.
3. Practical courses should have 12 hours per week for a group of 15 students.
4. Practical courses will not have tutorials.
5. There is no practical paper in B.A./BSc. Programme

The faculty should promote learning on a proportionate scale of 20:30:50 principle, where lectures (listening/hearing) constitute 20 per cent of the delivery; visuals (seeing) 30 per cent of the learning methods; and experience (doing/participating) 50 per cent. This ratio is subject to change as per institutional needs.

In order to achieve its objective of focused process based learning and holistic development, the Institution/University may use a variety of knowledge delivery methods:

1. Lectures

Lectures should be designed to provide the learners with interesting and fresh perspectives on the subject matter. Lectures should be interactive in a way that students work with their teachers to get new insights in the subject area, on which they can build their own bridges to higher learning.

2. Discussions

Discussions are critical components of learning, and can be used as a platform for students to be creative and critical with old and new ideas. Besides developing critiquing skills, arriving at consensus on various real life issues and discussion groups lead to innovative problem solving and, ultimately to success.

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3. Life Skills:

Life skills provide students opportunities to understand real life situations and scenarios (i.e. coping with disaster), and solve challenges in a controlled environment or make use of them in simulating cultural experiences by locating/transposing them in new (local, regional, national and international) situations.

4. Case Studies:

Case studies, wherever possible, should be encouraged in order to challenge students to find creative solutions to complex problems of individual, community, society and various aspects of knowledge domain concerned.

5. Role Playing

Assuming various roles, as in real life, is the key to understanding and learning. Students are challenged to make strategic decisions through role-plays, and to analyze the impact of these decisions. For this purpose, incidents from literary texts may also be used.

6. Team Work

Positive collaboration in the form of teamwork is critical in the classroom environment, for which it is necessary to transcend one's prejudices and predilections so as to achieve the desired outcomes. In the process of teamwork, leaners will acquire the skills of managing knowledge acquisition and other collaborative learners, thereby understanding how to incorporate and balance personalities.

7. Study Tours/Field Visits:

Study Tours/ Field trips provide opportunities to the learners to test their in-class learning in real life situations as well as to understand the functional diversity in the learning spaces. These may include visits to sites of knowledge creation, preservation, dissemination and application. Institutions may devise their own methods to substitute/modify this aspect.

8. Academics-Industries Interface:

The course curriculum of B.A/BSc. (Hons.) should encourage students for closer interaction with industries/corporate/research institutes, etc. for at least one week internship and training.

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8 (b) Assessment Methods:

The assessment of students' achievement in Geography will be aligned with course/program learning outcomes and the academic and geographical skills that the program is designed to be developed. Different assessment methods that are appropriate within the discipline of Geography will be used. Learning outcomes will be assessed through continuous evaluation using the oral and written examinations, cartographic and computer based exercises (GIS), practical assignments, observations of practical skills, project and field work reports, seminar presentations, viva voce, output from collaborative work activities and attendances, etc.

PART II: STRUCTURE OF B.A / B.SC GEOGRAPHY

9. Introduction

The curriculum uses CBCS framework and organise under Core Courses, Skill Enhancement Course, Elective Discipline Specific and Elective Generic Courses. The core courses cover key areas of geography about which all students should have basic knowledge. These courses are grouped as follows:

- **Theory** – These courses build up the theoretical and conceptual foundations of geography.
- **Practical** – Three courses on Statistical Techniques in Spatial Analysis; Remote Sensing and Geographical Information System, GIScience and Research Methods and Fieldwork in Geography will strengthen the methodological and practical foundations of geography.
- **Regional Approach** – Such courses focus on Geography of India / different states.
- **Application Oriented** – This includes disaster management, climate change, tourism geography, health and wellbeing etc.

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

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10. STRUCTURE OF B.A./B.Sc. (HONS) IN GEOGRAPHY

Note: *For the structure of BA/B.Sc Hons. Geography, the UGC Committee has followed the number of credits per course as suggested in the CBCS document, that is, six and four credits per course as follows. The core and elective papers are of six credit and Ability Enhancement Compulsory Course and Skill Enhancement Course hve 4 credit*

Semester	Core Course 14 papers, 6 credit each	Ability Enhancement Compulsory Course 2 papers, Credit-4 each	Skill Enhancement Course 2 Papers Credit-4 each	Elective Discipline Specific Any four, Credit-6 each	Elective: Generic Any four, Credi-6 each
I	GEO-C-112 Geomorphology	*ENG-A-111* Communicative English/ HIN-A-111 Sikshan			GEO-G-114: Disaster Management
	GEO-C-113 Cartographic technique (Practical)				GEO-G-115 : Geography of Tourism and Pilgrimage
II	GEO-C-122 Geography of Human and Cultural Landscape	*EVS- 121* Environmental Studies			GEO-G-124 Geospatial Information Technology
	GEO-C-123: Statistical Methods in Geography (Practical)				GEO-G-125 Coupled Human and Environmental System
III	GEO-C-231 Climatology and Oceanography		GEO-S-234: Geographic Information System (Practical)		GEO-G-236: Climate Change Vulnerability and Adaptation
	GEO-C-232 Fundamental of Remote Sensing (Practical)		GEO-S-235: Spatial Statistic Techniques		GEO-G-237: Rural Development
	GEO-C-233: Geography of India **5+1**				
IV	GEO-C- 241 Introduction to Global Ecosystem		GEO-S-244: Introduction to GI Science (Practical)		GEO-G-246: Industrial Development
	GEO-C-242: Environment and Natural Resource Management,		GEO-S-245: Thematic Atlas		GEO-G- 247 :Sustainable Resources Management

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	GEO-C-243: Digital Remote Sensing (Practical)				
V	GEO-C-351:Geography of North East India; Special reference to Arunachal Pradesh GEO-C-352: Field Techniques, Surveying and Research Methods (Practical)			GEO-E-353: Demography and Population Studies GEO-E-354: Hydrology and Soil Studies GEO-E-355: Urbanization and Urban System GEO-E-356: Agriculture and Food Security	
VI	GEO-C-361: Evolution Geographic Thought, GEO-C-362: Disaster Management Project work (Practical)			GEO-E-363: Geography of Health GEO-E-364: Political Geography GEO-E-365 :Biogeography GEO-E-366 : Geography of Social Wellbeing	

Note:

: GEO (Geography
: C (Core paper)
: ENG-A (English for arts)
: HIN-A (Hindi for arts)
: EVS-A (EVS for arts)
: GEO-S (Skill enhancement)
: GEO-E (Discipline specific elective)
: GEO-G (Generic elective for other discipline)
: 111 (First year, first semester and first paper. 362(Third year, sixth semester and paper two)

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SEMESTERWISE PAPERS & DISTRIBUTION OF CREDIT HOURS

Core Courses							
Semester	**Paper Code**	**Title**	**Credit**	**Lecture in Hrs**			
				L	P	T	
Semester I	**CONTENT**						
	GEO-C- 112	Geomorphology	6 HRS	5	-	1	
	GEO-C- 113	Cartographic Techniques (Practical)	6 HRS		12		
	ENG- A-111	Communicative English OR	4 HRS	4	-	-	
	HND-A-111	Hindi Sikshan	4 HRS	4	-	-	
	Generic Elective (any 1)						
	GEO-G-114	Disaster Management	6 HRS	5	-	1	
	GEO-G-115	Geography of Tourism and Pilgrimage	6 HRS	5	-	1	
Semester II	**CONTENT**						
	GEO-C-122	Geography of Human and Cultural Landscape	6 HRS	5	-	1	
	GEO-C-123	Statistical Methods in Geography (practical)	6 HRS	-	12	-	
	ENV-A- 121	Environmental Studies	4 HRS	4	-	-	
	Generic Elective (any 1)						
	GEO-G-124	Geospatial Information Technology	6 HRS	5	-	1	
	GEO-G-125	Coupled Human and Environmental System	6 HRS	5	-	1	
Semester III	**CONTENT**						
	GEO-C-231	Climatology	6 HRS	5	-	1	
	GEO-C-232	Fundamental of Remote Sensing (Practical)	6 HRS	-	12	-	
	GEO-C-233	Geography of India	6 HRS	5	-	1	
	Skill Enhancement Course (any 1)						
	GEO-S-234	Geographic Information System (Practical)	4 HRS	4			
	GEO-S-235	Spatial Statistic Techniques	4 HRS	4	-	-	
	Generic Elective (any 1)						
	GEO-G-236	Climate Change: Vulnerability and Adaptation	6 HRS	5	-	1	
	GEO-G-237	Rural Development	6 HRS	5	-	1	

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Semester	Paper code	Paper title	Credit	Lecture in Hrs			
				L	P	T	
Semester IV	**CONTENT**						
	GEO-C- 241	Introduction to Global Ecosystem	6 HRS	5	-	1	
	GEO-C- 242	Environment and Natural Resource Management	6 HRS	5	-	1	
	GEO-C 243	Digital Remote Sensing (Practical)	6 HRS	-	12	-	
	Skill Enhancement Course (any 1)						
	GEO-S-244	Introduction to GI Science (Practical)	4 HRS	-	8	-	
	GEO-S-245	Thematic Atlas	4 HRS	3	-	1	
	Elective Generic Papers (any 1)						
	GEO-G-246	Industrial Development	6 HRS	5	-	1	
	GEO-G-247	Sustainable Resource Management	6 HRS	5	-	1	
Semester V	**CONTENT**						
	GEO-C-351	Geography of North East India; especial reference to Arunachal Pradesh	6 HRS	5	-	1	
	GEO-C-352	Field Techniques, Surveying and Research Methods (Practical)	6 HRS	-	12	-	
	Elective Discipline Specific (any two)						
	GEO-E-353	Demography and Population Studies	6 HRS	5	-	1	
	GEO-E-354	Hydrology and Soil Studies	6 HRS	5	-	1	
	GEO-E 355	Urbanization and Urban system	6 HRS	5	-	1	
	GEO-E 356	Agriculture and Food Security	6 HRS	5	-	1	
Semester VI	**CONTENT**						
	GEO-C-361	Evolution of Geographical Thought	6 HRS	5	-	1	
	GEO-C-362	Disaster Management Project Work (Practical)	6 HRS	-	12	-	
	Elective Discipline Specific (any two)						
	GEO-E- 363	Geography of Health	6 HRS	5	-	1	
	GEO-E 364	Political Geography	6 HRS	5	-	1	
	GEO-E 365	Biogeography	6 HRS	5	-	1	
	GEO-E 366	Geography of Social Wellbeing	6 HRS	5	-	1	

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Minimum Credits

Semester	Core Courses	Elective courses				
I	COFRE-1	ENG OR			GENERIC	
	COFRE-2	HIN-				
II	COFRE-3	EVS			GENERIC	
	COFRE-4					
III	COFRE-5		SKILL EN		GENERIC	
	COFRE-6					
	COFRE-7					
IV	COFRE-8		SKILL EN		GENERIC	
	COFRE-9					
	COFRE-10					
V	COFRE-11			DSE		
	COFRE-12			DSE		
VI	COFRE-13			DSE		
	COFRE-14			DSE		
	84	8	8	24	24	148

