ROYAL GLOBAL UNIVERSITY
GUWAHATI

ROYAL SCHOOL OF ENVIRONMENTAL AND EARTH SCIENCES (RSEES)

DEPARTMENT OF GEOGRAPHY

Learning Outcomes-based Curriculum Framework (LOCF) for Undergraduate Programme in the line of NEP, 2020

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

2022-2023 Batch

Table of Contents

1. Preamble

The LOCF is designed to emphasize the teaching-learning process at the under graduate graduate B.A/B.Sc. level in Geography to sensitize and train the students to develop a sound and systematic approach regarding the 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 a focused and precise understanding of a 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 at the global, regional and local levels. It has considered learning as an activity of creativity, 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:

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

1.4 Introduction

Learning Outcomes based Curriculum Framework (LOCF) for Geography under CBCS Geography has been broadly accepted as a bridge discipline between human and physical sciences. In the beginning, geography focussed on the physical aspects of the earth but 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 transdisciplinary subject integrating regional diversity with the concepts of the timing of space and the spacing of time. It provides broad, human and place-centred perspectives on the transformation of rural ecology to a globalized urban landscape at different levels, from the local/regional/national to global. Geography is transformed through:

i. Journey from Village Ecology to Urban Regional Studies
ii. Qualitative Techniques to Spatial Information Technology
iii. 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 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 policymakers to consider the geospatial aspects with references to the location and in the 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.

1.4 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 which could be the panacea to 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.

1.2.1 Nature and Extent of Bachelor's Degree Programme in Geography (Honours)

A bachelor's degree in Geography with Research is a 3 years degree course which is divided into 6 semesters as under.

Sl. No.	Year	Mandatory Credits to be secured for the Award
1	After successful completion of 1st Year	48
2	After successful completion of 1st and 2nd Years	96
3	After successful completion of 1st, 2nd, and 3rd Years	148

The 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, the pedagogy process includes:

i. Identifying and explaining the physical and cultural characteristics globally and processes in varied spatiotemporal contexts.
ii. Understanding human-environment and nature-society interactions as well as various global environmental challenges.
iii. Analysing geographic information by using geospatial technologies.
iv. Responding to the global and national challenges and initiatives.

1.2.2 Aims of Bachelor's Degree (Honours) Programme in Geography:

The overall objectives of the Learning Outcomes-bases Framework (LOCF) for BA-Honours degree in Geography are-

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

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

1.3 Graduate Attributes in Geography

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

G A 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.

G A 2. 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.

G A 3. 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.

G A 4. 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 acquaints 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.

G A 5. 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.

G A 6. Cooperation/ Teamwork: The course enables to develop skill to work with students of diverse 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.

G A 7. Scientific Reasoning: Course will develop critical analysis of theories and models, raising critical questions about the theories and models, developing hypothesis and learning their testing. Many of the courses in geography are truly scientific in nature which will generate scientific reasoning aptitude and also skills to look towards new approaches.

G A 8. 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.

G A 9. 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.

G A 10. 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 to different capacities.

G A 11. 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 analyzing the information from the field; and presenting in the form of reports enhances written communication skills.

G A 12. 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

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.

1.4 Qualification Descriptors for B.A./B.Sc. Programme

The qualification descriptors for the B.A./B.Sc. Programme in Geography shall have the learning attributes such as field knowledge, use of advanced 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. Programme includes:

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

1.5 The Programme Learning Outcomes relating to B.A./B.Sc. (Honours) degree programme in Geography

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

PO-1: **Knowledge of Geography**: Students of the BA/BSc Honours degree in Geography will learn to use geographic understanding of various sub fields such as physiography, resources, global economic systems, socio- cultural aspects, rural and urban milieu, environmental and disaster studies, and mapping methods.

PO-2: **Understanding of global issues**: They will also develop an understanding of global issues from economic, social, environmental, and political perspectives, which has relevance in further studies across the globe.

PO-3: **Interpretation and generation of map**: They will be trained to read and interpret maps and generate maps and other geographic representations as well as extract, analyze, and present information from a spatial perspective.

PO-4: **Analyse both geographical qualitative and quantitative data:** The learners will have a general understanding of the various theoretical and methodological approaches in both physical and human geography and be able to develop research questions and critically analyze both qualitative and quantitative data to answer those questions.

PO-5: **Critical analysis with diverse perspective:** After the completion of the course, students will be able to evaluate, analyze, synthesize, and critique key concepts and experiences, and apply diverse perspectives to find creative solutions to problems concerning society and the natural world.

PO-6: **Developing skills of team work**: They will also be able to learn how to take teamwork experiences in the classroom and field excursions and use them to their advantage to further their career.

PO-7: **Skills of research and Hypothesis testing:** Students will acquire knowledge of scientific methods of data handling, hypothesis generation, testing and analysis.

PO-8: **New and independent learning techniques**: Students will be able to assess and build upon previous learning and experiences to pursue new learning, independently and in collaboration with others.

PO-9: **Preparing the students to face the real world challenges**: The course will better-equip students to face the challenges of an increasingly intercultural world, and contribute to improving tolerance within the diverse societies of India and World.

PO-10: **Developing ethical aptitudes**: Students will develop the ethical aptitudes and dispositions necessary to acquire and hold leadership positions in industry, government, and professional organizations.

PO-11: **Developing interest on exploration and personality development**: They will also developzeal of exploration and investigation, travel exploration and effective communication skills and teamwork.

PO-12: **Life-long learning**: The geography graduates will be able to pursue wide range of knowledge and experience from various fields. They will be well informed citizens who can play immense role in the civil society too and also be able to pursue career as planners, administrators, academicians, and managers.

Programme Specific Outcomes

PSO-1: Correlate the knowledge of physical geography with the human geography. They will analyze the problems of physical as well as cultural environments of both rural and urban areas.

PSO-2: Develop a sustainable approach towards the ecosystem and the biosphere with a view to conserve natural environment and analyze how physical environment, human societies and global economic systems are integrated to the principles of sustainable development.

PSO-3: Explain the cultural geographic processes, the global distribution of cultural mosaics, and comprehend how variations in culture and personal experiences may affect our perception and management of places and regions.

PSO-4: Identify socio-economic problems of their community through field experience envisaged in the curriculum by applying statistical and cartographic techniques, GIS and remote sensing process.

1.6. Teaching Learning Process

Teaching and learning in this programme involve classroom lectures, computer lab and tutorials.
It allows-

1. The tutorials allow a closer interaction between the students and the teacher as each student gets individual attention.
2. Written assignments and projects submitted by students
3. Project-based learning
4. Group discussion
5. Home assignments
6. Class tests
7. Quizzes
8. PPT presentations, Seminars, interactive sessions
9. Co-curricular activity etc.
10. Industrial Tour or Field visit

1.7. Programme Evaluation

1. The Programme structures and examinations shall normally be based on Semester System. However, the Academic Council may approve Trimester/Annual System for specified programmes.
2. In addition to end term examinations, student shall be evaluated for his/her academic performance in a
3. Programme through, presentations, analysis, homework assignments, term papers, projects, field work, seminars, quizzes, class tests or any other mode as may be prescribed in the syllabi. The basic structure of each Programme shall be prescribed by the Board of Studies and approved by the Academic Council.
4. Each Programme shall have a number of credits assigned to it depending upon the academic load of the Programme which shall be assessed on the basis of weekly contact hours of lecture, tutorial and

laboratory classes, self-study. The credits for the project and the dissertation shall be based on the quantum of work expected.

5. Depending upon the nature of the programme, the components of internal assessment may vary. However, the following suggestive table indicates the distribution of marks for various components in a semester: -

	Components of Evaluation	***Marks***	***Frequency***	***Code***	***Weightage (%)***
A	**Continuous Evaluation**				
i	Analysis/Class test	Combination of any three from (i) to (v) with 5 marks each	1-3	C	25%
ii	Home Assignment		1-3	H	
iii	Project		1	P	
iv	Seminar		1-2	S	
v	Viva-Voce/Presentation		1-2	V	
vi	MSE	MSE shall be of 10 marks	1-3	Q/CT	
vii	Attendance	Attendance shall be of 5 marks	100%	A	5%
B	**Semester End Examination**		1	SEE	70%
	Total				**100%**

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

Programme Structure

1st SEMESTER							
Sl. No	**Subject Code**	**Names of subjects**	**L**	**T**	**P**	**C**	**TCP**
		Core Courses					
1	GEO162C101	Geography of Human and Cultural Landscape	3	1	0	4	4
2	GEO162C112	Cartographic Techniques	0	0	8	4	8
3	GEO162C103	Geomorphology	2	0	4	4	6
		Ability Enhancement Compulsory Courses (AECC)					
4	CEN984A101	Communicative English-I	1	0	0	1	1
5	BHS984A103	Behavioural Science-I	1	0	0	1	1
		Skill Enhancement Courses (SEC)					
6	GEO162S111	Introduction to Map Making	2	0	4	2	6
		Value Added Courses (VAC)					
7		Will select one course from a basket of courses	2	0	0	2	2
		Generic Elective (GE)					
8	GEO162G101	Social and Political Geography	3	0	0	3	3
9	GEO162G102	Physical Geography	3	0	0	3	3
TOTAL CREDITS (C) = 24 AND TOTAL CONTACT PERIODS (TCP) = 34							
2nd SEMESTER							
Sl. No	**Subject Code**	**Names of subjects**	**L**	**T**	**P**	**C**	**TCP**
		Core Courses					
1	GEO162C201	Climatology and Oceanography	3	1	0	4	4
2	GEO162C212	Fundamentals of Geoinformatics	0	0	8	4	8
3	GEO162C203	Geography of Tourism	3	1	0	4	4
		Ability Enhancement Compulsory Courses (AECC)					
4	CEN984A201	Communicative English-II	1	0	0	1	1
5	BHS984A203	Behavioural Science-II	1	0	0	1	1
		Skill Enhancement Courses (SEC)					
6	GEO162S211	Remote Sensing	2	0	4	2	6
		Value Added Courses (VAC)					
7		Will select one course from a basket of courses	2	0	0	2	2
		Generic Elective (GE) - (any one)					
8	GEO162G201	Regional Development of N.E India	3	0	0	3	3
9	GEO162G202	Introduction to Geospatial Technology	3	0	0	3	3

TOTAL CREDITS (C) = 24 AND TOTAL CONTACT PERIODS (TCP) = 34							
3rd SEMESTER							
Sl. No	**Subject Code**	**Names of subjects**	**L**	**T**	**P**	**C**	**TCP**
		Core Courses					
1	GEO162C301	Economic Geography	3	1	0	4	4
2	GEO162C302	Quantitative Methods in Geography	3	1	0	4	4
		Internship/Training/Project					
3	GEO162C313	Project Work in rural area	4	0	0	4	4
		DSE subjects (any one to chosen out of two papers)					
	GEO162D301	Principles of Agricultural Geography	3	1	0	4	4
4	GEO162D302	Agricultural Practises in India	3	1	0	4	4
		Ability Enhancement Compulsory Courses (AECC)					
4	CEN984A301	Communicative English-III	1	0	0	1	1
5	EVS982A303	Environmental Studies	1	0	0	1	1
		Value Added Courses (VAC)					
7		Will select one course from a basket of courses	2	0	0	2	2
		Generic Elective (GE)					
8	GEO162G301	Population Studies	3	0	0	3	3
9	GEO162G302	Biogeography	3	0	0	3	3
TOTAL CREDITS (C) = 24 AND TOTAL CONTACT PERIODS (TCP) = 34							
4th SEMESTER							
Sl. No	**Subject Code**	**Names of subjects**	**L**	**T**	**P**	**C**	**TCP**
		Core Courses					
1	GEO162C401	Social and Political Geography	3	1	0	4	4
2	GEO162C402	Environmental Geography	3	1	0	4	4
		DSE (any one to chosen out of two papers)					
3	GEO162D401	Field Work in Geographical Research	3	1	0	4	4
	GEO162D402	Research Methodology in Geography	3	1	0	4	4
		Ability Enhancement Compulsory Courses (AECC)					
4	CEN984A401	Communicative English – IV	1	0	0	1	1
5		Behavioural Science	1	0	0	1	1
		Skill Enhancement Courses (SEC)					
6	GEO162S411	Report writing on Environmental Issues	2	0	4	2	6
		Value Added Courses (VAC)					
7		Will select one course from a basket of courses	2	0	0	2	2
		Generic Elective (GE) - (any one)					
8	GEO162G401	Climate Change Vulnerability and Adaptation	3	0	0	3	3
9	GEO162G402	Rural Development	3	0	0	3	3
TOTAL CREDITS (C) = 24 AND TOTAL CONTACT PERIODS (TCP) = 34							

5th SEMESTER							
Sl. No	**Subject Code**	**Names of subjects**	**L**	**T**	**P**	**C**	**TCP**
		Core Courses					
1	GEO162C501	Regional Planning and Development	3	1	0	4	4
2	GEO162C502	Population and Settlement Geography	3	1	0	4	4
		Internship					
3	GEO162C523	Internship	2	0	4	4	6

		DSE (any two to chosen out of four papers)					
4	GEO162D501	Geography of Rural Development	3	1	0	4	4
5	GEO162D502	Remote Sensing Principles and application	3	1	0	4	4
6	GEO162D503	Geography of Health	3	1	0	4	4
7	GEO162D504	Disaster Management	3	1	0	4	4
		Ability Enhancement Compulsory Courses (AECC)					
9	CEN984A501	Communicative English – IV	1	0	0	1	1
10	BHS984A503	Behavioural Science	1	0	0	1	1
		Value Added Courses (VAC)					
11		Will select one course from a basket of courses	2	0	0	2	2
		Generic Elective (GE) - (any one)					
TOTAL CREDITS (C) = 26 AND TOTAL CONTACT PERIODS (TCP) = 34							

6th SEMESTER							
Sl. No	**Subject Code**	**Names of subjects**	**L**	**T**	**P**	**C**	**TCP**
		Core Courses					
1	GEO162C601	Geography of India	3	1	0	4	4
2	GEO162C612	Practical in Geography	0	0	8	4	8
		DSE (Any 3 to be chosen)					
3	GEO162D601	Geographical Thought	3	1	0	4	4
4	GEO162D602	Soil and Biogeography	3	1	0	4	4
5	GEO162D603	Regional Development of North east India and Assam	3	1	0	4	4
6	GEO162D604	Environment and Sustainable development	3	1	0	4	4
7	GEO162D605	Global Climate Change	3	1	0	4	4
8	GEO162D606	Urban Geography	3	1	0	4	4
		Ability Enhancement Compulsory Courses (AECC)					
9	CEN984A601	Communicative English – IV	1	0	0	1	1
10		Behavioural Science	1	0	0	1	1
		Skill Enhancement Courses (SEC)					
11	GEO162S611	Mapping in GIS	2	0	4	2	6
		Value Added Courses (VAC)					
12		Will select one course from a basket of courses	2	0	0	2	2
TOTAL CREDITS (C) = 26 AND TOTAL CONTACT PERIODS (TCP) = 34							

