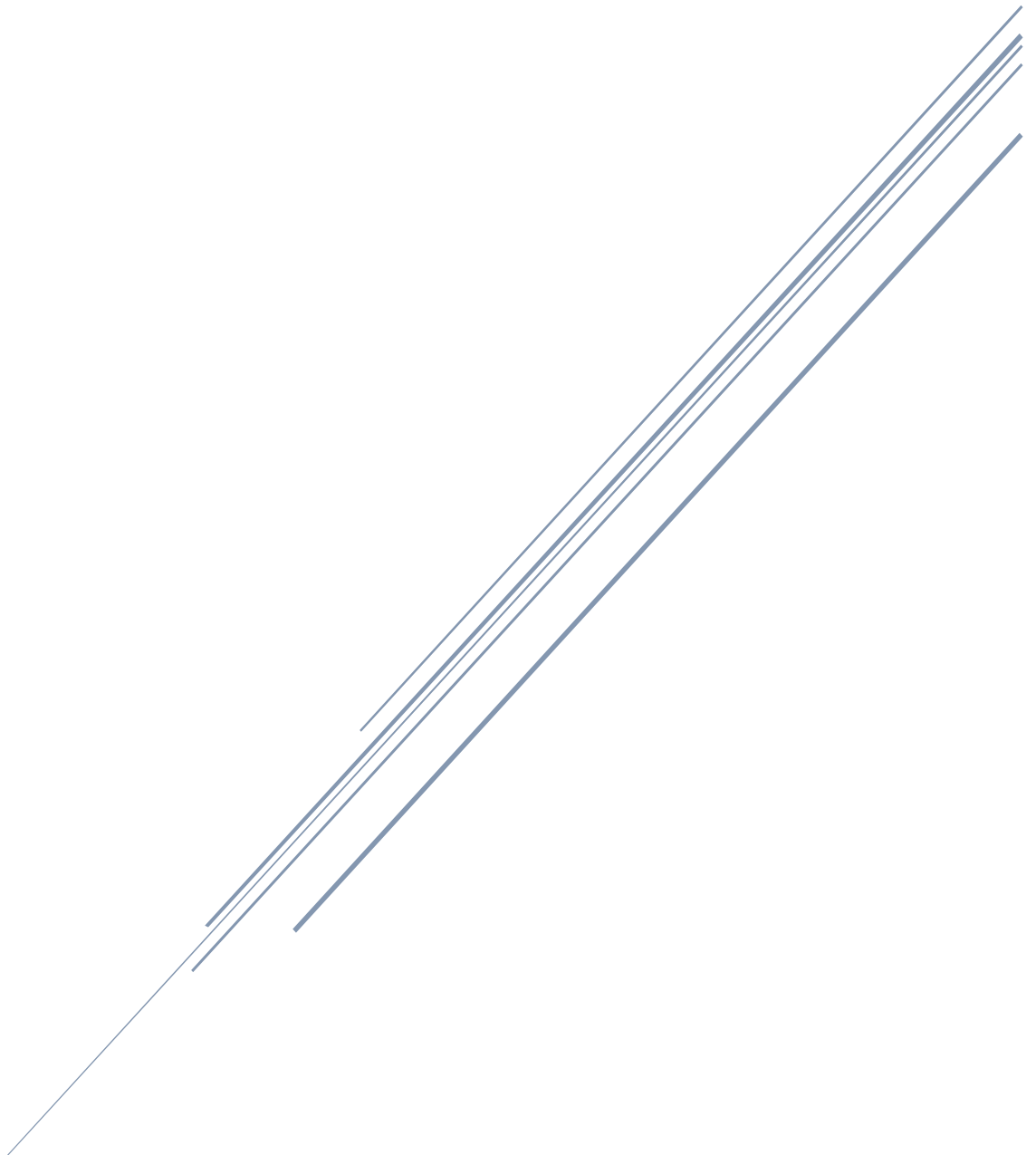


MASTER OF SCIENCE (GEOGRAPHY)-ODL

PROGRAMME PROJECT REPORT (PPR)



School of Sciences

PPR of M. Sc. in Geography approved by 39th Academic Council (vide memo no.: Reg/0322 dated 14.03.2023) for delivery of programme through Open Distance Learning mode.

i. Programme's mission and objectives:

Geography's relevance to science and society arises from a distinctive and integrating set of perspectives through which geographers view the world around them. A subject that is unique in bridging the social and physical aspects of the globe. Geography is a field of science devoted to the study of the lands, the features, the inhabitants, and the phenomena of Earth. In general, as ODL is concerned, our main objective is to democratize education as a resource and provide every citizen, irrespective of gender, caste and creed, easy and affordable access to quality education and particularly, in the paradigm of social sciences. The basic philosophy of our aim is to "Reach the Unreached". Keeping this in mind Netaji Subhas Open University launched its Post Graduate Geography (PGGR) from 2006-07 session. The opening of the post-graduate course in Geography was the result of the growing enrolment at the under-graduate level and the demand of the students as well as the study centres.

The main objectives for offering this program are: –

- ✓ To focus within the curriculum for understanding and resolving issues about the environment and sustainable development. It is an important link between the natural and social sciences.
- ✓ To develop a mental map of the community, province or territory, country and the world so that the learners can understand the "where" of places and events and relate them in the real world.
- ✓ The University is well prepared to offer such a program. Cooperation from study centres/colleges under different University shall be sought to keep the parity between regular as well distance mode of PG Geography.
- ✓ To educate and train individuals to be effective managers and decision-makers.
- ✓ To equip individuals with the necessary scientific skills and competencies to enable them to seek jobs and progress in their career.
- ✓ To enhance the capabilities of the existing workforce in the country and abroad and thus contribute to economic development and business growth.
- ✓ To give chances to the willing students those who could not enter into the convention Universities due to their age, job and limitation of the seat in the respective subject.

ii. Relevance of the program with HEI's Mission and Goals:

The NSOU, the only State Open University in West Bengal, delivers to build up the quality human resource base of the State and, along with other Open Universities of the country, and moves towards the improvement of the quality of open distance education. It also intends to promote and develop appropriate ambience to develop an international standard distance education scenario in our country, keeping in view of the demands for education of the learners in tune with the requirements of the twenty-first century.