Distribution of marks:

Courses	Credit	Total mark	Internal assessment	End term examination	Duration
Core course	6	100	20	80	3 hours
Discipline elective	6	100	20	80	3 hours
Generic elective	6	100	20	80	3 hours
Skill enhancement	4	50	10	40	2 hours
Ability enhancement	4	50	10	40	2 hours

Practical:

Viva-voce	Record Book	Internal assignment	End term examination	
05%	15%	20%	60%	100%

Pattern of Question Paper and Marking: For 80 marks

Sections	Number of questions	Number of questions to be attempted	Marks	Total marks	Over all total
A	6	4	05	20	80
B	5	3	10	30	
C	4	2	18	30	
For 40 marks					
A	5	3	05	15	40
B	2	1	10	10	
C	2	1	15	15	

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B.A. I SEMESTER

Core Courses						
Semester	**Paper Code**	**Title**	**Credit**	**Lecture in Hrs**		
				L	P	T
Semester I	**CONTENT**					
	GEO-C- 112	Geomorphology	6 HRS	5	-	1
	GEO-C-113	Cartographic Techniques (Practical)	6 HRS		12	
	ENG-A-111 OR HIN-A-111	Communicative English.or Hindi Shiksha	4 HRS	3	-	1
	Generic Elective (any 1)					
	GEO-G-114	Disaster Management	6 HRS	5	-	1
	GEO-G-115	Geography of Tourism and Pilgrimage	6 HRS	5	-	1

NB- For learning outcome for each paper following may be referred

Course Level Learning Outcomes Matrix at page- 13
Geography Course Outcome and SDGs at page - 14
Geography Core papers contribution towards SDGs at page- 14
Geography Elective papers contribution towards SDGs at page – 15
Questions and marking pattern may be seen at page 23

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GEO-C-112- Geomorphology

Credit 6- (Credit Hours in a week: Lecture-5, Practical-0, Tutorial-1)
Marks: 100 (End term examination=80 and internal examination-20)

Course Objectives:

1. To understand the associations between geomorphologic landforms, concepts andprocesses.
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 the completion of course, the students will have ability 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, Key concepts and Systems approach; Earth: Interior Structure.

2. Earth Movements: Isostasy. 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 and Environment.

References:

1. Bloom, A. L., (2003): *Geomorphology: A Systematic Analysis of Late Cenozoic Landforms*, Prentice-Hall of India, New Delhi.
2. Bridges, E. M., (1990): *World Geomorphology*, Cambridge University Press, Cambridge.
3. Christopherson, R. W. and Birkeland, G. H., (2012) *Geosystems: An Introduction to Physical Geography* (8th edition), Pearson Education, New Jersey.
4. Das Gupta, A and Kapoor, A.N., (2001) *Principles of Physical Geography,* S.C. Chand & Co1mpany Ltd. New Delhi.
5. Dayal, P., (1996) A Text book of Geomorphology. Shukla Book Depot, Patna.
6. Huggett, R.J. (2007) *Fundamentals of Geomorphology*, Routledge, New York.
7. Kale, V. S. and Gupta A., (2001): *Introduction to Geomorphology*, Orient Longman, Hyderabad.
8. Khullar, D.R., (2012)*Physical Geography*, Kalyani Publishers, New Delhi.
9. Mal, Suraj, Singh, R.B. and Huggel, Christian (2018): *Climate Change, Extreme Events and Disaster Risk Reduction*, Springer, Switzerland, pages 309.

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10. Selby, M.J., (2005): *Earth's Changing Surface,* Indian Edition, OUP
11. Singh, S (2009):*BhautikBhugolkaSwaroop(Hindi)*, PrayagPustak,Allahabad.
12. Skinner, Brian J. and Stephen C. Porter (2000), *The Dynamic Earth: An Introduction to Physical Geology,* 4th Edition, John Wiley and Sons.
13. Strahler, A. H. and Strahler, A N., (2001):*Modern Physical Geography* (4/E), John Wiley and Sons, Inc., New York.
14. Summerfield M. A. (2013): Global Geomorphology, Routledge, New York
15. Thornbury, W. D., (2004): *Principles of Geomorphology*, Wiley, New York.
16. Tikka, R N (1989): *BhautikBhugolkaSwaroop(Hindi)*, Kedarnath Ram Nath, Meerut.

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GEO-C-113- Cartographic Techniques (Practical)

Credit 6- (Credit Hours in a week: Lecture-0, Practical-12, Tutorial-0)
Total Marks: 100

i. End term examination= 60 (5 Questions 12 Marks each)
ii. internal examination =20
iii. Record Book =15
iv. Viva Voce =05

Course Objectives:

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

Learning Outcome:

After the completion of course, the students will have ability to:

1. Read and prepare maps.
2. Comprehend locational and spatial aspects of the earth surface.
3. Use and importance of maps for regional development and decision making.

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. Topographic rofiles-Introduction and plotting of Cross and Longitudinal Profiles.
4. Topographical Maps- Interpretation (one each- hilly/plain area) and Slope Analysis (Wentworth's method).
5. Interpretation of Weather Maps (at least one of summer, winter and monsoon seasons)

Practical Record:

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

References:

1. Anson, R., and Ormelling F. J.,(1994): *International Cartographic Association: Basic Cartographic, Vol.*Pregmen Press.
2. Singh, Gopal., (1998): *Map Work and Practical Geography (4th Edition)*, Vikas Publishing House, Ahmedabad.

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3. Gupta, K.K. and Tyagi V.C.,(1992): *Working with Map*, Survey of India, DST, New Delhi.
4. Kraak, M.J., (2010):*Cartography: Visualization of Geospatial Data* (3rd edition), Pearson Education Ltd., London.
5. Misra, R.P.,(2014): *Fundamentals of Cartography (*Second Revised and Enlarged Edition), Concept Publishing, New Delhi.
6. Monkhouse, F. J. and Wilkinson, H. R.,(1973): *Maps and Diagrams*, Methuen, London.
7. Rhind, D. W. and Taylor D. R. F., (eds.) (1989): *Cartography: Past, Present and Future*, Elsevier, International Cartographic Association.
8. Robinson, A. H.,(2009): *Elements of Cartography* (6th Edition), John Wiley and Sons, New York.
9. Sarkar, A.,(2015):*Practical geography: A systematic approach*, Orient Black Swan Private Ltd., New Delhi
10. Sharma, J. P., (2010): *PrayogicBhugol(Hindi)*, Rastogi Publishers, Meerut.
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13. Singh,R.L.,& Singh, Rana. P.B.,(1991):*PrayogtmakBhugolkeMoolTatva(Hindi)*, Kalyani Publishers, New Delhi
14. Steers, J.A. (1970):*An Introduction to the Study of Map Projections*, University of London Press, London.
15. Khan, Zulfequar Ahmad., (1998):*Text book of Practical Geography*, Concept Publishing Company, New Delhi.

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ENG-111- Communicative English

Course Level Learning Objectives

The course will seek to achieve the following objectives:

- to make students understand basic rules of Grammar
- to make students use the rules of Grammar for various composition exercises
- to make students appreciate rules of Grammar as used for model in various literarycompositions
- to make students enjoy and appreciate literary pieces
- to expose students to literary pieces to develop their creativity

Course Learning Outcomes

At the end of the course students will be able to:

- convey their ideas in English using simple and acceptable English in writing
- understand Fundamentals of Grammar
- describe a diagram or elaborate information contained in a graph, chart, table etc ,write areview of a book or a movie
- write a précis writing, paragraph writing(150 words), Letter writing – personal, official,Demi-official, Business, Public speaking, soft skills, Interviews, preparing curriculum vitae, Report(Meetings and Academic) writing

Course Content

Module – I: Poetry

William Shakespeare – All the World is a stage. William Wordsworth – I wondered lonely as a Cloud. Ralph Waldo Emerson – The Mountain and the Squirrel. Emily Dickinson – Success is Counted Sweetest.

Robert Frost - Stopping by Woods on a Snowy Evening. Rabindranath Tagore – Where the Mind is without Fear. A.K.Meherotra – Songs of the Ganga.

Module – II: Short stories

R.K. Narayan – Lawly Road/Mulk Raj Anand – Barbar's Trade Union. Somerset Mangham – The Luncheon/Guy De. Maupassant – The NecklaceAnton Chekhov – The Lament/ O' Henry – The Last Leaf

Manoj Das – The Submerged Valley.

Module – III: One- Act plays and Short fiction

(A) Norman Mckinnell - The Bishop's Candle Sticks/Anton Chekov – A MarriageProposal

Eugene lonesco – The Lesson /August Strandberg – Miss

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JullieFritz Karinthy– Refund

(B) Harper Lee – To kill a Mocking Bird.
Or
R. K. Narayan – Vendor of Sweets.

Module – IV: Fundamentals of Grammar

Parts of speech, articles and intensifiers, use of tense forms, use of infinitives, conditionals , adjectives and adverbs, prepositions, making affirmative, negative and interrogative, making question tag.

Module – V: Composition Practice

(A) Comprehension, précis writing, paragraph writing(150 words), reviewing movies and books ,Letter writing – personal, official, Demi-official, Business, Public speaking, soft skills, Interviews, preparing curriculum vitae, Report(Meetings and Academic) writing.

(B) Communication Practice –

Introducing yourself, introducing people to others, meeting people, Exchanging greetings, taking leave, answering the telephone, asking someone for some purpose, taking and leaving messages, call for help in Emergency, e-mails writing ,explaining a graph, chart, table etc.

Suggested Topics for Background Reading and Class Presentation

Short selections from the works prescribed in Modules**I, II and III** – reading , re-telling , role-playing , explaining with reference to contemporary social experiences

Practical writing work on Modules **IV and V**

Suggested Reading:

1- For reading the texts available sources of texts and help of the Web source may be taken.2- Crystal, David(1985) Rediscover Grammar with David Crystal. Longman.

3- Hewings, M. (1999) Advanced English Grammar. Cambridge University Press.4- Bakshi, R. N. A course in English Grammar, orient Longman

5- Krishnaswamy, N. Modern English – A Book of Grammar, usage andcomposition. MacMillan India Ltd.

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GEO-G-114- Disaster Management

Credit 6- (Credit Hours in a week: Lecture-5, Practical-0, Tutorial-1)
Marks: 100 (End term examination=80 and internal examination-20)

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.