B.A/B. Sc. (Honours) Course in Geography: Semester-I

Paper I Core Course	GEOGRAPHY OF HUMAN AND CULTURAL LANDSCAPE	Subject Code:
	L-T-P-C: 3-1-0-4 Credit Units: 4 Scheme of Evaluation: (T)	GEO162C101

Course Objectives: *The objective of this course is to make the student look into the chronology of development of human geography through contribution of varied scholars, approaches and schools of human geography, major themes and components of cultural geography.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the various parameters and components of the sub-branch.	BT1
CO2	**Interpret** the development of a humanistic view of geography.	BT2
CO3	**Identify** the various aspects of human geography.	BT3
CO4	**Discover** the humanistic perspective and its dimensions in Geography in relation to the physical and cultural surrounding.	BT4

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Meaning, contents and Scope of Human Geography, human versus physical geography; branches of Human Geography; Development of Human Geography; Contributions of German and French Geographers.	12
Unit 2	Approaches to the study of human geography: Determinism, possibilism, human ecology, positivism, neo-determinism, social determinism, behaviouralism, welfare geography, humanistic geography; **S**chools of human geography: Ecology, landscape, locational, marxism and Post-modernism.	12
Unit 3	Definition, Scope and Approaches of cultural geography; Major themes of Cultural Geography: Concept of cultural hearth, cultural region, cultural landscape and cultural integration.	12
Unit 4	Characteristics of culture, its components and functions; Cultural diffusion and factors associated with it, concept of cultural lag and cultural landscape, Major cultural regions of the World and their characteristics.	12
	Total	**48**

Text Books:

1. Huntington, E., 1951: ***Principles of Human Geography***, John Wiley & Sons, Inc, New York
2. Hussain, M., 1994: ***Human Geography***, Rawat Publication, New Delhi.

Reference books:

1. Chhokas, K.B., Understanding Environment, Sage Publication.
2. Haggett, P., 1972: Geography: A Modern Synthesis, Harper & Row, New York
3. Park, C., 1997: The Environment, Routledge, London
4. Rozenblat., Celine., Pumain., Denise and Velasquez., Elkin Eds. (2018): International and Transnational Perspectives on Urban Systems, Springer, Japan, pages 393.

5. Singh, S., 1991: Environmental Geography, PustakBhawan, Allahabad
6. Strahler, A.N. & A.H. Strahler, 1976: Geography and Man's Environment, John Willey, New York

Paper II Core Course	CARTOGRAPHIC TECHNIQUES			Subject Code:
	L-T-P-C: 0-0-8-4	Credit Units: 4	Scheme of Evaluation: (P)	GEO162C112

Course Objectives: *This course focuses on the basics of map and map scale and its varied types along with the diagrammatic representation of geographical data.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** about map and its types, map scale, transect chart and profile mapping.	BT1
CO2	**Interpret** topographic and weather maps.	BT2
CO3	**Construct** graphs/charts, cartograms and thematic maps based on socio-economic, cultural and climatic data.	BT3
CO4	**Analyze** the importance of maps for regional development and decision making.	BT4

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Map: Classification and types; Concept and characteristics of isopleth, choropleth, chorochromatic and dot maps; thematic maps: types and characteristics	12
Unit 2	Concept of Map scale and types of map scale: Drawing of Graphical Scale for Miles / Km from a given R. F.; Comparative Scale of Mile and Kilometre from a given R. F. Representation of land use / religious groups/ any suitable distribution by drawing of proportionate pie charts / Urban population by sphere graph	12
Unit 3	Interpretation of topographical maps in terms of physical and cultural features and drawing of transect chart, Measurement of distance, direction between any two places and computation of area (by graphical/geometric or instrumental techniques) in a topographical map	12
Unit 4	Diagrammatic representation of data through line, bar, circle; Interpretation of weather maps**;** Analysis and mapping of Slope by Wentworth's method, profile drawing and construction of transect chart	12
	Total	**48**

Text Books:

1. Mishra R.P. and Ramesh, A., 1989: ***Fundamentals of Cartography***, Concept, New Delhi.
2. Sarkar, A., 2015: ***Practical Geography: A Systematic Approach***, Orient Blackswan Private Limited, New Delhi.

Reference Books:

1. Anson R. and Ormelling F. J., 1994: International Cartographic Association: Basic Cartographic Vol. Pregmen Press. Delhi.
2. Gupta K.K. and Tyagi, V. C., 1992: Working with Map, Survey of India, DST, New Delhi.
3. Loxton J., 1980: Practical Map Production, John Wiley.
4. Rhind D. W. and Taylor D. R. F., (eds.), 1989: Cartography: Past, Present and Future, Elsevier, International Cartographic Association.
5. Robinson A. H., 2009: Elements of Cartography, John Wiley and Sons, New York.
6. Steers J. A., 1965: *An Introduction to the Study of Map Projections*, London
7. Monkhouse F. J. and Wilkinson H. R., 1973: Maps and Diagrams, Methuen, London.
8. Sarkar, A. (2015) Practical Geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi

9. Singh R. L. and Singh R. P. B., 1999: *Elements of Practical Geography*, Kalyani Publishers
10. Talukdar. S, 2010 Introduction to Map Projections.

Paper III Core Course	GEOMORPHOLOGY			Subject Code:
	L-T-P-C: 2-0-4-4	Credit Units: 4	Scheme of Evaluation: (T+P)	GEO162C103

Course Objectives: *The pivotal point of this course is to make students familiar with the fundamental concepts of geomorphology which incorporates the topics related to geomorphic structure and processes, earth's interior and composition, evolution of landforms and so on.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the functioning of Earth systems in real time.	BT1
CO2	**Outline** the roles of structure, stage and time in shaping the landforms along with **interpreting** geomorphological maps.	BT2
CO3	**Apply** the knowledge in geographical research.	BT3
CO4	**Distinguish** between the mechanisms that control these processes and also **analyse** how the natural and anthropogenic operating factors affect the development of landforms.	BT4

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Geomorphology: Nature, Scope, key concepts and theories of landform development, Systems approach; Earth's Interior and its Structure	12
Unit 2	Composition of the Earth with special reference to seismology; Earth Movements: Isostasy, Plate Tectonics, Types of Folds and Faults, Earthquakes and Volcanoes.	12
Unit 3	Geomorphic Processes: Weathering, Mass Wasting, Cycle of Erosion (Views of Davis and Penck); Profile drawing (Serial, Superimposed, Composite, Projected) - **2 Exercises**	12
Unit 4	Evolution of Landforms (Erosional and Depositional): Fluvial, Karst, Aeolian and Glacial; Applied Geomorphology; Drainage basin delimitation, Ordering of streams, calculation of bifurcation ratio, length ratio, computation of basin circularity ratio- **1 exercise**	12
	Total	**48**

Text Books:

1. Ahmed, E., 1985: ***Geomorphology***, Kalyani Publishers, New Delhi
2. Bloom A. L., 2003: ***Geomorphology: A Systematic Analysis of Late Cenozoic Landforms***, Prentice-Hall of India, New Delhi.
3. Singh, Savindra., 1998: ***Geomorphology***, Pravalika Publications, Allahabad, Uttar Pradesh.

Reference Books:

1. Bridges E. M., 1990: *World Geomorphology*, Cambridge University Press, Cambridge.
2. Christopherson, Robert W., (2011), Geosystems: *An Introduction to Physical*
3. *Geography,* 8 Ed., Macmillan Publishing Company

4. Selby, M.J., (2005), *Earth's Changing Surface,* Indian Edition, OUP
5. Dayal, P. (2nd Ed.) 1996, A Textbook of Geomorphology, Shukla Book Depot, Patna
6. Kale V. S. and Gupta A., 2001: *Introduction to Geomorphology*, Orient Longman, Hyderabad.
7. Khullar D.R. 2012: Physical Geography, Kalyani Publishers, New Delhi
8. Skinner, Brian J. and Stephen C. Porter (2000), *The Dynamic Earth: An Introduction to Physical Geology,* 4th Edition, John Wiley and Sons
9. Singh, Savindra, 2014: Geomorphology, Pravalika Publications, Allahabad-02
10. Thornbury W. D., 1968: *Principles of Geomorphology*, Wiley.
11. Knighton A. D., 1984: *Fluvial Forms and Processes*, Edward Arnold Publishers, London.
12. Richards K. S., 1982: *Rivers: Form and Processes in Alluvial Channels*, Methuen, London
13. Wooldridge W. S. and Morgan R. S., 1959: *An Outline of Geomorphology: The Physical Basis of Geography*, Longmans.

Paper SEC Course	INTRODUCTION TO MAP MAKING L-T-P-C: 2-0-4-2 Credit Units: 2 (T+P) Scheme of Evaluation:	Subject Code: GEO162S111

Course Objectives: *This course primarily focuses on the basic concepts of art and science of map making in geographical study.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Recall** knowledge regarding the classification and elements of maps.	BT1
CO2	**Interpret** graphs and prepare qualitative and quantitative thematic maps.	BT2
CO3	**Apply** the maps for the proper utilization in the process of development.	BT3
CO4	**Examine** the preparation of various thematic maps with the application of various techniques.	BT4

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	History of Map making, Classification of maps, Types of maps , uses of maps	6
Unit 2	Principles of Map Design and lay out, calculation of Map scale, signs and symbols used in maps	6
Unit 3	Toposheet reading and interpretation, Thematic Maps – Preparation and Interpretation	6
Unit 4	Map Projection: Basic concepts, classification, basic Principles of construction of zenithal, conical and cylindrical groups of map projections and choice of map projections	6
	Total	**24**

Text Books:

1. Cuff J. D. and Mattson M. T., 1982: ***Thematic Maps: Their Design and Production***, Methuen Young Book
2. Dent B. D., Torguson J. S., and Holder T. W., 2008: ***Cartography: Thematic Map Design (6th Edition)***, Mcgraw-Hill Higher Education

Reference books:

1. Gupta K. K. and Tyagi V. C., 1992: Working with Maps, Survey of India, DST, New Delhi. 4.
2. Kraak M.-J. and Ormeling F., 2003: Cartography: Visualization of Geo-Spatial Data, Prentice-Hall
3. Mishra R. P. and Ramesh A., 1989: Fundamentals of Cartography, Concept, New Delhi.
4. Tyner J. A., 2010: Principles of Map Design, The Guilford Press
5. Singh R. L. and Singh R. P. B., 1999: Elements of Practical Geography, Kalyani Publishers.
6. Sarkar, A. (2015) Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi 11.

B.A./B. Sc. (Generic Elective) Course in Geography: Semester-I

Paper: GE I Generic Elective	SOCIAL AND POLITICAL GEOGRAPHY			Subject Code:
	L-T-P-C: 3-0-0-3	Credit Units: 3	Scheme of Evaluation: (T)	GEO162G101

Course Objectives: *The course aims to make students understand the basic concepts related to social and cultural geography in the geographical framework and provide knowledge on the political system and geopolitics of the world in the spatial context.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the fundamental concepts of social and political dimensions.	BT1
CO2	**Interpret** the social, cultural, and political concepts in a broader and analytical manner	BT2
CO3	**Build** knowledge on structures, formations of countries as well as on various schools of political geography	BT3
CO4	**Analyze** the socio-cultural and political theme in the geographical dimensions	BT4

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Definition and field of social geography; Concept of social differentiation, social structure and social stratification as reflected in race, tribe, caste, language, dialect and religion in India; concept of social well-being and its determination, Concept of Space: Types and characteristics of space.	6
Unit 2	Review of five year plans and area plans towards social policy in India; Strategies to improve social well-being in tribal, hill, drought and flood-prone areas; Spatial distribution of social groups in India	10
Unit 3	Nature, scope and subject matter of political geography; Approaches to the study of political geography, The field and school of thoughts in political geography: landscape school, ecology school	10
Unit 4	Concepts in political geography: frontier and boundary (with reference to India), lebensraum, state and nation, core-periphery and capital, buffer zone, federal state, Colonialism, desalinization, theories of Rim-land and Heartland.	10
	Total	**36**

Text Books:

1. Sen, J (2016): ***A Textbook of Social and Cultural Geography***, Kalyani Publishers, New Delhi
2. Dwiveda R. L. (2019): ***Fundamentals of Political Geography***, Surjeet Publications, Delhi

Reference Books:

1. John R. S., 1982: An introduction to Political Geography, Routledge, London
2. Ahmad, A., 1999: Social Geography, Rawat Publication, Jaipur and New Delhi
3. Ahmad, A. (ed), 1993: Social Structure and Regional Development: A Social Geography perspective, Rawat Publication, Jaipur
4. Pounds N .J. G. (1972): ***Political Geography***, McGraw Hill, New York

Paper: GE II Generic Elective	PHYSICAL GEOGRAPHY			Subject Code:
	L-T-P-C: 3-0-0-3	Credit Units: 3	Scheme of Evaluation: (T)	GEO162G102

Course Objectives: *The course aims to make students aware about physical surroundings (landforms, climate, ecosystems and oceanic landforms) their processes and patterns on the earth's surface and acquire knowledge on Ecological balance, Global climatic changes and consequences.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the basic terms and terminologies related to physical earth.	BT1
CO2	**Compare** different global climatic patterns, climate change and its related consequences.	BT2
CO3	**Identify** physical processes and the resultant environment and its impact which shapes our life on planet earth.	BT3
CO4	**Examine** ecological, climatic and atmospheric phenomena of the earth.	BT4

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Nature, Scope and branches of Physical Geography; Processes of landform development - Exogenic and endogenic processes; Earth materials- Composition of the earth's crust, Rocks and minerals (3); Concept of Cycle of Erosion (1)	10
Unit 2	The lithosphere and Plate Tectonics; Distribution of plants and animals, Structure, functioning and material cycles of Ecosystem, Ecological Balance, Traditional ecological knowledge	10
Unit 3	Elements and factors of weather and climate; Structure and Composition of Atmosphere; Air Circulation, Pressure Systems, Cyclones and anticyclones, Global Climatic patterns and Climatic change and its consequences.	10
Unit 4	Bottom Configuration of oceans with special reference to the Atlantic Ocean, Distribution of salinity, temperature and ocean deposits and resources, and ocean Currents.	6
		36