This PG Geography programme is following some significant mission of the University, like:

1. To propagate quality education in flexible mode all over the State and to provide access to different skills-enhancing support.
2. To collaborate with other Higher Education Institutions (HEIs) for academic endeavours.
3. To provide education at low cost to the underprivileged people.
4. To provide facility of Life Long Education to the intending learners.
5. To integrate technological tools in the pedagogy for facilitating the learning experiences.
6. To contribute to the existing body of knowledge through research and extension activities.
7. To render services for the development of the State in particular and the Nation in general in order to sensitize the learners towards a humanistic and democratic ecosystem.

The instruction is designed to engage students in learning experiences that not only enable them to learn content but also to develop greater passion for learning – enabling them to 'learn to learn' and

to be lifelong learners. In the *learner-centred paradigm of education*, students are encouraged to take greater responsibility for their learning outcomes. We are also promoting this PG programme for the working people and age is no bar for doing this programme. Thus students completing this program will be able to:

1. Appreciate Earth as the homeland of humankind and provide insight for wise management decisions about how the planet's resources should be used.
2. Understand geography's way of looking at the world through the lenses of place, space, and scale. A central tenet of geography is that "location matters" for understanding a wide variety of processes and phenomena. Indeed, geography's focus on location provides a cross-cutting way of looking at processes and phenomena that other disciplines tend to treat in isolation. Geographers focus on "real world" relationships and dependencies among the phenomena and processes will give character to any location or *place*.
3. Analyze environmental-societal dynamics relating human action to the physical environment, environmental dynamics linking physical systems, and human-societal dynamics linking economic, social, and political systems; and
4. Conduct spatial representation using visual, verbal, mathematical, digital, and cognitive approaches. Places are natural laboratories for the study of complex relationships among processes and phenomena.

iii. Nature of prospective target group of learners:

In West Bengal, a lot of students are graduated with science background. But due to limitation of seats in the conventional Universities/ PG colleges, all of them could not get enrolled themselves in the subject of their choice (i.e., Geography). In recent years there are ample scope of higher studies as well as research in Geography, thus the students opt this subject by choice. In Netaji Subhas Open University the target group of learners are mainly from the rural areas, particularly where the Universities are too far from their local residence. Students from urban areas are also enrolling themselves. Students who graduate themselves also do not find an opportunity to go for post graduate studies in other universities. NSOU caters and tries to offer them the best of the opportunity by offering this subject at the postgraduate level.

iv. Appropriateness of programme to be conducted in Open and Distance Learning and/or Online mode to acquire specific skills and competence:

We view the greatest strength of geography, as a discipline, in NSOU is its ability to integrate and apply knowledge across the interface of the Earth's social and environmental systems.

iWe welcome students into the postgraduate program based on their previous academic work, research interests, letters of reference, and the ability of faculty to act as counsellors.

iCounsellors with expertise in various fields of geography like geomorphology, hydrology, biogeography, climatology, meteorology etc. work together with graduate students to study fundamental and applied problems that are of compelling societal and scientific interest. Issues such as global climate change, water, energy and carbon cycling, vegetation and carbon dynamics associated with environmental change and management, landscape development, and human impacts on the environment are studied with particular emphasis.

In Geography, we don't just learn in the classroom; we provide students with opportunities to learn relevant skills and apply their knowledge to real-world challenges.

Our field courses are designed to give students an opportunity to do just that: learn valuable field skills, apply classroom knowledge, and connect to the many organizations and issues that require geographic and environmental expertise.

Geomatica, MapInfo softwares, which are used in the University as a significant part of the course curriculum, helps to employ the applications of Remote Sensing (RS) and Geographic Information Systems (GIS) and integrating the data, information etc. within the sphere of physical, social and environmental sciences. The laboratory contains a good number of computers with mentioned specialized software for remote sensing, GIS, spatial analysis and 3-D visualization. The laboratory supports the applications of remote sensing and GIS for PG students and research scholars, examining the use of machine learning in automated environmental mapping, environmental change, and population health on continental, national and regional scales

v. Instructional Design:

a. Introduction:

In this PG Geography programme, all the SLMs are written in English version. The learners read the SLM before coming the PCPs and their doubts are clarified. Apart from the face to face PCPs, some online PCPs and tutorials are also provided by the University to complete the syllabus

b. Course Structure: (Please see the detailed table below):

Paper	Paper Code	Paper Type	Weightage for Assignment	Weightage for Term End	Full Marks
Geotectonics & Geomorphology	PGGR-1A	Theory	20%	80%	100
Hydrology, Oceanography	PGGR-1B				
Climatology	PGGR-2A	Theory	20%	80%	100
Soil & Bio-geography	PGGR-2B	Theory			
Economic Geography	PGGR-3A	Theory	20%	80%	100
Social & Cultural Geography	PGGR-3B	Theory			
Population & Settlement Geography	PGGR-4A	Theory	20%	80%	50
Quantitative techniques	PGGR-4B	Practical	0	100%	50
Preparation of thematic Maps	PGGR-5A	Practical	0	100%	50
Map Interpretation & Field Techniques	PGGR-5B	Practical	0	100%	50
Geographical Thought	PGGR-6A	Theory	20%	80%	100
Historical & Political Geography	PGGR-6B	Theory			
Environmental Issues in Geography	PGGR-7A	Theory	20%	80%	100
Regional Planning & Development	PGGR-7B	Theory			
Special Paper (Urban Geography & Geomorphology)	PGGR-8A	Theory	20%	80%	100
Special Paper (Urban Geography & Geomorphology)	PGGR-8B	Theory			
Regional Problems in India	PGGR-9A	Theory	20%	80%	50

