

**HONOURSCOURSE: CORE SUBJECTS**

**Semester-I (July to December)**

**Core Course-1: Geotectonics and Geomorphology**

**Course Code: CC1**

PROGRAMME	B.Sc. Hons Geography
COURSE CODE	COURSE NAME
CC1	Geotectonics and Geomorphology
YEAR & SEMESTER	1 <sup>st</sup> Year 1 <sup>st</sup> Semester
PREREQUISITE COURSE	NIL
COURSE OBJECTIVE	Understanding Earth's surface processes and landscape evolution

<b>UNIT I: GEOTECTONICS</b>	<b>No.of Lec</b>	<b>Faculty</b>
1. Earth's tectonic and structural evolution with reference to geological time scale	2	EB
2. Earth's interior with special reference to seismology. Isostasy: Models of Airy, Pratt, and their applicability	2	LB
3. Plate Tectonics as a unified theory of global tectonics: Processes and landforms at plate margins and hotspots	7	LB
4. Folds and Faults—origin and types.	3	BP
<b>UNIT II: GEOMORPHOLOGY</b>		
5. Degradational processes: Weathering, mass wasting, and resultant landforms	4	BP
6. Processes of entrainment, transportation, and deposition by different geomorphic agents. Role of humans in landform development	4	LB
7. Development of river network and landforms on uniclinal and folded structures. Surface expression of faults	7	BB
8. Development of river network and landforms on granites, basalts and limestones	4	BB
9. Coastal processes and landforms	3	EB
10. Glacial and glacio-fluvial processes and landforms	3	MG
11. Aeolian and fluvio-aeolian processes and landforms	3	EB
12. Role of time in geomorphology: Schumm and Lichty's model. Models on landscape evolution: Views of Davis, Penck, King, and Hack. Significance of systems approach	5	EB

**2.2 GEO-A-CC-1-01-P – Geotectonics and Geomorphology Lab ☐ 30 Marks / 2 Credits**

TOPIC	No.of Lec	Faculty
1. Measurement of dip and strike using clinometer	5	BB
2. Megascopic identification of (a) mineral samples: Bauxite, calcite, chalcopryrite, feldspar, galena, gypsum, hematite, magnetite, mica, quartz, talc, tourmaline; and (b) rock samples: Granite, basalt, dolerite, laterite, limestone, shale, sandstone, conglomerate, slate, phyllite, schist, gneiss, quartzite, marble	14	MG
3. Extraction and interpretation of geomorphic information from Survey of India 1:50k topographical maps of plateau region: Construction of relief profiles (superimposed, projected, and composite). Delineation of drainage basins. Construction of relative relief map, slope map (Wentworth's method), drainage density map, stream ordering (Strahler), and bifurcation ratio on a drainage basin (c. 5' x 5')	25	EB
4. Construction of hypsometric curve and derivation of hypsometric integer of a drainage basin (c. 5' x 5') from Survey of India 1:50k topographical maps of plateau region	4	LB

**Semester-1 (July To December)**

**Core Course-II (Cartographic Technique)**

**Course Code –CC2**

PROGRAMME	B.Sc. HONS (GEOGRAPHY)
COURSE CODE	COURSE NAME
CC2	CARTOGRAPHIC TECHNIQUE
YEAR AND SEMESTER	1 <sup>ST</sup> YEAR 1 <sup>ST</sup> SEMESTER
PREREQUISITE COURSE	NIL
COURSE OBJECTIVE	Ability to collect and interpret physical and geographic data for a region

**2.3 GEO-A-CC-1-02-TH – Cartographic Techniques ☐ 60 Marks / 4 Credits**

1. Maps: Components and classification [4]	BP
2. Concept and application of scales: Plain, comparative, diagonal and Vernier [8]	LB
3. Coordinate systems: Polar and rectangular [6]	BB
4. Concept of generating globe [2]	BB
5. Grids: Angular and linear systems of measurement [5]	LB
6. Bearing: Magnetic and true, whole-circle and reduced [5]	MG
7. Concept of geoid and spheroid with special reference to Everest and WGS-84 [4]	LB
8. Map projections: Classification, properties and uses [8]	BB
9. Concept and significance of UTM projection [2]	EB
10. Representation of data using dots, spheres and divided proportional circles [5]	BP
11. Representation of data using isopleth, choropleth, and chorochromatic maps [5]	MG
12. Survey of India topographical maps: Reference scheme of old and open series. Information on the margin of maps [6]	EB

**2.4 GEO-A-CC-1-02-P – Cartographic Techniques Lab 30 Marks / 2 Credits**

1. Graphical construction of scales: Plain, comparative, diagonal and Vernier [16]	<b>LB</b>
2. Construction of projections: Polar Zenithal Stereographic, Simple Conic with one standard parallel, Bonne’s, Cylindrical Equal Area, and Mercator’s [20]	<b>EB + BB</b>
3. Thematic maps: Proportional squares, pie diagrams with proportional circles, dots and spheres [12]	<b>BP</b>
4. Thematic maps: Choropleth, isopleth, and chorochromatic maps [12]	<b>MG</b>