Text Books:

1. Strahler, A. N. and Strahler, A. H., 1989: ***Elements of Physical Geography* (4th Edition)**, John Wiley & Sons, New York.
2. Strahler, Alan, 2013: ***Introduction to Physical Geography***, Wiley, New York

Reference Books:

1. Dayal, P. (2nd Ed.) 1996, A Textbook of Geomorphology, Shukla Book Depot, Patna
2. Kale V. S. and Gupta A., 2001: *Introduction to Geomorphology*, Orient Longman, Hyderabad.
3. Singh, S. 2020: *Physical Geography*, Pravalika Publications, Allahabad.
4. Hussain, M.: Fundamentals of Physical Geography, Rawat Publications, Jaipur
5. Raina, N. S.: Contemporary Physical Geography, Rawat Publications, Jaipur
6. Khullar, D. R. , 2012: Physical Geography, Kalyani Publishers, New Delhi.
7. Lal, D. S, 2009: Physical Geography, Sharada Pustak Bhawan, Allahabad

B.A/B. Sc. (Honours) Course in Geography: Semester-II

B.A/B. Sc. (Honours) Course in Geography: Semester-II

Paper III Core Course	CLIMATOLOGY AND OCEANOGRAPHY			Subject Code:
	L-T-P-C: 2-0-4-4	Credit Units: 4	Scheme of Evaluation: (T+P)	GEO162C201

Course Objectives: *The course aims to illustrate the atmospheric elements, processes and resultant weather and climates, the impact of climates on planet earth, the oceanic processes, ocean floor topography and marine resources.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the elements of weather and climate and its impacts at different scales.	BT1
CO2	**Demonstrate** weather charts, hythergraph and other similar practical exercises.	BT2
CO3	**Develop** the climatic aspects and its bearing on planet earth and the oceanic process and availability of resources.	BT3
CO4	**Distinguish** between the different aspects of climatic and oceanic terms.	BT4

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	The structure and composition of Earth's atmosphere; Elements of weather and climate; Factors affecting the distribution of temperature; Vertical and horizontal and seasonal distribution of temperature; Insolation and heat budget; Temperature inversion; Atmospheric pressure and circulation of planetary winds; Air masses and their characteristics	12
Unit 2	Cyclones: Tropical Cyclones, Temperate Cyclones, Monsoon - Origin and Mechanism, Jet Streams; Atmospheric Moisture: Evaporation, Humidity, Condensation, Fog and Clouds, Precipitation Types, Stability and Instability; Climatic Regions, Climate change and global warming, El Nino; Preparation of rainfall variability map (Assam and Rajasthan) , drawing of hythergraph, climograph and ergograph	12
Unit 3	Ocean floor topography of Indian, Atlantic and Pacific oceans; Oceanic water Movements: Waves, Currents, Tsunamis and Tides; rainfall frequency analysis, water deficiency and surplus graph, weather chart interpretation,	12
Unit 4	Ocean Salinity and Temperature: Distribution and Determinants; Coral Reefs and Marine Deposits and Ocean Resources.	12
	Total	**48**

Text Books:

1. Critchfield, H. J., 1987: ***General Climatology***, Prentice-Hall of India, New Delhi
2. Lal, D.S., 2001, ***Climatology***, Chaitanya Publishing House, Allahabad

Reference Books:

1. Anikouchine W. A. and Sternberg R. W., 1973: The World Oceans: An Introduction to Oceanography, Prentice-Hall.
2. Barry, R. G. and Carleton , A. M., 2001: *Synoptic and Dynamic Climatology*, Routledge, UK.
3. Barry, R. G. and Chorley, R. J., 1998: *Atmosphere, Weather and Climate*, Routledge, New York.

4. Batten L. J., 1979: Fundamentals of Meteorology, Prentice-Hall Inc., Englewood Cliffs, New Jersey.
5. Boucher K., 1975: Global Climates, Halstead Press, New York.
6. Garrison T., 1998: Oceanography, Wordsworth Company, Belmont.
7. Gerald S., 1963: General Oceanography: An Introduction, John Willey & Sons, New York.
8. Kershaw S., 2000: *Oceanography: An Earth Science Perspective*, Stanley Thornes, UK.
9. King C. A. M., 1962: *Oceanography for Geographers*, Edward Arnold.
10. Lutgens F. K., Tarbuck E. J. and Tasa D., 2009: The Atmosphere: An Introduction to Meteorology, Prentice-Hall, Englewood Cliffs, New Jersey.
11. Oliver J. E. and Hidore J. J., 2002: Climatology: An Atmospheric Science, Pearson Education, New Delhi.
12. Pinet P. R., 2008: Invitation to Oceanography (Fifth Edition), Jones and Barlett Publishers, USA, UK and Canada.
13. Singh, S. Climatology, 2007, Sharada Pustak Bhawan, Allahabad
14. Strahler, Arthur. N., 1987: *Modern Physical Geography*, John Wiley and Sons, New York,
15. Singapore.
16. Strahler, A., 2018: Introducing *Physical Geography*, John Wiley and Sons, New York, Singapore.
17. Sharma R. C. and Vatal M., 1980: *Oceanography for Geographers*, Chaitanya Publishing House, Allahabad.
18. Trewartha G. T. and Horne L. H., 1980: *An Introduction to Climate*, McGraw-Hill.
19. Thurman H. V., 1996: *Essentials of Oceanography*, Prentice-Hall, New Jersey

Paper II Core Course	FUNDAMENTALS OF GEOINFORMATICS	Subject Code:
	L-T-P-C: 0-0-8-4 Credit Units: 4 Scheme of Evaluation: (P)	GEO162C212

Course Objectives: *The course aims to make student interpret the data, tools and technology and applications of Geoinformatics - GIS, Remote Sensing and GPS and Construct and Analyse maps using Geospatial Technology (Geoinformatics)*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the fundamental terms and terminologies of Geoinformatics.	BT1
CO2	**Outline** the strength and application of Geospatial Technology.	BT2
CO3	**Build** map of the resources, their location and availability.	BT3
CO4	**Analyse** the different remote sensing data sets collected from various platforms.	BT4

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Geoinformatics- Meaning and scope, The Earth: shape, size, and earth models; Referencing systems; Definition of map, map properties, Geospatial data types and structure and their characteristics; Georeferencing a scanned map **(1 Exercise)**; Creation of vector data layers - point, line and polygon and map layout **(2 Exercises)**;	10
Unit 2	Vector data editing; Vector Attribute database preparation; Basics of spatial and non-spatial / attribute database, relational database; Attribute mapping / thematic mapping of various attributes of point, line and polygon attributes **(3 Exercises)**.	14
Unit 3	Basic concept of Remote Sensing; Satellites – geostationary and remote sensing (Land sat and IRS) and Sensors, Resolution (spatial, spectral, radiometric and temporal) - **(1 Exercise)** Data characteristics, data acquisition and analysis techniques - visual interpretation **(2 Exercises)**; Important areas of applications; Global Position System (GPS) and applications: Mapping of utilities and services **(1 Exercise)**	12
Unit 4	Mapping, visualization, and analysis of Geospatial data: (a) Digital elevation data – Topographic map/GLOBE/GTOPO30 /SRTM - **(2 Exercises)** (b) Remote Sensing data- Preparation of Land use / Land cover (LU/LC) map from LANDSAT and IRS **(2 Exercises**) (c) Aerial photograph and its uses - **(1 Exercise)**	12
	Total	**48**

Text Books:

1. De Mars, M. N., 1999: **Fundamentals of Geographic Information Systems**, John Wiley & Sons Inc., New York.
2. Jensen, J. R., 2011: **Remote Sensing of the Environment – An Earth Resource Perspective**, 3rd Impression, Pearson, New Delhi.

Reference Books:

1. Burrough, P.A. and Mc Donnel, R. A., 1998: **Principles of Geographical Information Systems**, Oxford University Press.
2. Curtis, H., 2000: **The GPS Accuracy Improvement Initiative**, GPS World, June, 20
3. Chetry, N., 2019 (Ed): A Glimpse of Geospatial Technology and Applications, Eastern Book House, Guwahati

4. Sabins, Floyd F., 1987: **Remote Sensing Principles and Interpretation**, W.H. Freeman and Company, New York.

NOTE: Software packages: ArcGIS / QGIS /ILWIS, ERDAS Imagine/SAGA/ILWIS. Record of the exercises (duly signed by the teacher concerned within specified date for each exercise) in the form of Practical Note Book to be made by the students is mandatory. Records of all exercises of each unit is compulsory. Maximum 20-25% marks of Semester End Examination may be kept for viva and practical note book with equal weightage on each aspect. Rest of the marks may be more or less / equally distributed to each exercise depending on difficulty level. Semester End Examination will be of 4 (four) hours duration with maximum 2 (two) exercises only from any of the units

Paper I Core Course	GEOGRAPHY OF TOURISM			Subject Code:
	L-T-P-C: 3-1-0-4	Credit Units: 5	Scheme of Evaluation: (T)	GEO162C203

Course Objectives: *The course aims to make the students define the basic theme and concepts of tourism geography and interpret the geographical components of tourism.*

Learning Outcome:

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the geographical aspects that organise economic space.	BT1
CO2	**Illustrate** the geographical aspects of tourism in an area.	BT2
CO3	**Develop** practical field knowledge about tourist places across India.	BT3
CO4	**Analyse** the knowledge gathered through field visits and prepare their respective reports.	BT4

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Meaning, Scope and contents of Geography of tourism: Importance of geography of tourism; Types of tourism; Motivations of tourism; Components of Tourism;	12
Unit 2	Impacts of tourism: Environmental, Social, Cultural, and Economic impacts of tourism; Definition and principles of sustainable tourism development; Concept of carrying capacity; Concept of Responsible tourism	10
Unit 3	Tourism resources: Destination and resource factors; Mass tourism vs. alternative tourism; Ecotourism; Spatial pattern of Tourism Resources in India-National Parks, Wildlife sanctuaries, Tiger Reserves, Biosphere reserves & wetlands, history and culture	14
Unit 4	Important tourist destinations of India and abroad, Factors of travel, International date line **Field visits to major local attractions**: Group visits to tourist attraction in India guided by Faculty of the department. On completion of the tour, the students have to submit a tour report along with an oral presentation. These reports will be treated as assignments which would carry scores as per the prevailing evaluation guidelines of the university.	12
	Total	**48**

Text Books:

1. Bhatia, A. K., 1996***: Tourism Development: Principles and Practices,*** Sterling Publishers, New Delhi.
2. Sharma J. K. (ed.), 2000: ***Tourism Planning and Development - A new perspective***, Kanishka Publishers, New Delhi.

Reference Books:

1. Robinson, H., 1996: ***A Geography of Tourism***. Macdonald and Evans, London, 1996.
2. Williams Stephen, 1998: ***Tourism Geography***, Routledge, Contemporary Human
3. Geography Series, London.
4. Shaw G. and Williams A. M., 1994: ***Critical issues in Tourism-A Geographical Perspective***, Oxford: Blackwell

Paper SEC Course	REMOTE SENSING L-T-P-C: 2-0-4-2 Credit Units: 2 Scheme of Evaluation: (T+P)	Subject Code: GEO162S211

Course Objectives: *This course intends to show the rationale behind the use of remotely sensed data and its advantages and disadvantages and illustrate how GIS/GPS methodologies can be used to address spatial analysis from the theoretical and practical perspective.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** basic concepts of remote sensing.	BT1
CO2	**Interpret** principles and applications of various remote sensing techniques including aerial photography.	BT2
CO3	**Utilize** remote sensing data products for minor and major projects on environmental/natural resource assessments and mapping, disaster and hazard management, urban planning, and many applications.	BT3
CO4	**Apply** this knowledge for land use land cover map preparation.	BT4

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Remote Sensing: Definition and Development; Platforms and Types; Photogrammetry	6
Unit 2	Satellite Remote Sensing: Principles, EMR and its Interaction with Atmosphere and Earth Surface; Remote Sensing Satellites (Landsat and IRS); Sensors	6
Unit 3	Image Processing (Digital and Manual): Pre-processing (Radiometric and Geometric Correction); Enhancement (Filtering); Classification (Supervised and Un-supervised)	6
Unit 4	Satellite Image Interpretation; Applications of Remote Sensing: Land Use Land Cover mapping	6
	Total	**24**

Practical Record: A project file consisting of 4 exercises on using any method on above mentioned themes

Text Books:

1. Bhatta, B. (2008): ***Remote Sensing and GIS***, Oxford University Press, New Delhi
2. Reddy, M.A., (2006) : ***Textbook of Remote Sensing and Geographical Information Systems (4th Edition)***, B. S. Publications

Reference books:

1. Jensen, J. R. (2005) Introductory Digital Image Processing: A Remote Sensing Perspective, Pearson Prentice-Hall.

2. Joseph, G. 2005: Fundamentals of Remote Sensing, United Press India.
3. Lillesand T. M., Kiefer R. W. and Chipman J. W., 2004: Remote Sensing and Image Interpretation, Wiley. (Wiley Student Edition).
4. Campbell J. B., 2007: Introduction to Remote Sensing, Guildford Press

B. A. / B. Sc. (Generic Elective) Course in Geography: Semester-II

Paper GE-2 Core Course	**REGIONAL DEVELOPMENT OF NORTHEAST INDIA**			**Subject Code:**
	L-T-P-C: 3-0-0-3	**Credit Units: 3**	**Scheme of Evaluation: (T)**	**GEO162G201**

Course Objectives: *The course aims to define the regional basis of Northeast India and Assam and evaluate the basic ideas of the position of Northeast India and Assam in the Indian context.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the concepts involved in explaining North-East India as a regional unit.	BT1
CO2	**Compare** and interpret the disparity that prevails among the different states of northeast.	BT2
CO3	**Build** knowledge on population structure, industrial aspects, transport and communication of the region.	BT3
CO4	**Analyse** various prospects of northeast India and Assam.	BT4

Detailed Syllabus:

Modules	**Topics and Course Content**	**Periods**
Unit 1	North-East India: location and situation; Physiographic divisions of India, Climate: characteristics and classification, soil, drainage and natural vegetation	6
Unit 2	Population growth, spatial distribution, population characteristics, Social structure and distribution: by race, caste, religion, language, tribes	10
Unit 3	Natural resources and their distribution, utilization and development: Coal, petroleum, natural gas and forests in North-East India; constraints of Industrial development	10
Unit 4	Transport and communication system**,** Disparity in socio-economic development; socio-economic problems, problems and prospects of tourism	10
	Total	**36**

Text Books:

1. Taher M. and Ahmed, P., 2000: ***Geography of North East India***, Mani-Manik Prakash, Guwahati.
2. Bhagabati, A. K. ***et al,*** 2001: ***Geography of Assam***, Rajesh Publications, New Delhi.

