

**COURSE OUTCOME OF GEOGRAPHY HONOURS (MAJOR) & GENERAL (MINOR) ACCORDING TO NEP, 2020 SYLLABUS.
(Effective from July, 2023 onwards)**

1.3 Structure of the 4-year Undergraduate Programme (Honours) offered by Geography

Table 4: Semester-wise and Course category-wise distribution of credits

SEM	Course Code	Course Name	Course Type	Credit	Component	
I	GEOADS01T/ 1P	Physical Geography + Lab	Major	3+2	Th	P
	GEOHM01T	Physical Geography	Minor	4+1	Th	Tu
	GEOMD-01M	Geomatics and Spatial Analysis	Multi-Disciplinary	3		
	AE-1		AEC	3		
	GEOSE-01M	Remote Sensing	SEC	3		
	VA-1		VAC	3		
II	GEOADS02T/ 2P	Human Geography + Lab	Major	3+2	Th	P
	GEOHM02T	Human Geography	Minor	4+1	Th	Tu
	XXXMD-02		Multi-Disciplinary	3		
	AE-1		AEC	3		
	GEOSE-02M	Advanced Spatial Statistical Techniques	SEC	3		
	VA-1 (3)		VAC	3		
	Exit option	with certificate after 1 Year				
III	GEOADS03T/ 3P	Geotectonics and Geomorphology + Lab	Major	3+2	Th	P
	GEOHM03T	General Cartography+ Lab	Minor	3+2	Th	P
	XXXMD-03		Multi-Disciplinary	3		
	AE-1		AEC	3		
	GEOSE-03M	Research Methodology	SEC	3		
	VA-1 (3)		VAC	3		
IV	GEOADS04T/ 4P	Climatology + Lab	Major	3+2	Th	P
	GEOADS05T	Economic Geography	Major	4+1	Th	Tu
	GEOADS06T	Geography of India and West Bengal	Major	4+1	Th	Tu
	GEOADS07T/ 7P	Cartographic Techniques and Thematic Mapping	Major	3+2	Th	P
	Exit option	with diploma after 2 Years				
V	GEOADS08T	Population Geography	Major	4+1	Th	Tu
	GEOADS09T/ 9P	Environmental Geography + Lab	Major	3+2	Th	P
	GEOADS10T	Soil and Biogeography	Major	4+1	Th	Tu
	GEOADS11T/ 11P	Remote Sensing, GIS, and GNSS + Lab	Major	3+2	Th	P
VI	GEOADS12T	Evolution of Geographical Thought	Major	4+1	Th	Tu
	GEOADS13T/ 31P	Hazard Management+ Lab	Major	3+2	Th	P
	GEOADS14T	Social Geography	Major	4+1	Th	Tu
	GEOADS15P	Surveying Techniques and fieldwork Lab	Major	4+1	P	P
	Exit option	with Major after 3 Years				
VII	GEOADS16T	Hydrology and Oceanography	Major	4+1	Th	Tu
	GEOADS17T/ 17P	Statistical Methods In Geography + Lab	Major	3+2	Th	P
	GEOHSM01P	Project Report based on Field Work	Special Minor	4+1	P	P
VIII	GEOADS18T	Advanced Geomorphology	Major	4+1	Th	Tu
	GEOADS19T	Regional Development and Planning	Major	4+1	Th	Tu
	GEOADS20T	Advanced Climatology	Major	4+1	Th	Tu
	GEOADS21T	Rural and Urban Geography	Major	4+1	Th	Tu

Th= Theory, P= Practical, Tu= Tutorial. M= Courses with both theory and practical components.

XXXMD= Multi-disciplinary course offered by another subject apart from Geography

SEM	COURSE CODE & NAME	COURSE OUTCOME
SEM - 1	<p>GEOADS01T/ 1P : Physical Geography + Lab (5 Credits) THEORY - 3 Credits <u>Unit I : Geotectonics and Geomorphology</u> 1. Internal Structure of Earth based on Seismic Evidence. 2. Influence of lithology on landforms : Granite and Basaltic landforms. 3. Factors controlling landform development; endogenetic and exogenetic forces. 4. Evolution of landforms under fluvial process. 5. Nature and classification of hazards in Indian context. <u>Unit II : Climatology, Soil and Biogeography</u> 6. Nature, composition and layering of the atmosphere. 7. Distribution of pressure belts and planetary wind system, jet streams, and index cycle. 8. Factors of soil formation. 9. Evolution of an ideal soil profile. 10. Concept of ecosystem – basic ecological principles, ecotone, communities, niche, succession, and habitat. 11. Concept of Biomes: study of Tropical rainforest, Taiga, Desert, Savannah, Tundra and Temperate grasslands. PRACTICAL - 2 Credits 1. Graphical construction of linear scales: Plain. 2. Altimetric frequency distribution; Demarcation of broad physiographic zones. 3. Denoting drainage, geomorphic, settlement and transport attributes using sketches. 4. Identification of drainage and channel patterns from Survey of India 1:50,000 topographical maps. 5. Construction and interpretation of wind rose diagram 6. Viva-voce based on a laboratory notebook.</p>	<ul style="list-style-type: none"> ● Physical geography is a crucial discipline that helps us to understand the Earth's systems, manage the environment, address climate change, manage natural resources, and plan sustainable cities. ● Physical Geography explores the physical characteristics of the Earth such as landforms, climate patterns, soil, vegetation, and ecosystems. ● Physical geography helps us to understand the interconnectedness of the Earth's systems, including the atmosphere, hydrosphere, lithosphere, and biosphere. ● By studying the interactions between these systems, students can better comprehend the processes that shape our planet, such as weather patterns, erosion, and the distribution of resources. ● By examining the natural processes and features of an area, students can assess the potential environmental impacts of human activities. ● Physical geography is essential for the sustainable management of natural resources. By studying the distribution and characteristics of resources such as water, minerals, and forests, students can identify the areas of abundance or scarcity by which we can ensure the responsible use and conservation of these resources. ● Physical geography provides valuable insights for urban planning and development. By analysing the physical characteristics of an area, including its topography, climate, and natural hazards, physical geographers can help identify suitable locations for infrastructure, assess the potential risks, and design sustainable cities that harmonise with the natural environment.
	<p>GEOADS02T/ 2P: Human Geography + Lab (5 Credits) THEORY - 3 Credits</p>	<ul style="list-style-type: none"> ● Human Geography provides knowledge about the human aspects of