**Semester –II (January To July)**

**Core Course III:-Human Geography**

**Course Code:-CC3**

PROGRAMME	B.Sc. HONS GEOGRAPHY
COURSE CODE	COURSE NAME
CC3	HUMAN GEOGRAPHY
YEAR & SEMESTER	1 <sup>st</sup> YEAR 2 <sup>nd</sup> SEMESTER
PREREQUISITE COURSE	NIL
COURSE OBJECTIVE	Basic idea about human geography

<b>Unit I: Nature and Principles</b>		
1. Nature, scope and recent trends. Elements of human geography [4]		<b>EB</b>
2. Approaches to Human Geography: Resource, locational, landscape, environment [6]		<b>LB</b>
3. Concept and classification of race. Ethnicity [5]		<b>BB</b>
4. Space, society, and cultural regions (language and religion) [5]		<b>BP</b>
<b>Unit II: Society, Demography and Ekistics</b>		
5. Evolution of human societies: Hunting and food gathering, pastoral nomadism, subsistence farming, and industrial society [6]		<b>BP</b>
6. Human adaptation to environment: Case studies of Eskimo, Masai and Maori [4]		<b>BB</b>
7. Population growth and distribution, composition; demographic transition [5]		<b>EB</b>
8. Population–resource regions (Ackerman) [5]		<b>EB</b>
9. Development–environment conflict [5]		<b>LB</b>
10. Types and patterns of rural settlements [5]		<b>MG</b>
11. Rural house types in India [5]		<b>MG</b>
12. Morphology and hierarchy of urban settlements [5]		<b>LB</b>

**2.6 GEO-A-CC-2-03-P – Human Geography Lab 30 Marks / 2 Credits**

1. Spatial variation in continent- or country-level religious composition by divided proportional circles [12]	9	BP
2. Measuring arithmetic growth rate of population comparing two decadal datasets [15]	10	MG
3. Types of age-sex pyramids (progressive, regressive, intermediate, and stationary): Graphical representation and analysis [20]	15	BP
4. Nearest neighbour analysis from Survey of India 1:50k topographical maps of plain region (c. 5' x 5') [13]	10	BB

**SEMESTER-II (JANUARY-JULY)**

**Core Course-4: Thematic Mapping and Surveying**

**Course Code: CC4**

Programme	B.Sc Hons Geography
Course code	Course Name
CC4	THEMATIC MAPPING AND SURVEYING
Year and Semester	1 <sup>st</sup> year 2 <sup>nd</sup> Semester
Prerequisite course	Nil
Course objective	To create basic ideas of Thematic Mapping and Surveying.

**2.7 GEO-A-CC-2-04-TH – Thematic Mapping and Surveying 60 Marks / 4 Credits**

1. Concepts of rounding, scientific notation. Logarithm and anti-logarithm. Natural and log scales	4	LB
2. Concept of diagrammatic representation of data	2	MG
3. Preparation and interpretation of geological maps	4	EB
4. Preparation and interpretation of weather maps	4	BP
5. Preparation and interpretation land use land cover maps	3	BB
6. Preparation and interpretation of socio-economic maps	3	BB
7. Principal national agencies producing thematic maps in India: NATMO, GSI, NBSSLUP, NHO, and NRSC / Bhuvan	3	BP
8. Basic concepts of surveying and survey equipment: Prismatic compass	3	EB
9. Basic concepts of surveying and survey equipment: Dumpy level	4	MG
10. Basic concepts of surveying and survey equipment: Theodolite	4	LB
11. Basic concepts of surveying and survey equipment: Abney level	3	LB
12. Basic concepts of surveying and survey equipment: Laser distance measurer	3	EB

**2.8 GEO-A-CC-2-04-P – Thematic Mapping and Surveying Lab 30 Marks / 2 Credits**

1. Traverse survey using prismatic compass	7	LB
2. Profile survey using dumpy Level	8	MG
3. Height determination of base accessible and inaccessible (same vertical plane method) objects by theodolite	12	LB
4. Interpretation of geological maps with uniclinal structure, folds, unconformity, and intrusions	12	EB

**Semester- III (July to December)**

**Core Course –05-Climatology**

Course Code: CC5

Programme	B.Sc HONS Geography
Course Code	Course Name
CC5	Climatology
Year and Semester	2 <sup>nd</sup> year 3 <sup>rd</sup> semester
Prerequisite Course	Nil
Course Objective	To understand the climate system and their associated climate outcomes.

<b>Unit I: Elements of the Atmosphere</b>	<b>No of Lec</b>	<b>Faculty</b>
1. Nature, composition and layering of the atmosphere	3	BP
2. Insolation: Controlling factors. Heat budget of the atmosphere	4	BP
3. Temperature: horizontal and vertical distribution. Inversion of temperature: types, causes and consequences	4	BP
4. Overview of climate change: Greenhouse effect. Formation, depletion, and significance of the ozone layer	3	BP
<b>Unit II: Atmospheric Phenomena and Climatic Classification</b>		
5. Condensation: Process and forms. Mechanism of precipitation: Bergeron-Findeisen theory, collision and coalescence. Forms of precipitation	5	EB
6. Air mass: Typology, origin, characteristics and modification	3	EB
7. Fronts: Warm and cold, frontogenesis, and frontolysis	3	EB
8. Weather: Stability and instability, barotropic and baroclinic conditions	4	EB
9. Circulation in the atmosphere: Planetary winds, jet streams, index cycle	4	BB
10. Atmospheric disturbances: Tropical and mid-latitude cyclones, thunderstorms	4	BB
11. Monsoon circulation and mechanism with reference to India	4	BB
12. Climatic classification after Thornthwaite (1955) and Oliver	3	BB