Remote Sensing & GIS	PGGR-9B	Practical	0	100%	50
Special Paper Practical	PGGR-10A	Practical	0	100%	50
Field/ Field Oriented Dissertation	PGGR-10B	Practical	0	100%	50

a) Structure of Syllabus:

Structure of M.Sc. Part-I

Paper 1: (100 marks) - Theoretical

Group A : Geotectonics and Geomorphology (50 marks)

Group B : Hydrology and Oceanography (50 marks)

Paper 2: (100 marks) - Theoretical

Group A : Climatology (50 marks)

Group B : Soil and Biogeography (50 marks)

Paper 3: (100 marks) - Theoretical

Group A : Economic Geography (50 marks)

Group B : Social and Cultural Geography (50 marks)

Paper 4: (100 marks) - Theoretical & Practical

Group A : Population and Settlement Geography (50 marks)

Group B : Quantitative Techniques (Practical) (50 marks)

Paper 5: (100 marks) - Practical

Group A : Preparation of thematic Maps (Practical) (50 marks)

Group B : Map Interpretation and Field Techniques (Practical) (50 marks)

Structure of M.Sc. Part- II

Paper 6: (100 marks) - Theoretical

Group A : Geographical Thought (50 marks)

Group B : Historical and Political Geography (50 marks)

Paper 7: (100 marks) - Theoretical

Group A : Environmental Issues in Geography (50 marks)

Group B : Regional Planning and Development (50 marks)

Paper 8: (100 marks) - Theoretical

Group A: Special Paper- Theoretical Issues (Geomorphology/Urban Geography)- (50 marks)

Group B : Special Paper - Applied Issues (Geomorphology/Urban Geography)- (50 marks)

Paper 9: (100 marks) - Theoretical and Practical

Group A : Regional Problems of India (50 marks)- Theoretical

Group B : Remote Sensing and GIS (Practical) (50 marks)

Paper 10: (100 marks) - Practical

Group A : Special Paper (Geomorphology/Urban Geography)- (Practical) (50 marks)

DETAILED SYLLABUS

First Year: Part-I

Paper - 1: GROUP A (50 Marks)

Geotectonics

- 1.1 Modern theories of the origin of the earth
- 1.2 Isostasy and related theories
- 1.3 Vulcanicity and related landforms
- 1.4 Plate tectonics and mountain building (with spl. ref. to the Himalayas)

Geomorphology

- 2.1 Development of modern concepts in geomorphology (with spl. ref. to India)
- 2.2 Non-cyclic concept and process geomorphology
- 2.3 Concept of grade, profile of equilibrium and base level
- 2.4 Theories of slope evolution

Paper - 1: GROUP B (50 Marks)

Hydrology

- 1.1 Estimation and measurements of hydrological parameters
- 1.2 Unit hydrograph and its application
- 1.3 Wetland ecosystem of India and West Bengal
- 1.4 Criteria for river-basin management

Oceanography

- 2.1 Distribution of ocean water over the globe. Salinity and temperature of ocean water
- 2.2 Coastal geomorphology – mangroves and coral reefs
- 2.3 Morphology of the oceans: ridges, submarine canyons and oceanic deposits
- 2.4 Marine resources

Paper- 2: GROUP A – Climatology (50 Marks)

- 1.1 Climatology and its relation with Meteorology, Agro-meteorology and applied climatology; concept of macro and micro-climate; concepts of climatic resources and climatic hazards, weather forecasting.
- 1.2 Atmospheric disturbances: Tropical cyclones, extra-tropical cyclones and anticyclones. Tropical disturbances – tornadoes, dust storms and nor'wester; regional distribution and tracks of movement, environmental implications
- 1.3 Global warming – causes and consequences, impact on global water balance. El Nino and La Nina/ ENSO phenomena – mechanism and impact on biosphere
- 1.4 Climatic changes – evidences and possible causes, reconstruction of past climates, climatic changes through geological time – Quaternary ice age, changes after Industrial Revolution, theories of climate change.

Paper - 2: GROUP B – Soil and Biogeography (50 Marks)

- 2.1 Processes of soil formation; Development of soil profile; concept of pedon and polypedon, podzolization, laterization and calcification; soil catena; classification of world soils: Genetic, Environmental and FAO
- 2.2 Soil nutrients and soil organisms – their role in determining soil fertility; Degradation of soil – processes, causes and consequences; methods of soil conservation.
- 2.3 Concepts of ecology, ecosystem, environment and habitat; Plant ecology: adaptation of plants and habitat factors; Plant succession and climax vegetation; plant communities, environmental impact of deforestation; forest conservation, participatory management of forest and social forestry; major biomes of the world and their relationship with hydrological cycles.
- 2.4 Means and barriers of global dispersal of animals; distribution of animals through geological times; Environmental organizations and agencies; “International Biological Programme” and “Man and Biosphere Programme” in the world and in India; factors controlling biodiversity; need for conservation of biodiversity in the present global context; endangered species and their extinction, wildlife conservation and their management.

Paper - 3: GROUP A – Economic Geography (50 Marks)

- 1.1 Scope, content and recent trends in Economic Geography. Classification of economies, spatial organization of economic activities, sectors of economy – Primary, Secondary and Tertiary.
- 1.2 Natural resources, its classification and spatial distribution. Conservation and management of resources. Changing nature of economic activities; Determinants of agriculture. Agricultural regions – crop combination and diversification. Von Thunen’s model and its relevance. Green revolution of India.
- 1.3 Classification of industries – resource-based and foot-loose industries. Theories of industrial location – Weber, Losch and Isard. Selected industries (Iron and Steel, Textiles, Aluminium, Chemical, Engineering) and industrial complex (regions).
- 1.4 Modes of Transport; Transport cost, accessibility and connectivity, comparative cost advantages. Markets, its typology and network. Role of market in the development of trade and commerce. Impact of globalization on Indian economy.