<p>SEM - 2</p>	<p><u>Unit - I : Scope and Approaches</u> 1. Elements of Human Geography: Nature, scope and recent trends. 2. Approaches to Human Geography; Resource, Locational, Landscape, Environmental. <u>Unit - II : Social and Population Geography</u> 3. Evolution of human societies: Hunting and food gathering, pastoral nomadism, subsistence farming, industrial society and post-industrial urban society. 4. Human adaptation to the environment: Eskimo, Masai and Maori. 5. Population distribution, density and growth of world population. 6. Demographic Transition Theory. <u>Unit - III : Economic and Settlement Geography</u> 7. Sectors of the economy: primary, secondary, tertiary and quaternary, quinary. 8. Types of agriculture: Intensive subsistence rice farming, Plantation agriculture (Tea). 9. Site, situation, types and patterns of Rural Settlements. 10. Classification of Urban Settlements after Census of India.</p>	<p>geography.</p> <ul style="list-style-type: none"> ● Students can easily understand the relationship between human beings and the natural world. ● Various philosophical contents are there in this course to provide the philosophical background of the subject. ● Various quantitative techniques, indexes, formulas are taught to depict, interpret and represent the human geographic data. ● Students will learn about the evolution of human societies with the passage of time. ● They will learn the lifestyle of different human societies living in different parts of the world. ● Concept of rural and urban settlements will also enrich them.
<p>SEM - 3</p>	<p><u>GEOADS03T/ 3P: Geotectonics and Geomorphology + Lab (5 Credits)</u> <u>THEORY - 3 Credits</u> <u>Unit - I : Geotectonics</u> 1. Earth's tectonic and structural evolution with reference to geological time scale, with special reference to the events of the Pleistocene. 2. Isostasy: Models of Airy and Pratt, and their applicability. 3. Plate Tectonics as a unified theory of global tectonics: Processes & landforms at plate margins and hotspots. 4. Folds and Faults—Formation and classification. <u>Unit - II: Geomorphology</u> 5. Degradational processes: Weathering, mass wasting and resultant landforms. 6. Development of river network and landforms on uniclinal and</p>	<ul style="list-style-type: none"> ● Geotectonics and Geomorphology aims to provide an in-depth knowledge about the physical features of the earth. ● It focuses on various aspects of the earth's surface, especially the lithosphere. ● Through this paper students will gain knowledge about the topographic and surficial characteristics of the earth surface. ● It also aims to make the students aware of the dynamic geomorphic processes responsible for the development of landforms of varied types and nature. ● This paper also focuses on the creation, evolution, structure, and destruction of various landforms of the earth.

	<p>folded structures, Surface expression of faults. 7. Coastal processes and landforms. 8. Glacial and glacio-fluvial processes and landforms. 9. Aeolian and fluvial-aeolian processes and landforms. 10. Models on landscape evolution: Views of Davis, Penck and Hack.</p>	<ul style="list-style-type: none"> • The practical portion of this core course aims to train the students with the ability to read, measure and construct maps explaining the physical characteristics of the topography of the earth and preparation of various profile drawings to explain the geomorphic processes of the earth in a better way. • They will learn the components and characteristics of various rocks & rock forming minerals.
SEM - 4	<p>GEOADS04T/4P : Climatology + Lab (5 Credits) THEORY - 3 Credits <u>Unit - I: Elements of the Atmosphere</u> 1. Insolation: controlling factors. Heat budget of the atmosphere. 2. Temperature: horizontal and vertical distribution. Inversion of temperature: types, causes and consequences. 3. Greenhouse effect and formation, depletion, restoration, and significance of the ozone layer.</p> <p><u>Unit - II: Atmospheric Phenomena and Climatic Classification</u> 4. Condensation: Process and forms. Forms of precipitation. Mechanism of precipitation: Bergeron-Findeisen theory, collision and coalescence. 5. Air mass: Typology, origin, characteristics and modification. 6. Types of fronts: warm and cold; frontogenesis and frontolysis. 7. Weather: stability and instability; barotropic & baroclinic conditions. 8. Atmospheric disturbances: Tropical and mid-latitude cyclones. 9. Monsoon circulation and mechanism with reference to India. 10. Climatic classification after Köppen, Thornthwaite (1955).</p>	<ul style="list-style-type: none"> • Climatology provides the knowledge of the dynamics of earth's atmosphere and global climate. • Theoretical concept, explanation and classification of world climates are there based on various approaches and practical observation of climatologists. • Climatology is instrumental in studying and understanding climate change. Through the analysis of historical climate data and the atmospheric processes, students will understand global warming and its impacts on ecosystems, weather patterns, and human societies. • They can easily relate the causes and consequences of worldwide global climatic change. • Different weather-related techniques and tools are used in its practical portion like Hythergraph and Climograph to make this field more up to date with daily life. • They are also capable of interpreting and analysing the weather map of pre-monsoon, monsoon and post-monsoon period.
	<p>GEOADS05T : Economic Geography (5 Credits) <u>Unit - I : Concepts and Theories</u> 1. Meaning and approaches to Economic Geography. 2. Concepts in Economic Geography: Goods and services, production, exchange and consumption.</p>	<ul style="list-style-type: none"> • Economic Geography studies the nature and use of areas of the Earth's surface, relating and interpreting interactions of physical and cultural phenomena. • Agriculture geography investigates areas transformed by humans through

<p>3. Concept of economic man, theories of choices. 4. Economic distance and transport costs. 5. Factors affecting location of economic activity with special reference to agriculture (Von Thünen), and industry (Weber). <u>Unit- II : Economic Activities</u> 6. Primary activities: Agriculture, forestry, fishing and mining. 7. Secondary activities: Manufacturing (cotton textile, iron and steel), concept of manufacturing regions, special economic zones and technology parks. 8. Tertiary activities: Transport, trade and services. 9. Economic globalisation: Concepts and contemporary issues. 10. International trade, role of WTO. 11. Emergence of economic blocs (Post WW-II): BRICS: Evolution, structure and significance.</p>	<p>the activities that belong to the primary sector. It is concerned with different structures of agricultural landscapes and tries to research what exactly led to the development of these places.</p> <ul style="list-style-type: none"> • Using economic geography, researchers can understand the structure of the economy in a specific area and also discover how it relates to other areas in the world. • Using economic geography, we can study the economic activities of particular regions. This can allow us to discover the best ways of setting up economic activities in appropriate regions.
<p>GEOADS06T : Geography of India and West Bengal (5 Credits) <u>Unit - I : Geography of India</u> 1. Tectonic and stratigraphic provinces, physiographic divisions. 2. Climate, soil and vegetation regions. 3. Tribes of India with special reference to Gaddi, Toda, Santal & Jarwa. 4. Agricultural regions. Green revolution (Phase I and II) and their impacts. 5. Mineral and power resources distribution and utilisation of iron ore, coal, petroleum and natural gas. 6. Industrial development : Automobile and information technology. 7. Regionalisation of India: Physiographic (R.L. Singh) and Economic (P. Sengupta). <u>Unit - II : Geography of West Bengal</u> 8. Physical perspectives: Physiographic divisions, forest and water resources. 9. Resources: Agriculture, mining, and industry. 10. Population: Growth, distribution and human development. 11. Regional Issues: Darjeeling Hills and Sundarban.</p>	<ul style="list-style-type: none"> • Geography of India and West Bengal intends to provide the students with the knowledge about the diversity of India. • Students can learn about the physical environment, locational pattern, population size, shape and characteristics, agricultural distribution with different methods applied in different regions, industrial location and their distribution, transportation systems with their regional distribution etc. about the country of India. • Students will learn about the physiographic divisions, character of soil and natural vegetation of our state also. • Some places of West Bengal experience serious issues for which they are facing problems in their development. Students come to know about all these problems and may formulate some remedial measures in order to mitigate those problems to some extent.