Reference books:

1. Barua, P. C., 1990: ***Development Planning of North East India***, Mittal Publications, New Delhi.
2. North East India Geographical Society: ***North Eastern Geographer***, Department of Geography, Gauhati University.

Paper GE-2 Core Course	INTRODUCTION TO GEOSPATIAL TECHNOLOGY			Subject Code:
	L-T-P-C: 3-0-0-3	Credit Units: 3	Scheme of Evaluation: (T)	GEO162G202

Course Objectives: *The course aims to explain the technological revolution in mapping and analysing resources and infrastructure using Geospatial Technologies and develop theoretical knowledge and skill in Remote Sensing, GIS and GPS.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**List** the basic concepts and historical development of geographical information technology.	BT1
CO2	**Interpret** data structure, functions and working of geographical information technology.	BT2
CO3	**Apply** the geographical information technology for the sustainable development of the nation.	BT3
CO4	**Analyse** and understand the basics of EMR and energy interaction in atmosphere and on earth surface features.	BT4

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Introduction: Definitions, Concept and Historical development of Geospatial Information Technology; Geospatial Data: Data Products, Web data sources; Data types and structures (Raster, Vector and TIN) and their characteristics	6
Unit 2	Basics of Geographical Information Systems (GIS);Database Management Systems, Georeferencing; Point and line data interpolation and modelling	10
Unit 3	Basic concept of Remote Sensing (RS); Electro-Magnetic Radiation (EMR) Principles; Satellites –geostationary and remote sensing (Landsat and IRS) and Sensors, Resolution (spatial, spectral, radiometric, and temporal); Data interpretation - visual and digital techniques; Important areas of applications	10
Unit 4	Introduction to Global Positioning System: Working Principles and major areas of applications; Geospatial Information Technology for Natural Resource Monitoring, Management and Sustainable Development	10
	Total	**36**

Text Books:

1. Burrough, P.A. and Mc Donnel, R. A., 1998: ***Principles of Geographical Information Systems***, Oxford University Press.
2. Bhatta, B., 2008. ***Remote sensing and GIS.*** Oxford University Press, USA.

Reference Books:

1. Curtis, H., 2000: ***The GPS Accuracy Improvement Initiative***, GPS World, June, 20
2. De Mars, M. N., 1999: ***Fundamentals of Geographic Information Systems***, John Wiley & Sons Inc., New York.
3. Jensen, J. R., 2011: ***Remote Sensing of the Environment – An Earth Resource Perspective***, 3rd Impression, Pearson, New Delhi.
4. Sabins, Floyd F., 1987: ***Remote Sensing Principles and Interpretation***, W.H. Freeman and Company, New York.

B.A/B. Sc. (Honours) Course in Geography: Semester-III

B.A/B. Sc. (Honours) Course in Geography: Semester-III

Paper I Core Course	ECONOMIC GEOGRAPHY			Subject Code:
	L-T-P-C: 2-0-4-4	Credit Units: 4	Scheme of Evaluation: (T+P)	GEO162C301

Course Objectives: *It focuses on the basic concepts of economic geography and its associated patterns and processes of the prime economic activities of the world.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** concepts and ways on how geographical aspects organise economic space.	BT1
CO2	**Compare** different sectors of economy and arrive at logical conclusion regarding importance of each sector in economic development of the nation.	BT2
CO3	**Identify** the principles and significance of economic geography.	BT3
CO4	**Discover** new insights among students on the relevance of economy and geography and associated problems in contemporary times.	BT4

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Meaning and scope of Economic Geography; Approaches in Economic Geography; Concept and classification of economic activity; factors influencing economic activities.	10
Unit 2	Primary Activities: Subsistence and Commercial agriculture, forestry, fishing and mining; Secondary Activities: Manufacturing (Cotton Textile, Iron and Steel), Concept of Manufacturing Regions; Special Economic Zones and Technology Parks; Tertiary Activities: Transport, Trade and Services.	14
Unit 3	Theories of Economic Geography: Von Thunen's model of agricultural location, Industrial location theories of Weber, E.M. Hoover, A. Losch, A. Pred and D. M. Smith; Theories of economic development by Myrdal and Rostow.	14
Unit 4	Economic Geography of Resources; Global pattern of distribution and production of selected resources: Food grains, iron ore, coal, petroleum and nuclear power; Global economic scenario.	10
	Total	**48**

Text Books:

1. Alexander J. W., 1963: ***Economic Geography***, Prentice-Hall Inc., Englewood Cliffs, New Jersey.
2. Coe N. M., Kelly P. F. and Yeung H. W., 2007: ***Economic Geography: A Contemporary Introduction***, Wiley-Blackwell.

Reference Books:

1. Wheeler J. O., 1998: *Economic Geography*, Wiley..
2. Durand L., 1961: *Economic Geography*, Crowell.
3. Bagchi-Sen S. and Smith H. L., 2006: *Economic Geography: Past, Present and Future*, Taylor and Francis.
4. Willington D. E., 2008: *Economic Geography*, Husband Press.

5. Clark, G. L., Feldman, M. P., Gertler, M. S., & Williams, K. (Eds.). (2003). *The Oxford handbook of economic geography*. Oxford University Press

Paper II Core Course	QUANTITATIVE METHODS IN GEOGRAPHY	Subject Code:
	L-T-P-C: 3-1-0-4 Credit Units: 4 Scheme of Evaluation: (T)	GEO162C302

Course Objectives: *This paper provides an understanding of the pure and applied nature of Geography along with the key elements in the discipline.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the statistical methods and quantitative techniques used in Geography.	BT1
CO2	**Interpret** various methods and techniques of data collection, data tabulation, data interpretation and analysis.	BT2
CO3	**Identify** the importance of data in geography.	BT3
CO4	**Analyse** data through tabulation, sample size and other methods by handling data in the field.	BT4

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Quantitative and qualitative techniques; Significance and limitations of quantitative techniques; Descriptive and inferential statistics; Levels of measurement; Data sources and acquisition techniques; Significance and limitations of quantitative techniques; Descriptive and inferential statistics;	10
Unit 2	Measures of central tendencies (Mean, Median and Mode); Measures of dispersion (Range, Quartile Deviation, Mean Deviation, Standard Deviation; Coefficient of variation); Concept of spatial mean and median centres	12
Unit 3	Sampling: Purposive, Random, Systematic and Stratified and their utilities in geographical data collection and analysis.	12
Unit 4	Time series analysis techniques: Moving average and Least Squares Methods; Correlation analysis (Spearman's Rank correlation and Karl Pearson's product moment correlation coefficient); Regression analysis in geographic studies (linear and non-linear); regression residual mapping. (Exercises-4)	14
	Total	**48**

Text Books:

1. Mahmood A., 1977: ***Statistical Methods in Geographical Studies***, Concept.
2. Hammond P. and McCullagh P. S., 1978: ***Quantitative Techniques in Geography: An Introduction***, Oxford University Press.

Reference Books:

1. Berry B. J. L. and Marble D. F. (eds.): *Spatial Analysis – A Reader in Geography*. Monkhouse, F.J. &Wilkinson,H.R.,1989: Maps and Diagrams, B.I Publication, New Delhi
2. Pal S. K., 1998: *Statistics for Geoscientists*, Tata McGraw Hill, New Delhi.
3. Sarkar, A. (2013) Quantitative geography: techniques and presentations. Orient Black Swan Private Ltd., New Delhi
4. Silk J., 1979: *Statistical Concepts in Geography*, Allen and Unwin, London.
5. Spiegel M. R.: Statistics, *Schaum's Outline Series.*
6. Yeates M., 1974: *An Introduction to Quantitative Analysis in Human Geography*, McGraw Hill, New York.

Paper III Core Course	PROJECT WORK			Subject Code:
	L-T-P-C: 0-0-8-4	Credit Units: 4	Scheme of Evaluation: (P)	GEO162C313

Course Objectives: *This paper provides an understanding the basics of research project preparation.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Relate** real world issues for carrying out research on a specific field	BT1
CO2	**Infer** ideas of research through literature review.	BT2
CO3	**Develop** hypothesis and research questions.	BT3
CO4	**Identify** appropriate sampling techniques.	BT4
CO5	**Interpret** the various types of data along with **critical evaluation**.	BT5
CO6	**Design and develop** a detail project report	BT6

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Identification of research problem / topic on any one of the following aspects (preferably of local area / District / State) Any kind of geographical studies on socio-economic / cultural issues / demographic problems and characteristics The topic selection / modification may be done just before the 2nd Semester End Examination so that the data collection can be done during semester break.	24
Unit 2	Preparation of project report in prescribed format during 4th week of the commencement of course of 3rd semester. Final project presentation by each student using PowerPoint during on the scheduled date of viva-voce examination of this paper.	24
	Total	**48**

Note: Students will work as an intern during the semester break for 4 weeks after 4th semester. Students not being able to obtain any internship will be assigned project work from the department.

Text Books:

As per the list of given in the syllabus for other papers

Reference Books:

As per the list of given in the syllabus for other papers

Paper DSE - 1	PRINCIPLES OF AGRICULTURAL GEOGRAPHY L-T-P-C: 4-0-0-4 Credit Units: 4 Scheme of Evaluation: (T)	Subject Code: GEO162D301

Course Objectives: *The course tries to make the students understand the basic concepts of agricultural geography and its associated patterns and processes of the prime economic activities of the world.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** concepts of agricultural geography.	BT1
CO2	**Compare** different sectors of economy and arrive at logical conclusion regarding importance of agriculture sector in economic development of the nation.	BT2
CO3	**Identify** the principles and significance of agricultural geography.	BT3
CO4	**Discover** new insights on the relevance of agricultural geography and associated problems in contemporary times.	BT4

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Trends in the study of agricultural geography, Approaches to the study of agricultural geography: commodity, systematic, regional, inductive and deductive, Determinants of agriculture: physical, economic, social, institutional and technological,	12
Unit 2	Factors of agricultural production: land, labour, capital, organization and govt. policy, Concept of large-scale and small-scale agriculture , Agricultural region, agricultural types and agricultural systems, Land use and land capability classification,	12
Unit 3	Methods of agricultural regionalization: crop-combination, crop concentration and diversification, crop intensity, degree of commercialisation , crop rotation and agricultural efficiency, Agricultural productivity: concept and measurement, factors influencing crop productivity,	14
Unit 4	Problems of agriculture: crop and cropping hazards, sustainability of agricultural practices and production; Technological factors in Indian agriculture, Government policy for agricultural policy and planning and agricultural trade in India.	10
	Total	**48**

Text Books:

1. Anderson, J.R., 1970: A Geography of Agriculture, Iowa: WMC Brown Co. Clark, Colin and Haswell, Margaret, 1964: The Economy of Subsistence Agriculture, St. Martin's, London.
2. Chorley, R. J. and Haggett, P., 1971: Socio-Economic Models in Geography, Methuen and Co. Ltd., London.
3. Dunn, E. S., 1954: The Location of Agricultural Production, University of Florida Press, Gainsville.

Reference Books:

1. Hussain, M., 2001: Systematic Agricultural Geography, Rawat Publication, Jaipur and New Delhi.
2. Morgan, W.B. and Munton, R.J.C., 1971: Agricultural Geography, Methuen, London.
3. Singh, J., 1974: Agricultural Atlas of India: A Geographical Analysis, Vishal Publishers, Kurukhsetra.
4. Singh, J., 1976: Agricultural Geography, Tata McGraw Hill Pub. Co., New Delhi.
5. Symons, L., 1967: Agricultural Geography, G. Bells and Sons, London.

Learning Outcomes:

By the end of this course the students will be able to

- Understand the principles of agricultural geography
- Understand various concepts related to agricultural geography
- Understand the strategic importance and applicability of agricultural geography in national and global aspects

Paper, DSE - 1	AGRICULTURAL PRACTICES IN INDIA L-T-P-C: 4-0-0-4 Credit Units: 4 Scheme of Evaluation: (T)	Subject Code: GEO162D302

Course Objectives: *The course aims to make the students understand the role and place of agriculture in Indian Economy.*

Course Outcomes:

By the end of this course the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Recall** the definition, basic concepts and field of Agricultural Geography.	BT1
CO2	**Apply** the various indices associated with agriculture.	BT2
CO3	**Develop** the basic ideas related to geographical perspective of agriculture in India.	BT3
CO4	**Analyse** the fundamental processes associated with agricultural system of India.	BT4
CO5	**Appraise** the significance of agriculture in Indian economy.	BT5

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Place of Indian agriculture in global economy, type, characteristics, growth, distribution and development, Agricultural regions of India and their characteristics, Indian agriculture: types, characteristics, growth, distribution and development	10
Unit 2	Agricultural land use pattern and shifting cropping pattern in India; Regional variation in the levels of agricultural development in India - Food deficit and food surplus regions; nutritional index, sustainability of agricultural practices and production	14
Unit 3	Problems of Indian agriculture: crop and cropping hazards, sustainability of agricultural practices and production; Technological factors in Indian agriculture, Government policy for agricultural policy and planning and agricultural trade in India.	10
Unit 4	Agriculture in North East India – Agriculture as an economic basis of North-East India; major food crops and cash crops produced; problems and prospects of agriculture in North-East India with special reference to Assam	14
	Total	**48**

Text Books:

1. Bayliss Smith, T. P., 1987: The Ecology of Agricultural Systems. Cambridge University Press, London
2. Morgan, W.B. : Agriculture in the Third World - A Spatial Analysis. Westview Press, Boulder, 1978
3. Hussain, M., 2001: Systematic Agricultural Geography, Rawat Publication, Jaipur and New Delhi.

Reference Books:

1. Grigg, D.B., 1978: *Agricultural Systems of the World: An Evolutionary Approach*, Cambridge
2. University Press, Cambridge.
3. Singh, J., 1976: *Agricultural Geography*, Tata McGraw Hill Pub. Co., New Delhi. Sukla, S. P. and
4. Agarwal, A.K.: *Agriculture in Northeast India*.
5. Hussain, M., 2001: Systematic *Agricultural Geography*, Rawat Publication, Jaipur and New Delhi.