Paper - 3: GROUP B – Social and Cultural Geography (50 Marks)

- 2.1 Nature, scope and development of social Geography, Concept of social space. Social structure and social processes. Region as a social unit – social change
- 2.2 Social well-being and deprivation. Indicators of well-being – concept of Aristotle, Plato, Amartya Sen. Global review with special reference to India. Social policy and planning.
- 2.3 Nature, scope and development of cultural Geography, components of culture, cultural processes and cultural advantages: cultural diffusion and acculturation. Cultural Hearth and Cultural Realm.
- 2.4 Cultural diversity. Race, religion, language and ethnicity; Tribal groups; global review with special reference to India; Rural-urban cultural differentials; Impact of globalization on regional culture.

Paper - 4: GROUP A: Population and Settlement Geography (50 Marks)

Population Geography

- 1.1 Determinants and dynamics of population growth: fertility, morbidity, mortality and migration; Migration and Urbanization; Theories of population growth: Malthus, Marx, Neo-Malthus; Demographic Transition; Limits to growth approach and Sen's approach;
- 1.2 Population problems of Third World: backwardness, gender discrimination, poverty and famine with special reference to India, Pakistan, China and Ethiopia; Population policies influencing fertility, mortality and migration in selected countries: India, China, Sweden and USA

Settlement Geography

- 1.3 Evolution of settlements: rural and urban, – their nature and hierarchy. Spatial distribution and dispersion of rural settlements; rural house forms and types in different environmental conditions with special reference to India.
- 1.4 Hierarchy of settlements: Christaller's Central Place theory, Losch's theory of market centres and Zipf's Rank Size Rule - their applications in India; Metropolis, Megalopolis, Ecumenopolis, Necropolis; Census classification of Indian towns. Urban housing, policies and problems with special reference to slums; New Town; Rural-urban continuum.

Paper - 4: GROUP B: Quantitative Techniques (50 Marks)

(Lab note book + viva voce: 5+5 = 10 marks; Examination: 40 marks; Total: 50 Marks)

- a) Point Pattern Analysis: Mean centre of population and its locational shift over time; Nearest neighbour analysis of settlement pattern and its change over time
- b) Line Pattern Analysis: Measures of connectivity of a transport network (alpha index, beta index, gamma index, etc); Measures of accessibility from a point (de tour index etc)
- c) Areal Pattern Analysis: Measures of specialization (dominant and distinctive analysis, and indices of diversification, specialization, etc); Pattern of regional inequality using Lorenz curve and Gini Coefficient, Z-score values etc
- d) Hierarchy Analysis: Rank-size distribution of towns; Functional hierarchy of towns

Paper - 5: GROUP A – Preparation of Thematic Maps (50 Marks)

(Lab note book + viva voce: 5+5 = 10 marks; Examination: 40 marks; Total: 50 Marks)

1. Concept of thematic mapping; types of thematic maps.
2. Preparation and interpretation of the following maps –
 - a) Land use map (Chorochromatic method)
 - b) Density map (Choropleth method) on basin drainage morphology
 - c) Trend surface map (Isopleth method)
 - d) Environmental mapping (hazard and pollution)

Paper - 5: GROUP B – Map Interpretation and Field Technique (50 Marks)

(Lab note book + viva voce: 5+5 = 10 marks; Examination: 40 marks; Total: 50 Marks)

Interpretation of toposheet

- 1.5 Interpretation of toposheets
- 1.6 Interpretation of aerial photograph
- 1.7 Interpretation of satellite imagery
- 1.8 Preparation of questionnaire schedule

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Second Year: Part-II

Paper - 6: GROUP–A: Geographical Thought (50 Marks)

Paradigms in Geography

- 1.1 Dichotomies in Geography: Physical and Human, Systematic and Regional, Determinism and Possibilism.
- 1.2 Landscape morphology- Cultural expression of Carl Sauer
- 1.3 Hartshorne - Schaefer debate on regional differentiation and spatial organization
- 1.4 Nomothetic and Idiographic approaches in geography; System and Ecological approaches in Geography.

Recent Trends in Geography

- 2.1. Radicalism
- 2.2. Geography of Inequality and Geography of Gender
- 2.3. Post modernism
- 2.4. Recent trends in Geography in methods and contents.

Paper - 6: GROUP-B: Historical and Political Geography (50 Marks)

Historical Geography

- 1.1 Nature, scope and content; source materials of Geography- Literature, Travel accounts, Archives and chronicles.
- 1.2 Territorial Organization of Janapadas in ancient India; Travel accounts of Huen Tsiang and Iban-e-Batuta
- 1.3 Territorial organization of the Mughal Empire; Agriculture, Trade and Urbanization during the Mughal Period.
- 1.4 Agriculture, industrialization, Urbanization and trade in colonial economy with special reference to Eastern India. Development of port oriented transport network; origin and development of Gate way cities.