	<p>GEOADS07T/ 7P : Cartographic Techniques & Thematic Mapping (5 Credits) THEORY - 3 Credits</p> <ol style="list-style-type: none"> 1. Scientific notation, concepts of rounding, logarithm & antilogarithm, natural and log scales. 2. Maps: Classification and types. Components of a map. 3. Concept and application of scales: Comparative, diagonal and vernier. 4. Coordinate systems: Polar and rectangular. 5. Concept of generating globe and UTM projection. 6. Map projections: Classification, properties and uses. 7. Representation of data: Line, Bar, Isopleths. 8. Representation of area data: Dots and spheres, proportional circles and Choropleth. 9. Preparation and interpretation of land use land cover maps. 10. Preparation and interpretation of socio-economic maps. 	<ul style="list-style-type: none"> • Cartographic Techniques and Thematic Mapping aims to provide an in-depth knowledge about the theoretical understanding of the science of map making. • Various concepts are taught in this paper regarding various kinds of maps, their scales, uses, utilities etc. • Practical portion mainly deals with the equipment to construct various types of maps, based on various projections. • Students gain knowledge about different map projections, their utility and the regions which are best suited for a particular projection.
SEM - 5	<p>GEOADS08T : Population Geography (5 Credits) Unit - I : Population Dynamics</p> <ol style="list-style-type: none"> 1. Development of Population Geography as a field of specialisation. Relation between population geography and demography. Sources of population data, their level of reliability and problems of mapping. 2. Population distribution: density and growth. Classical and modern theories in population distribution and growth, Demographic transition model. 3. World patterns determinants of population distribution and growth. Concept of optimum population. 4. Population distribution, density and growth profile in India. <p>Unit - II : Population and Development</p> <ol style="list-style-type: none"> 5. Concepts of Age-Sex Composition; Rural and Urban Composition; Literacy and education. 6. Measurements of fertility and mortality. Concept of cohort and life table. 7. Population composition of India: Urbanisation and Occupational structure. 	<ul style="list-style-type: none"> • Population Geography is the study of the demography from a geographical perspective. • The importance of a spatial perspective for the demographic research has received considerable attention over the past few decades. • Population geography addresses demographic issues and population processes in an explicitly spatial manner, with a focus on the connection between people and places. • Population studies help us to know how far the growth rate of the economy is keeping pace with the growth rate of the population. • This course helps to understand the various facets pertaining to the spatial variation in the distribution of the human population across the Earth with reference to the physical, cultural and socio-economic environment. • The spatial distribution, characteristics, and spatial variation of the population. The importance of a spatial perspective for demographic

<p>8. Causes and types of national and international migration with reference to India.</p> <p>9. Population and development: Problem of declining sex-ratio. Concept of human development index and its components.</p> <p>10. Population policies in developed and less developed countries. India's population policies, population and environment, implications for the future.</p>	<p>research has received considerable attention over the past few decades.</p>
<p>GEOADS09T/ 9P : Environmental Geography + Lab (5 Credits) THEORY - 3 Credits <u>Concepts</u></p> <ol style="list-style-type: none"> 1. Geographers' approach to environmental studies. 2. Concept of holistic environment and systems approach. 3. Ecosystem : Concept, structure and functions. 4. Ecosystem Services : Concept, Identifying Ecosystem Services (Provisioning services, Cultural services, Supporting services, Regulating services). 5. Wetland ecosystem with special reference to East Kolkata Wetlands <p><u>Environmental problems and policies</u></p> <ol style="list-style-type: none"> 6. Rural environmental issues with special reference to sanitation & public health. 7. Urban environmental issues with special reference to waste management. 8. Ocean environmental issues with special reference to plastic pollution. 9. Environmental policies – National Environmental Policy, 2006, Earth Summits (Stockholm, Rio, Johannesburg), National Action Plan on Climate Change. 10. Global initiatives for environmental management (special reference to Montreal Protocol, Kyoto Protocol, Paris Climate Summit). 	<ul style="list-style-type: none"> ● Environmental Geography provides a much-needed capability to study and understand interactions between people, and the environments in which they live. ● Environmental Geographers have expert knowledge and skills to research, analyse and communicate how the changing environment affects our lives. ● Their ability to visualise geographical issues at different spatial scales, from global to local and to offer solutions to some of our most pressing environmental problems. ● Environmental geography prepares students for careers in environmental planning, design, and restoration, as well as in environmental assessment and monitoring, resource management, natural areas preservation, and outdoor and environmental education. ● Environmental Geography is the discipline which goes on to explain the effects of humans on their environment as well as the impact of the environment on humans. Basically, one can study the interrelationship & interdependence between the living beings and their surrounding environment. ● Environmental Studies is an interdisciplinary field that draws on knowledge and analytical tools from many areas of study to understand the function of natural ecosystems, the effects of human societies on the environment, and the role that the environment has played in shaping human cultures and artistic endeavours.

<p>GEOADS10T : Soil and Biogeography (5 Credits) <u>Unit I : Soil Geography</u> 1. Definition and significance of soil properties: Texture, structure, and moisture. 2. Definition and significance of soil properties: pH, organic matter, and NPK. 3. Soil profile. Origin and profile characteristics of lateritic, podsol and chernozem soils. 4. Soil erosion and degradation: Factors, processes and management measures. Humans as active agents of soil transformation. 5. Principles of soil classification: Genetic and USDA. Concept of land capability and its classification. <u>Unit II: Biogeography</u> 6. Concepts of biosphere, ecosystem, biome, ecotone, community, niche, succession and ecology. 7. Concepts of trophic structure, food chain and food web. Energy flows in ecosystems. 8. Biogeochemical cycles with special reference to carbon dioxide and nitrogen. 9. Geographical extent and characteristic features of: Tropical rainforest, Savanna, Hot desert and Taiga biomes. 10. Spatial distribution of world fauna. 11. Phytogeographical regions; Plant species, family and genera. 12. Deforestation: Causes, consequences and management.</p>	<ul style="list-style-type: none"> ● From the content of this core course students will learn how to protect soils, plants and animals. One-quarter of all living things live in the soil. ● Students will learn the importance of soil which is the foundation of basic ecosystem function. Soil filters our water, provides essential nutrients to our forests and crops, and helps to regulate the Earth's temperature as well as many of the important greenhouse gases. ● Students will learn the important role of Biogeography in managing the world's biodiversity. ● From these students come to know about the study of the geographical distribution of organisms, and the information about how and when species may have evolved. ● They will be able to understand and forecast changes to species distributions caused by environmental changes, both natural and anthropogenic, such as widespread vegetation clearance and shifts in climate.
<p>GEOADS11T/ 11P : Remote Sensing, GIS, and GNSS + Lab (5 Credits) THEORY - 3 Credits <u>Unit - I : Remote Sensing</u> 1. Principles of Remote Sensing (RS): Types of RS satellites & sensors. 2. Sensor resolutions and their applications with reference to IRS and Landsat missions. 3. Image referencing schemes and acquisition procedure of free geospatial data from NRSC / Bhuvan and USGS.</p>	<ul style="list-style-type: none"> ● Remote sensing helps us to acquire information about the Earth. ● It is essential to hazard assessment as well as the monitoring of land degradation and conservation. ● Remote sensing is also useful in oceanography as it tracks ocean circulation, temperature, and wave heights to understand ocean resources better. ● Remote sensing technique is an effective tool for systematic survey,