**2.10 GEO-A-CC-3-05-P –Climatology Lab 30 Marks / 2 Credits**

1. Measurement of weather elements using analogue instruments: Mean daily temperature, air pressure, relative humidity, and rainfall	10	BB
2. Interpretation of a daily weather map of India (any two): Pre-Monsoon, Monsoon, and MPost-Monsoon	10	BP
3. Construction and interpretation of hythergraph and climograph (G. Taylor)	10	EB
4. Construction and interpretation of wind rose	8	BP

**Semester- III (July to December)**

**Core Course –06-Hydrology and Oceanography**

Course Code: CC6

Programme	B.Sc HONS Geography
Course Code	Course Name
CC6	<b>Hydrology and Oceanography</b>
Year and Semester	2 <sup>nd</sup> year 3 <sup>rd</sup> semester
Prerequisite Course	Nil
Course Objective	Study of the interrelationship between water and environment and to differentiate between underwater formations, seawater composition and qualities

<b>Unit-I: Hydrology</b>	<b>No of Lec</b>	<b>Faculty</b>
1. Systems approach in hydrology. Global hydrological cycle: Its physical and biological role	4	MG
2. Run off: controlling factors. Infiltration and evapotranspiration. Run off cycle	4	BB
3. Drainage basin as a hydrological unit. Principles of water harvesting and watershed management	4	MG
4. Groundwater: Occurrence and storage. Factors controlling recharge, discharge and movement	4	MG
<b>Unit-II: Oceanography</b>		
5. Major relief features of the ocean floor: Characteristics and origin according to plate tectonics	4	BB
6. Physical and chemical properties of ocean water	3	BB
7. Water mass, T-S diagram	3	LB
8. Air-Sea interactions, ocean circulation, wave and tide	5	LB
9. Ocean temperature and salinity: Distribution and determinants	3	LB
10. Coral reefs: Formation, classification and threats	3	BP
11. Marine resources: Classification and sustainable utilisation	3	BP
12. Sea level change: Types and causes	4	LB

**2.12 GEO-A-CC-3-06-P–Hydrology and Oceanography Lab [ 30 Marks / 2 Credits**

1. Construction and interpretation of rating curves	5	MG
2. Construction and interpretation of hydrographs and unit hydrographs	5	BB
3. Construction and interpretation of monthly rainfall dispersion diagram (Quartile method), Climatic water budget and Ergograph	10	LB
4. Construction of Thiessen polygon from precipitation data	5	BP

**Semester- III (July to December)**

**Core Course –7: Statistical Methods in Geography**

Course Code: CC7

Programme	B.Sc HONS Geography
Course Code	Course Name
CC7	Statistical Methods in Geography
Year and Semester	2 <sup>nd</sup> year 3 <sup>rd</sup> semester
Prerequisite Course	Nil
Course Objective	Significance and application of statistics in Geography

**2.13 GEO-A-CC-3-07-TH – Statistical Methods in Geography ☑ 60 Marks / 4 Credits**

<b>Unit I: Frequency Distribution and Sampling</b>	<b>No of Lec</b>	<b>Faculty</b>
1. Importance and significance of statistics in Geography	3	EB
2. Discrete and continuous data, population and samples, scales of measurement (nominal, ordinal, interval and ratio)	4	EB
3. Sources of geographical data for statistical analysis	3	EB
4. Collection of data and preparation of statistical tables	4	MG
5. Sampling: Need, types, significance, and methods of random sampling	4	EB
6. Theoretical distribution: Frequency, cumulative frequency, normal, and probability	5	MG
<b>Unit II: Numerical Data Analysis</b>		
7. Central tendency: Mean, median, mode, and partition values [6]	5	MG
8. Measures of dispersion range, mean deviation, standard deviation, and coefficient of variation [6]	4	MG
9. Association and correlation: Product moment correlation and rank correlation, [5]	4	LB
10. Regression: Linear and non-linear	4	LB
11. Time series analysis: Moving average	4	LB
12. Hypothesis testing: Chi-square test and T-test	4	LB

**2.14 GEO-A-CC-3-07-P – Statistical Methods in Geography Lab ☑ 30 Marks / 2 Credits**

<b>TOPIC</b>	<b>No of Lec</b>	<b>Faculty</b>
1. Construction of data matrix with each row representing an areal unit (districts / blocks / mouzas / towns) and corresponding columns of relevant attributes	10	EB
2. Based on the above, a frequency table, measures of central tendency, and dispersion would be computed and interpreted using histogram and frequency curve	10	MG
3. From the data matrix, a sample set (20%) would be drawn using random, systematic, and stratified methods of sampling and the samples would be located on a map with an explanation of the methods used	10	EB

4. Based on the sample set and using two relevant attributes, a scatter diagram and linear regression line would be plotted and residual from regression would be mapped with a short interpretation	10	LB
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**HONOURSCOURSE:SKILLENHANCEMENTELECTIVES**

**Semester- III (July to December)**

**Core Course –SEC: Coastal Management**

Programme	B.Sc HONS Geography
Course Code	Course Name
SEC	Coastal Management
Year and Semester	2 <sup>nd</sup> year 3 <sup>rd</sup> semester
Prerequisite Course	Basic knowledge of geomorphology
Course Objective	To plan for, and where appropriate, restrict development activities where such activities would damage or destroy coastal resources