Political Geography

- 2.1 Geographical Perspectives of Formation of State, Nation and Nation-State; Core and Peripheral areas, Capitals, Frontiers and Boundaries, Buffer zones, Buffer states and Land locked areas
- 2.2 Heartland and Rimland: Geo - static ideas of Mackinder and Spykeman.
- 2.3 Partition of India and its geopolitical implication; Organization of Indian States since independence.
- 2.4 Politics of world resources; Political and Economic blocks, Political Geography of foreign trade

Paper - 7: GROUP-A: Environmental Issues in Geography (50 Marks)

Components and Concept

- 1.1 Geographer's approach to environmental studies; Physical Component of Environment: Lithosphere, Hydrosphere, Atmosphere and Biosphere.
- 1.2 Socio-cultural components of Environment: Demographic characteristics, Housing and Sanitation, Health and Nutrition, Levels of Income and Education.
- 1.3 Concept of holistic environment; Concept of Degradation, hazards (natural, quasi-natural and social) and disaster.
- 1.4 Global resource crisis and sustainable development (Agenda-21); Ecotourism.

Environmental Issues

- 2.1 Soil, air, water and noise pollution.
- 2.2 Conservation of forest and wetland; Significance of biodiversity conservation.
- 2.3 Kyoto protocol and Montreal Protocol.
- 2.4 Environmental impact of big dams and urban- industrial expansion.

Paper - 7: GROUP- B : Regional Planning and Development (50 Marks)

Concept of regional Planning

- 1.1. Concept of Region: Formal, Functional and planning; Classification and delineation; Resource region and regional hierarchy; Administrative region, city region and metropolitan.
- 1.2. Concept of multilevel planning: Local, regional and national level planning; Planning process-goal, objectives and decision-making.
- 1.3 Economic Base theory and Theory of Growth Centre and Growth Pole.
- 1.4. Metropolitan concept: Metropolis, metropolitan area, metropolitan region, mega city and megalopolis.

Regional Planning and strategies of Development

- 2.1. Basic principles of regional planning; Regional Planning in India: DVC and Kolkata case Studies.
- 2.2. Indicators of regional development: economic, social, technological and infrastructural; Theories and models of regional development.
- 2.3. Integrated regional development: Rural Development; Urban Planning: Redevelopment, renewal and management; planning for city region.
- 2.4. Concept of regional disparity and imbalances; Theories of convergence and divergence; National Regional Development policy.

Paper - 8: GROUP-A: Advanced Geomorphology (Special Paper I) (50 Marks)

Module (Theoretical): General Principles

1. Perspectives in Geomorphology

- 1.1 : Evolution of geomorphological thoughts and ideas: A general review.
- 1.2 : Concepts of spatial scale, temporal scale, equilibrium and threshold.
- 1.3 : Approaches to geomorphology: Structural, Climatic, Applied and Structural approach
- 1.4 Principles of landform classification: Genetic and hierarchical

2. Fluvial processes and forms

- 2.1: Hydrological properties of channels: regime, velocity, discharge and energy. Factors controlling entrainment, transportation and deposition by running water.

2.2: Morphological properties of channels: profiles, plan forms and patterns.

2.3: Formation, system of change and classification of fluvial landforms with special reference to badlands, terraces, alluvial fans and accretional topography.

2.4: Slope processes in fluvial landscapes: factors and processes of mass wasting with special reference to landslide and mass wasting.

3. Coastal and peri glacial processes and forms

3.1 Coastal morpho-dynamics: factors. Characteristics and relative dominance of wave, tidal and fluvial processes in coasts.

3.2 Processes and effects of long shore drift, bio-turbation, bio-tidal accretion coral formation and storm surge in coasts.

3.3 Formation, system of change and classification of coastal landforms with special reference to rhythmic beach topography, coastal dunes and deltas.

3.4 Peri glacial processes: Formation, system of change and classification of peri glacial land forms

4. Tropical Geomorphology

4.1 : Definition and boundary of humid and tropics. Climatic and vegetation characteristics and their control on tropical landforms.

4.2 : Factors and processes of deep weathering with special reference to formation of tors, domed inselbergs and laterite duricrusts.

4.3 : Characteristics of tropical streams with special reference to of large rivers.

4.4 : Urban geomorphology of humid tropics.

Paper - 8: GROUP-B: Advanced Geomorphology (50 Marks)

Module: (Theoretical): Applications and Case Studies

1. Applied geomorphology

1.1 : Methods and uses of rainwater harvesting and check dams.

1.2 : Geomorphic consequences of sea level change in coasts and estuaries.

1.3 : Application of geomorphology in Terrain Evaluation, EIA and EMP.

1.4 : Principles of Integrated Drainage Basin Management and Integrated Coastal Zone Management with reference to Coastal Regulation Zones.

2. Case studies of landforms and land use

2.1 : Badlands on laterite duricrusts: Garhbeta and Santiniketan, West Bengal

2.2 : Tors and inselbergs: Chhotanagpur plateau, Jharkhand

2.3 : Alluvial fans: Sub-Himalayan, West Bengal

2.4 : Deltas and Estuaries : Lower Ganga delta, West Bengal

3. Management of geomorphic problems

3.1 : Management of mining subsidence with special reference to Raniganj Coal belt.

3.2 : Management of river discharge with special reference to Damodar Valley Corporation and Farakka Barrage Project.

3.3 : Management of urban water supply and disposal with special reference to Kolkata.

3.4 : Management of reclaimed coastal areas with special reference to Indian Sundarban

4. Management of geomorphic hazards

4.1 : Management of landslides with special reference to northern West Bengal

4.2 : Management of floods with special reference to northern piedmont areas and Padma-Bhagirathi interfluves of West Bengal.

- 4.3 : Management of riverbank erosion with special reference to Ganga and Bhagirathi in West Bengal
- 4.4 : Management of coastal erosion with special reference to Digha township and Sagar island of West Bengal.