<p>4. Preparation of False Colour Composites from IRS LISS-3 and Landsat TM / OLI data.</p> <p>5. Principles of image interpretation. Preparation of inventories of land use land cover (LULC) features from satellite images.</p> <p>6. Acquisition and utilisation of free Digital Elevation Model data : CartoDEM, SRTM and ALOS.</p> <p><u>Unit - II : GIS and Global Navigation Satellite System</u></p> <p>7. Concept of GIS and its applicability.</p> <p>8. GIS data structures types: Spatial and non-spatial, raster and vector.</p> <p>9. Principles of preparing attribute tables, data manipulation, and overlay analysis.</p> <p>10. Principles and significance of buffer preparation.</p> <p>11. Principles of GNSS positioning and waypoint collection.</p> <p>12. Principles of transferring of GNSS waypoints to GIS. Area and length calculations from GNSS data.</p>	<p>analysis, and better management of natural resources like land, soil, water, forests, mountains etc.</p> <ul style="list-style-type: none"> • It helps in the monitoring of desertification, flood, drought, and landform change. • Satellite remote sensors can serve as major sources of data on the effects of human behaviour within the biosphere, enabling the establishment of the spatial scale and extent of the direct interaction of humans with the global land cover.
<p>GEODS12T : Evolution of Geographical Thought (5 Credits)</p> <p><u>Unit - I : Nature of Pre Modern Geography</u></p> <p>1. Development of Geography: Contributions of Greek and Chinese geographers.</p> <p>2. Impact of 'Dark Age' in Geography and Arab contributions.</p> <p>3. Geography during the age of 'Discovery' and 'Exploration' (contributions of Columbus, Vasco da Gama, Magellan, James Cook).</p> <p>4. Transition from cosmography to scientific Geography (contributions of Bernard Varenius and Immanuel Kant). Dualism and Dichotomies (Idiographic vs. Nomothetic, Physical vs. Human, Regional vs. Systematic, Determinism vs. Possibilism,).</p> <p><u>Unit II: Foundations of Modern Geography and Recent Trends</u></p> <p>5. Evolution of Geographical thoughts in Germany, France, Britain and the United States of America.</p> <p>6. Contributions of Humboldt and Ritter.</p> <p>7. Contributions of Richthofen, Hettner, Ratzel and Vidal deLaBlaché.</p> <p>8. Trends of geography in the post-World War-II period:</p>	<ul style="list-style-type: none"> • Geographical Thought provides a clear and accessible introduction to the key ideas and figures in human geography. • It provides an essential introduction to the theories that have shaped the study of societies and space. • Opening with an exploration of the fundamental concepts of human geography in the nineteenth century, the range of theoretical perspectives that have emerged within human geography over the last century from feminist and Marxist concepts to post-colonial and non-representational theories. • "Geographic thought" encompasses the development of geographic knowledge in particular places, times, and contexts. Accordingly, it has traditionally been approached from a historical perspective. • A brief history of geographic thought portrays the evolving modes of perception in geographies from ancient period to modern times.

SEM-6	<p>Quantitative Revolution, systems approach.</p> <p>9. Evolution of Critical Geography: Behavioural, humanistic and radical.</p> <p>10. Changing concept of time-space in geography in the 21st Century.</p>	
	<p>GEOADS13T/ 13P : Hazard Management Lab (5 Credits)</p> <p>THEORY - 3 Credits</p> <p>Unit - I : Concepts</p> <ol style="list-style-type: none"> 1. Classification of hazards and disasters. 2. Approaches to hazard study: Risk perception and vulnerability assessment. Hazard paradigms. 3. Responses to hazards: Preparedness, trauma and aftermath. Resilience and capacity building. 4. Hazards mapping: Data and geospatial techniques (for hazards enlisted in Unit II and DS13P) <p>Unit - II : Hazard-specific Study with focus on India</p> <ol style="list-style-type: none"> 5. Earthquake: Factors, vulnerability, consequences and management 6. Landslide: Factors, vulnerability, consequences and management. 7. Tropical Cyclone: Factors, vulnerability, consequences and management. 8. Flood: Factors, vulnerability, consequences, and management. 9. Riverbank erosion: Factors, vulnerability, consequences and management. 10. Biohazard: Classification, vulnerability, consequences, and management. 	<ul style="list-style-type: none"> • Disaster is a serious disruption of the functioning of a community or society, which involves widespread human, material, economic or environmental impacts that exceed the ability of the affected community or society to cope up with using its own resources. • Students will learn how the combination of hazards, vulnerability and inability to reduce the potential negative consequences of risk results in disaster. • From this course students will learn how to prepare the society to face certain kind of disaster, respond to a particular disaster, what are the different mitigative measures for both different natural and man-made disaster, what kind of response of the affected people will be during the occurrence of a particular disaster and in what way we will be able to manage and recover the loss caused at the time of disaster. • It helps individuals to understand the cause and effects of the natural and human made disasters like floods, earthquakes, cyclones, pollution, etc., and the measures that must be taken to protect the environment from those disasters.
	<p>GEOADS14T : Social Geography (5 Credits)</p> <p>Unit I : Society, Identity and Crisis</p> <ol style="list-style-type: none"> 1. Social Geography: Concept, Origin, Nature and Scope. 2. Concept of Space, Social differentiation and stratification; social processes. 3. Social Categories: Caste, Class, Religion, Race and Gender and their Spatial distribution. 	<ul style="list-style-type: none"> • In a nutshell, social geography focuses on the scientific study of the relationship of society and space (spatial components). • It is interested in answering the questions of how societal processes determine space and its structures and how spatial conditions determine the existence of societies.

<p>4. Basis of Social region formation; Evolution of social-cultural regions of India.</p> <p>5. Peopling Process of India: Technology and Occupational Change; Migration.</p> <p>6. Social groups, social behaviour and contemporary social environmental issues with special reference to India.</p> <p><u>Unit II : Social Wellbeing and Planning</u></p> <p>7. Concept of Social Well-being, Quality of Life, Gender and Social Well-being.</p> <p>8. Measures of Social Well-being: Healthcare, Education, Housing, Gender Disparity.</p> <p>9. Social Geographies of Inclusion and Exclusion, Slums, Gated Communities, Communal Conflicts and Crime.</p> <p>10. Social Planning during the Five Year Plans in India.</p> <p>11. Social Policies in India: Education and Health.</p> <p>12. Social Impact Assessment (SIA): Concept and importance.</p>	<ul style="list-style-type: none"> ● Master's degrees in Social Geography offer advanced study of the relationships between people, natural resources and animal life, and their spatial distribution over geographical locations. ● Students become informed in a variety of areas, such as politics, citizenship, cultural awareness and some general knowledge of world affairs. ● Students gain a broad understanding of history, geography and cultures around the world. ● They learn more about their civic duties and responsibilities and get a better understanding of how the government and economy work. ● The learners are taught to be more well-rounded individuals with the concept of social well-being.
<p><u>GEOADS15P : Surveying Techniques and fieldwork Lab (5 Credits)</u></p> <p><u>Unit I : Surveying</u></p> <p>1. Open and closed traverse survey using Prismatic Compass; Bowditch correction for closing error adjustment.</p> <p>2. Profile line survey and Radial Contouring using a Dumpy Level; Plotting radial contouring data.</p> <p>3. Profile survey using Abney level.</p> <p>4. Determination of heights of objects with accessible and inaccessible bases by Transit Theodolite (instrument and object not in the same vertical plane method).</p> <p><u>Unit II : Fieldwork</u></p>	<ul style="list-style-type: none"> ● Different surveying techniques and methods are taught so that the students are capable of using such techniques in the practical field. ● Fieldwork is an essential ingredient of geography because it provides a 'real-world' opportunity for students to develop and extend their geographical thinking; it adds value to classroom experiences. ● Field studies are learning experiences outside of the classroom. ● Field studies allow students to gather their own (primary) data, provide opportunities to extend classroom learning through direct observation and experience, and allow for scientific research through field experiments. ● Field study trips can range from short walks in the schoolyard or nearby neighbourhood to vehicle excursions over some distance for several hours to a full day.
<p><u>GEOADS16T : Hydrology and Oceanography (5 Credits)</u></p> <p><u>Unit-I : Hydrology</u></p>	<ul style="list-style-type: none"> ● Hydrology has evolved as a science in response to the need to understand