**4.1 GEO-A-SEC-A-3-01-TH – Coastal Management 90 Marks / 2 Credits**

1. Components of a coastal zone. Coastal morphodynamic variables and their role in evolution of coastal forms	6	LB
2. Environmental impacts and management of mining, oil exploration, salt manufacturing, land reclamation and tourism	6	BP
3. Coastal hazards and their management using structural and non-structural measures: Erosion, flood, sand encroachment, dune degeneration, estuarine sedimentation and pollution	6	BB + MG
4. Principles of Coastal Zone Management. Exclusive Economic Zone and Coastal Regulation Zones with reference to India.	6	EB



**Semester- IV (January to June)**  
**Core Course – Economic Geography**

Programme	B.Sc HONS Geography
Course Code	Course Name
CC-8	Economic Geography
Year and Semester	2 <sup>nd</sup> year 4 <sup>th</sup> semester
Prerequisite Course	A general knowledge about the key concepts in economic geography location, transportation, resources, and trade
Course Objective	Understand the concept of economic activity, factors affecting location of economic activity. Gain knowledge about different types of Economic activities

<b>Unit I: Concepts</b>	<b>No.of Lec</b>	<b>Faculty</b>
1. Meaning and approaches to economic geography	3	BB
2. Concepts in economic geography: Goods and services, production, exchange, and consumption	5	BB
3. Concept of economic man. Theories of choices	5	EB
4. Economic distance and transport costs	3	EB
<b>Unit II: Economic Activities</b>		
5. Concept and classification of economic activities	3	BB
6. Factors affecting location of economic activity with special reference to agriculture (von Thünen), and industry (Weber)	4	BB
7. Primary activities: Agriculture, forestry, fishing, and mining	5	EB
8. Secondary activities: Classification of manufacturing, concept of manufacturing regions, special economic zones and technology parks	5	EB
9. Tertiary activities: Transport, trade and services	5	BP
10. Transnational sea-routes, railways and highways with reference to India	3	BP
11. International trade and economic blocs	3	BP
12. WTO and BRICS: Evolution, structure and functions	3	BP

**2.16 GEO-A-CC-4-08-P – Economic Geography Lab 30 Marks / 2 Credits**

	<b>No.of Lec</b>	<b>Faculty</b>
1. Choropleth mapping of state-wise variation in GDP [10]	6	BP
2. State-wise variation in occupational structure by proportional divided circles [15]	5	BP
3. Time series analysis of industrial production (India and West Bengal) [20]	10	EB
4. Transport network analysis by detour index and shortest path analysis [15]	5	BB

**Core Course 09: Regional Planning and Development**  
**Course Code: CC 09**

Programme	B.Sc. HONS Geography
Course Code	Course Name
CC 09	Regional Planning and Development
Year and Semester	2nd year 4th Semester
Prerequisite Course	Basic Class 12 Geography
Course Objective	To equip students with basic ideas of regional approach towards planning and development

**2.17 GEO-A-CC-4-09-TH – Regional Planning and Development 60 Marks / 4 Credits**

<b>Unit I: Regional Planning</b>	<b>No.of Lec</b>	<b>Faculty</b>
1. Regions: Concept, types, and delineation	3	EB
2. Regional Planning: Types, principles, objectives, tools and techniques		EB
3. Regional planning and multi-level planning in India	5	EB
4. Concept of metropolitan area and urban agglomeration	3	LB
<b>Unit II: Regional Development</b>		
5. Concept of growth and development, growth versus development	4	MG
6. Indicators of development: Economic, demographic, and environmental	4	LB
7. Human development: Concept and measurement	3	LB
8. Theories and models for regional development: Cumulative causation (Myrdal)	3	EB
9. Models and theories in regional development: Stages of development (Rostow), growth pole model (Perroux)	5	LB
10. Underdevelopment: Concept and causes	4	MG
11. Regional development in India: Disparity and diversity	4	BB
12. Need and measures for balanced development in India	4	BB

**2.18 GEO-A-CC-4-09-P – Regional Planning and Development Lab 30 Marks / 2 Credits**

<b>TOPIC</b>	<b>No.of Lec</b>	<b>Faculty</b>
1. Delineation of formal regions by weighted index method	8	LB
2. Delineation of functional regions by breaking point analysis	8	LB
3. Measurement of inequality by location quotient	6	BB
4. Measuring regional disparity by Sopher index	8	EB

**Core Course 10: Soil and Biogeography**  
**Course Code: CC 10**

Programme	B.Sc. HONS Geography
Course Code	Course Name
CC 10	Soil and Biogeography
Year and Semester	2nd year 4th Semester
Prerequisite Course	Basic Class 12 Geography
Course Objective	To make students learn basic ideas of soil and biosphere