Learning Outcome:

After the completion of course, the students will have ability to:

1. Gain a perspective of disasters and various dimensions of disaster management
2. Have comprehensive knowledge of various natural and manmade disasters in India
3. Examine the response and mitigation measures of 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; (c) Cyclone: Causes, Impact, Distribution and Mapping.
4. Manmade disasters: Causes, Impact, Distribution and Mapping
5. Response and Mitigation to Disasters: Mitigation and Preparedness, NDMA and NIDM; Indigenous Knowledge and Community-Based Disaster Management; Do's and Don'ts During and Post-disasters.

References:

1. Government of India, (2008): *Vulnerability Atlas of India*. New Delhi, Building Materials & Technology Promotion Council, Ministry of Urban Development, Government of India.
2. Govt. of India, (2011): *Disaster Management in India*, Ministry of Home Affairs, New Delhi.
3. Kapur, Anu., (2010): *Vulnerable India: A Geographical Study of Disasters*, Sage Publication, New Delhi.
4. Modh, S., (2010): Mana*ging Natural Disaster: Hydrological, Marine and Geological Disasters*, Macmillan, Delhi.
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7. Singh, R.B., (2005):*Risk Assessment and Vulnerability Analysis*, IGNOU, New Delhi. Chapter 1, 2 and 3
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GEO-G-115- Geography of Tourism and Pilgrimage

Credit 6- (Credit Hours in a week: Lecture-5, Practical-0, Tutorial-1)
Marks: 100 (End term examination=80 and internal examination-20)

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 tourismwith its impacts.
3. To critically evaluates the infrastructure in tourism in India focusing with having casestudies along with the reviewing the tourism policy in country.

Learning Outcome:

After the completion of course, the students will have ability 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: Concepts and Issues, Tourism, Recreation and Leisure Inter-Relations; Geographical Parameters of Tourism by Robinson.

2. Trends and Patterns: Nature Tourism, Cultural Tourism, Medical Tourism, Pilgrimage, Geo-tourism.

3. Recent Trends of Tourism: International and Regional; Domestic (India); Eco-Tourism, Sustainable Tourism, Meetings Incentives Conventions and Exhibitions

4. Impact of Tourism: Economy; Environment; Society

5. Tourism in India: Tourism Infrastructure; Case Studies of Himalaya, Desert and Coastal Areas; India's World Heritage Sites and National Geological Monuments National Tourism Policy

References:

1. Alan, A. Lew, (2017): *New Research Paradigms in Tourism Geography*, Routledge,.
2. Dhar, P.N., (2006): *International Tourism: Emerging Challenges and Future Prospects,*Kanishka, New Delhi.
3. Hall, M., and Stephen, P., (2006): *Geography of Tourism and Recreation – Environment, Place and Space*, Routledge, London.
4. Kamra, K. K., and Chand, M., (2007): *Basics of Tourism: Theory, Operation and Practise*, Kanishka Publishers, Pune.
5. Milton, D.,(1993): *Geography of World Tourism,* Prentice. Hall, New York.,
6. Nelson, V., (2017): *An Introduction to the Geography of Tourism*, Rowman & Littlefield

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8. Raj, R. and Nigel, D., (2007): *Morpeth Religious Tourism and Pilgrimage Festivals Management: An International perspective by CABI*, Cambridge, USA.
9. Robinson, H. A.,(1996): *Geography of Tourism,* Macdonald and Evans, London,.
10. Singh, Jagbir., (2014): "*Eco-Tourism*", I.K. International Pvt. Ltd. New Delhi, India.
11. Tourism Recreation and Research Journal, Centre for Tourism Research and Development, Lucknow.
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B.A II. SEMESTER

Core Courses						
Semester	**Paper Code**	**Title**	**Credit**	**Lecture in Hrs**		
				L	P	T
Semester II	**CONTENT**					
	GEO-C-122	Geography of Human and Cultural Landscape	6 HRS	5	-	1
	GEO-C-123	Statistical Methods in Geography (practical)	6 HRS	-	12	-
	EVS-A- 121	Environmental Studies	4 HRS	4	-	-
	Generic Elective (any 1)					
	GEO-G- 124	Geospatial Information Technology	6 HRS	5	-	1
	GEO-G-125	Coupled Human and Environmental System	6 HRS	5	-	1

NB- For learning outcome for each paper following may be referred

Course Level Learning Outcomes Matrix at page- 13
Geography Course Outcome and SDGs at page - 14
Geography Core papers contribution towards SDGs at page- 14
Geography Elective papers contribution towards SDGs at page – 15
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GEO–C-122- Geography of Human and Cultural Landscape

Credit 6- (Credit Hours in a week: Lecture-5, Practical-0, Tutorial-1)
Marks: 100 (End term examination=80 and internal examination-20)

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:

After the completion of course, the students will have ability to:

1. Know the changing human and cultural landscape at different levels.
2. Understand patterns and processes of population growth and its implications.
3. Appreciate the nature and quality of human landscapes.

Course Content:

1. Human Geography: Definition, Scope and Principles; Contemporary Relevance.
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 and Regional Resource Development

References:

1. Chandna, R.C., (2017):*Population Geography*, Kalyani Publishers, New Delhi.
2. Daniel, P.A. and Hopkinson, M.F. (1989):*The Geography of Settlement*, Oliver & Boyd, London.
3. Hassan, M.I. (2005):*Population Geography*, Rawat Publications, Jaipur
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5. Johnston, R., Gregory, D.,& Pratt, G., et al. (2008):*The Dictionary of Human Geography*, Blackwell Publication.
6. Jordan-Bychkov., et al., (2006):*The Human Mosaic: A Thematic Introduction to Cultural Geography,* W. H. Freeman and Company, New York.
7. Kaushik, S.D., (2010):*ManavBhugol*, Rastogi Publication, Meerut.
8. Maurya, S.D., (2012):*ManavBhugol*, ShardaPustakBhawan, Allahabad.
9. Rozenblat., Celine., Pumain., Denise and Velasquez., Elkin Eds. (2018): *International and Transnational Perspectives on Urban Systems*, Springer, Japan, pages 393.
10. Singh, R.B., Ed. (2015): *Urban Development Challenges, Risk and Resilience in Asian Mega Cities-Sustainable Urban Future of Emerging Asian Mega Region*, Springer, Tokyo, Pages 488, 2015.

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GEO-C-123- Statistical Methods in Geography (Practical)

Credit 6- (Credit Hours in a week: Practical-12)
Marks: 100 (End term examination=80 and internal examination-20)

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 collectionpurposes.
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:

After the completion of course, the students will have ability to:

1. Understand the basics of data collection and processing for the meaningful outcomes.
2. Comprehend the representation and interpretation of the results.
3. Put into practice results obtained in representation as well as day-to-day life.

Course Content:

1. Use of Data in Geography: Significance of Statistical Methods in Geography; Sources of Data, Scales of Measurement (Nominal, Ordinal, Interval and Ratio).

2. Tabulation and Descriptive Statistics: Frequencies (Deciles, Quartiles), Cross Tabulation, Central Tendency (Mean, Median and Mode, Centro-graphic Techniques, Dispersion (Standard Deviation, Variance and Coefficient of Variation).

3. Sampling: Purposive, Random, Systematic and Stratified.

4. Theoretical Distribution: Probability and Normal Distributions.

5. Association and Correlation: Rank Correlation, Product Moment Correlation, and Simple Regression.

Class Record:

Each student will submit a record containing five exercises:

1. Construct a data matrix (of about 10 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.

3. Histograms and frequency curve would be prepared for 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 per cent) would be drawn using random-systematic and/or stratified methods of sampling and locate the samples on a map with a short note on method used.

5. Based on 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:

1. Ajai, S. G. and Sanjaya, S.G. (2009) *Statistical Methods for Practice and Research,* Sage Publications, New Delhi.
2. Berry, B. J. L. and Marble, D. F. (eds.): *Spatial Analysis–A Reader in Geography*.
3. Ebdon, D., (1977): *Statistics in Geography: A Practical Approach*.
4. Hammond, P. and McCullagh, P. S., (1978): *Quantitative Techniques in Geography: An Introduction,* Oxford University Press.
5. King, L. S., (1969): *Statistical Analysis in Geography*, Prentice-Hall.
6. Mahmood, A., 1977: *Statistical Methods in Geographical Studies,* Concept.
7. Pal, S. K., (1998): *Statistics for Geoscientists*, Tata McGraw Hill, New Delhi.
8. Rogerson,P. A., (2001) *Statistical Methods for Geography*, Sage Publications, New Delhi.
9. Sarkar, A. (2013): *Quantitative geography: techniques and presentations*. Orient Black Swan Private Ltd., New Delhi
10. Shinha, Indira., (2007):*Sankhyikibhugol(Hindi)*. Discovery Publishing House, New Delhi.
11. Silk, J., (1979): *Statistical Concepts in Geography*, Allen and Unwin, London.
12. Taylor P.J., (1983) *Quantitative Methods in Geography: An Introduction to Spatial Analysis,* Waveland Press, Boston Publishers.
13. Yeates, M., (1974): *An Introduction to Quantitative Analysis in Human Geography*, McGraw Hill, New York.

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EVS-121-A- ENVIRONMENTAL STUDIES

Credit 4- (Credit Hours in a week: Lecture-3, Practical-0, Tutorial-1)
Marks: 100 (End term examination=80 and internal examination-20)

Course Objective:

1. To know the basic components of environment and functioning of ecosystem.
2. To know the common environmental problems, causes and consequences and solutions.

Learning Outcome:

1. To develop a sense of responsibility and attitude towards conservation of environment.
2. To develop basic skill of solving environmental problem at local level.