SEM-7	<p>1. Systems approach in hydrology. Global hydrological cycle: Its physical and biological role.</p> <p>2. Run off: controlling factors. Infiltration and evapotranspiration. Run off cycle.</p> <p>3. Drainage basin as a hydrological unit. Principles of water harvesting and watershed management.</p> <p>4. Types of subsurface water, Types of aquifers, Groundwater Flow: Darcy's Law.</p> <p>5. Groundwater: Occurrence and storage. Factors controlling recharge, discharge and movement.</p> <p>Unit-II : Oceanography</p> <p>6. Major relief features of the ocean floor: characteristics and origin according to plate tectonics.</p> <p>7. Physical and chemical properties of ocean water.</p> <p>8. Water mass, T-S diagram.</p> <p>9. Air-Sea interactions, ocean circulation, wave and tide.</p> <p>10. Ocean temperature and salinity: Distribution and determinants.</p> <p>11. Coral reefs: Formation, classification and threats.</p> <p>12. Marine resources: Classification and sustainable utilisation.</p> <p>13. Sea level change: Types and causes.</p>	<p>the complex water systems of the Earth and help to solve water problems.</p> <ul style="list-style-type: none"> Hydrologists play a vital role in finding solutions to water problems, and interesting and challenging careers are available to those who choose to study hydrology. Engineering hydrology is a very important branch of civil engineering as it is necessary for the construction of various types of water resource-related infrastructures. Mostly, engineering hydrology is focused on the scientific study of the water cycle, water resources and water resource sustainability. It is the study of the Earth's water, particularly of water on and under the ground before it reaches the ocean or before it evaporates into the air. Hydrology provides guidance for undergoing proper planning and management of water resources. Calculates rainfall, surface runoff, and precipitation. It determines the water balance for a particular region. It mitigates and predicts flood, landslide and drought risk in the region. It is especially important today as climate change, pollution, and other factors are threatening the ocean and its marine life. The ocean has a great effect on the world's climate because the sea stores so much heat. From the knowledge obtained from the course oceanography, one can predict future changes in the temperature of the planet, and also to give warning of sea level changes, which could devastate low lying countries and coral reefs. Field of Oceanography is the best career option for the students having interest in the study of the ocean and its surrounding environment.
	<p>GEOADS17T/ 17P : Statistical Methods In Geography + Lab (5 Credits)</p>	<ul style="list-style-type: none"> Statistics play an important role in real life, especially in large industries,

<p>THEORY - 3 Credits <u>Unit I : Frequency Distribution and Sampling</u> 1. Discrete and continuous data, population and samples, scales of measurement (nominal, ordinal, interval and ratio), 2. Collection of data and formation of statistical tables. 3. Sampling: Need, types, and significance and methods of random sampling. 4. Theoretical distribution: frequency, cumulative frequency, normal and probability. <u>Unit II : Numerical Data Analysis</u> 5. Central tendency: Mean, median, mode, partition values. 6. Measures of dispersion range, mean deviation, standard deviation, coefficient of variation. 7. Association and correlation: Rank correlation, product moment correlation. 8. Regression: Linear and nonlinear, bi-variate analysis and curve fitting – linear, exponential. power relationship; residuals. 9. Time series analysis: Moving average. 10. Hypothesis testing: Chi-square test and T-test.</p>	<p>where data is computed in bulk.</p> <ul style="list-style-type: none"> ● It helps to collect, analyse and interpret the data. ● Also, with the help of statistical graphs, charts and tables we can easily present the data. ● Based on the representation of data such as using Bar graphs, Pie charts or tables, we can analyse and interpret it. ● The main purpose of using statistics is to plan the collected data in terms of experimental designs and statistical surveys. Statistics is considered a mathematical science that works with numerical data. ● Statistics is a crucial process which helps to make the decision based on the data. ● Students learn how to describe and summarise spatial data. ● To make generalisations concerning complex spatial patterns. ● To estimate the probability of outcomes for an event at a given location. ● To use samples of geographic data to infer characteristics for a larger set of geographic data (population).
<p>GEOADS18T : Advanced Geomorphology (5 Credits) <u>Unit I : Explanation in Geomorphology</u> 1. Principle of Uniformitarianism, Catastrophism, inheritance from the past; Actualism. 2. Systems Analysis in Geomorphology: Feedback mechanisms, Ideas of Equilibrium, Geomorphic thresholds. 3. Planetary geomorphology with special reference to Mars. 4. Tectonic and Structural landforms: Structure and form of orogenic belts with reference to the Himalayas: Fore deep basins, thrust belt, metamorphism and tectonics. 5. Tectonic Geomorphology: Basic principles; geomorphic markers</p>	<ul style="list-style-type: none"> ● Geomorphology is an important part of Physical geography which concerns the scientific study of the relief features of the earth. ● To establish the relationship between tectonism and geomorphology. ● To verify the impact of dynamic agencies on denudation and their work. ● To understand planetary geomorphology. ● To understand the cycle of erosion with special reference to slope development.

<p>SEM-8</p>	<p>ascertaining neotectonic movements, principles of relative and absolute dating.</p> <p>6. Morphogenetic regions and their importance. Significance of process studies in geomorphology.</p> <p><u>Unit II: Geomorphic Processes and Forms</u></p> <p>7. Significance of drainage basin as a geomorphic unit; channel initiation.</p> <p>8. Hydraulics of streamflow: Types of flow, stream velocity and resistance, stream energy. entrainment and bed erosion, bank erosion processes and deposition.</p> <p>9. Processes of evolution of periglacial landforms.</p> <p>10. Karst processes and landforms in Tropical Humid Environments.</p> <p>11. Coastal morphodynamic variables and their influence on evolution of coastal forms. Bioturbation, Tidal accretion, Storm surge effects.</p> <p>12. Slope evolution models – King, Wood and Young.</p> <p>13. Applied and anthropogenic geomorphology – emergence and relevance. Geoinformatics in Geomorphology : Utility of satellite images, Digital Elevation Models.</p>	<ul style="list-style-type: none"> ● To see the application of geomorphology in the view of anthropogenic and environmental geomorphology.
	<p><u>GEOADS19T : Regional Development and Planning (5 Credits)</u></p> <p><u>Unit I : Regional Development</u></p> <p>1. Regions: Concept, types, and delineation.</p> <p>2. Concepts of growth and development. Indicators of development: Economic, demographic, and environmental.</p> <p>3. Theories and models for regional development: Cumulative causation (after Myrdal), stages of development (after Rostow), and growth pole model (after Perroux).</p> <p>4. Underdevelopment: Concept and causes.</p> <p>5. Regional disparities in India: Economic and social.</p> <p><u>Unit II : Regional Planning</u></p> <p>6. Regional planning: Principles, objectives, and approaches.</p> <p>7. Types of planning: Temporal, sectoral, spatial, and non-spatial.</p> <p>8. Centralised and decentralised planning. Multi-level planning in India.</p>	<ul style="list-style-type: none"> ● From Regional Development and Planning we understood about improving the distribution pattern of Human activity and reducing the disparities between rich and poor regions of the country. ● Also focus on Region-wise environmental, social and economic issues. ● Regional planning aims to improve different aspects of life for the people in the area, like transportation, housing, environment, and economy. ● Regional planning tries to think about how towns, villages, cities, transportation systems, and natural resources fit into the larger region. ● Overall objective of a development plan is to encourage continuous learning, performance improvement and personal growth.