Paper - 10: GROUP-A: Advanced Geomorphology (Special Paper Practical) (50 Marks)

1. Analysis of drainage basin morphometry and channel aspect from topographical maps

- 1.1 : Computation of stream order (Strahler's method), bifurcation ratio, drain age density and constant of channel maintenance
- 1.2 : Preparation of maps showing relative relief, dissection index and slope (Wentworth's method)
- 1.3 : Computation of braiding index, sinuosity index, meander wavelength and radius of curvature
- 1.4 : Computation of river profiles

2. Geomorphic mapping

- 2.1 : Preparation of geomorphic maps from field data using standard symbols and colours.
- 2.2 : Preparation of overlays from topographical maps showing geomorphic features
- 2.3 : Extraction of geomorphic features from satellite FCCs
- 2.4 : Extraction of relative height of geomorphic features from aerial photo pairs using parallax bar

3. Velocity, discharge and sediment load analysis

- 3.1 : Measurement of wetted perimeter, velocity (by current meter or floats) and discharge.
- 3.2 : Preparation and interpretation of hydrographs, unit hydrographs and rating curves
- 3.3 : Collection and analysis of coastal or riverine sediments using ϕ -graded sieves and chemical / electronic balance.
- 3.4 : Analysis of fluvial or coastal pebbles for shape and constituents.

4. Laboratory Notebook and Viva-voce

Paper - 8: GROUP-A: Urban Geography (Special Paper II) (50 Marks)

Module: (Theoretical):

1. Concept of Urban

- 1.1 Concept and definition: urban, urbanization, urbanism. Urban system, urban pattern, urban ecology, urban sprawl.
- 1.2 Different approaches - changing emphasis - recent trends - perception of urban space.
- 1.3 Growth of urban settlements - processes of urbanization - stages of urban development.
- 1.4 Characteristics of Third World Urbanization.

2. Urban Structure

- 2.1 City - size distribution - rank - size rule and primacy; Central Place theory and its extension,
- 2.2 The city - region - regional capitals - The Metropolis - Megalopolis and Ecumenopolis - Conurbation - rural - urban continuum.
- 2.3 Aspects of urban economic base. Basic and Non-basic functions.
- 2.4 Theories of urban structure — spatial spread - emergence of urban centres.

3. Urban Space

- 3.1 Urban social space.
- 3.2 Urban land use—residential segregation.
- 3.3 Central Business District.
- 3.4 Suburbs - rural-urban fringe.

4. Urban Internal Structure

- 4.1 Definition of Towns: physical, social, functional; human ecology of cities.
- 4.2 Factorial ecology, Neighbourhood concept.
- 4.3 Social area analysis.
- 4.4 The general nature of the problems of cities - inner city decay - slums.

Paper - 8: GROUP-A: Urban Geography (50 Marks)

Module: (Theoretical):

1. Urban Planning

- 1.1 Need, importance and concept of Urban Planning.
- 1.2 Planned town: concept, New Towns and New Towns of India.
- 1.3 Redevelopment vs. renewal; National Commission on urbanization.
- 1.4 Urban Planning in India: Kolkata, Mumbai and Delhi; Metropolitan Planning Problems

2. Urban India

- 2.1 Census categories of towns; concept of Metropolitan and Mega city.
- 2.2 Urbanization in India - processes, patterns and correlates.
- 2.3 Morphology of Kolkata, Mumbai and Delhi.
- 2.4 Urban Planning, management; Real estate management.

3. Urban Issues

- 3.1 Urban problems in Mega cities of India.
- 3.2 Urban Transport.
- 3.3 Issues of Urban Environment.
- 3.4 Urban Infrastructure.

4. Urban Management

- 4.1 Urban Governance - evolution of local self-government in India.
- 4.2 Millennium development goals.
- 4.3 Mega city Programmes; GIS and Information Management.
- 4.4 Management of urban facilities. Participatory urban management; Governance in peri-urban and fringe areas.

Paper - 10: GROUP-A: Urban Geography (Special Paper Practical) (50 Marks)

1.0 Selected Statistical Techniques:

- 1.1 Regression Analysis.
- 1.2 Time Series Analysis.
- 1.3 Lorenz Curve.
- 1.4 Rank and Size distribution of towns.

2.0 Mapping of Spatial distribution:

- 2.1 Residual Mapping.
- 2.2 Rural-urban growth differentials.

2.3 Size-Class variations.

2.4 Urban land use.

3.0 Mapping of urban infrastructure:

3.1 Connectivity.

3.2 Accessibility.

3.3 Infrastructure and development.

3.4 Gravity models.

4.0 Laboratory Note book and Viva-voce.

Paper - 9: GROUP-A: Regions and Regional Problems of India (50 Marks)

Regions and Regionalisation

- 1.1. Various bases of regionalisation of India; problems of identification and delineation.
- 1.2. Physiographic and Climatic regions; Interrelation among climate, vegetation and soil; Bio-climatic regions.
- 1.3. Agricultural, Industrial and planning regions.
- 1.4. Evolution of social regions of India; Nuclear regions and Regions of Isolation.

Regional Problems and their Mitigation

- 2.1. Regional problems of the Himalayan belt: Availability of Water, sensitivity and Seismic sensitivity and Landslide, Transport network and Accessibility, Ethnic conflict with Special Reference to North-East India.
- 2.2. Problems of arid regions: Desertification and crisis of water, Salinization and negative impact of irrigation.
- 2.3. Problems of the humid belt of peninsular India: Flood and Drought, River bank erosion, Share of river water, Vulnerability of the Coastal belt and coastal Regulation Zones (CRZ).
- 2.4. Regional Disparities in Population growth, agriculture production, infrastructure and Industrialization, urbanization and Human development.

Paper -9: GROUP-B: Remote Sensing & Geographical Information System (Practical) (50 Marks)

Visual Image Interpretation

- 1.1 Comparative assessment of topographical maps, aerial photographs and satellite images in representation of geographical data; Geometry of aerial photographs and satellite photoproducts; Principles of mosaicing.
- 1.2. Preparation of Thematic overlays from aerial photographs and satellite photoproducts.