Course Content

I **Introduction to Environmental Studies**
- i. Development of Environmental Studies
- ii. Meaning of environment
- iii. Concept of Environment
- iv. Scope of Environmental Studies

II **Understanding the Environment**
- i. Biosphere
- ii. Ecosystem
- iii. Habitat
- iv. Cultural Landscape

III **Environmental Hazards**
- i. Natural Hazards:
  - a) Flood, Drought
  - b) Cyclone
  - c) Earthquake
  - d) Landslide
- ii. Man Made Hazards:
  - a) Deforestation
  - b) Pollution (land, water, soil)
  - c) Climate change

IV **Environmental conservation**
- i. Awareness about the importance of Environment
- ii. Monitoring
- iii. Conservation
- iv. Sustainable Development

V- **Environmental Hazards in Arunachal Pradesh**
- i. Landslides
- ii. Deforestation
- iii. Flood
- iv. Earthquake
- v. Cloud Burst

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Reference:

1. Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
2. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad – 380 013, India, Email:mapin@icenet.net (R)
3. Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p
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6. De A.K., Environmental Chemistry, Wiley Eastern Ltd.
7. Down to Earth, Centre for Science and Environment (R)
8. Gleick, H.P. 1993. Water in crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute Oxford Univ. Press. 473p
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14. Miller T.G. Jr. Environmental Science, Wadsworth Publishing Co. (TB)
15. Odum, E.P. 1971. Fundamentals of Ecology. W.B. Saunders Co. USA, 574p
16. Rao M N. & Datta, A.K. 1987. Waste Water treatment. Oxford & IBH Publ. Co. Pvt. Ltd. 345p.
17. Sharma B.K., 2001. Environmental Chemistry. Geol Publ. House, Meerut
18. Survey of the Environment, The Hindu (M)
19. Townsend C., Harper J, and Michael Begon, Essentials of Ecology, Blackwell Science (TB)
20. Trivedi R.K., Handbook of Environmental Laws, Rules Guidelines, Compliances and Stadards, Vol I and II, Enviro Media (R)
21. Trivedi R. K. and P.K. Goel, Introduction to air pollution, Techno-Science Publication (TB)
22. Wanger K.D., 1998 Environmental Management. W.B. Saunders Co. Philadelphia, USA 499p

(M) Magazine

(R) Reference (TB) Textbook

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GEO-G-124-Geospatial Information Technology

Credit 6- (Credit Hours in a week: Lecture-5, Practical-0, Tutorial-1)
Marks: 100 (End term examination=80 and internal examination-20)

Course Objectives:

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

Learning Outcomes:

After the completion of course, the students will have ability to:

1. Appreciate the basic concepts and historical development of geographical information technology
2. Acquire knowledge on data structure, interpolation, modelling, functions and working of geographical information technology
3. Apply the geographical information technology for sustainable development of the nation

Course Content:

1. Introduction: Definitions, Concept and Historical Development of geospatial technology.
2. Geospatial Data: Web data sources; Registration and projection; Data structures; Data interpolation and modelling
3. Working on spatial information system
4. Functions of Geospatial Information System: Information retrieval; Topological modelling; Networks; Overlay; Data output
5. Application of Geospatial Information Technology for sustainable development

References:

1. D. Tomlin., (1990): *Geographic Information Systems and Cartographic Modeling*, Prentice-Hall, Englewood Cliffs, NJ, ISBN 0-13-350927-3.
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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*, Addison Wiley Longmont, New York.
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GEO-G-125- Coupled Human and Environment System

Credit 6- (Credit Hours in a week: Lecture-5, Practical-0, Tutorial-1)
Marks: 100 (End term examination=80 and internal examination-20)

Course Objectives:

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

Course Learning Outcome:

After the completion of course, the students will have ability to:

1. Understand the fundamental concepts of coupled human-environment system.
2. Assess the vulnerability, risk and resilience issues associated with the human-environment system.
3. Develop possible solutions for addressing the contemporary sustainability challenges.

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:

1. Clarke, G. L., (1967). *Elements of ecology*, New York: John Wiley Pub.
2. Haden-Guest, S., Wright, J. K., and Teclaff, E. M.,(1956):*World Geography of Forest Resources*, New York: Ronald Press Co.
3. Hoyt, J.B.,(1992):*Man, and the Earth*, Prentice Hall, U.S.A.
4. Lapedes, D.N.,(1974):*Encyclopaedia of Environmental Science (eds.),* McGraw Hill.
5. Parmesan, C., Yohe, G.,(2003):*A globally coherent fingerprint of climate change impacts across natural systems*. Nature, 421 (6918), 37–42.
6. Singh Savindra., (2015): *Paryawaran Bhoogol (Hindi)*, Prayag Pushtak Bhawan, Allahabad.
7. Singh, R.B., Schickhoff, Udo and Mal, Suraj., (2016): *Climate Change, Glacier Response and Vegetation Dynamics in the Himalaya*, Springer, Switzerland.
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B.A. III SEMESTER

Core Courses						
Semester	**Paper Code**	**Title**	**Credit**	**Lecture in Hrs**		
				L	P	T
Semester III	**CONTENT**					
	GEO-C-231	Climatology	6 HRS	5	-	1
	GEO-C-232	Fundamental of Remote Sensing (Practical)	6 HRS	-	12	-
	GEO-C-233	Geography of India	6 HRS	5	-	1
	Skill Enhancement Course (any 1)					
	GEO-S-234	Geographic Information System (Practical)	4 HRS	3		1
	GEO-S-235	Spatial Statistic Techniques	4 HRS	4	-	-
	Generic Elective (any 1)					
	GEO-G-236	Climate Change: Vulnerability and Adaptation	6 HRS	5	-	1
	GEO-G- 237	Rural Development	6 HRS	5	-	1

NB- For learning outcome for each paper following may be referred

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GEO-C-231- Climatology and Oceanography

Credit 6- (Credit Hours in a week: Lecture-5, Practical-0, Tutorial-1)
Marks: 100 (End term examination=80 and internal examination-20)

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:

After the completion of course, the students will have ability to:

1. Understand the elements of weather and climate and its impacts at different scales.
2. Comprehend the climatic aspects and its bearing on planet earth.
3. Understand the oceanic process and availability of resources.

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; Atmospheric Moisture: Evaporation, Humidity, Condensation, Fog and Clouds, Precipitation Types, Stability and Instability; Climatic Regions.
3. Cyclones: Tropical Cyclones, Temperate Cyclones, Monsoon - Origin and Mechanism, El Nino.
4. Ocean Floor Topography and Oceanic water Movements: Waves, Currents and Tides.
5. Ocean Salinity and Temperature: Distribution and Determinants; Coral Reefs and Marine Deposits and Ocean Resources.

References:

1. Anikouchine, W. A. and Sternberg, R. W., (1973): *The World Oceans: An Introduction to Oceanography*, Prentice-Hall.
2. Barry, R. G., and Chorley, R. J., (2009): *Atmosphere, Weather and Climate (9th Edition)*,Routledge, New York.
3. Bhutani, S., (2000): *Our Atmosphere*, Kalyani Publishers, Ludhina.
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8. Lutgens, F. K., Tarbuck E. J. and Tasa D., (2009): *The Atmosphere: An Introduction to Meteorology*, Prentice-Hall, Englewood Cliffs, New Jersey.
9. Oliver, J. E., and Hidore J. J., (2002): *Climatology: An Atmospheric Science*, Pearson Education, New Delhi.
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11. Singh, S., (2009): *Jalvayu Vigyan (Hindi),*, Prayag Pustak Bhawan, Allahabad

12. Strahler, A.N., (1987) *Modern Physical Geography*, John Wiley and Sons, New York, Singapore.
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GEO-C-232-Fundamentals of Remote Sensing (Practical)

Credit 6- (Credit Hours in a week: Lecture-0, Practical-12, Tutorial-0)

Total Marks: 100

i. End term examination= 60 (5 Questions 12 Marks each)
ii. internal examination =20
iii. Record Book =15
iv. Viva Voce =05

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, satelliteremote sensing.
3. This course shall provide detailed understanding related to interpretation and application ofremote sensing, GPS/GNSS.

Learning Outcomes:

After the completion of course, the students will have ability to:

1. Appreciate the strength and application of remote sensing
2. Map the resources, their location and availability
3. Apply this knowledge for sustainable development

Course Content:

1. Remote Sensing: Definition, Development, Platforms and Types
2. Aerial Photography and Satellite Remote Sensing: Principles, Types and Geometry of Aerial Photograph; EMR Interaction with Atmosphere and Earth Surface; Satellites – geostationary and remote sensing (Landsat and IRS) and Sensors, Resolution (spatial and temporal).
3. Introduction to Image Processing and Data Analysis: Geo-Referencing; Editing and Output.
4. Interpretation and Application of Remote Sensing: Land use/ Land Cover, Urban Sprawl Analysis,.
5. Interpretation and Application of Remote Sensing: Forests Monitoring, Water Resources and Natural hazards.

Practical Record:

A project file consisting of two exercises will be done from aerial photos and satellite images (scale, orientation and interpretation) and 3 exercises on using any Software on above mentioned themes.

References:

1. Anji Reddy, M. (2008): Textbook of Remote Sensing and Geographic Information System, B.S. Publication, Hyderabad
2. Campbell, J. B., (2007): *Introduction to Remote Sensing*, Guildford Press.
3. Chauniyal, D.D., (2010): *SudurSamvedanevam Bhogolik Suchana Pranali (Hindi)*, Sharda Pustak Bhawan, Allahabad.
4. Jensen, J. R., (2004): *Introductory Digital Image Processing: A Remote Sensing Perspective*, Prentice Hall Inc., New Jersey.
5. Jensen, J.R. (2007):*Remote Sensing of the Environment: An Earth Resource*

6. Joseph, G. (2005): *Fundamentals of Remote Sensing*, United Press India.
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9. Nag, P. and Kudra, M., (1998): *Digital Remote Sensing*, Concept, New Delhi.
10. Rees, W. G., (2001): *Physical Principles of Remote Sensing*, Cambridge University Press.
11. Sarkar, A. (2015): *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi
12. Singh, R. B. and Murai, S., (1998): *Space-informatics for Sustainable Development*, Oxford and IBH Pub.

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GEO-C-233-Geography of India

Credit 6- (Credit Hours in a week: Lecture-5, Practical-0, Tutorial-1)
Marks: 100 (End term examination=80 and internal examination-20)

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 inIndia
3. This course shall provide detailed understanding related to resource base and economicsystems in India.

Learning outcomes:

After the completion of course, the students will have ability to:

1. Understand the physical profile of the country
2. Study the resource endowment and its spatial distribution and utilization for sustainable development
3. Synthesise and develop the idea of regional dimensions.

Course Content:

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

References:

1. Deshpande, C. D., (1992): *India: A Regional Interpretation*, ICSSR, New Delhi.
2. Douglas, L. Johnson.,(2009): World Regional Geography, Tenth edition, Pearson Education Inc, New Jersey.
3. Johnson, B. L. C., ed. (2001):*Geographical Dictionary of India*. Vision Books, New Delhi.
4. Khullar, D.R. (2014): *India: A Comprehensive Geography*, Kalyani Publishers, New Delhi.
5. Majid Husain (2009): *Geography of India*, Tata McGraw hill Education Private Ltd, New Delhi.
6. Mandal, R. B. (ed.), (1990): *Patterns of Regional Geography–An International Perspective. Vol. 3–Indian Perspective*.
7. Pathak, C. R. (2003): *Spatial Structure and Processes of Development in India*. Regional Science Assoc., Kolkata.
8. Sdyasuk, Galina and P, Sengupta., (1967): *Economic Regionalisation of India*, Census of India.
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13. Spate O. H. K. and Learmonth A. T. A., (1967): *India and Pakistan: A General and Regional Geography*, Methuen.
14. Tirtha, Ranjit (2002): *Geography of India,*Rawat Publs., Jaipur & New Delhi.
15. Tiwari, R.C. (2007): *Geography of India*. PrayagPustakBhawan, Allahabad.

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GEO-S-234- Introduction to Geographic Information System (practical)

Credit 4- (Credit Hours in a week: Lecture-0, Practical-8, Tutorial-0)
Marks: 100 (End term examination=80 and internal examination-20)

Course Objectives:

1. The course aim is to give basic understanding of concept of GIScience, its definitions andprinciples;
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 coverstudy.