<b>Unit I: Soil Geography</b>	<b>No.of Lec</b>	<b>Faculty</b>
1. Factors of soil formation	3	MG
2. Definition and significance of soil properties: Texture, structure, and moisture	4	MG
3. Definition and significance of soil properties: pH, organic matter, and NPK	4	LB
4. Soil profile. Origin and profile characteristics of lateritic, podsol and chernozem soils	5	MG
5. Soil erosion and degradation: Factors, processes and management measures. Humans as active agents of soil transformation	4	LB
6. Principles of soil classification: Genetic and USDA. Concept of land capability and its classification	5	LB
<b>Unit II: Biogeography</b>		
7. Concepts of biosphere, ecosystem, biome, ecotone, community and ecology	4	MG
8. Concepts of trophic structure, food chain and food web. Energy flow in ecosystems	4	MG
9. Classification of world biomes (Whittaker). Geographical extent and characteristics of tropical rain forest, savanna, hot desert, taiga and coral reef biomes	6	BP
10. Bio-geochemical cycles with special reference to carbon dioxide and nitrogen	3	BP
11. Deforestation: Causes, consequences and management	3	BP
12. Biodiversity: Definition, types, threats and conservation measures	3	BP

**2.20 GEO-A-CC-4-10-P–Soil and Biogeography Lab 30 Marks / 2 Credits**

<b>TOPIC</b>	<b>No.of Lec</b>	<b>Faculty</b>
1. Determination of soil reaction (pH) and salinity using field kit	10	LB+EB
2. Determination of soil type by ternary diagram textural plotting	6	MG
3. Plant species diversity determination by matrix method	8	MG
4. Time series analysis of biogeography data	8	EB

**Skill Enhancement Course B-03: Rural Development  
Course Code: SEC-B-4-03**

Programme	B.Sc. HONS Geography
Course Code	Course Name
SEC-B-4-03	Rural Development
Year and Semester	2nd year 4th Semester
Prerequisite Course	Basic Class 12 Geography
Course Objective	To equip students with basic ideas of and approaches towards rural development including rural governance

**4.3 GEO-A-SEC-B-4-03-TH – Rural Development 90 Marks / 2 Credits**

TOPIC	No.of Lec	Faculty
1. Rural Development: Concept, basic elements, measures of level of rural development	4	MG
2. Paradigms of rural development: Gandhian approach to rural development Lewis model of economic development, 'big push' theory of development, Myrdal's model of 'spread and backwash effects'	8	BP+BB+EB
3. Area based approach to rural development: Drought prone area programmes, PMGSY, SJSY, MNREGA, Jan Dhan Yojana	8	LB
4. Rural Governance: Panchayati Raj System and rural development policies and Programmes in India	4	BB

**SEMESTER-V**

Core Course 11: Research Methodology and Fieldwork  
Course Code: CC 11

Programme	B.Sc. HONS Geography
Course Code	Course Name
CC 11	Research Methodology and Fieldwork
Year and Semester	3rd year 5th Semester
Prerequisite Course	Basic Class 12 Geography
Course Objective	To equip students with basic ideas of research and fieldwork and various methodologies

**2.21 GEO-A-CC-5-11-TH – Research Methodology and Fieldwork ☐ 60 Marks / 4 Credits**

<b>Unit I: Research Methodology</b>		
1. Research in Geography: Meaning, types and significance	4	BP
2. Literature review and formulation of research design	4	BP
3. Defining research problem, objectives and hypothesis	5	EB
4. Research materials and methods	3	LB
5. Techniques of writing scientific reports: Preparing notes, references, bibliography, abstract, and keywords	5	LB
6. Plagiarism: Classification and prevention	3	LB
<b>Unit II: Fieldwork</b>		
7. Fieldwork in Geographical studies: Role and significance. Selection of study area and objectives. Pre-field academic preparations. Ethics of fieldwork	5	EB
8. Field techniques and tools: Observation (participant, non-participant), questionnaires (open, closed, structured, non-structured). Interview	4	EB
9. Field techniques and tools: Landscape survey using transects and quadrants, constructing a sketch, photo and video recording	4	EB
10. Positioning and collection of samples. Preparation of inventory from field data	3	BP
11. Post-field tabulation, processing and analysis of quantitative and qualitative data	4	BP
12. Fieldwork: Logistics and handling of emergencies	4	BP

**2.22 GEO-A-CC-5-11-P – Research Methodology and Fieldwork Lab ☐ 30 Marks / 2 Credits**

1. Each student will prepare a report based on primary data collected from field survey and secondary data collected from different sources.	<b>BY ROTATION EB + BP</b>
2. Students will select either one rural area (mouza) or an urban area (municipal ward) for the study, with the primary objective of evaluating the relation between physical and cultural landscape.	