Digital Image Processing

- 1.3. Image rectification and Enhancement techniques: methods and application; Identification of Individual IRS LISS bands from spectral; signature; Preparation of Standard FCC's and Identification of Individual features.
- 1.4. Georeferencing of scanned maps and images, aerial photographs and maps of different dates and scales.

GIS Data Processing

- 2.1. Basic Concept, raster and Vector data; Generation of Vector layers, buffers and attributes tables from image and/or map data.

- 2.2. Editing attribute tables using demographic and /or land use data.
- 2.3. Preparation of annotated (i) Land use and land cover map and (ii) Map showing demographic or land use data through choropleth /pie charts.
- 3.0. **Laboratory Notebook and viva- voce: (10 marks).**

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Reference Books

Paper 1: (100 marks) - Theoretical

Group A : Geotectonics and Geomorphology (50 marks)

• Suggested Readings:

- Billings, M.P. (1971). Structural Geology, Pearson.
- Bland, W. And Rolls, D. 1998. Weathering, Hodder & Stonagnton.
- Bloom A. L. (2001) Geomorphology: A Systematic Analysis of Late Cenozoic Landforms, Prentice-Hall of India, New Delhi
- Bloom, A.L. 1998. Geomorphology: A Systematic Analysis of Late Cenozoic Landforms, 3rd edition, prentice Hall India Ltd.
- Bridges E. M. (1990) World Geomorphology, Cambridge University Press, Cambridge.
- Burbank, D.G. and Andersson, R.S. 2001. Tectonic Geomorphology: A Frontier in Earth Science, Blackwell Science Inc. London.
- Christopherson, Robert W. (2011). Geosystems: An Introduction to Physical Geography, 8 Ed., Macmillan Publishing Company
- Condie, Kent C. 2013: Plate Tectonics and Crustal Evolution, Elsevier.
- Condie, Kent C. and Pease, V. 2008: When Did Plate Tectonics Begin on Planet Earth?, Geological Society of America.
- Cox, A. and Hart, R.B. 1986: Plate Tectonics: How it Works, Blackwell Scientific publications, Oxford.
- Duff, P.M.D. (editor) 1993: Holmes' Principle of Physical Geology, Taylor & Francis.
- Faniran, A. And Jeje, L.K. 1983. Humid Tropical Geomorphology, Longman, London.
- Frisch, W., Meschede, M., Blakey, R.C. (2011). Plate Tectonics: Continental Drift and Mountain Building. Springer Science & Business Media.
- Gabler R. E., Petersen J. F. and Trapasso, L. M.,(2007). Essentials of Physical Geography (8th Edition), Thompson, Brooks/Cole, USA.
- Garrett N. (2000). Advanced Geography, Oxford University Press.
- Goudie, A. (1984) The Nature of the Environment: An Advanced Physical Geography, Basil Blackwell Publishers, Oxford.
- Gregory, K.J., Lewin, J. (2014). The Basics of Geomorphology: Key Concepts, Sage.
- Gubbins, D. 1990: Seismology and Plate Tectonics, Cambridge University Press, Cambridge.
- Hallam, A. 1973: A Revolution in Earth Science: From Continental Drift to Plate Tectonics, Oxford University Press, London.
- Harvey, A. (2012). Introducing Geomorphology: A Guide to Landforms and Processes, Dunedin
- Hugget R.J. (2007). Fundamentals of Geomorphology, Routledge
- Husain M. (2002) Fundamentals of Physical Geography, Rawat Publications, and Jaipur.
- Kale V. S. and Gupta A. (2001). Introduction to Geomorphology, Orient Longman, Hyderabad.
- Kearey, P., Klepeis, K.A., Vine, F.J. (2011). Global Tectonics, 3rd ed, Wiley-India.
- Keary, P. and Vine, M. 1997: Global Tectonics, 2nd edition. Blackwell Scientific publications, Oxford.
- Knighton A. D. (1984). Fluvial Forms and Processes, Edward Arnold Publishers, London.
- Knighton, D. 1998. Fluvial Forms and Processes: A new Perspective, Arnold, London.

- Ollier, C.D. 1981: Tectonics and Landforms, Longman, London.
- Sanders, J.E. 1981: Principles of Physical Geology, Wiley Science.
- Selby, M.J. (2005). Earth's Changing Surface, Oxford University Press.
- Selby, M.J. 1985. An Introduction to geomorphology, Clarendon, Oxford.
- Sil A.K. (2018). Geotectonics and Geomorphology, Vol. I, The Himalayan Books, Kolkata
- Singh, S. Geomorphology, Prayag Pustak Bhavan, Allahabad.
- Skinner, Brian J. and Porter S.C. (1987). Physical Geography, John Wiley and Sons
- Skinner, Brian J. and Stephen C. Porter (2000), The Dynamic Earth: An Introduction to physical Geology, 4th Edition, John Wiley and Sons.
- Small, R.J. 1978: The Study of Landforms, Cambridge University Press, Cambridge.
- Strahler A. N. and Strahler A. H. (2008). Modern Physical Geography, John Wiley & Sons, New York.
- Strahler, A.N. and Strahler, A.H. 1984: Elements of Physical Geography, John Wiley, New York.
- Summerfield, M.A. (editor) 1991, Global Geomorphology: An Introduction to the Study of Landforms, John Wiley and Sons Ltd., New York.
- Tarbuck, E.J., Lutgens, F.K. and Tasa, D. 2003: Earth Science, 10th edition, Printice Hall, Englewood Cliffs.
- Thronbury, W.D. 1969. Principles of Geomorphology, Wiley Easterb Limited, New Delhi.
- Woodroffe, C.D. 2002. Coasts: Form, process and Evolution, Cambridge University Press, Cambridge.
- Woolridge, S.W. and Morgan, R.S. 1959. Outline of Geomorphology: The Physics, Basis of Earth, Longman, London.