Learning Outcomes:

After the completion of the course, the students will have the ability to:

1. Appreciate the basic principles and components of GIS;
2. Apply raster and vector data structure for GIS analysis;
3. Analyse the basic resources, land use and urban related data using GIS software for meaningful interpretation.

Course Content:

1. Geographic 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:

1. Bhatta, B. (2010) Analysis of Urban Growth and Sprawl from Remote Sensing, Springer, BerlinHeidelberg.
2. Burrough, P.A., and McDonnell, R.A. (2000) Principles of Geographical Information System-Spatial Information System and Geo-statistics, Oxford University Press, Oxford.
6. Chauniyal, D.D. (2010) Sudur Samvedanevam Bhogolik Suchana Pranali, Sharda Pustak Bhawan, Allahabad.
7. Heywoods, I., Cornelius, S and Carver, S. (2006) An Introduction to Geographical Information system. Prentice Hall, New Jersey.
8. Jha, M.M. and Singh, R.B. (2008) Land Use: Reflection on Spatial Informatics

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9. Nag, P. (2008) Introduction to GIS, Concept India, New Delhi.
10. Sarkar, A. (2015) Practical Geography: A Systematic Approach. Orient Black Swan Private Ltd., New Delhi.
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GEO-S-235- Spatial Statistical Techniques

Credit 4- (Credit Hours in a week: Lecture-3 Practical-0, Tutorial-1)
Marks: 100 (End term examination=80 and internal examination-20)

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:

After the completion of course, the students will have ability to:

1. Understand the basics of data collection and, processing for the meaningful outcomes
2. Understand the selection of proper sampling techniques for the collection of data
3. Put into practice the results obtained for spatial analysis of results and to apply various statistical softwares for the study

Course Content:

1. Statistics and Statistical Data: Spatial and non-spatial; .
2. Probability theory, probability density functions with respect to Normal, Binomial and Poisson distributions and their geographical applications.
3. 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 regression and correlation 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:

1. Bart, James, E, and Gerald, M. Barber., (1996): *Elementary Statistics for Geographers*, The Guieford Press, London.
2. Cressie, N.A.C., (1991): *Statistics for Spatial Analysis*, Wiley, New York.
3. Eldon, D., (1983): *Statistics in Geography: A Practical Approach*, Blackwell, London.
4. Gregory, S., (1978): *Statistical Methods and the Geographer (4th Edition)*, Longman, London.
5. Haining, R.P., (1990): *Spatial Data Analysis in the Social and Environmental Science*, Cambridge University Press, Cambridge.
6. Hammond, R. and McCullagh, P.S., (1974):*Quantitative Techniques in Geography: An Introduction,*Clarendan Press, Oxford.
7. Mathews, J.A., (1987): *Quantitative and Statistical Approaches to Geography: A Practical Manual*,Pergamon, Oxford.
8. Mc Grew, Jr. and Cahrles, B. M., (1993): *An Introduction to Statistical Problem Solving*

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9. Rogerson ,P. A. (2001) *Statistical Methods for Geography*, Sage Publications, New Delhi.
10. Wei, W.S.,(1990): *Time Series Analysis: Variate and Multivariate Methods* , Addison Wesley Publishing.
11. Yeates, Mauris, (1974): *An Introduction to Quantitative Analysis in Human Geography*, McGrawhill, New York.

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GEO-G-236- Climate Change Vulnerability and Adaptation

Credit 6- (Credit Hours in a week: Lecture-5, Practical-0, Tutorial-1)
Marks: 100 (End term examination=80 and internal examination-20)

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:

After the completion of course, the students will have ability to:

1. Understand the foundational concepts of climate change and its impacts.
2. Assess the human and environmental vulnerability to climate change.
3. Learn the various adaptation and mitigation for reducing the impacts of climate change and national action plan.

Course Content:

1. Climate Change: Understanding Climate Change; Greenhouse 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. National Action Plan on Climate Change; Local Institutions (Urban Local Bodies, Panchayats)

References:

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* Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
2. 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.*
3. OECD (2008): Climate Change Mitigation: "*What do we do?"*(Organisation and Economic Co-operation and Development).
4. Sen, Roy, S., and Singh, R.B., (2002): *Climate Variability, Extreme Events and Agricultural Productivity in Mountain Regions*, Oxford & IBH Pub., New Delhi.
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, Springer
6. Singh, R.B., Mal, Suraj, and Huggel, Christian (2018): Climate Change, Extreme Events and Disaster Risk Reduction, Springer, Switzerland, pages 309.
7. UNEP (2007): Global Environment Outlook: GEO4: *Environment for Development*, United Nations Environment Programme.

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GEO-G-237- Rural Development

Credit 6- (Credit Hours in a week: Lecture-5, Practical-0, Tutorial-1)
Marks: 100 (End term examination=80 and internal examination-20)

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 andprovision of services in rural areas.

Learning Outcomes:

After the completion of course, the students will have ability to:

1. Appreciate the concepts, needs and various approaches to rural development;
2. Understand the strong economic bases of rural areas of India;
3. Appreciate the area based and target group based approaches and provision of services to rural development.

Course Content:

1. Defining Development: Inter-Dependence of Urban and Rural Sectors of the Economy; Need for Rural Development, Gandhian Approach of Rural Development.
2. Rural Economic Base: Panchayati Raj System, Agriculture and Allied Sectors, Seasonality and Need for Expanding Non-Farm Activities, Co-operatives, PURA.
3. Area Based Approach to Rural Development: Drought Prone Area Programmes, PMGSY.
4. Target Group Approach to Rural Development: SJSY, MNREGA, Jan DhanYojana and Rural Connectivity.
5. Provision of Services – Physical and Socio-Economic Access to Elementary Education and Primary Health Care and Micro credit

References:

1. Anand, Subhash.,(2013): *Dynamics of Rural Development*, Research India Press, Delhi
2. Gilg, A. W., (1985): *An Introduction to Rural Geography,* Edwin Arnold, London.
3. Krishnamurthy, J.,(2000): *Rural Development - Problems and Prospects,* RawatPubls., Jaipur
4. Lee, D. A. and Chaudhri, D. P., (eds.)(1983): *Rural Development and State*, Methuen, London.
5. Misra, R. P., and Sundaram, K. V., (eds.)(1979): *Rural Area Development: Perspectives and Approaches*, Sterling, New Delhi.
6. Misra, R. P., (ed.), (1985): *Rural Development: Capitalist and Socialist Paths*, Vol. 1, Concept, New Delhi.
7. Palione, M., (1984): *Rural Geography*, Harper and Row, London.
8. Ramachandran, H., and Guimaraes, J.P.C., (1991): *Integrated Rural Development in Asia–Leaning fromRecent Experience,* Concept Publishing, New Delhi.
9. Robb, P.,(1983): *Rural South Asia: Linkages, Change and Development*, Curzon Press.
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11. UNAPDI (1986):*Local Level Planning and Rural Development: Alternative Strategies*. (United Nations Asian & Pacific Development Institute, Bangkok), Concept Publs. Co., New Delhi.
12. Wanmali, S., (1992): *Rural Infrastructure Settlement Systems and Development of the RegionalEconomy in South India*, International Food Policy Research Institute, Washington, D.C.
13. Yugandhar, B. N. and Mukherjee, Neela., (eds.) (1991): *Studies in Village India: Issues in Rural Development,* Concept Publications. Co., New Delhi.

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B.A. IV SEMESTER

Semester	Paper code	Paper title	Credit	Lecture in Hrs		
				L	P	T
Semester IV	**CONTENT**					
	GEO-C-241	Introduction to Global Ecosystem	6 HRS	5	-	1
	GEO-C 242	Environment and Natural Resource Management	6 HRS	5	-	1
	GEO-C-243	Digital Remote Sensing (Practical)	6 HRS	-	12	-
	Skill Enhancement Course (any 1)					
	GEO-S- 244	Introduction to GI Science (Practical)	6 HRS	-	12	-
	GEO-S-245	Thematic Atlas	4 HRS	3	-	1
	Elective Generic Papers (any 1)					
	GEO-G-246	Industrial Development	6 HRS	5	-	1
	GEO-G-247	Sustainable Resource Management	6 HRS	5	-	1

NB- For learning outcome for each paper following may be referred

Course Level Learning Outcomes Matrix at page- 13
Geography Course Outcome and SDGs at page - 14
Geography Core papers contribution towards SDGs at page- 14
Geography Elective papers contribution towards SDGs at page – 15
Questions and marking pattern may be seen at page 23

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GEO-C-241- Introduction to Global Economic System

Credit 6- (Credit Hours in a week: Lecture-5, Practical-0, Tutorial-1)
Marks: 100 (End term examination=80 and internal examination-20)

Course Objectives:

1. To understand the concept and spatial distribution of economic activities in theworld.
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 the completion of course, the students will have ability to:

1. Distinguish 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. 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:

1. Alexander, J. W., (1963): *Economic Geography*, Prentice-Hall Inc., Englewood Cliffs, New Jersey.
2. Bagchi-Sen, S. and Smith, H. L., (2006): *Economic Geography: Past, Present and Future*, Taylor and Francis.
3. Clark, Gordon L.; Feldman, M.P. and Gertler, M.S., eds. (2000): *The New Oxford Handbook of Economic Geography*, Oxford Press.
4. Coe, N. M., Kelly P. F. and Yeung H. W., (2007): *Economic Geography: A Contemporary Introduction*, Wiley-Blackwell.
5. Combes, P., Mayer T. and Thisse, J. F., (2008): *Economic Geography: The Integration of Regions and Nations*, Princeton University Press.
6. Durand, L., (1961): *Economic Geography,* Crowell.
7. Hodder, B. W. and Lee, Roger, (1974): *Economic Geography,* Taylor and Francis.
8. Knowles, R. &Wareing, J., (2004):*Economic and Social Geography Made Simple*, Rupa& Co., Kolkata.
9. Knox, P. & Marston, S.,(2013): *Human Geography: Places and Regions in Global Context*, 6th Edition, Pearson Education, New Delhi
10. Prithwish, Roy (2014):*Economic Geography* - A study of Resources, New Central Book Agency,

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12. Siddhartha, K., (2013):*Economic Geography*, Kisalaya Publications Pvt. Ltd., New Delhi.
13. Wheeler, J. O., (1998): *Economic Geography*, Wiley.
14. Willington, D. E., (2008): *Economic Geography*, Husband Press.

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GEO-C-242-Environment and Natural Resource Management

Credit 6- (Credit Hours in a week: Lecture-5, Practical-0, Tutorial-1)
Marks: 100 (End term examination=80 and internal examination-20)

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 andNatural Resources.