3. A specific problem or a special feature should be identified based on which, the study area will be selected.	
4. The report should be handwritten in English on A4 size paper in candidate's own words within 5,000 words (Introductory Chapter: 1000 words; Physical Aspects: 1500 words; Socio-economic Aspects: 1500 words; Concluding Chapter: 500 words, approximately) excluding tables, photographs, maps, diagrams, references and appendices.	
5. Photographs, maps and diagrams should not exceed 15 pages.	
6. A copy of the bound report, duly signed by the concerned teacher, will be submitted during examination.	
7. The field work and post-field work will include:	
a. Collection of primary data on physical aspects (relief and soil) of the study area. Students should use survey instruments like prismatic compass, dumpy level, Abney level or clinometer wherever necessary.	
b. Collection of soil samples from different land cover land use regions of the study area for determining pH and NPK values with help of a soil kit.	
c. Collection of socio economic data, at the household level (with the help of a questionnaire) in the selected study area.	
d. Plot to plot land use survey for preparation of a land use map, covering whole or part of the selected area.	
e. Visit to different organisations and departments for collection of secondary data.	
f. Any other survey relevant to the objective of the study.	
8. The Field Report should contain the following sections (a–e).	
a. Introduction: Study area extent and space relations, reasons for selection of the study area on the basis of a specific problem or special feature, objectives, methods of data collection, analyses and presentation, sources of information, etc.	
b. Physical aspects: Lithology and geological structure, relief, slope, drainage, climate, soil, vegetation, environmental issues, proneness to natural hazards, etc.	
c. Socio-economic aspects:	
i. Population attributes: Number, sex ratio, literacy, occupational structure, ethnic and religious composition, language, per capita income, etc.	
ii. Settlement characteristics: Number of houses, building materials, number and size of rooms, amenities, etc.	
iii. Agriculture: General land use, crop-combination, use of fertiliser and irrigational facilities, production and marketing etc.	
iv. Other economic activities: Fishing, horticulture, brick-making, household and other industries, etc.	

**Core Course 12: Remote Sensing, GIS and GNSS**

**Course Code: CC 12**

Programme	B.Sc. HONS Geography
Course Code	Course Name
CC 12	Remote Sensing, GIS and GNSS
Year and Semester	3rd year 5th Semester
Prerequisite Course	Basic Class 12 Geography
Course Objective	To equip students with basic ideas and utilisation of remote sensing, GIS and GNSS

**2.23 GEO-A-CC-5-12-TH – Remote Sensing, GIS and GNSS 30 Marks / 2 Credits**

<b>Unit I: Remote Sensing</b>	<b>No of Lec</b>	<b>Faculty</b>
1. Principles of Remote Sensing (RS): Types of RS satellites and sensors	4	BB
2. Sensor resolutions and their applications with reference to IRS and Landsat missions	4	BB
3. Image referencing schemes and acquisition procedure of free geospatial data from NRSC / Bhuvan and USGS	4	BB
4. Preparation of False Colour Composites from IRS LISS-3 and Landsat TM / OLI data.	4	BB
5. Principles of image interpretation. Preparation of inventories of landuse land cover (LULC) features from satellite images	4	MG
6. Acquisition and utilisation of free Digital Elevation Model data: CartoDEM, SRTM and ALOS	4	MG
<b>Unit II: Geographical Information Systems and Global Navigation Satellite System</b>		
7. GIS data structures types: Spatial and non-spatial, raster and vector [5]	4	LB
8. Principles of preparing attribute tables, data manipulation, and overlay analysis [6]	5	LB
9. Principles and significance of buffer preparation	3	LB
10. Principles and significance of overlay analysis	4	LB
<b>Unit III: Global Navigation Satellite System (GNSS)</b>		
11. Principles of GNSS positioning and waypoint collection	4	MG
12. Principles of transferring of GNSS waypoints to GIS. Area and length calculations from GNSS data	4	MG

**2.24 GEO-A-CC-5-12-P – Remote Sensing, GIS and GNSS Lab ☐ 30 Marks / 2 Credits**

1. Image georeferencing and enhancement. Preparation of reflectance libraries of LULC features across different image bands of IRS L3 or Landsat OLI data	10	LB
2. Supervised image classification, class editing, and post-classification analysis	10	LB
3. Digitisation of features and administrative boundaries. Data attachment, overlay, and preparation of annotated thematic maps	12	LB
4. Waypoint collection from GNSS receivers and exporting to GIS database	8	MG

**HONOURSCOURSE: DISCIPLINESPECIFIC ELECTIVES**

**Discipline Specific Elective A-2: Climate Change: Vulnerability and Adaptation**

**Course Code: DSE-A**

Programme	B.Sc. HONS Geography
Course Code	Course Name
DSE A-2	Climate Change: Vulnerability and Adaptation
Year and Semester	3rd year 5th Semester
Prerequisite Course	Basic Class 12 Geography
Course Objective	To equip students with basic ideas of causes and consequences of climate change, measures of mitigation at national and international levels

TOPIC	No of Lec	Faculty
1. The science of climate change: Origin, scope and trends	4	MG
2. Climate change with reference to the geological time scale	5	MG
3. Evidences and factors of climate change: The nature –man dichotomy	3	BB
4. Greenhouse gases and global warming	4	BB
5. Electromagnetic spectrum, atmospheric window, heat balance of the earth	4	BB
6. Global climatic assessment: IPCC reports	4	BB
7. Climate change and vulnerability: Physical; economic and social	4	BP
8. Impact of climate change: Agriculture and water; flora and fauna; human health and morbidity	4	BP
9. Global initiatives to climate change mitigation: Kyoto Protocol, carbon trading, clean development mechanism, COP, climate fund	4	LB
10. Climate change vulnerability assessment and adaptive strategies with particular reference to South Asia	4	LB
11. National Action Plan on climate change	4	EB



12. Role of urban local bodies, panchayats, and educational institutions on climate change mitigation: Awareness and action programmes	4	EB
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**3.4 GEO-A-DSE-A-5-02-P – Climate Change: Vulnerability and Adaptations Lab ☐ 30 Marks**

1. Analysis of trends of temperatures (maximum and minimum of about three decades) of any India Meteorological Department (IMD) station	8	BB
2. Comparative analysis of seasonal variability of rainfall on the basis of monthly data of any two IMD stations	8	BB
3. Annual rainfall variability of about three decades for any two representative climatic regions of India	8	BP
4. Preparation of an inventory of extreme climatic events and mitigation measure of any climatic region / country of South Asia for a period of one decade on the basis of secondary information	10	EB

**Semester- V (July to December)**

**Core Course –DSE-B Cultural and Settlement Geography**

Course Code: DSE-B

Programme	B.Sc HONS Geography
Course Code	Course Name
DSE-A	Cultural and Settlement Geography
Year and Semester	3rd year 6 <sup>th</sup> semester
Prerequisite Course	Nil
Course Objective	Understand the scope and content of cultural geography and trace the development of cultural geography in relation to allied Disciplines.