6. Mohammad, N. (ed), 1992: *New Dimensions in Agricultural Geography* (in 8 Volumes), Concept Publishing Company, New Delhi.

Paper: GE I Generic Elective	POPULATION STUDIES			Subject Code:
	L-T-P-C: 3-0-0-3	Credit Units: 3	Scheme of Evaluation: (T)	GEO162G301

Course Objectives: *The course aims to make students understand different concept related to population and their characteristics.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the basic definitions and concepts related to population geography.	BT1
CO2	**Outline** the population parameters of India.	BT2
CO3	**Apply** and analyse the resultant impact of contemporary issues related to population on society and environment.	BT3
CO4	**Analyse** contemporary issues related to population dynamics and environment.	BT4

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Definition, nature and scope of Population Geography, population geography and demography, distribution, growth and density of population with special reference India and World, sources of population data	6
Unit 2	Composition of population, components of population growth, Demographic Transition Model, Malthusian Theory, population policies of developed and developing nations with special reference to India and China	6
Unit 3	Population and Development: population and resource relationship, concept of optimum, under and over population, concept of Human Development Index, Gross National Happiness Index	6
Unit 4	Contemporary issues in population geography: ageing of population, life style diseases, gender issues, gender based violence, international migration and displacement, population and environment dichotomy.	6
	Total	**24**

Text Books:

1. Chandna, R.C. 2016. ***Geography of Population: Concepts, Determinants and Patterns***, Kalyani Publishers
2. Sandram, K.V. and Nangia, S., (eds): ***Population Geography***, Heritage publishers, New Delhi, Inc., New York.

Reference Books:

1. Clarke, J.I., 1972: ***Population Geography***, Pergamon Press, Oxford.
2. Peters, G.L. and larkin, R.P., 1979: ***Population Geography: Problems, Concepts and Prospects***, Kandall/ Hunt Iowa.

Paper: GE II Generic Elective	BIOGEOGRAPHY			Subject Code:
	L-T-P-C: 3-0-0-3	Credit Units: 3	Scheme of Evaluation: (T)	GEO162G302

Course Objectives: *The course aims to make students understand the fundamental concept of biogeography under various categories.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** and understand the basic terms and concepts of biogeography.	BT1
CO2	**Interpret** the important issues pertaining to environment.	BT2
CO3	**Construct** the basic concepts of biogeography.	BT3
CO4	**Analyse** independently the various biodiversity conservation and management issues.	BT4

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Nature, scope and subject matter of biogeography, ecology, ecosystem, trophic level, food chain and energy flow in ecosystem, nutrient cycle	6
Unit 2	Biomes, distribution of plants and animal, ecological regions with special reference to India	10
Unit 3	Biodiversity, biodiversity hot spot, conservation of biodiversity and mechanism: national park, marine national park, wildlife sanctuary, reserve forest, bird sanctuary; with special reference to India	10
Unit 4	Conservation of the environment, important environmental days, EIA, UNFCC, UNCED, environmental policies in India.	10
		36

Text Books:

1. Odum, E.P., 1977: ***Fundamentals of Ecology***
2. Bhattacharya, N.N., 2003, ***Biogeography***, Rajesh Publications, New Delhi.

Reference Books:

1. Lomolino, M. V., Riddle, B. R., Whittaker, R. J. (2017). Biogeography, fifth edition. (5), 730. Sunderland, MA: Oxford University Press.
2. Savindra, S., 2015, Environmental Geography, Pravalika Publications, Allahabad.
3. Anderson: Ecology for Environmental Science.

B.A/B. Sc. (Honours) Course in Geography: Semester-IV

BA/B. Sc. (Honours) Course in Geography: Semester-IV

Paper I Core Course	SOCIAL AND POLITICAL GEOGRAPHY L-T-P-C: 3-1-0-4 Credit Units: 4 Scheme of Evaluation: (T)	Subject Code: GEO162C401

Course Objectives: *The objective of the course is to introduce students to the principles and significance of social and political geography.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Find** the definition, basic concepts and field of the subject.	BT1
CO2	**Explain** the social, cultural and political concept in a broader and analytical manner.	BT2
CO3	**Develop** new insights among students on the relevance of social and political aspects of geography and associated problems in contemporary times.	BT3
CO4	**Analyse** the socio-cultural and political theme in the geographical dimensions.	BT4

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Nature of Social Geography: Meaning, scope and subject matter of Social Geography; Growth and development of Social Geography; Meaning and characteristics of Society; Types of Society: Tribal, agrarian and industrial; Community: meaning and characteristics; Basic concept of social space, social group, social hierarchy, social inequality and social justice	12
Unit 2	Elements of Society: Social Groups: meaning, classification and characteristics; Importance of social groups; Spatial distribution of social groups in India	12
Unit 3	Nature of Political Geography: Meaning and scope of political geography; Approaches to the study of political geography; The field and school of thoughts in political geography: Landscape school and Ecology school	12
Unit 4	Issues and concepts of Political Geography: Frontier and boundary (with reference to India), lebensraum, state and nation, core-periphery and capital, buffer zone, federal state, Rim-land and Heartland; Mackinder's Heartland theory	12
	Total	**48**

Text Books:

1. A Sen, J (2016): ***A Textbook of Social and Cultural Geography,*** Kalyani Publishers, New Delhi
2. Dwiveda R. L. (2019): ***Fundamentals of Political Geography,*** Surjeet Publications, Delhi

Reference books:

1. John R. S., 1982: ***An introduction to Political Geography***, Routledge, London.
2. Ahmad, A., 1999: ***Social Geography***, Rawat Publication, Jaipur and New Delhi.
3. Ahmad, A. (ed), 1993: ***Social Structure and Regional Development: A Social Geography perspective***, Rawat Publication, Jaipur.
4. Noble, A. G. and Dutta, A. K. (eds): ***India: Cultural Pattern and Processes***, West View Press, Colorado.

Paper II Core Course	ENVIRONMENTAL GEOGRAPHY			Subject Code:
	L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEO162C402

Course Objectives: *The course aims to give the idea of the concept of global environment and its impact on various aspects, along with providing knowledge on adaptation and mitigation of climate impacts and also to know institutional role in it.*

Course Outcomes:

By the end of this course the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Relate** to basics of science of environmental change and sustainable development.	BT1
CO2	**Classify** different types of natural resources and its importance.	BT2
CO3	**Develop** understanding about various impacts of Climate Change on Agriculture and Water, Flora and Fauna, Human Health, ozone layer and other spheres of environment.	BT3
CO4	**Inspect** upon the issues of adaptation and mitigation from hazards and management of solid wastes.	BT4
CO5	**Explain** the policies of development and environmental protection in developed and developing countries.	BT5

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Environmental Geography: Concept, Scope and Significance; Human-Environment Relationships: Historical Progression, Adaptation in different Biomes.	14
Unit 2	Eco-system: Concept, types and components, structure and functions; Ecology – Concept and Principles, Environmental Laws in India: Wild life Act, Forest Acts, Environmental Protection Ac.	14
Unit 3	Major Global Environmental Problems: Pollution, Deforestation, Desertification, Global Warming, Bio-Depletion. Management of Environment and Resources; Importance of Environmental Impact Assessment,	10
Unit 4	Environmental Programmes and Policies – Global, National and Local levels; Stockholm Conference, the Earth Summits, Inter- Governmental Panel for Climate Change (IPCC)	10
	Total	**48**

Text Book:

1. Chandna R. C., 2002: *Environmental Geography*, Kalyani, Ludhiana.
2. Miller G. T., 2004: *Environmental Science: Working with the Earth, Thomson*BrooksCole, Singapore.
3. Goudie A., 2001: *The Nature of the Environment*, Blackwell, Oxford.
4. MoEF, 2006: *National Environmental Policy-2006*, Ministry of Environment and Forests, Government of India.

References:

1. Odum, E. P. et al, 2005: *Fundamentals of Ecology*, Ceneage Learning India.
2. Singh S., 1997: *Environmental Geography*, PrayagPustakBhawan, Allahabad.
3. Singh, R.B. (Eds.) (2009) *Biogeography and Biodiversity*. Rawat Publication, Jaipur
4. Singh, R.B. (1998) *Ecological Techniques and Approaches to Vulnerable Environment*, New Delhi, Oxford & IBH Pub

DSE II	FIELD WORK IN GEOGRAPHICAL RESEARCH	Subject Code:
	L-T-P-C: 0-0-8-4 Credit Units: 4 Scheme of Evaluation: (P)	GEO162D401

Course Objectives: *It aims to give the idea of the importance of various surveying techniques in geographical study, and understand the field ethics and different tools of field study.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**How** to scientifically design a research and write a field report.	BT1
CO2	**Interpret** the various dimensions of field work and its role in geographical studies.	BT2
CO3	**Identify** the principles and techniques of surveying.	BT3
CO4	**Analyze** with the help of different surveying techniques for representation of various spatial objects/Phenomena.	BT4

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Geographic Research: Definition and types, Research methodology in geography; Defining a research problem; Statement of the problem; Objectives, and hypothesis/ research questions, Database and methodology, significance, review of research works and bibliography and references, Research design: Meaning, need and features of a good design	10
Unit 2	Field Work in Geographical Studies – Role, Value, Data and Ethics of Field-Work; Defining the Field and Identifying the Case Study – Rural / Urban / Physical / Human / Environmental; Designing the Field Report – Aims and Objectives, Methodology, Analysis, Interpretation and Writing the Report	14
Unit 3	Field Tools and Techniques – Merits, Demerits and Selection of the Appropriate Technique; Observation (Participant / Non Participant), Questionnaires (Open/ Closed / Structured / Non-Structured) Interview with Special Focus on Focused Group Discussions; Space Survey (Transects and Quadrants, Constructing a Sketch), Surveying: Plane and Geodetic Surveying; Concept of ground surveying	14
Unit 4	Research ethics: Plagiarism- classification and prevention; Intellectual property rights; Research report: Structural components and presentation.	10
	.	**48**

Text Books:

1. Creswell J., 1994: ***Research Design: Qualitative and Quantitative Approaches,*** Sage Publications.
2. Steers, J. A., 1965: ***An Introduction to the Study of Map Projection***, University of London, London

Reference Books:

1. 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. Special Issue on "Doing Fieldwork" The Geographical Review 91:1-2 (2001).
2. Stoddard R. H., 1982: *Field Techniques and Research Methods in Geography*, Kendall/Hunt.

Wolcott, H. 1995. *The Art of Fieldwork*. Alta Mira Press, Walnut Creek, CA

DSE II	RESEARCH METHODOLOGY IN GEOGRAPHY L-T-P-C: 4-0-0-4 Credit Units: 4 Scheme of Evaluation: (T)	Subject Code: GEO1642D402

Course Objectives: *The course aims to make the students understand the basics of qualitative and quantitative research, literature review, data collection, identification of research problem, formulate research objectives and research questions, formulation of hypothesis and testing, framing of questionnaires, techniques of collection of both qualitative and quantitative data and their analysis.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the concepts and tools of research.	BT1
CO2	**Infer** ideas that can be taken up for research work through literature review.	BT2
CO3	**Develop** hypothesis and research questions.	BT3
CO4	**Identify** appropriate data collection and sampling techniques.	BT4
CO5	**Interpret** the various types of data along with **critical evaluation**.	BT5
CO6	**Design and develop** a scientific research report	BT6

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Research: Definition, types, significance and important features; Research methodology in geography; Defining a research problem; Statement of the problem; Objectives, and hypothesis/ research questions, Database and methodology, significance, review of research works and bibliography and references.	12
Unit 2	Research design: Meaning, need and features of a good design, Field techniques in Geography: Types, role and significance; Questionnaire design (Open, Closed, Structured, Non-structured), data collection, Interview with Special Focus on Focused Group Discussions	12
Unit 3	Space Survey (Transects and Quadrants, Constructing a Sketch), Surveying: Plane and Geodetic Surveying; Concept of ground surveying Post field processes: construction of data matrix, data processing and analysis; Role of quantitative techniques in Geography	12
Unit 4	Sources of geographic data (Conventional and Geospatial technology based), their representation, interpretation and analysis; Research ethics: Plagiarism- classification and prevention; Intellectual property rights; Research report: Structural components and presentation.	12
	Total	**48**

Note: Computer / calculator based compulsory home assignments may be given for various units. Scientific calculator may be permitted in the examination hall for this paper.

Paper SEC Course	Report Writing on Environmental Issues			Subject Code:
	L-T-P-C: 2-0-4-2	Credit Units: 2	Scheme of Evaluation: (T+P)	GEO162S411

Course Objectives: *This course intends to make the students understand the various dimensions of field work and its role in geographical studies, along with introducing to basic report writing and field tools.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Choose** new geographical landscape as study area.	BT1
CO2	**Infer** in-depth knowledge of different field techniques.	BT2
CO3	**Choose** the field ethics and different tools of field study.	BT3
CO4	**Analyze** different field techniques in detail.	BT4

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Visit a local polluted area (local urban area/ agricultural area) , map the area and note the environmental issues thereof.	12
Unit 2	Generation of report (within about 100 A4 size pages including 30-40 maps/diagrams/field photographs) on the basis of field works carried out under	12
	Total	**24**

Text Books:

1. Creswell, J., (1994). ***Research Design: Qualitative and Quantitative Approaches***. UK: Sage Publications.
2. Dikshit, R. D. (2003). ***The Art and Science of Geography: Integrated Readings***.

Reference books:

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

Wolcott, H. (1995). The Art of Fieldwork. CA, USA: Alta Mira Press.