Learning Outcome:

After the completion of course, the students will have ability to:

1. Understand the dynamic interactive relationship between man and environment.
2. Have sound understanding on distribution, utilization and proper management of natural resources at global level.
3. Make assessment and review of planning and policies related to environment and natural resources.

Course Content:

1. Environment and Natural Resource Management: Concept, Human-Environment Relationships;
2. Ecosystem: Concept, Structure and Functions.
3. Environmental Issues in Tropical, Temperate and Polar Ecosystems.
4. Natural Resource: Concept, Classification; Distribution, Utilisation, Problems and Management of Land, Water Forests and Energy.
5. Appraisal and Conservation of Environment and Natural Resources and Sustainable Resource Development.
6. Environmental Programmes and Policies – Global, National and Local levels

References:

1. Chandna, R. C., (2002): *Environmental Geography*, Kalyani, Ludhiana.
2. Cunninghum, W. P. and Cunninghum, M. A., (2004): *Principals of EnvironmentalScience: Inquiry andApplications*, Tata Macgraw Hill, New Delhi.
3. Goudie, A., (2001): *The Nature of the Environment*, Blackwell, Oxford.
4. Holechek, J. L. C., Richard, A., Fisher, J. T. and Valdez, R., (2003): *Natural Resources: Ecology, Economics and Policy*, Prentice Hall, New Jersey.
5. Jones, G. and Hollier, G., (1997): *Resources, Society and Environmental Management*, Paul Chapman, London.
6. Kumaraswamy, K., Alagappa Moses., A & Vasanthy, M. (2004) *Environmental Studies,* Bharathidasan University, Tiruchirappalli.
7. Miller, G. T., (2004): *Environmental Science: Working with the Earth,* Thomson BrooksCole, Singapore.
8. Mitchell, B., (1997): *Resource and Environmental Management*, Longman Harlow, England.

10. Odum, E. P. et al, (2005): *Fundamentals of Ecology,*Ceneage Learning India.
11. Saxena, H.M., 2012: *Environmental Studies*, Rawat Publications, Jaipur.
12. 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*, Springer
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GEO-C-243
Remote Sensing (Practical)

Credit 6- (Credit Hours in a week: Lecture-0, Practical-12, Tutorial-0)
Total Marks: 100

i. End term examination= 60 (5 Questions 12 Marks each)
ii. internal examination =20
iii. Record Book =15
iv. Viva Voce =05

Course Objective:

1. This course shall introduce basic concepts of image processing.
2. This paper shall enable learners to interpret digital images.
3. Learners shall be taught the use of digital Remote sensing & its importance in land use, land cover & reading natural hazards like cyclone, flood.

Learning Outcomes:

After the completion of course, the students will have ability to:

1. Develop the skill so as to use digital satellite data using software
2. Prepare the maps based with satellite data to compare with the ground realities.
3. Classify digital data for the land use/land cover and urban studies

Course Content:

1. Image Processing (Digital and Manual): Pre-processing (Radiometric and Geometric Correction); Enhancement (Filtering); Classification (Supervised and Un-supervised)
2. Digital Image Processing and Interpretation.
3. Application of Digital Remote Sensing: Land Use /Land Cover.
4. Application of Digital Remote Sensing in Urban Studies.
5. Application of Remote Sensing in weather (cyclones) studies and natural hazards (e.g. floods)

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

References:

1. Bhatta , B., (2008): *Remote Sensing and GIS*, Oxford University Press, New Delhi.
2. Campbell, J. B., (2007): *Introduction to Remote Sensing*, Guildford Press
3. Chauniyal, D., (2010): *SudurSamvedana Avam Bhaugolik Suchna Pranali*, Sharda Pustak Bhawan, Allahabad.
4. Hord R.M.,(1989): *Digital Image Processing of Remotely Sensed Data*, Academic, New York.
5. Jensen, J. R., (2005): *Introductory Digital Image Processing: A Remote Sensing Perspective*, Pearson Prentice-Hall.
6. Jensen, J. R.,(2007): *Remote Sensing of the Environment: An Earth Resource Perspective*, Prentice-Hall Inc, New Jersey.
7. Joseph, G.,(2005): *Fundamentals of Remote Sensing,* United Press India.
8. Kumar, Dilip, Singh, R.B. and Kaur, Ranjeet.,(2019): "*Spatial Information Technology for Sustainable Development Goals*", Springer.
9. Li, Z., Chen, J. and Batsavias, E., (2008): *Advances in Photogrammetry, Remote Sensing and Spatial Information Sciences,* CRC Press, Taylor and Francis, London
10. Lillesand, T. M., Kiefer, R. W. and Chipman, J. W., (2004): *Remote Sensing and Image*

12. Nag, P. and Kudra, M., (1998): *Digital Remote Sensing*, Concept, New Delhi.
13. Richards, J. A. and JiaXiuping., (2005): *Remote Sensing Digital Image Analysis: An Introduction*, 4th Edition, Springer, Verlag, Berlin.

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GEO-S-244- Introduction to GI Science (Practical)

Credit 4- (Credit Hours in a week: Lecture-, Practical-8hrs, Tutorial-)
Marks: 100 (End term examination=80 and internal examination-20)

Course Objectives:

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

Learning Outcome:

After the completion of course, the students will have ability to:

1. Have comprehensive understand of GIS for the construction of maps and their use the development planning.
2. Have knowledge of using GPS & DGPS for the accurate location
3. Apply the GIScience platform for the monitoring and forecasting analysis

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, Natural disasters

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

References:

1. Bhatta, B., (2010*): Analysis of Urban Growth and Sprawl from Remote Sensing*, Springer, Berlin Heidelberg 41
2. Burrough, P.A., and McDonnell, R.A., (2000):*Principles of Geographical Information System-Spatial Information System and Geo-statistics*. Oxford University Press
3. Chauniyal, D.D., (2010): *Sudur Samvedan evam Bhogolik Suchana Pranali*, Sharda Pustak Bhawan, Allahabad
4. Heywoods, I., Cornelius, S and Carver, S., (2006):*An Introduction to Geographical Information system,* Prentice Hall.
5. Jha, M.M. and Singh, R.B. (2008): *Land Use: Reflection on Spatial Informatics Agriculture and Development*, Concept Publishing, New Delhi.
6. Kumar, Dilip, Singh, R.B. and Kaur, Ranjeet: *Spatial Information Technology for Sustainable Development Goals*, Springer, 2019

8. Sarkar, A., (2015):*Practical geography: A systematic approach*, Orient Black Swan Private Ltd., New Delhi
9. Singh, R.B. and Murai, S., (1998): *Space Informatics for Sustainable Development*, Oxford and IBH, New Delhi.

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GEO-S-245-Thematic Atlas

Credit 4- (Credit Hours in a week: Lecture-3, Practical-0, Tutorial-1)
Marks: 100 (End term examination=80 and internal examination-20)

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; Better understand thematic map techniques, its cartographic representation andInterpretation

Learning Outcomes:

After the completion of course, the students will have ability to:

1. Have sound knowledge regarding the classification and elements of maps.
2. Have proper utilization of maps for the development.
3. Appreciate the preparation of various thematic maps with the application of various techniques.

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 at least five plates for any state in India.

References:

1. Singh, R. L, and Duttta, P. K., (2012): *Prayogatama Bhugol*, Central Book Depot, Allahabad
2. Cuff, J. D. and Mattson, M. T., (1982): *Thematic Maps: Their Design and Production*, Methuen Young Books
3. Dent, B. D., Torguson, J. S., and Holder, T. W., (2008): *Cartography: Thematic Map Design* (6th Edition), McGraw Hill Higher Education
4. Gupta, K. K. and Tyagi, V. C., (1992): *Working with Maps*, Survey of India, DST, New Delhi.
5. Kraak, M.J. and Ormeling, F., (2003): *Cartography: Visualization of Geo-Spatial Data*, Prentice-Hall.
6. Mishra, R. P. and Ramesh, A., (1989): *Fundamentals of Cartography*, Concept, New Delhi.
7. Sarkar, A., (2015):*Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi
8. Sharma, J. P., (2010): *Prayogic Bhugol (Hindi)*, Rastogi Publishers, Meerut.
9. Singh, R. L. and Singh, Rana, P. B., (1999): *Elements of Practical Geography*, Kalyani Publishers.
10. Singh, L. R. & Singh. R., (1977): *Manchitra or Pryaogatamek Bhugol (Hindi)*, Central Book Depot, Allahabad

12. Slocum, T. A., Mcmaster, R. B. and Kessler, F. C., (2008): *Thematic Cartography and Geovisualization* (3rd Edition), Prentice Hall.
13. Tyner, J. A., (2010): *Principles of Map Design*, The Guilford Press.

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GEO-G-246- Industrial Development

Credit 6- (Credit Hours in a week: Lecture-5, Practical-0, Tutorial-1)
Marks: 100 (End term examination=80 and internal examination-20)

Course Objective:

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

Learning Outcomes:

After the completion of course, the students will have ability to:

1. Understand the factors responsible for location of an industry.
2. Differentiate various types of industries and industrial regions and policies of India.
3. Evaluate the socio, economic and environmental implications of various types of industries.

Course Contents:

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

References:

1. Gunnar, Alexandersson., (1967): "*Geography of Manufacturing*, Prentice Hall, New Jersey
2. Leong, G.C., (1997): "*Human and economic geography*", Oxford University Press, New York.
3. Miller, E., (1962):*Geography of Manufacturing,* Prentice Hall, Englewood Cliff, New Jersey
4. Pathak, C. R.,(2003): *Spatial Structure and Processes of Development in India*. Regional Science Assoc., Kolkata.
5. Sharma, T.C., (2013): *Economic Geography of India*, Rawat Publication, Jaipur
6. Singh, Jagdish (2003): *India - A Comprehensive & Systematic Geography*, Gyanodaya Prakashan, Gorakhpur.
7. Thoman, R.S., Conkling E.C., and Yeates. M.H., (1968): *Geography of Economic Activity*, McGraw Hill Book Company, 1968.
8. Tirtha, Ranjit (2002): *Geography of India,* Rawat Publs., Jaipur & New Delhi.
9. Tiwari, R.C., (2007): *Geography of India*, Prayag Pustak Bhawan, Allahabad.
10. Truman, A. Harishorn, John W. Alexander., (2000):"*Economic Geography*", Prentice Hall of India Ltd., New Delhi.

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GEO-G-247-Sustainable Resource Management

Credit 6- (Credit Hours in a week: Lecture-5, Practical-0, Tutorial-1)
Marks: 100 (End term examination=80 and internal examination-20)

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 & SustainableDevelopment Goals.
3. To critically evaluate the global policies and programmes for sustainable development.

Learning Outcomes:

After the completion of course, the students will have ability to:

1. Understand difficulties in defining the components of sustainable development;
2. Distinguish the patterns of regional development of the world and the need for sustainable development plan;
3. Appreciate the efforts and initiatives of the Governments in reducing the levels of poverty and inequality among the people of various countries.