<p>9. Planning issues in hill area (as formal region) and city region (as functional region). 10. Planning strategies: Participatory planning and governance.</p>	
<p>GEOADS20T : Advanced Climatology (5 Credits) <u>Unit I : Atmospheric Dynamics and Climatology of the Tropics</u> 1. Atmospheric temperature; equations for state of ideal gases; First and Second Laws of Thermodynamics. 2. Atmospheric moisture; process of condensation and precipitation; Carnot Cycle, conditions of stability and instability. 3. Concepts and equations of pressure, gravity, centripetal and Coriolis forces; geostrophic and gradient winds. 4. Tropical wet and dry climates; Tropical air masses – characteristics, identification and modification, convergence and divergence. 5. Mechanism of Indian Monsoon and causes of its variability. Hadley and Walker cells, ENSO phenomena. 6. Weather hazards: heat and cold waves– genesis and forecasting. <u>Unit II : Climate Change and Applied Climatology</u> 7. Theories of climate change. Scientific evidence of climate change; reconstruction of past climates. 8. The climate cycle and climate trends. 9. Bioclimatology: Human comfort in relation to climate. 10. Synoptic Climatology in pollution studies, aviation and navigation. 11. Urban climatology with special reference to urban heat island. 12. Approaches and techniques of weather forecasting in India: short, medium and long range.</p>	<ul style="list-style-type: none"> ● To understand atmospheric temperature, moisture with the concept and equations of pressure ,gravity, coriolis force. ● To understand the variations of the weather system in terms of stability and instability of the atmosphere. ● To understand the mechanism of monsoon and its variability. ● To understand the regional and seasonal variations of the weather system in India. ● To know about history, recent trends, impact and dynamics of climate change on earth. ● To assess future risk of climate change and the adaptation and mitigation options. ● To know the significance of synoptic climatology in pollution studies and navigation. ● To study bioclimatology to find the relationship between climate and human comfort. ● To study urban climatology with special reference to urban heat island. ● To study the approaches and techniques of weather forecasting in India.
<p>GEOADS21T : Rural and Urban Geography (5 Credits) <u>Unit I : Rural Geography</u> 1. Paradigms of rural development : Modernisation paradigm, holistic development paradigm, Gandhian approach to rural development. 2. Approaches to Rural Development: Area-based (DPAP) and</p>	<ul style="list-style-type: none"> ● Urban and rural areas are two terms used to describe populated areas. ● It is important for the students to understand the perceptions of both urban and rural areas, and the evaluation of living space. ● Rural development involves improving the quality of life and economic

Target based (NFFWP).

3. Rural Employment policies and programmes in India, PMGSY, SJSY, NREGA, Jan Dhan Yojana.

4. 73rd Constitutional Amendment of India and its implications for governance.

5. Participatory rural planning and management with reference to JFM, Watershed Management, SHGs.

Unit II : Urban Geography

6. Approaches and recent trends in urban geography.

7. Origin of urban places in ancient, mediaeval, modern, and postmodern periods: Factors, stages, and characteristics.

8. Patterns of urbanisation in developed and developing countries

9. Patterns and trends of urbanisation in India.

10. Urban issues: urban poverty and crime, housing, and civic amenities.

well-being of people living in rural areas, often relatively isolated and sparsely populated.

- The development of rural areas has traditionally centred on the exploitation of land-intensive natural resources such as agriculture and forestry.
- Rural areas, however, have changed due to changes in global production networks and urbanisation. Resources extraction and agriculture have increasingly been replaced as dominant economic drivers by tourism, niche manufacturers, and recreation.
- Urban geography is the study of the history and development of cities and towns and the people in them.
- Geographers and urban planners' study urban geography to understand how and why cities change.
- The relationship between urban and rural areas is changing in countries all over the world. Urban and rural land uses in these countries are no longer mutually exclusive, but rather exist on a continuum of community types that are increasingly interconnected.
- Migration and settlement patterns are changing as new forms of urban, suburban and exurban development alter patterns of community development.
- The population is increasingly decentralised as suburbanization is being replaced by exurban development, characterised by low-density growth where households with fewer people are living on larger pieces of land further from urban centres.

1.3 Structure of the 3-year Multidisciplinary Undergraduate Programme

Table 3: Semester-Wise and Course Category-Wise Distribution of Credit

SEM	Core Course (A)	Core Course (A)	Core Course (A)	MDC	AEC	SEC	VAC	Internship	Total Credits
I	MA-1 (5)	MB-1 (5)	MC-1 (5)		AE-1 (3)		VA-1 (3)		21
II	MA-2 (5)	MB-2 (5)	MC-2 (5)		AE-2 (3)		VA-2 (3)	(4**)	21
Exit with Certificate after 1 Year									42+(4**)
III	MA-3 (5)	MB-3 (5)	MC-3 (5)		AE-3 (3)	SE-1 (3)			21
IV	MA-4 (5)	MB-4 (5)	MC-4 (5)	MD-1 (3)		SE-2 (3)		(4**)	21
Exit with Diploma after 2 Years									84+(4**)
V	MA-5 (5)	MB-5 (5)	MC-5 (5)	MD-2 (3)		SE-3 (3)		2	21
VI	MA-6 (5)	MB-6 (5)	MC-6 (5)	MD-3 (3)		SE-4 (3)		(4**)	21
Credit	30	30	30	9	9	12	6	4	(4**)+126

MA: Minor discipline 1, MB: Minor discipline 2, SM: Special Minor courses from the same discipline, either MA or MB, but of higher level. MDC= multi-disciplinary, AEC= Aptitude enhancement course, SEC= Skill enhancement course, VA= value added course.

Credit (5) distribution: Lab-based Courses: L=3, P=2, Non-Lab based Courses: L=4, Tu=1, Field-based courses: P=5

MINOR COURSES OFFERED BY GEOGRAPHY

SEM	COURSE CODE & NAME	COURSE OUTCOME
SEM-1	<p>GEOHM01T/ GEOMC01T : Physical Geography <u>Unit I : Geotectonics and Geomorphology</u> 1. Internal Structure of Earth based on Seismic Evidence. 2. Influence of lithology on landforms: Granite and Basaltic landforms. 3. Factors controlling landform development; endogenetic and exogenetic forces. 4. Evolution of landforms under fluvial process. 5. Nature and classification of hazards in Indian context. <u>Unit II : Climatology, Soil and Biogeography</u> 6. Nature, composition and layering of the atmosphere 7. Distribution of pressure belts and planetary wind system, jet streams, and index cycle. 8. Factors of soil formation. 9. Evolution of an ideal soil profile. 10. Concept of ecosystem – basic ecological principles, ecotone, communities, niche, succession, and habitat. 11. Concept of Biomes: study of Tropical rainforest, Taiga, Savannah, Desert, Tundra and Temperate grasslands.</p>	<ul style="list-style-type: none"> ● Physical geography is a crucial discipline that helps us to understand the Earth's systems, manage the environment, address climate change, manage natural resources, and plan sustainable growth of cities. ● Physical Geography explores the physical characteristics of the Earth such as landforms, climate patterns, soil, vegetation, and ecosystems. ● It helps us to understand the interconnectedness of the Earth's systems, including the atmosphere, hydrosphere, lithosphere, and biosphere. ● By studying the interactions between these systems, students can better comprehend the processes that shape our planet, such as weather patterns, erosion, and the distribution of resources. ● By analysing the physical characteristics of an area, including its topography, climate, and natural hazards, physical geographers can help to identify suitable locations for infrastructure, assess the potential risks that harmonise with the natural environment.
	<p>GEOHM02T/ GEOMC02T : Human Geography <u>Unit I - Scope and Approaches</u> 1. Elements of Human Geography: Nature, scope and recent trends. 2. Approaches to Human Geography; Resource, Locational, Landscape, Environmental. <u>Unit II Social and Population Geography</u> 3. Evolution of human societies: Hunting and food gathering, pastoral nomadism, subsistence farming, industrial society and post-industrial urban society.</p>	<ul style="list-style-type: none"> ● Human Geography provides knowledge about the human aspects of geography. ● Students can easily understand the relationship between human beings and the natural world. ● Various philosophical contents are there in this course to provide the philosophical background of the subject. ● Various quantitative techniques, indexes, formulas are taught