B.A./B. Sc. (Generic Elective) Course in Geography: Semester-IV

Paper: GE I Generic Elective	CLIMATE CHANGE VULNERABILITY AND ADAPTATION L-T-P-C: 3-0-0-3 Credit Units: 3 Scheme of Evaluation: (T)	Subject Code: GEO162G401

Course Objectives: *The course aims to give the idea of the concept of climate change and its impact on various aspects, along with providing knowledge on adaptation and mitigation of climate impacts and also to know institutional role in it.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Relate** to basics of Science of Climate Change.	BT1
CO2	**Classify** different types of vulnerability.	BT2
CO3	**Develop** understanding about various Impacts of Climate Change on Agriculture and Water; Flora and Fauna; Human Health.	BT3
CO4	**Inspect** upon the issues of adaptation and mitigation.	BT4

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Science of Climate Change: Understanding Climate Change; Green House Gases and Global Warming; Global Climatic Assessment- IPCC	6
Unit 2	Climate Change and Vulnerability: Physical Vulnerability; Economic Vulnerability; Social Vulnerability	10
Unit 3	Impact of Climate Change: Agriculture and Water; Flora and Fauna; Human Health; Adaptation and Mitigation: Global Initiatives with Particular Reference to South Asia.	10
Unit 4	National Action Plan on Climate Change; Local Institutions (Urban Local Bodies, Panchayats)	10
	Total	**36**

Text Books:

1. IPCC. (2007). Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge, UK: Cambridge University Press.
2. IPCC. (2014). Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge, UK: Cambridge University Press.

Reference Books:

1. Malhotra, Nitasha and Sen, Shyamoli, 2018: Climatology, R.K. Books, New Delhi.
2. Sen Roy, S. and Singh, R.B. (2002). Climate Variability, Extreme Events and Agricultural Productivity in Mountain Regions. New Delhi, India: Oxford & IBH Pub.

3. Singh, M., Singh, R.B. and Hassan, M.I. (Eds.) (2014). Climate change and biodiversity: Proceedings of IGU Rohtak Conference, Volume 1. Advances in Geographical and Environmental Studies. Basel: Springer
4. OECD. (2008). Climate Change Mitigation: What Do we Do? Organisation and Economic Co-operation and Development (www.oecd.org/env/cc)
5. UNEP. (2007). Global Environment Outlook: GEO4: Environment for Development. Nairobi, Kenya: United Nations Environment Programme.

Paper: GE II Generic Elective	**RURAL DEVELOPMENT**			**Subject Code: GEO162G402**
	L-T-P-C: 3-0-0-3	**Credit Units: 3**	**Scheme of Evaluation: (T)**	

Course Objectives: *The course aims to make students aware of the concepts, approaches and planning process related to rural development in India, along with understanding the rural economic base, rural development process and provision of services in rural areas.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the need and approaches to rural development.	BT1
CO2	**Interpret** in detail about the rural economic base especially about the significance of development of non-farm sector in rural areas.	BT2
CO3	**Develop** in-depth knowledge of pre and post-independence period of rural development.	BT3
CO4	**Analyze** the relevance of access to services like health, education in rural areas.	BT4

Detailed Syllabus:

Modules	**Topics and Course Content**	**Periods**
Unit 1	Defining Development: Inter-Dependence of Urban and Rural Sectors of the Economy; Need for Rural Development, Gandhian Approach of Rural Development	6
Unit 2	Rural Economic Base: Panchayati raj System, Agriculture and Allied Sectors, Seasonality and Need for Expanding Non-Farm Activities, Co-operatives, PURA.	10
Unit 3	Target Group Approach to Rural Development: SJSY, MNREGA, Jan Dhan Yojana and Rural Connectivity.	10
Unit 4	Provision of Services – Physical and Socio-Economic Access to Elementary Education and Primary Health Care and Micro credit	10
		36

Text Books:

1. Krishnamurthy, J. (2000). ***Rural Development - Problems and Prospects***. Jaipur, India: Rawat Publs.
2. Singh, R.B. (1985): ***Geography of Rural Development***. New Delhi, India: Inter India.

Reference Books:

1. Gilg, A. W. (1985). An Introduction to Rural Geography. London, UK: Edwin Arnold.
2. Lee, D. A. and Chaudhri, D. P., (eds.) (1983). Rural Development and State. London, UK: Methuen.
3. Palione, M. (1984). Rural Geography. London, UK: Harper and Row.

4. Robb, P. (1983). Rural South Asia: Linkages, Change and Development. UK: Curzon Press.
5. UNAPDI. (1986). Local Level Planning and Rural Development: Alternative Strategies. New Delhi, India: (United Nations Asian & Pacific Development Institute, Bangkok), Concept Publs. Co.

B.A/B. Sc. (Honours) Course in Geography: Semester-V

B.A/B. Sc. (Honours) Course in Geography: Semester-5

Paper I Core Course	REGIONAL PLANNING AND DEVELOPMENT L-T-P-C: 3-1-0-4 Credit Units: 4 Scheme of Evaluation: (T)	Subject Code: GEO162C501

Course Objectives: *This course intends to make the students* **u**nderstand the concept of a region from a Geographic perspective and its ramifications in planning.

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** basic concepts of regional planning	BT1
CO2	**Explain** the strategic importance and applicability of planning in multi-level aspects	BT2
CO3	**Build** plans for development in rural and urban regions	BT3
CO4	**Apply** this knowledge in real world situations.	BT4
CO5	**Interpret** various issues related to regional planning on national and global perspective	BT5

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Concept of region, regionalization, regionalism and regional development; Types of Regions; Meaning and purpose of regional planning; Approaches to regional planning	12
Unit 2	Identification of resource regions; Concept of Development: Growth versus development; Concept of sustainable development and balanced development, Case studies of regional planning exercises: National Capital Region and River basin planning- a case study from India	12
Unit 3	Decentralization and Multi-level planning - features of decentralised planning, decentralised planning in India, concept and procedures in multilevel planning; stages in the evolution of multi-level planning process, multi-level planning in India, Regional planning strategy under Five Year Plans, Regional Planning in India: Macro, meso and micro level planning; Local level planning and Panchayati Raj (GPDP); Participatory approach in planning; NITI Aayog	12
Unit 4	Disparity of Regional Development in India: Development indicators; Measuring level of development, Regional Development theories and models: Concept and basic ideas of Growth Pole Model of Perroux, Theory of Prebisch, Cumulative Causation Theory of Gunnar Myrdal, Stages of Economic Growth model of Rostow	12
	Total	**48**

Text Book:

1. Alden J. and R. Morgan, 1974: ***Regional Planning: A Comprehensive View***, Leonard Hills Books, U.K.
2. Bhat, L. S., 1976: ***Micro-Level Planning: A Case Study of Karnal Area, Haryana***, Concept Publishing Co., New Delhi.
3. Chand, M. and Puri, V. K. 1993: ***Regional Planning in India***, Allied Publishers Limited, B/M Asraf, Ali Road, New Delhi-110002.
4. Chandna, . R. C., 2000: ***Regional Planning: A Comprehensive Text***, Kalyani Publishers, New Delhi .

References:

1. Dickinson , R. E: ***City, Region and Regionalism,***
2. Hall, P., 1975: ***Urban and Regional Planning***, David and Charlos, London.
3. Hilborst,J. G. M. (1971) : ***Regional Planning: A System Approach***, Notterdam University Press.
4. Mishra, R. P, 1992: ***Regional Planning: Concept, Techniques, Policies and Case Studies,*** Concept Publications, New Delhi.

Paper III Core Course	POPULATION AND SETTLEMENT GEOGRAPHY			Subject Code:
	L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEO162C502

Course Objectives: *The course aims to make students understand different concept related to population and their characteristics.*

Course Outcomes:

By the end of this course the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Tell** about the basic definitions and concepts related to population geography and human settlements.	BT1
CO2	**Outline** the population parameters of India.	BT2
CO3	**Apply** and analyse the resultant impact of contemporary issues related to population on society and environment.	BT3
CO4	**Analyse** contemporary issues related to population dynamics and environment.	BT4
CO5	**Determine** clear exposition of spatial and structural characteristics of human settlements	BT5

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Field of Population Geography, its emergence as a branch of Geography, significance and relation with demography; Key concepts of Population pressure: under population, optimum population, over population; Components of population change: fertility, mortality and migration; and associated factors	12
Unit 2	Population Growth and Distribution: World and India, factors influencing population distribution; Measures of population density and distribution; Demographic transition model and theory of population growth by Malthus; concept of population resource relationship and population resource regions	12
Unit 3	Defining the field and scope of Settlement Geography; origin of settlements; rural and urban settlements: types of rural settlement, classification of urban settlement , functional classification of towns, law of primate city and rank size rule.	12
Unit 4	Concept of urbanization and westernisation, rural-urban fringe, city region, settlement hierarchy with respect to central place theory (Christaller and Losch)	12
	Total	**48**

Text Books Suggested:

1. Singh R.Y. (Rep. 2010) - Geography of Settlements, Sharda Pustak Bhawan, Allahabad
2. Chandna R. C. (Rep.2010) – ***A Geography of Population, Concepts, Determinants and Patterns***, Kalyani Publishers, New Delhi.
3. Maurya S.D (Rep. 2018): ***Settlement Geography***, Sharda Pustak Bhawan, Allahabad
4. Sandram, K. V. and Nangia, S., (eds): ***Population Geography***, Heritage Publishers, New Delhi. Inc., New York.

Reference books:

1. Clarke, J. I., 1972**:** ***Population Geography*****,** Pergamon Press, Oxford.
2. Peters, G. L. and Larkin, R. P., 1979: ***Population Geography: Problems, Concepts and Prospects,*** Kendall/ Hunt Iowa.
3. Trewartha, G. T., 1969: ***A Geography of Population: World Pattern***, John Wiley & Sons.
4. Woods, R., 1979**:** ***Population Analysis in Geography***, Longman, London.
5. Robinson, H., 1981: ***Population and Resources***, Macmillan Press, London

Paper II Core Course	Internship			Subject Code:
	L-T-P-C: 0-0-2-6	Credit Units: 6	Scheme of Evaluation: (P)	GEO162C523

Course Objectives: *This paper provides an understanding the basics of research project preparation.*

Course Outcomes:

After the completion of course, the students will have ability to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Relate** real world issues for carrying out research on a specific field	BT1
CO2	**Infer** ideas of research through literature review.	BT2
CO3	**Develop** hypotheses and research questions.	BT3
CO4	**Identify** appropriate sampling techniques.	BT4
CO5	**Interpret** the various types of data along with **critical evaluation**.	BT5
CO6	**Design and develop** a detailed project report	BT6

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Internship in institutes, organizations, and firms / industry of repute in Northeast India.	24
Unit 2	Preparation of internship report in prescribed format during 6th - 8th week of the commencement of course of 5th semester. Submission of the report after a week of the announcement of routine for 5th End Semester Examination duly signed by the appropriate person in the institute concerned.	24
	Total	**48**

Note: Students will work as an intern during the semester break for 4 weeks after 4th semester. Students not being able to obtain any internship will be assigned project work from the department.

Text Books:

As per the list of given in syllabus based on topic selected

Reference Books:

As per the list of given in syllabus based on topic selected

Learning Outcomes:

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

- Prepare and execute major project by collecting primary and/or secondary data,
- Improve the skill of organizing the study based on project / research objectives
- Process, analyse the data and write scientific project report

DSE PAPER - I	GEOGRAPHY OF RURAL DEVELOPMENT	Subject Code:
	L-T-P-C: 3-1-0-4 Credit Units: 4 Scheme of Evaluation: (T)	GEO162D501

Course Objectives: *The course aims to make students aware of the concepts, approaches and planning process related to rural development in India, along with understanding the rural economic base, rural development process and provision of services in rural areas.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the need and approaches to rural development.	BT1
CO2	**Interpret** in detail about the rural economic base especially about the significance of development of non-farm sector in rural areas.	BT2
CO3	**Develop** in-depth knowledge of pre and post-independence period of rural development.	BT3
CO4	**Analyze** the relevance of access to services like health, education in rural areas	BT4
CO5	**Interpret** the various types of data along with **critical evaluation**.	BT5
CO6	**Design and develop** a detail project report	BT6

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Rural Development: meaning and dimensions; Need for Rural Development studies in geography; Rural Poverty; Rural development in India: Role of Zilla Parishad and Panchayats in Rural Development, Rural Finances – Banks, NABARD etc.	10
Unit 2	Concept of Village, Rural Settlement pattern, Rural Economic Base: Panchayati raj System, Agriculture and Allied Sectors, Seasonality and Need for Expanding Non-Farm Activities, Co-operatives	14
Unit 3	The Problem of Housing, housing types, low cost houses, the housing schemes in rural area, Dimensions of Rural unemployment and under employment; Rural – Urban migration issues.	10
Unit 4	Sustainable Rural Development programmes in India: Drought Prone Area Programmes, Hill Area Development Programme, PMGSY, DDU-GKY, MGNREGA, Jan Dhan Yojana, DAY-NRLM, NHM, Samagra Sikhsa Abhiyan	14
	Total	**48**

Text Book:

1. Gilg A. W., 1985: An Introduction to Rural Geography, Edwin Arnold, London.
2. Krishnamurthy, J. 2000: Rural Development - Problems and Prospects, Rawat Publs., Jaipur
3. Lee D. A. and Chaudhri D. P. (eds.), 1983: Rural Development and State, Methuen, London.
4. Misra R. P. and Sundaram, K. V. (eds.), 1979: Rural Area Development: Perspectives and Approaches, Sterling, New Delhi.