Course Content:

1. Sustainable Resource Development: Definition, Components and Limitations
2. The Millennium Development Goals: National Strategies and International Experiences
3. Sustainable Regional Development: Need and examples from different Ecosystems.
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,
5. Sustainable Development Policies and Programmes: The proposal for SDGs at Rio+20; SDGs; Goal-Based Development; Financing for Sustainable Development; Principles of Good Governance; National Environmental Policy, CDM.

References:

1. Agyeman, Julian, Robert D. Bullard and Bob, Evans., (Eds.) (2003): *Just Sustainabilities: Development in an Unequal World. London: Earthscan*. (Introduction and conclusion.).
2. Ayers, Jessica and David, Dodman., (2010): "*Climate change adaptation and development I: the state of the debate*". Progress in Development Studies 10(2): 161-168.
3. Baker, Susan., (2006): *Sustainable Development.* Milton Park, Abingdon, Oxon; New York, N.Y.: Routledge.
4. Brosius, Peter., (1997): "*Endangered forest, endangered people: Environmentalist representations of indigenous knowledge*", Human Ecology 25: 47-69.
5. Lohman, Larry., (2003):*Re-imagining the population debate*, Corner House Briefing.
6. Martínez-Alier, Joan., (2010): "*Sustainable de-growth: Mapping the context, criticisms and future prospects of an emergent paradigm*" Ecological Economics 69: 1741-1747.

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8. Osorio, Leonardo., et al., (2005): "*Debates on sustainable development: towards a holistic view of reality*", Environment, Development and Sustainability 7: 501-518.
9. Robbins, Paul., (2004):*Political Ecology: A Critical Introduction*. Blackwell Publishing.
10. Singh, R.B., (Ed.) (2001): *Urban Sustainability in the Context of Global Change*, Science Pub., Inc., Enfield (NH), USA and Oxford & IBH Pub., New Delhi.

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B.A. V SEMESTER

Semester	Paper code	Paper title	Credit	Lecture in Hrs		
				L	P	T
Semester V	**CONTENT**					
	GEO- C-351	Geography of North East India; especial reference to Arunachal Pradesh	6 HRS	5	-	1
	GEO- C-352	Field Techniques, Surveying and Research Methods (Practical)	6 HRS	-	12	-
	Elective Discipline Specific (any two)					
	GEO-E-353	Demography and Population Studies	6 HRS	5	-	1
	GEO -E-354	Hydrology and Soil Studies	6 HRS	5	-	1
	GEO-E- 355	Agriculture and Food Security	6 HRS	5	-	1
	GEO- E-356	Agriculture and Food Security	6 HRS	5	-	1

NB- For learning outcome for each paper following may be referred

Course Level Learning Outcomes Matrix at page- 13
Geography Course Outcome and SDGs at page - 14
Geography Core papers contribution towards SDGs at page- 14
Geography Elective papers contribution towards SDGs at page – 15
Questions and marking pattern may be seen at page 23

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GEO-C-351- GEOGRAPHY OF NORTH EAST INDIA

(with special reference to Arunachal Pradesh)

Credit 6- (Credit Hours in a week: Lecture-5, Practical-0, Tutorial-1)
Marks: 100 (End term examination=80 and internal examination-20)

Course Objectives:

1. To acquaint with the geographical set of the region and the associated problems and prospects of it.
2. To have a basic understanding of the demographic pattern and economy of the region.

Learning Outcome:

1. To develop ability to identify problems and prospect of their local area in conformity to geographical set up.
2. To realize the factors responsible for regional variations and also the importance of geographically unifying factors.

Course Content:

I Physical Geography of North East India:

i. Physical setting: Physiographic divisions
ii. Climate and its seasonal and regional
iii. Soil types, Vegetation and its distribution
iv. Environmental Hazards (Earthquake, Soil Erosion, Flood and siltation)

II Demography of North East India:

i. Population: Trend of growth,
ii. spatial variation in growth and distribution
iii. Age and sex composition
iv. Linguistic and religious composition

III Agriculture and Industry:

i. Agriculture: Regional distribution and production patterns
ii. Plantation sector of NE India : Tea and Rubber
iii. Industry: Distribution and production
iv. Role of transport system in industrial development

IV Geography of Arunachal Pradesh

i. Physical Background; Location, physiography, climate, vegetation and locational disadvantages
ii. Tribes of Arunachal Pradesh (Major and Sub Tribe, and their Distribution)
iii. Economic Activities (Agricultural, hunting and fishing, trade & commerce)
iv. Environmental Hazards (Deforestation, flood, Forest Fire, Earthquake)

Suggested Readings:

1. Bhagabati, A.K. et al. (2001): Geography of Assam, Rajesh Publications, New Delhi
2. Das, H.P (1972): Geography of Assam
3. Singh, R.L. (ed) (1972): India: A Regional Geography, Varanasi.
4. Taher, M. and Amhed, P. (2001): Geography of North – East India: Mani Manik Prakash, Guwahati

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GEO-C-352- Field Techniques, Surveying and Research Methods (Practical)

Credit 6- (Credit Hours in a week: Lecture-0, Practical-12, Tutorial-0)

Total Marks: 100

i. End term examination= 60 (5 Questions 12 Marks each)
ii. internal examination =20
iii. Record Book =15
iv. Viva Voce =05

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, fieldtechniques.
3. This course shall provide detailed understanding related to questionnaire development andpreparation of the field report.

Learning Outcome:

After the completion of course, the students will have ability to:

1. Conduct proper field work for the collection of primary data to bring out grassroots realities.
2. Make use of proper tools and surveying methods for measurement in context of collection and processing of data.
3. Prepare a report based on field data.

Course Content:

1. Meaning, Significance, Types and Approaches to Research in Geography; Literature review; Field Work in Geographical Studies –Defining the Field and Identifying the Case Study.
2. Research Design: Identification of Research Problem; Research questions. Data Collection: Type and Sources of Data; Methods of Collection; 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.
4. Surveying Use of Field Tools: Plain Table survey, Prismatic Compass, Theodolite.
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 fieldwork.
2. The duration of the fieldwork should not exceed 10 days.
3. The word count of the report should be about 8000 to 12,000 excluding figures, tables,

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References:

1. Creswell, J., (1994): *Research Design: Qualitative and Quantitative Approaches* Sage Publications.
2. Dikshit, R. D.,(2003):*The Art and Science of Geography: Integrated Readings*, Prentice-Hall of India, New Delhi.
3. Evans, M., (1988): "*Participant Observation: The Researcher as Research Tool*" in *Qualitative Methods in Human Geography*, eds. J. Eyles and D. Smith, Polity.
4. Misra, R.P., (2014). *Fundamentals of Cartography*. (Second revised, enlarged Edition). Concept Publishing, New Delhi.
5. Mukherjee, Neela.,(1993): *Participatory Rural Appraisal: Methodology and Application,* Concept Publs. Co., New Delhi.
6. Mukherjee, Neela.,(2002):*Participatory Learning and Action: with 100 Field Methods*. Concept Publs. Co., New Delhi
7. 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.
8. Singh, R.L., & Dutta, P.K., (2012): *Prayogatmak Bhugol* (Hindi). Central Book Depot, Allahabad.
9. Special Issue on "Doing Fieldwork" *The Geographical Review* 91:1-2 (2001).
10. Stoddard, R. H., (1982): *Field Techniques and Research Methods in Geography*, Kendall/Hunt.
11. Wolcott, H., (1995): *The Art of Fieldwork*, Alta Mira Press, Walnut Creek, CA.

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GEO-E- 353-Demography and Population Studies

Credit 6- (Credit Hours in a week: Lecture-5, Practical-0, Tutorial-1)
Marks: 100 (End term examination=80 and internal examination-20)

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 Outcome:

After the completion of course, the students will have ability to:

1. Learn the role of demography and population studies as a distinct fields of human geography
2. Have sound knowledge of key concept, different components of population along with its drivers
3. Examine population dynamics and characteristic with contemporary issues

Course Contents:

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

References:

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

GEO-E-354-Hydrology and Soil Studies

Credit 6- (Credit Hours in a week: Lecture-5, Practical-0, Tutorial-1)
Marks: 100 (End term examination=80 and internal examination-20)

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 Outcome

After the completion of course, the students will have ability to:

1. Understand the basic components of hydrological cycle and comprehend practices of integrated watershed management.
2. Evaluate the water balancing and river basin and water disputes.
3. Study the soil as a basic resource, focusing its distribution, problems and management.

Course Content:

1. Hydrological Cycle: Systems approach in hydrology, human impact on the hydrological cycle; Precipitation, interception, evaporation, evapotranspiration, infiltration, ground-water, runoff and overland flow;
2. Water Balance: input and output; water balance; floods and droughts; Integrated water resource management.
3. River Basin: Characteristics and problems of river basins, basin surface run-off, and measurement of river discharge. Watershed management
4. River Water Dispute; River linkages; Case studies
5. Soil Resource: Definition, Types and Distribution, Utilisation, Problems and Management of Soil Resource.

References:

1. Andrew. D. ward, and Stanley, Trimble., (2004): *Environmental Hydrology*, 2nd edition, Lewis Publishers, CRC Press.
2. Fetter, C.W. (2005):*Applied Hydrogeology*, CBS Publishers & Distributors, New Delhi.
3. Reddy, K. Ramamohan, Venkateswara Rao,B, Sarala, C., (2014):*Hydrology and Watershed Management*, Allied Publishers.
4. Karanth, K.R., (1988): *Ground Water: Exploration, Assessment and Development,* Tata-McGraw Hill, New Delhi.
5. Lyon, J.G., (2003):*GIS for Water Resource and Watershed Management*, Taylor and Francis, New York.
6. Meinzer,.O.E., (1962):*Hydrology,* Dover Publication, New York.
7. Ramaswamy, C., (1985): *Review of floods in India during the past 75 years: A Perspective*, Indian National Science Academy, New Delhi.
8. Rao, K.L., (1982): *India's Water Wealth,* 2nd edition, Orient Longman, Delhi.
9. Singh, M., Singh, R.B. and Hassan, M.I., (Eds.) (2014):*Landscape ecology and water*

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10. Singh, Vijay P., (1995): *Environmental Hydrology*. Kluwar Academic Publications, The Netherlands.
11. Tideman, E.M., (1999):*Watershed management - Guidelines for Indian Conditions*, Omega Scientific Publishers, New Delhi
12. Todd, D.K. (1959):*Ground water Hydrology*, Wiley India Edition, New Delhi.