SEM-2	<p>4. Human adaptation to the environment: Eskimo, Masai and Maori. 5. Population distribution, density and growth of world population. 6. Demographic Transition Theory. <u>Unit III Economic and Settlement Geography</u> 7. Sectors of the economy: primary, secondary, tertiary and quaternary, quinary. 8. Types of agriculture: Intensive subsistence rice farming, Plantation agriculture (Tea). 9. Site, situation, types and patterns of Rural Settlements. 10. Classification of Urban Settlements after Census of India.</p>	<p>to depict, interpret and represent the human geographic data.</p> <ul style="list-style-type: none"> • Students will learn about the evolution of human societies with the passage of time. • They will learn the lifestyle of different human societies living in different parts of the world. • Concept of rural and urban settlements will also enrich them.
SEM-3	<p>GEOHM03T/ GEOMC03T/ 3P : General Cartography + Lab <u>Cartographic Techniques</u> 1. Concept of map scale: Types and Application. Reading distances on a map. 2. Map Projections: Criteria for choice of projections. Attributes and properties of: Zenithal Gnomonic Polar Case, Zenithal Stereographic Polar Case, Cylindrical Equal Area, Mercator's Projection, Bonne's Projection. Concept of UTM projection. 3. Survey of India topographical maps: Reference scheme of old and open series. Information on the margin of maps. 4. Representation of Data – Symbols, Dots, Choropleth, Isopleth and Flow Diagrams, Interpretation of Thematic Maps.</p>	<ul style="list-style-type: none"> • This paper aims to provide an in-depth knowledge about the theoretical understanding of the science of map making. • Various concepts are taught in this paper regarding various kinds of maps, their scales, uses, utilities etc. • Practical portion mainly deals with the equipment to construct various types of maps, based on various projections.
SEM-4	<p>GEOMC04T – Environmental Geography <u>Concepts</u> 1. Environmental Geography: Concepts and Approaches; 2. Human-Environment Relationship in equatorial, desert, mountain and coastal regions. 3. Concept of holistic environment and system approach. 4. Ecosystem: Concept, structure and functions; Environmental problems and policies. 5. Environmental Problems and Management: Air Pollution; Water</p>	<ul style="list-style-type: none"> • Environmental Geography provides a much-needed capability to study and understand interactions between people, and the environments in which they live. • Environmental Geographers have expert knowledge and skills to research, analyse and communicate how the changing environment affects our lives. • Their ability to visualise geographical issues at different spatial scales, from global to local and to offer solutions to some of our most pressing environmental problems. • Environmental geography prepares students for careers in

	<p>pollution Biodiversity Loss; Solid and Liquid Waste.</p> <p>6. Environmental problems and management : Desertification and soil erosion.</p> <p>7. Environmental Programmes and Policies : Developed Countries; Developing Countries.</p> <p>8. New Environmental Policy of India.</p>	<p>environmental planning, design, and restoration, as well as in environmental assessment and monitoring, resource management, natural areas preservation, and outdoor and environmental education.</p> <ul style="list-style-type: none"> ● Basically, one can study the interrelationship & interdependence between the living beings and their surrounding environment. ● Environmental Studies is an interdisciplinary field that draws on knowledge and analytical tools from many areas of study to understand the function of natural ecosystems, the effects of human societies on the environment, and the role that the environment has played in shaping human cultures and artistic endeavours.
SEM-5	<p>GEOMC05T – Soil and Biogeography <u>Unit I : Soil Geography</u></p> <ol style="list-style-type: none"> 1. Factors or soil formation. 2. Soil profile. Origin and profile characteristics of Lateritic and Chernozem soils. 3. Definition and significance of soil properties: Texture, structure and moisture, pH and organic matter. 4. Principles of soil classification: Genetic and USDA. Concept of land capability and its classification. <p><u>Unit II : Biogeography</u></p> <ol style="list-style-type: none"> 5. Concepts of biosphere, ecosystem, biome, ecotone, community, niche and succession. 6. Concepts of food chain and food web. Energy flows in ecosystems. 7. Geographical extent and characteristic features of : Tropical rainforest and Grassland biomes. 8. Biogeochemical cycles with special reference to carbon dioxide and nitrogen. 	<ul style="list-style-type: none"> ● From the content of this core course students will learn how to protect soils, plants and animals. One-quarter of all living things live in the soil. ● Students will learn the importance of soil which is the foundation of basic ecosystem function. Soil filters our water, provides essential nutrients to our forests and crops, and helps to regulate the Earth's temperature as well as many of the important greenhouse gases. ● Students will learn the important role of Biogeography in managing the world's biodiversity. ● From these students come to know about the study of the geographical distribution of organisms, and the information about how and when species may have evolved. ● They will be able to understand and forecast changes to species distributions caused by environmental changes, such as widespread vegetation clearance and shifts in climate.

<p>SEM-6</p>	<p>GEOMC06T – Regional Development <u>Concepts of Regions and Regional Planning</u> 1. Definition of Region. Types and Need of Regional planning. 2. Choice of a Region for Planning: Characteristics of an Ideal Planning Region; Delineation of Planning Region. 3. Regionalization of India for Planning (Agro Ecological Zones). 4. Strategies/Models for Regional Planning: Growth Pole Model of Perroux; Growth Centre Model in Indian Context. 5. Problem Regions and Regional Planning: Backward Regions and Special Area Development Plans in India.</p> <p><u>Regional Development</u> 6. Changing concept of development and underdevelopment; 7. Indicators of development: Economic, social and environmental. Concept of human development. 8. Development and regional disparities in India since Independence: Disparities in agricultural development and industrial development. 9. Development and regional disparities in India since independence : Disparities in human resource development in terms of education and health.</p>	<ul style="list-style-type: none"> • From Regional Development and Planning we understood about improving the distribution pattern of Human activity and reducing the disparities between rich and poor regions of the country. • Also focus on Region-wise environmental, social and economic issues. • Regional planning aims to improve different aspects of life for the people in the area, like transportation, housing, environment, and economy. • Regional planning tries to think about how towns, villages, cities, transportation systems, and natural resources fit into the larger region. • Overall objective of a development plan is to encourage continuous learning, performance improvement and personal growth.
<p>SEM-7 (Special Minor)</p>	<p>GEOHSM01P : Project Report based on Field Work Project work is compulsory for completing B.A/ B.Sc 3 Year Multi-Disciplinary Course in Geography. The Project report should be based on field work on some specific topics as suggested by the Department. Each student will prepare an individual report based on primary and secondary data collected during field work. The word count of the report should be about 8000 excluding figures, tables, photographs, maps, reference and appendices. The report should include an introduction, literature review, project aims and objectives, methodology, results and discussion and references.</p>	<ul style="list-style-type: none"> • Field study trips can range from short walks in the schoolyard or nearby neighbourhood to vehicle excursions over some distance for several hours to a full day. • Fieldwork is an essential ingredient of geography because it provides a 'real-world' opportunity for students to develop and extend their geographical thinking; it adds value to classroom experiences. • Field studies allow students to gather their own (primary) data, provide opportunities to extend classroom learning through direct observation and experience, and allow for scientific research through field experiments.