References:

1. Robb P. (ed.), 1983: Rural South Asia: Linkages, Change and Development, Curzon Press.
2. UNAPDI 1986:Local Level Planning and Rural Development: Alternative Strategies. (United Nations Asian & Pacific Development Institute, Bangkok), Concept Publs. Co., New Delhi.
3. Wanmali S., 1992: Rural Infrastructure Settlement Systems and Development of the Regional Economy in South India, International Food Policy Research Institute, Washington, D.C.
4. Yugandhar, B. N. and Mukherjee, Neela (eds.) 1991: Studies in Village India: Issues in Rural Development, Concept Publs. Co., New Delhi.
5. Misra, R. P. (ed.), 1985: Rural Development: Capitalist and Socialist Paths, Vol. 1, Concept, New Delh

DSE PAPER - III	REMOTE SENSING: PRINCIPLES AND APPLICATIONS			Subject Code:
	L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEO162D502

Course Objectives: *This course intends to show the rationale behind the use of remotely sensed data and its advantages and disadvantages and illustrate how GIS/GPS methodologies can be used to address spatial analysis from the theoretical and practical perspective.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** basic concepts of remote sensing.	BT1
CO2	**Explain** principles and applications of various remote sensing techniques including aerial photography.	BT2
CO3	**Utilize** remote sensing data products for minor and major projects on environmental/natural resource assessments and mapping, disaster and hazard management, urban planning, and many applications.	BT3
CO4	**Apply** this knowledge for land use land cover map preparation.	BT4
CO5	**Interpret** Geospatial data	BT5

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Principles of Aerial photography; Aerial photography platforms Aerial camera and film characteristics; Types of aerial photographs, Vertical air photographs – its geometry, scale and height measurements, stereoscopic measurements of aerial photographs; Image / photo interpretation keys / elements; Applications of Aerial Photography.	14
Unit 2	Earth observation satellites (EOS) and Remote Sensing (RS) satellites - orbital characteristics; Types and characteristics of sensors; Spatial, radiometric, spectral and temporal resolutions of RS data; Data products, characteristics and uses of selected Remote Sensing Satellites– LANDSAT, IRS, SPOT, Quickbird, GeoEye and Sentinel data	14
Unit 3	Electromagnetic radiation (EMR) principles, Major application areas of remote sensing: Natural resource monitoring and management; Disaster management; Biomass estimation, Crop yield and acreage estimation.	10
Unit 4	Introduction to Digital Image Processing (DIP) tools and techniques: Data preparation processes and techniques; Image classification techniques (Supervised and Unsupervised)	10
	Total	**48**

Text Book:

1. Jensen, J. R., 2011: Remote Sensing of the Environment – An Earth Resource Perspective, 3rd Impression, Pearson, New Delhi
2. Joseph, George, 2005: Fundamentals of Remote Sensing, United Press India, Hyderabad.
3. Lilesand, T.M. and Kiefer, R.W., 2007: Remote Sensing and Image Interpretation,6th Edition, John Wiley.
4. Rampal, K. K., 1999: Handbook of Aerial Photography and Interpretation, Concept Publishing Company, New Delhi-59.
5. Wolf, P. R., Dewitt, B. A., 2000: Elements of Photogrammetry With Applications in GIS, McGraw Hill, New York.

Reference Books:

1. American Society of Photogrammetry, 1960: Manual of Photographic Interpretation, Banta Publishing Co., Menastha, Wisconsin.
2. Barret, E. C. and Curtis, L.E., 1976: Introduction to Environmental Remote Sensing, Champman Hill, London.
3. Chetry, N. (Editor), 2019: A Glimpse of Geospatial Technologies and Applications, EBH Publishers (India), Guwahati
4. Curran, Paul, J., 1985: Principles of Remote Sensing, Longman Group Ltd.
5. Sabins, Floyd F., 1987: Remote Sensing Principles and Interpretation, W.H. Freeman and Company, New York.

DSE PAPER - II	GEOGRAPHY OF HEALTH			Subject Code: GEO162D503
	L-T-P-C: 3-1-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives: *The course aims to develop understanding about the concepts of health, factors determining human health, its diffusion under various environments and overall health related issues that comes up.*

Course Outcomes:

By the end of this course the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Recall** the different disease classifications and the approaches to study about health.	BT1
CO2	**Outline** the concept of human health and healthcare from the perspective of geography.	BT2
CO3	**Develop** knowledge about factors influencing human health and occurrence of diseases in varying ecological settings.	BT3
CO4	**Analyse** the impact of environmental degradation on human health and occurrence of various diseases in different ecological settings.	BT4

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Geography of Health: Definition and significance; approaches of study: ecological, social, and spatial; dualism between medical geography and geography of health. Classification of diseases: genetic, zoonotic, communicable, non-communicable, occupational, deficiency diseases and malnutrition.	10
Unit 2	Disease ecology: ecology and human health; geographical factors affecting human health; factors influencing disease transmission (pathological, physical, environmental, social, cultural, and economic); Diffusion of diseases and their causes in varied biotic, physical, and cultural environments.	14
Unit 3	Disease occurrence: emergence, re-emergence, and persistence; modes of transmission of major diseases (Malaria, Japanese encephalitis, tuberculosis, hepatitis, AIDS, and COVID-19) and their broad global distribution. Healthcare systems: Meaning and components; Universal government-funded health system; Role of WHO and UNICEF in global health care; SDG3 for good health and Well-being.	14
Unit 4	Environment, human habit, and health: Basic concept and ideas relating to food habit and health, occupation and health, environmental degradation and health, lifestyle, and human health.	10
	Total	**48**

Text Book:

1. Akhtar Rais (Ed.), 1990: Environment and Health Themes in Medical Geography, Ashish Publishing House, New Delhi
2. Anthamatten P, (2011), Introduction to the Geography of Health, Rawat Publications, Jaipur

References:

1. Cliff, A.D. and Peter,H., 1988 : Atlas of Disease Distributions, Blackwell Publishers, Oxford
2. Hardham T. and Tannav M.,(eds): Urban Health in Developing Countries; Progress, Projects, Earthgoan, London
3. Murray C. and A. Lopez, 1996: The Global Burden of Disease, Harvard University Press.
4. National Health Portal India https://www.nhp.gov.in/healthprogramme/national-health programmes
5. Shaw, M., Dorling, D. and Mitchell, R, (2002) Health, Place and Society, Pearson, London Brown, T., McLafferty, S., Moon, G. (2010): A Companion to Health and Medical Geography, Wiley Blackwell, UK
6. Mishra, R.P. (1970): Medical Geography of India, National Book Trust of India

Paper DSE - 5	DISASTER MANAGEMENT L-T-P-C: 4-0-0-4 Credit Units: 4 Scheme of Evaluation: (T)	Subject Code: GEO162D504

Course Objectives: *The objective of this course is to make the student understand about the hazards, disasters, its associated causes and impacts, its distribution and mitigation with special reference to India.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
SI No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1.	**Define** the concepts of hazard and disaster and its related terminologies.	**BT 1**
CO2.	**Demonstrate** the distribution and mapping of disasters that is prevalent in India.	**BT 2**
CO3.	**Explain** the mitigation process and response to disasters across Indian territory.	**BT 2**
CO4.	**Distinguish** between causes and effect of varied disasters, as well as their implications in present day India.	**BT 4**

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Disasters: Definition and Concepts: Hazards, Disasters; Risk and Vulnerability; Classification	12
Unit 2	Disasters in India: (a) Flood: Causes, Impact, Distribution and Mapping; Landslide: Causes, Impact, Distribution and Mapping; Drought: Causes, Impact, Distribution and Mapping	12
Unit 3	Disasters in India: (b) Earthquake and Tsunami: Causes, Impact, Distribution and Mapping; Cyclone: Causes, Impact, Distribution and Mapping. Manmade disasters: Causes, Impact, Distribution and Mapping	12
Unit 4	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	12
	Total	**48**

Text Book:

1. Singh, R. B. (ed.), (2006) Natural Hazards and Disaster Management: Vulnerability and Mitigation, Rawat Publications, New Delhi.
2. Sinha, A. (2001). Disaster Management: Lessons Drawn and Strategies for Future, New United Press, New Delhi.

References:

1. Government of India. (1997) Vulnerability Atlas of India. New Delhi, Building Materials & Technology Promotion Council, Ministry of Urban Development, Government of India.
2. Kapur, A. (2010) Vulnerable India: A Geographical Study of Disasters, Sage Publication, New Delhi.
3. Modh, S. (2010) Managing Natural Disaster: Hydrological, Marine and Geological Disasters, Macmillan, Delhi.
4. Singh, R.B. (2005) Risk Assessment and Vulnerability Analysis, IGNOU, New Delhi.
5. Stoltman, J.P. et al. (2004) International Perspectives on Natural Disasters, Kluwer Academic Publications. Dordrecht.
6. Singh Jagbir (2007) "Disaster Management Future Challenges and Opportunities", 2007. Publisher- I.K. International Pvt. Ltd. S-25, Green Park Extension, Uphaar Cinema Market, New Delhi, India (www.ikbooks.com

SEMESTER 6

Paper I Core Course	GEOGRAPHY OF INDIA			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEO162C601

Course Objectives: *The course aims to define the regional basis of India and evaluate the basic ideas of the different aspects of India.*

Course Outcomes:

By the end of this course the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the concepts involved in explaining India as a regional unit.	BT1
CO2	**Compare** and **interpret** the disparity that prevails among the different states of India.	BT2
CO3	**Build** knowledge on population structure, industrial aspects, transport and communication of the region.	BT3
CO4	**Analyse** various prospects of India.	BT4
CO5	**Examine** the position of India in global context.	BT5

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	India as a geographical entity, Location and situation; India in the context of neighbouring counties, Physical background of regional development: relief, drainage system, climate, soil and natural vegetation; Indian monsoon: mechanism and characteristics; natural disasters in India (earthquake, drought, flood, cyclone, tsunami, Himalayan highland hazards)	10
Unit 2	Population and development issues: population growth and its socio-economic implications, literacy, urbanization, occupation and social structure and development inequalities, tribes and religion	14
Unit 3	Mineral and power resources and development: iron ore, coal, petroleum and hydro-electric power potential, climate, physiography and cropping pattern relationship in the context of India; Agro-climatic regions of India; Industrial regions of India	12
Unit 4	Regional disparities in economic development: Agriculture, industry and transport and communication, India's geo-economic position in Asia and the world; its economic development policies and international relations.	12
	Total	**48**

Text Books:

1. Singh, R. L., (ed), 1971: India: A Regional Geography, National Geographical Society of
2. India, Varanasi.
3. Bhatt, L. S., 1973: Regional Planning in India, Statistical Publishing Society, Calcutta.
4. Tirtha R. & Gopal Krishna, 1996: Emerging India Reprinted by Rawat Publications, Jaipur.

Reference Books:

1. Dreze, Jean & Amartya Sen (ed.), 1996: India Economic Development and Social opportunity, Oxford University Press, New Delhi.
2. Kundu A. Raza Moonis, 1982: Indian Economy: the Regional Dimension. Spectrum
3. Publishers, New Delhi.

4. Robinson, Francis, 1989 : The Cambridge Encyclopaedia of India, Pakistan, Bangladesh, Sri
5. Lanka, Nepal, Bhutan & Maldives. Cambridge University Press, London.

Paper II Core Course	PRACTICAL WORKS IN GEOGRAPHY L-T-P-C: 0-0-4-2 Credit Units: 4 Scheme of Evaluation: (P)	Subject Code: GEO162C612

Course Objectives: *The course aims at increasing the practical knowledge of the students.*

Course Outcomes:

By the end of this course the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the principles and concepts involved in Practical Geography.	BT1
CO2	**Classify** the nature, characteristics and sources of map projection.	BT2
CO3	**Develop** the skills and technical capabilities of the students.	BT3
CO4	**Simplify** the application of the concepts related to Geomorphology, Climatology and Population Geography.	BT4

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Analysis of Slope by Wentworth's method, Profile drawing (Serial, Superimposed, Composite, Projected) , Drainage basin delimitation, Ordering of streams, calculation of bifurcation ratio, length ratio, drainage frequency and density,	10
Unit 2	Map Projection: Basic concepts, classification, basic Principles of construction of zenithal, conical and cylindrical groups of map projections Construction of graticules and drawing of maps thereon including properties and uses of: Zenithal Gnomonic Projection (Equatorial case) Sinusoidal Projection Conical Projection with one-standard parallels Lambert's Conical Equal Area Projection Mercator's Projection	10
Unit 3	Preparation of rainfall variability map (Assam and Rajasthan) **- 2 Exercises**, drawing of hythergraph, climograph and ergograph - **3 Exercises**, rainfall frequency analysis, rainfall dispersion graph, water deficiency and surplus graph- **2 Exercises**, weather chart interpretation- **1 Exercise**	10
Unit 4	Urban population by proportionate sphere or circles, Preparation of one quantitative thematic map (Choropleth technique or Isopleth technique) by using state level data of North East India, Bar graph, histogram, line graph for socio-economic data of India; Mapping of Population distribution, density and concentration in the World and India; Population growth trend and projection in the World and India; Population-Resource regions in the world- **9 Exercises**	18
	Total	**24**

Reference Books:

1. Weiesner, C. J.: ***Hydrometeorology***, Chapman & Hall Ltd.
2. Gregory, K, J. and Walling, D.E., 1973: Drainage Basin- Form and Process, Edward Arnold, London
3. Goudie, Andrew, et. Al. (eds), 1981: Geomorphological Techniques, George Allen & Unwin, London.
4. Woods, R., 1979**: *Population Analysis in Geography***, Longman, London.

Paper I Core Course	GEOGRAPHICAL THOUGHT			Subject Code: GEO162D601
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course objective*: The objective of this course is to make the student look into the chronology of development of the subject of geography through contribution of varied scholars, approaches and schools, major themes and components of geography.*

Course Outcomes:

By the end of this course the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the various parameters and components of Geography.	BT1
CO2	**Interpret** the chronological development of the subject of geography.	BT2
CO3	**Identify** the contributions made by the schools of geography.	BT3
CO4	**Discover** the physical and humanistic perspective and its dimensions in Geography in relation to the physical and cultural surrounding	BT4
CO5	**Explain** the various issues of real world with a geographical perspective	BT5

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Place of geography in the classification of knowledge: Defining the field of geography, relation of geography with other natural and social sciences; Geography as the study of areal differentiation and spatial organisation; Defining the field of human geography; nomothetic and ideographic approaches	12
Unit 2	Geography through the ages; general character of geographic knowledge during the ancient and mediaeval period; impact of discoveries and European renaissance on the emergence of modern geography, Foundations of modern geography: Contribution of German (Humboldt, Ritter, Ratzel), French (Paul Vidal de la Blache), British and American geographers.	12
Unit 3	Evolution of geographic thought (Determinism- the impact of Darwinism, Possibilism, Human Ecology, Morphology of Landscape), , Areal differentiation) and their impact in the development of the field	10
Unit 4	Positivism and quantitative revolution, behaviouralism, radicalism, humanism and post-modernism, locational analysis, Explanation in geography: laws and theories; models and system analysis, Spatial analysis: history and concept of space and spatial organisation, gender geography and post modernism geography	14
	Total	**48**

Text Books:

1. Adhikari, S., 1992: Geographical Thought, Chaitanya Pub. House, Allahabad.
2. Berry, B. J. L., 1973: 'A Paradigm for Modern Geography', in R. J. Chorley (ed), Directions in Geography, London Methuen.
3. Bunge, W., 1962: Theoretical Geography, Lund Studies in Geography, Lund, C.W.K. Gleerup.
4. Buttimar, A., 1978: 'On People, Paradigms and Progress in Geography', in D.R. Stoddart (ed),
5. Geography, Ideology and Social Concern, Oxford, Blackwell.
6. Dickinson, R. E., 1969: Makers of Modern Geography, Routledge and Kegan Paul, London.