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GEO-E-355-Urbanization and Urban System

Credit 6- (Credit Hours in a week: Lecture-5, Practical-0, Tutorial-1)
Marks: 100 (End term examination=80 and internal examination-20)

Course Objective

1. To introduce the students with concepts and approach to studying the urbangeography.
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 the completion of course, the students will have ability to:

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

Course Content:

1. Urban Geography: Introduction, nature, scope and approaches.
2. Patterns of Urbanisation in developed and developing countries
3. Functional classification of cities: Quantitative and Qualitative Methods
4. Cities and Central Place Theory: Christaller and Losch
5. Urban Issues: problems of housing, slums, civic amenities (water and transport); Case studies of Delhi, Mumbai, Kolkata, Chennai.

References:

1. Carter, H., (1972): *The study of Urban Geography*, Edward Arnold, London.
2. Fyfe, N. R. and Kenny, J. T., (2005): *The Urban Geography Reader*, Routledge.
3. Graham, S. and Marvin, S., (2001): *Splintering Urbanism: Networked Infrastructures, Technological Mobilities and the Urban Condition*, Routledge.
4. Hall, T., (2006): *Urban Geography*, Taylor and Francis.
5. Kaplan, D. H., Wheeler, J. O. and Holloway, S. R., (2008): *Urban Geography*, John Wiley.
6. Knox, P. L., and McCarthy, L., (2005): *Urbanization: An Introduction to Urban Geography*, Pearson Prentice Hall New York.
7. Knox, P. L., and Pinch, S., (2006): *Urban Social Geography: An Introduction*, Prentice-Hall.
8. Pacione, M., (2009): *Urban Geography: A Global Perspective*, Taylor and Francis.
9. Ramachandran, R., (1989): *Urbanisation and Urban Systems of India*, Oxford University Press, New Delhi
10. Ramachandran, R., (1992): *The Study of Urbanisation*, Oxford University Press, Delhi
11. Sassen, S., (2001): *The Global City: New York, London and Tokyo*, Princeton University Press.
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GEO-E-356- Agriculture and Food Security

Credit 6- (Credit Hours in a week: Lecture-5, Practical-0, Tutorial-1)
Marks: 100 (End term examination=80 and internal examination-20)

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 the completion of course, the students will have ability to:

1. Conceptualise 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:

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3. Burger, A., (1994): *Agriculture of the World*, Aldershot, Avebury.
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6. Ilbery, B. W., (1985): *Agricultural Geography: A Social and Economic Analysis*, Oxford University Press.
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B.A. VI SEMESTER

Semester	Paper code	Paper title	Credit	Lecture in Hrs		
				L	P	T
Semester VI	**CONTENT**					
	GEO- C-361	Evolution of Geographical Thought	6 HRS	5	-	1
	GEO- C-362	Disaster Management Project Work (Practical)	6 HRS	-	12	-
	Elective Discipline Specific (any two)					
	GEO- E-363	Geography of Health	6 HRS	5	-	1
	GEO-E-364	Political Geography	6 HRS	5	-	1
	GEO-E-365	Biogeography	6 HRS	5	-	1
	GEO- E-366	Geography of Social Wellbeing	6 HRS	5	-	1

NB- For learning outcome for each paper following may be referred

Course Level Learning Outcomes Matrix at page- 13
Geography Course Outcome and SDGs at page - 14
Geography Core papers contribution towards SDGs at page- 14
Geography Elective papers contribution towards SDGs at page – 15
Questions and marking pattern may be seen at page 23

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GEO-C-361-Evolution of Geographical Thought

Credit 6- (Credit Hours in a week: Lecture-5, Practical-0, Tutorial-1)
Marks: 100 (End term examination=80 and internal examination-20)

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 Outcome:

After the completion of course, the students will have ability to:

1. Distinguish the paradigms in geography discipline through time
2. Understand the geographical thinking in different regions of world
3. Appreciate the past and future trends of world geography in general and Indian geography in particular

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. **Debates** – 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, Future of Geography.

References:

1. Bhat, L.S., (2009):*Geography in India* (Selected Themes). Pearson
2. Bonnett, A., (2008): *What is Geography*? Sage.
3. Dikshit, R. D., (1997): *Geographical Thought: A Contextual History of Ideas*, Prentice–Hall India.
4. Freeman, R., (1970): *Hundred year of Geography*, Hutchinson. London.
5. Hartshone, R., (1959): *Perspectives of Nature of Geography*, Rand MacNally and Co.
6. Harvey, David., (1969): *Explanation in Geography*, London: Arnold.
7. Holt-Jensen, A., (2011): *Geography: History and Its Concepts: A Students Guide*, SAGE.
8. Hussain, M., (2005): *Bhougolik Chintan Ka Itihas*, Rawat Publications
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11. Kapur, A., (2001): *Indian Geography Voice of Concern*, Concept Publications.
12. Martin Geoffrey J., (2005): *All Possible Worlds: A History of Geographical Ideas*, Oxford.
13. Singh, R.B. (2016): *Progress in Indian Geography*, Indian National Science Academy, New Delhi.
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GEO-C-362-Disaster Management Project Work (Practical)

Credit 6- (Credit Hours in a week: Lecture-0, Practical-12, Tutorial-0)

Total Marks: 100

i. End term examination= 60 (5 Questions 12 Marks each)
ii. internal examination =20
iii. Record Book =15
iv. Viva Voce =05

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:

After the completion of course, the students will have ability to:

1. Understand processes and impact of disaster
2. Understand both the natural and man-made disaster and human negligence in context of environment
3. Write a field work based report on Disaster Management to minimize the disaster risk/ Risk from Disaster.

Course Content:

The Project Report based on any two fields based case studies among following disasters and one disaster preparedness plan of respective college/locality and district:

1. Flood
2. Drought
3. Cyclone and Hailstorms
4. Earthquake and Volcanoes
5. Landslides
6. Human Induced Disasters: Fire Hazards, Chemical, Industrial accidents

References:

1. Carter, N., (1991): *Disaster Management: A Disaster Manager's Handbook*. Asian Development Bank, Manila.
2. Government of India (2011): *Disaster Management in India*. Ministry of Home Affairs, New Delhi.
3. Government of India (2008): *Vulnerability Atlas of India*. New Delhi, Building Materials & Technology Promotion Council, Ministry of Urban Development, Government of India
4. Kapur, A., (2010): *Vulnerable India: A Geographical Study of Disasters*, Sage Publication, New Delhi.
5. Modh, S., (2010): *Managing Natural Disaster: Hydrological, Marine and Geological Disasters*, Macmillan, Delhi.
6. Ramkumar, M., (2009): *Geological Hazards: Causes, Consequences and Methods of Containment*, New India Publishing Agency, New Delhi.
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10. Singh, R.B., (2005): *Risk Assessment and Vulnerability Analysis*, IGNOU, New Delhi. Chapter 1, 2 and 3
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GEO-E-363-Geography of Health

Credit 6- (Credit Hours in a week: Lecture-5, Practical-0, Tutorial-1)
Marks: 100 (End term examination=80 and internal examination-20)

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:

After the completion of course, the students will have ability to:

1. Understand the key concepts related to health and its driving forces
2. Identify the linkages between the health, environment, exposure and risk.
3. Explain the relationships among health and disease pattern in environmental context with reference to climate change

Course Content:

1. Perspectives on 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 and water pollution; household wastes;; 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: Changes in climate system – heat and cold; Biological disease agents; food production and nutrition.

References:

1. Rais, Akhtar., (Ed.), (1990): *Environment and Health Themes in Medical Geography*, Ashish Publishing House, New Delhi.
2. Avon, Joan, L. and Jonathan, A, Patzed (2001): *Ecosystem Changes and Public Health*,Baltimin, John Hopling Unit Press(ed).
3. Bradley,D.,(1977): *Water, Wastes and Health in Hot Climates*, John Wiley Chichesten.
4. Christaler, George and Hristopoles, Dionissios., (1998): *Spatio-Temporal Environment Health Modelling*, Boston Kluwer Academic Press.
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GEO-E-364- Political Geography

Credit 6- (Credit Hours in a week: Lecture-5, Practical-0, Tutorial-1)
Marks: 100 (End term examination=80 and internal examination-20)

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.

Learning Outcomes:

After the completion of course, the students will have ability 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, Highways and Special Economic Zones

References:

1. Adhikari, S. (2007): *Political Geography*, Rawat Publication, NewDelhi.
2. Adhikari, S. (2013): *Political Geography of India* –Sharda Pustak Bhawan, Allahabad.
3. Agnew, J., (2002): *Making Political Geography*, Arnold.
4. Agnew, J., Mitchell K. and Total G., (2003): *A Companion to Political Geography*, Blackwell.
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GEO-E-365- Biogeography

Credit 6- (Credit Hours in a week: Lecture-5, Practical-0, Tutorial-1)
Marks: 100 (End term examination=80 and internal examination-20)

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:

After the completion of course, the students will have ability to:

1. Familiarise the dynamics of climate and related theories.
2. Understand of Vegetation as an index of climate.
3. Assess of different aspects of floral and faunal provinces.

Course Content:

1. Introduction to Bio-geography: Nature, scope, and components.
2. World Climatic Patterns (Koppen) vis-à-vis biogeographical regions
3. Evolution of major groups of floral and faunal provinces.
4. Ecological successions: stages and climax.
5. Biodiversity; bio-diversity hotspots, biodiversity conservation.

References:

1. Bhattacharyya, N.N.(2003): *Biogeography,* Rajesh Publications, New Delhi.
2. Clarke, G. L. (1967): *Elements of ecology*, New York: John Wiley Pub.
3. Haden-Guest, S., Wright, J. K. and Teclaff, E. M. (1956): *World Geography of Forest Resources*, New York: Ronald Press Co.
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8. Mal, Suraj., and Singh, R.B. (Eds.) (2009):*Biogeography and Biodiversity*,Rawat Publication, Jaipur
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GEO-E-366- Geography of Social Wellbeing

Credit 6- (Credit Hours in a week: Lecture-5, Practical-0, Tutorial-1)
Marks: 100 (End term examination=80 and internal examination-20)

Course Objectives:

1. To familiarise the student with the theoretical foundations and conceptual grounding ofunique 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 andpolicies.

Learning Outcomes:

After the completion of course, the students will have ability to:

1. Understand the nature, scope and relationships of geography and human wellbeing;
2. Acquire knowledge on spatial dimensions of social diversity components;
3. Appreciate the social welfare programs related to inclusive and exclusive policies in India.

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:

1. Ahmed, A., (1999): *Social Geography*, Rawat Publications.
2. Casino, V. J. D., Jr., (2009): *Social Geography: A Critical Introduction*, Wiley Blackwell.
3. Cater, J. and Jones, T., (2000): *Social Geography: An Introduction to Contemporary Issues*, Hodder Arnold.
4. Holt, L., (2011): *Geographies of Children, Youth and Families: An International Perspective,* Taylor & Francis.
5. Panelli, R., (2004): *Social Geographies: From Difference to Action*, Sage.
6. Rachel, P., Burke, M., Fuller, D., Gough, J., Macfarlane, R. and Mowl, G., (2001): *Introducing SocialGeographies,* Oxford University Press.
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