**3.9 GEO-A-DSE-B-5-05-TH – Cultural and Settlement Geography ☐ 60 Marks / 4 Credits**

<b>Unit I: Cultural Geography</b>	<b>No of Lec</b>	<b>Faculty</b>
1. Definition, scope and content of cultural geography	4	BP
2. Development of cultural geography in relation to allied disciplines	4	BP
3. Cultural hearth and realm, cultural diffusion, diffusion of major world religions and languages	4	BP
4. Cultural segregation and cultural diversity, culture, technology and development.	4	EB
5. Races and racial groups of the world	4	EB
6. Cultural regions of India	3	EB
<b>Unit II: Settlement Geography</b>		
7. Rural settlement: Definition, nature and characteristics	3	MG
8. Rural settlement: Site, situation, and morphology	3	MG
9. Rural house types with reference to India, social segregation in rural areas. Census of India categories of rural settlements	5	MG

10. Urban settlement: Census of India definition and categories	3	LB
11. Urban morphology: Models of Burgess, Hoyt, Harris, and Ullman.	6	LB
12. City-region and conurbation. Functional classification of cities: Schemes of Harris, Nelson, and McKenzie	4	LB

**3.10 GEO-A-DSE-B-5-05-P – Cultural and Settlement Geography Lab ☑ 30 Marks / 2 Credits**

1. Mapping language distribution of India	8	EB
2. CD block-wise housing distribution in any district of West Bengal using proportional square	8	MG
3. Identification of rural settlement types from Survey of India 1:50k topographical maps	10	LB
4. Social area analysis of a city (Shevky & Bell)	10	EB

**Semester- VI (July to December)**

**Core Course –13- Evolution of Geographical Thought**

Course Code: CC13

Programme	B.Sc HONS Geography
Course Code	Course Name
CC13	Evolution of Geographical Thought
Year and Semester	3rd year 6 <sup>th</sup> semester
Prerequisite Course	Nil
Course Objective	Know about the trends of geographical thoughts.

<b>Unit I: Nature of Pre Modern Geography</b>	No of Lec	Faculty
1. Development of pre-modern Geography: Contributions of Greek, Chinese, and Indian geographers	4	BB
2. Impact of 'Dark Age' in Geography and Arab contributions	4	BB
3. Geography during the age of 'Discovery' and 'Exploration' (contributions of Portuguese voyages, Columbus, Vasco da Gama, Magellan, Thomas Cook)	4	BP
4. Transition from cosmography to scientific Geography (contributions of Bernard Varenius and Immanuel Kant). Dualism and Dichotomies (General vs. Particular, Physical vs. Human, Regional vs. Systematic, Determinism vs. Possibilism, Ideographic vs. Nomothetic)	6	BP
<b>Unit II: Foundations of Modern Geography and Recent Trends</b>		
5. Evolution of Geographical thoughts in Germany, France, Britain, and United States of America	4	EB
6. Contributions of Humboldt and Ritter	3	EB
7. Contributions of Richthofen, Hartshorne–Schaeffer, Ratzel, La Blaché	5	LB

8. Trends of geography in the post World War-II period: Quantitative revolution, systems approach	6	LB
9. Structuralism and historical materialism	3	MG
10. Changing concept of space with special reference to Harvey	3	MG
11. Evolution of Critical Geography: Behavioural, humanistic, and radical	4	EB
12. Towards post modernism: Geography in the 21st Century	4	LB

**2.26 GEO-A-CC-6-13-P – Evolution of Geographical Thought Lab ☐ 30 Marks / 2 Credits**

1. Changing perception of maps of the world (Ptolemy, Ibn Batuta, Mercator)		BP
2. Mapping voyages; Columbus, Vasco da Gama, Magellan, Thomas Cook		BB
3. Group Presentation of five to ten students on any selected school of geographical thought (20marks)		EB

**Semester- VI (July to December)**

**Core Course –14- Hazard Management**

Course Code: CC14

Programme	B.Sc HONS Geography
Course Code	Course Name
CC14	Hazard Management
Year and Semester	3rd year 6 <sup>th</sup> semester
Prerequisite Course	Nil
Course Objective	Gain knowledge about approaches to hazard study and develop an idea about factors, consequences and management of different types of hazard