Reference Books:

1. Dikshit, R. D., 1997: Geographical Thoughts: A Contextual History of Ideas, Prentice Hall of India, New Delhi.
2. Gold, J. R., 1980: An Introduction to Behavioural Geography, Oxford University Press.
3. Hartshorne, R., 1939: The Nature of Geography, Association of American Geographers, Lancaster, Penn.

4. Hartshorne, R., 1959: Perspective on the Nature of Geography, Rand Mckully, Chicago.
5. Harvey, D., 1969: Explanation in Geography, St. Martin's Press, New York.
6. Harvey, Milton and Holly, Brian P.1989: Themes in Geographic Thought, Routledge, London.
7. James, P. E., 1972: ***All Possible World: A History of Geographic Ideas***, The Odyssey Press, New

DSE Course	**SOIL AND BIOGEOGRAPHY** **L-T-P-C: 4-1-0-4** **Credit Units: 4** **Scheme of Evaluation: (T)**	**Subject Code:** **GEO162D602**

Course Objectives: *The course aims to make students understand the fundamental concept of soil and biogeography under various categories.*

Course Outcomes:

By the end of this course the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** and understand the basic terms and concepts of soil and biogeography.	BT1
CO2	**Interpret** the important issues pertaining to environment.	BT2
CO3	**Construct** the basic properties, morphology and other properties associated with soil and biogeography.	BT3
CO4	**Analyse** independently the various biodiversity conservation and management issues.	BT4

Detailed Syllabus:

Modules	**Topics and Course Content**	**Periods**
Unit 1	Soil geography: meaning and significance; Soil forming factors: Parent material, organic, climatic, topographic, spatio-temporal dimensions; Processes of soil formation and soil development: Physical, biotic and chemical; Soil profile development and soil catena	10
Unit 2	Physical properties of soils: Morphology, texture, structure, water, air, temperature and other properties of soil; chemical properties of soil and soil reaction; pedogenic regimes; podzolization, laterization, calcification and gleization.	12
Unit 3	Forms and functions of ecosystem: Forest, grassland, marine and mountain ecosystem; trophic level, Energy flux in the ecosystem; material Cycles / bio- energy cycles in the terrestrial ecosystem, concept of food chain, food web and ecological pyramid, Environmental ethics and Deep ecology	12
Unit 4	Biogeography: meaning and significance, Approaches in biogeography: evolutionary and ecological, Concept of biodiversity; Conservation of biotic resources; Biodiversity hotspots; State of forest cover changes in India, environment policy of India, National Forest Policy of India, legal framework for biodiversity protection: Brundtland Commission, Kyoto Protocol, Agenda 21, Sustainable Development Goals, Paris Agreement	14
	Total	**48**

Text Books:

1. Hugget, R. J., 1988: Fundamentals of Biogeography. Routledge, London.
2. Bunting, B. T., 1967: The Geography of Soil, Hutchinson, London.
3. Robinson, H., 1982: Biogeography, E.L.B.S., Mc Donald & Evans, London.
4. Sivaperuman, Chandrakasan et al., (2018): Biodiversity and Climate Change Adaptation in Tropical Islands, Academic Press, London.

Reference Books:

1. Barry, C., 1977: Biogeography - An Ecological and Evolutionary Approach, Cox Blackwell, Oxford.
2. Singh, S. 1991: Environmental Geography, Prayag Publications, Allahabad
3. Tivy, J. 1992: Biogeography: A study of Plants in Ecosphere, 3rd edn. Oliver and Boyd, U.S.A.

Paper, DSE - 1	REGIONAL DEVELOPMENT OF NORTHEAST INDIA AND ASSAM L-T-P-C: 4-0-0-4 Credit Units: 4 Scheme of Evaluation: (T)	Subject Code: GEO164D603

Course Objectives: *The course aims to define the regional basis of Northeast India and Assam and evaluate the basic ideas of the position of Northeast India and Assam in the Indian context.*

Course Outcomes:

By the end of this course the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Define** the concepts involved in explaining North-East India as a regional unit.	BT1
CO2	**Compare** and interpret the disparity that prevails among the different states of northeast.	BT2
CO3	**Build** knowledge on population structure, industrial aspects, transport and communication of the region.	BT3
CO4	**Analyse** various prospects of northeast India and Assam.	BT4
CO5	**Examine** the basic idea of position of Northeast India and Assam in Indian context.	BT5

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	North East India: location and strategic significance; Physical characteristics and their relation to development: Relief, drainage, climate, soil and vegetation and bio-diversity, Position of North-East India in relation to India and its neighbours, Socio-economic and trade relation with ASEAN countries	12
Unit 2	Population and Development: Population growth, composition and distribution, migration, population characteristics, social structure: race, caste, religious and linguistic composition.	12
Unit 3	Natural resources, their utilization and development: Coal, petroleum, natural gas, water and forests in North East India; Agriculture and Development: Agricultural modernization and strategies for future development; constraints of Industrial development; problems and prospects of tourism.	12
Unit 4	Locational significance of Assam; Position of Assam in relation to rest of India, its physical characteristics and their relation to development: Relief, drainage, climate, soil and vegetation, Population growth, composition and distribution in North-East India and Assam; Characteristics and status of agriculture, industry and tourism in Assam	12
	Total	**48**

Text Books:

1. Dutta Ray, B., et. al (eds), 2000: Population, Poverty and Environment in North East India,
2. Concept Publishing Co., New Delhi.
3. Taher M. and Ahmed, P., 2000: Geography of North East India, Mani-Manik Prakash, Guwahati.
4. Bhagabati, A. K. et al, 2001: Geography of Assam, Rajesh Publications, New Delhi.

Reference Books:

1. Barua, P. C., 1990: Development Planning of North East India, Mittal Publications, New Delhi.
2. North East India Geographical Society: North Eastern Geographer, Department of Geography, Gauhati University.

DSE PAPER	Environment and Sustainable Development	Subject Code:
	L-T-P-C: 4-1-0-4 Credit Units: 4 Scheme of Evaluation: (T)	GEO162D604

Course Objectives: *The course aims to give the idea of the concept of global environment and its impact on various aspects, along with providing knowledge on adaptation and mitigation of climate impacts and also to know institutional role in it.*

Course Outcomes:

By the end of this course the students will be able to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Relate** to basics of science of environmental change and sustainable development.	BT1
CO2	**Classify** different types of natural resources and its importance.	BT2
CO3	**Develop** understanding about various impacts of Climate Change on Agriculture and Water, Flora and Fauna, Human Health, ozone layer and other spheres of environment.	BT3
CO4	**Inspect** upon the issues of adaptation and mitigation from hazards and management of solid wastes.	BT4
CO5	**Explain** the policies of development and environmental protection in developed and developing countries.	BT5

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Introduction to Environment: meaning and types; Environmental factors, The Global Environment and its segments and associated development patterns; Natural resources: renewable and non-renewable, land resources, water resource, forest resource and energy resource	12
Unit 2	Man- environment relationship: Historical perspectives on man's interaction with environment; population growth and environment; Man and atmosphere: Man as a factor of climatic change; Global environmental problems: Types and extent of environmental problems, area-specific major environmental issues and problems.	12
Unit 3	Concept of sustainability; concept of sustainable development and historical perspectives; relation among environment, economy and society; Pillars and principles of Sustainable development; Environmental Pollution- causes and effects; Nuclear Hazard and Human Health; Solid Waste Management; Climate Change, Global warming, ozone layer depletion and their impacts	12
Unit 4	Environmental protection movements: Chipko Movement, Silent Valley, Narmada Bachhao Andolan; Environmental Legislation Programme in India: Wildlife Protection Act, Water Act, Forest Act, Air Act, Environmental Protection Act, International Agreement-Earth Summit, UNFCC, Montreal and Kyoto Protocol, Environmental Communication and Awareness	12
	Total	**48**

Text Books:

1. Goudie, A., (1984): The Nature of Environment, Basil Blackwell, London.
2. Singh, S., 1991: Environmental Geography, Prayag Pustak Bhawan, Allahabad

Reference Books:

1. Park, C., (1997): The Environment, Routledge, London.
2. Pickering, K. T. & L. A. Owne, (1994): An Introduction to Global Environmental Issues, Routledge, London.
3. Strahler, A. N. and A. H. Strahler, 1976: Geography and Man's Environment, John Willey, New York.

Paper DSE-5	GLOBAL CLIMATE CHANGE L-T-P-C: 4-0-0-4 Credit Units: 4 Scheme of Evaluation: (T)	Subject Code: GEO162D605

Course Objectives: *The course aims to give the idea of the concept of climate change and its impact on various aspects in global context, along with providing knowledge on adaptation and mitigation of climate impacts and also to know institutional role in it.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1.	**Relate** to basics of Science of Climate Change.	**BT 1**
CO2.	**Classify** different types of vulnerability.	**BT 2**
CO3.	**Develop** understanding about various Impacts of Climate Change on Agriculture and Water; Flora and Fauna; Human Health.	**BT 3**
CO4.	**Inspect** upon the issues of adaptation and mitigation.	**BT 4**
CO5.	**Recommend** suitable measure for mitigation of issues related to climate change.	**BT 5**

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Causes of global warming and climate change - natural and anthropogenic (industrial and vehicular emissions of Green House Gases, Global precipitation and temperature distribution patterns; Extreme climatic events and processes; Consequences of climate change in various geographical regions.	12
Unit 2	Impact of climate change on agriculture and human heath, Geographical theories of climatic changes involving displacement of continents and change in the composition of atmosphere, solar radiation.	12
Unit 3	Global climatic assessment by Inter-governmental Panel on Climate Change (IPCC); Sources of climatic data and Statistical analysis of climatic data; Climate and biodiversity: Ecological succession of plants and animal life.	10
Unit 4	Global and national initiatives on adaptation and mitigation measures on climate change; National Action Plan on Climate Change; Role of Non-governmental Organizations, Local Institutions -Urban Local Bodies and Panchayats	14
	Total	**48**

Text Books:

1. Chritchfield, H. J., 1992: General Climatology, Prentice-Hall of India Pvt. Ltd, New Delhi
2. Lal, D. S., 1997: Climatology, Sharada Pustak Bhawn, Allahabad-02
3. Lal, D. S., 2016: Climatology and Oceanography, Sharada Pustak Bhawn, Allahabad-02

Reference Books:

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. UNEP, 2007: Global Environment Outlook: GEO4: Environment for Development, United Nations Environment Programme.
5. Sen, Roy, S., and Singh, R.B., (2002): Climate Variability, Extreme Events and Agricultural Productivity in Mountain Regions, Oxford & IBH Pub., New Delhi.

Paper DSE-6	Urban Geography L-T-P-C: 4-0-0-4 Credit Units: 4 Scheme of Evaluation: (T)	Subject Code: GEO162D606

Course Objectives: *The course aims to give the idea of the concept of urban geography and its major aspects as well as it seeks to develop new insights among the students on the relevance of urban geography and its associated problems in a rapidly urbanizing world.*

Course outcomes:

After successful completion of the course, the students will be able to:		
SI No.	**Course Outcome**	**BT Level**
CO1.	**Define** concepts related to urban geography and its approaches.	**BT 1**
CO2.	**Explain** different geographical factors which organise urban spaces and develop ideas in its relation.	**BT 2**
CO3.	**Identify** the new insights on the relevance of urban geography.	**BT 3**
CO4.	**Discover** and develop skills seeking advanced studies on urban planning and development.	**BT 4**

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Urban Geography: Meaning, subject matter and scope; approaches and trends in urban geography; Towns: Types, characteristics, origin and growth in global and national contexts; Functional classification of towns; Schemes of city classification	10
Unit 2	Patterns of Urbanization in developed and developing countries; Components of urbanization and urban population growth; Urban morphology and land use structure; Theories on the internal structure of town: concentric zone theory of Burgess and the Sector Theory of Hoyt	14
Unit 3	Concept of city-region, urban agglomeration, urban sprawl, Umland and periphery, rural-urban dichotomy and continuum, urban fringe, satellite town, new town, smart city; Urban Systems: Concept of urban system and hierarchy; Christaller's Central Place Theory; the rank-size distribution of cities; concept of primate city.	14
Unit 4	Urban issues and problems: Housing, slums, civic amenities (transportation and drinking water), traffic congestion, pollution (air, noise, water), and crime. Urbanization and urban development planning in India: Trend and regional patterns of urbanization; national urban development policies and programmes; emerging urban issues of selected cities (Delhi NCR, Mumbai, Guwahati).	10
	Total	**48**

Text Book:

1. Bansal, S.C. (2010): Urban Geography, Meenakshi Prakashan, Meerut.
2. Hall T., 2006: Urban Geography, Taylor and Francis.
3. Kaplan D. H., Wheeler J. O. and Holloway S. R., 2008: Urban Geography, John Wiley.
4. Knox P. L. and McCarthy L., 2005: Urbanization: An Introduction to Urban Geography, Pearson Prentice Hall New York.
5. Pacione M., 2009: Urban Geography: A Global Perspective, Taylor and Francis.

References:

1. Bala, R. (1986): Urbanisation in India, Rawat, Jaipur.
2. Fyfe N. R. and Kenny J. T., 2005: The Urban Geography Reader, Routledge.
3. Graham S. and Marvin S., 2001: Splintering Urbanism: Networked
4. Infrastructures, Technological Mobilities and the Urban Condition, Routledge

Paper SEC Course	Mapping in GIS			Subject Code:
	L-T-P-C: 2-0-4-2	Credit Units: 2	Scheme of Evaluation: (T+P)	GEO162S611

Course Objectives: *This course intends to make the students understand the practical applications of geoinformatics*

Course Outcomes:

After the completion of the course, the students will have the ability to:		
Sl. No.	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Build** map of the resources, their location and availability.	BT1
CO2	**Analyse** the different data sets collected from various platforms through GIS.	BT2
CO3	**Interpret** Geospatial data in GIS platforms and perform analysis from various sources of data such as Remote Sensing and GPS for geographical research	BT3

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Mapping of Population distribution, density and concentration in India and North East India using GIS Software; Map creation using remote sensing indices: NDVI, NDWI, NDBI	6
Unit 2	Preparation of Land use Land cover map by using supervised and unsupervised classification techniques through GIS Software; Buffer analysis and overlay analysis of point, line and polygon data.	6
	Total	**24**

Text Books:

3. Creswell, J., (1994). ***Research Design: Qualitative and Quantitative Approaches***. UK: Sage Publications.
4. Dikshit, R. D. (2003). ***The Art and Science of Geography: Integrated Readings***.

Reference books:

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