SKILL ENHANCEMENT COURSE (SEC)

SEM	COURSE CODE & NAME	COURSE OUTCOME
SEM-1	<p>GEOSE-01M : Remote Sensing</p> <ol style="list-style-type: none"> 1. Principles of Remote Sensing (RS): Classification of RS satellites and sensors. 2. Sensor resolutions and their applications with reference to IRS and Landsat missions, image referencing schemes and data acquisition. 3. Preparation of False Colour Composites from IRS LISS-3 and Landsat TM and OLI data. Principles of image rectification and enhancement. 4. Principles of image interpretation and feature extraction. Preparation of inventories of land use land cover features from satellite images. 	<ul style="list-style-type: none"> ● Remote sensing technique has emerged as an effective tool for systematic survey, analysis, and better management of natural resources (land, soil, water, forests, mountains) along with the monitoring of desertification, flood, drought, and landform change. ● Remote sensing helps people acquire information about the Earth. ● It is essential to hazard assessment as well as the monitoring of land degradation and conservation. ● Remote sensing is also useful in oceanography as it tracks ocean circulation, temperature, and wave heights to understand ocean resources better. ● Satellite remote sensors can serve as major sources of data on the effects of human behaviour within the biosphere, enabling the establishment of the spatial scale and extent of the direct interaction of humans with the global land cover.
SEM-2	<p>GEOSE-02M : Advanced Spatial Statistical Techniques</p> <ol style="list-style-type: none"> 1. Probability theory, probability density functions with respect to Normal, Binomial and Poisson distributions and their geographical applications. 2. Sampling: Sampling plans for spatial and non-spatial data, sampling distributions. Sampling estimates for large and small samples tests involving means and proportions. 3. Correlation and Regression Analysis: Rank order correlation and product moment correlation; linear regression, residuals from regression, and simple curvilinear regression. Introduction to multivariate analysis. 4. Time Series Analysis: Time Series processes; Smoothing time series; 	<ul style="list-style-type: none"> ● Spatial Statistics involves modelling and data analysis for processes displaying spatially-indexed dependence structures. ● Spatial statistics is all about analysing data that has a spatial (location) characteristic to it. ● This type of analysis looks for patterns or correlation in recorded observations of some process that occurs across a space. ● Typical Spatial statistical analysis would concentrate on analysing the patterns produced by the points. More specifically, analysis would try to determine if there are random, regular or clustered patterns evident. An example of this could be the study of the positions of a specific type of tree in a forest.

	<p>Time series components.</p>	<ul style="list-style-type: none"> ● Geostatistical data is collected at point locations but represents a continuous measurement. The method can be used to statistically predict a value in a new location based on values around it. An example of this is a study is a prediction of a yearly rainfall value based on the rainfall figures available around town.
<p>SEM-3</p>	<p>GEOSE-03M : Research Methodology <u>Unit I : Research Methodology</u> 1. Defining research problems, objectives and hypotheses. 2. Literature review and formulation of research design. 3. Research materials and methods. 4. Techniques of writing scientific reports: Preparing notes, references, bibliography, abstract and keywords. 5. Plagiarism: Classification and prevention.</p> <p><u>Unit II : Field Methodology</u> 6. Fieldwork in Geographical studies: Role and significance. Selection of study area and objectives. Pre-field academic preparations. Ethics of fieldwork. 7. Field techniques and tools: Observation (participant, non-participant), questionnaires (open, closed, structured, non-structured). Interview. 8. Field techniques and tools: Landscape survey using transects and quadrants, constructing a sketch, photo and video recording. 9. Positioning and collection of samples. Preparation of inventory from field data. 10. Post-field tabulation, processing and analysis of quantitative and qualitative data. 11. Fieldwork: Logistics and handling of emergencies.</p>	<ul style="list-style-type: none"> ● The main objective of Research Methodology is to introduce the basic concepts of research; fieldwork, identification of area of study, methodology, quantitative and quantitative analysis, and conclusions to be drawn about the area – fundamental to geographical research. ● This course addresses the issues inherent in selecting a research problem and discusses the techniques and tools to be employed in completing a research project. ● This will also enable the students to prepare report writing and framing Research proposals and also Fieldwork have these educational purposes like Conceptual development, ● Students who complete this course will be able to understand and comprehend the basics in research methodology and apply them in research/ field work. ● This course will help them to select an appropriate research design. ● The course will also enable them to collect the data, edit it properly and analyse it accordingly. Thus, it will facilitate students’ prosperity in higher education. ● The Students will develop skills in qualitative and quantitative data analysis and presentation. ● Students will be able to demonstrate the ability to choose methods appropriate to research objectives. ● Develop skills in photography, mapping and video recording.

MULTIDISCIPLINARY COURSE OFFERED BY GEOGRAPHY (MDC)

SEM	COURSE CODE & NAME	COURSE OUTCOME
SEM-1	<p>GEOMD-01M : Geomatics and Spatial Analysis <u>Unit I : Cartography</u> 1. Concept and applications of scales and projections. Components and classification of maps. 2. Map projections: Classification, properties and uses with special reference to simple conical projection and Universal Transverse Mercator (UTM). 3. Construction of simple conical projection with one standard parallel. <u>Unit II : Surveying</u> 4. Basic concepts of surveying, survey equipment, and their capabilities: Dumpy level, theodolite, total station, and Global Navigation Satellite System (GNSS). 5. Bearing: Magnetic and true, whole-circle and reduced. Concept of geoid and spheroid with special reference to WGS-84. 6. Traverse survey and plotting UTM coordinates using smartphone GNSS application. <u>Unit III : Remote Sensing</u> 7. Principles of remote sensing (RS). Types of RS satellites and sensors with reference to IRS and Landsat missions. 8. Principles of • preparing standard false colour composites (FCCs) and • supervised image classification. 9. GIS data types: Spatial and non-spatial (attribute table and metadata), raster and vector. 10. Principles of preparing attribute tables, data manipulation, query, and overlay. 11. Identification of land use / land cover features from standard FCCs and preparation of inventories. 12. Change detection of riverbank or coastline shift from multi-dated maps and images.</p>	<ul style="list-style-type: none"> ● Geomatics and Spatial Analysis is designed to provide the knowledge and skills for understanding the process of map making, and to acquaint students with new technology used in map making. ● The students will be able to apply the techniques and principles of map making and designing for map creation and be able to read and coordinate various sheets for making mosaics. ● The students will be able to develop an idea about different types of thematic mapping techniques. ● They will Learn the usages of survey instruments. ● It brings direct interaction with different types of surveying instruments like Dumpy level, total station, GPS and Theodolite with the environment. ● They will gather knowledge about the principles of remote sensing, sensor resolutions and image referencing schemes. ● It will help about how to interpret satellite imagery and understand the preparation of false colour composites from them. Training will be done in the use of Geographic Information System (GIS) software for contemporary mapping skills. ● It will learn to analyse and interpret remotely sensed satellite images and aerial photographs in order to understand topographical and cultural variations on the Earth's surface.