**2.27 GEO-A-CC-6-14-TH – Hazard Management ☐ 60 Marks / 4 Credits**

<b>Unit I: Concepts</b>	<b>No of Lec</b>	<b>Faculty</b>
1. Classification of hazards and disasters. Hazard continuum	3	EB
2. Approaches to hazard study: Risk perception and vulnerability assessment. Hazard paradigms	5	EB
3. Responses to hazards: Preparedness, trauma, and aftermath. Resilience, capacity building	4	EB
4. Hazards mapping: Data and geospatial techniques (for hazards enlisted in Unit II)	4	LB
<b>Unit II: Hazard-specific Study with Focus on West Bengal and India</b>		
5. Earthquake: Factors, vulnerability, consequences, and management	4	MG
6. Landslide: Factors, vulnerability, consequences, and management	4	MG

7. Land subsidence: Factors, vulnerability, consequences, and management	4	BP
8. Tropical cyclone: Factors, vulnerability, consequences, and management	4	BP
9. Flood: Factors, vulnerability, consequences, and management	4	LB
10. Riverbank erosion: Factors, vulnerability, consequences, and management	4	LB
11. Fire: Factors, vulnerability, consequences, and management	4	BB
12. Biohazard: Classification, vulnerability, consequences, and management	4	BB

**2.28 GEO-A-CC-6-14-P – Hazard Management Lab [ 30 Marks / 2 Credits**

**A Group Project Report is to be prepared and submitted based on any one case study among the following hazards from West Bengal, incorporating a preparedness plan, preferably in the vicinity of the candidates' institution / district:**

1. Earthquake	BY ROTATION  LB/BB
2. Landslide	
3. Land subsidence	
4. Thunderstorm	
5. Flood	
6. Riverbank / Coastal erosion	
7. Fire	
8. Industrial accident	
9. Road / Railway accident	
10. Structural collapse	
11. Environmental pollution	
12. Biohazard	

**Discipline Specific Elective: Resource Geography**

**Course Code: DSE A-4**

Programme	B.Sc. HONS Geography
Course Code	Course Name
DSE A-4	Resource Geography
Year and Semester	3rd year 6th Semester
Prerequisite Course	Basic Class 12 Geography
Course Objective	To equip students with basic ideas of concept, distribution, utilisation, depletion and conservation of resources

**3.7 GEO-A-DSE-A-6-04-TH – Resource Geography 60 Marks / 4 Credits**

<b>Unit I: Resource and Development</b>	<b>No of Lec</b>	<b>Faculty</b>
1. Natural resources: Concept and classification	3	EB
2. Approaches to resource utilization: Utilitarian, conservational, community based adaptive	5	EB
3. Significance of resources: Backbone of economic growth and development	4	EB
4. Pressure on resources. Appraisal and conservation of natural resources	4	BP
5. Problems of resource depletion: global scenario (forest, water, fossil fuels)	6	BP
6. Sustainable resource development	3	BB
<b>Unit II: Resource Conflict and Management</b>		
7. Distribution, utilisation, problems and management of metallic mineral resources: Iron ore, bauxite, copper	5	BB
8. Distribution, utilisation, problems and management of non-metallic mineral resources: Limestone, mica, gypsum	5	MG
9. Distribution, utilisation, problems and management of energy resources: Conventional and non-conventional	5	MG
10. Contemporary energy crisis and future scenario	3	LB
11. Politics of power resources	3	LB
12. Limits to growth and sustainable use of resources. Concept of resource sharing	4	LB

**3.8 GEO-A-DSE-A-6-04-P – Resource Geography Lab 30 Marks / 2 Credits**

<b>TOPIC</b>	<b>No of Lec</b>	<b>Faculty</b>
1. Mapping and area estimate of changes in forest or vegetation cover from maps and/or satellite images	6	MG
2. Mapping and number estimate of changes in water bodies from maps and/or satellite images	6	MG
3. Decadal changes in state-wise production of coal and iron ore	8	BP
4. Computing Human Development Index: Comparative decadal change of top five Indian states	8	BB

**3.15 GEO-A-DSE-B-6-08-TH – Geography of India 60 Marks / 4 Credits**

<b>Unit I: Geography of India</b>	<b>No of Lec</b>	<b>Faculty</b>
1. Physiographic divisions with reference to tectonic provinces	4	LB
2. Climate, soil and vegetation: Classification and interrelation	5	LB
3. Population: Distribution, growth, structure, and policy	3	BB
4. Tribes of India with special reference to Gaddi, Toda, Santal, and Jarwa	4	BB
5. Agricultural regions. Green revolution and its consequences	3	MG
6. Mineral and power resources: Distribution and utilisation of iron ore, coal, petroleum, and natural gas	3	MG
7. Industrial development: Automobile and information technology	3	LB
8. Regionalisation of India: Physiographic (R.L. Singh) and economic (P. Sengupta)	6	EB

<b>Unit II: Geography of West Bengal</b>		
9. Physical perspectives: Physiographic divisions, forest and water resources	5	BP
10. Resources: Agriculture, mining,, and industry	5	BP
11. Population: Growth, distribution, and human development	3	EB
12. Regional issues: Darjeeling Hills and Sundarban	3	EB

**3.16 GEO-A-DSE-B-6-08-P–Geography of India Lab ☐ 30 Marks / 2 Credits**

1. Monthly temperature and rainfall graphs of five select stations from different physiographic regions of India	10	EB
2. Crop combination: Comparison of any two contrasting districts from West Bengal	10	EB
3. Annual trends of production: Mineral resources and manufacturing goods over two decades	12	LB
4. Composite Index: Comparison of developed and backward states of India	8	LB