Group B : Hydrology and Oceanography (50 marks)

• Suggested Readings:

- Affholder, M. and Valiron, F.2001: Descriptive Physical Oceanography, CRC Press.
- Apel, J. 1987: Principles of Ocean Physics, Academic Press, London.
- Black, Peter E., 1996: Watershed Hydrology, Lewis Publishers.
- Chorley, R.J., 1969 : Water, Earth and Man, Methuen, London.
- Chow, V. T., Maidment, D.R. and Mays, L.W. 1988: Applied Hydrology, McGraw Hill, New York.
- Cundy, A. and Kershaw, S., 2013: Oceanography: an Earth Science Perspective, Routledge.
- Davie T. (2008). Fundamentals of Hydrology, Routledge, London
- Dingman, S.L. (2015). Physical Hydrology, 3rd ed, Macmillan Publishing Co.
- Fetter, C.W., 1990: Applied Hydrology, CBS Publisher and Distributors, New Delhi.
- Fitts, C.R. (2002). Groundwater Science, Elsevier.
- Garrison, T. (2016). Oceanography: An Invitation to Marine Science, 9th ed, Cengage Learning.
- Garrison, T., 2009: Essentials of Oceanography, Brookes-Cole, USA.
- James, A., 2011: Watershed Modeling, Island Press, Andrew Ford.
- Karanth, K.R. (1988). Ground Water: Exploration, Assessment and Development, Tata- McGraw Hill.
- Kearey, P., Klepeis, K.A., Vine, F.J. (2011). Global Tectonics, 3rd ed, Wiley-India.
- King, C.A.M. 1962: Oceanography for Geographers, Arnold, London.
- King, C.A.M., 1972: Beaches and Coasts, Arnold, London.
- Linsley, K., Kohler, M. and Paulhus, J.L. 1975: Applied Hydrology, Tata McGraw Hill, New York.
- Meinzer, O.E. 1942: Hydrology, Dover Publication Inc. New York.
- Paul, R. Pinet, 2008: Invitation to Oceanography, Jones & Bartlett Publishers.
- Pinet, P.R. (2014). Invitation to Oceanography. 7th ed, Jones and Barlett Publishers.
- Pinneker, E.V. (2010). General Hydrogeology, Cambridge University Press.
- Pugh, D., Woodworth, P. (2014). Sea-Level Science: Understanding Tides, Surges, Tsunamis and Mean
- Raghunath, H.M. (2006). Hydrology: Principles, Analysis, Design, 3rd ed, New Age International
- Raghunath, H.M. 1997: Hydrology- Principles, analysis, Design, New Age International Pvt. Ltd, New Delhi.
- Reddy, P.J.R. (2014). A Textbook of Hydrology, University of Science Press.
- Sharma, R.C. & Vatal, M., 1992: Oceanography for Geographers, Chaitanya Publishing House, Allahabad.

- Shepard, F.P., 1963: Submarine Geology, Harper and Row, New York.
- Siddharth, K., 1999: Oceanography: A brief introduction, Kishalaya Publisher, Noida.
- Sil A.K. (2017). Hydrology A Science of Water of the Landmass, The Himalayan Books, Kolkata
- Singh, V.P., 1989: Hydrologic System, Prentice-Hall, Englewood Cliffs.
- Small. R.J. 1989: Geomorphology and Hydrology, Longman Group Ltd, London.
- Steers, J.A. 1953: The Sea Coast, Collins, London.
- Subramanya, K. (2013). Engineering Hydrology, McGraw Hill Education.
- Sverdrup, Duxbury, Duxbury (2006). Fundamentals of Oceanography, McGraw Hill
- Sverdrup, H.U. 1942: The Oceans, their Physics, Chemistry and General Biology, Prentice- Hall, New York.
- Sverdrup, K.A., Armrest, E.V. (2010). An Introduction to the World Oceans, 10th ed, McGraw Hill
- Todd, D.K., Larry, W.M. (2004). Groundwater Hydrology, John Wiley & Sons, New York.
- Walters, D. 2010: Physical Hydrology, Routledge.
- Walton, W.C. 1970: Ground Water Resource Evaluation, McGraw Hill, Tokyo.
- Ward, A.D. and Trimble, S.W. 2004: Environmental Hydrology: Lewis Publishers.

Paper 2: (100 marks) - **Theoretical**

Group A : Climatology (50 marks)

- Ahrens, C.D. (2012). Essentials of Meteorology: An Invitation to the Atmosphere. 9th Ed, Cengage
- Anthes, R. 1987: Meteorology, 7th edition, Prentice- Hall Inc., Upper Saddle River.
- Barry R. G. and Carleton A. M. (2001). Synoptic and Dynamic Climatology, Routledge, UK.
- Barry R. G. and Chorley R. J. (1998). Atmosphere, Weather and Climate, Routledge, New York.
- Blair, T.A. and Fite, R.C. 1965: Weather Elements: A Text in Elementary Meteorology, Prentice Hall, New York.
- Chritchfield, H. J. 1983 : General Climatology, 4th edition, Prentice Hall India Ltd., New Delhi.
- Coch, N. K. 1995: Geohazards: Natural and human Prentice Hall, Englewood cliffs.
- Das, P. K. 1995: Monsoon, 2nd edition, National Book Trust, New Delhi.
- Henderson-Sellers, A. and Robinson, P.J. 1966: Contemporary Climatology, ELBS/ Longman.
- Lal, D.S. (2012). Climatology. Sharda Pustak Bhawan, New Delhi.
- Lutgens, F.K. and Tarbuck, E. J. 1998 : The Atmosphere : An Introduction to Meteorology, 7th edition, Prentice-Hall Inc., Upper Saddle River.
- Mather, J.R.,1974.: Climatology: Fundamentals and Applications, McGraw Hill, New York
- Moran, J.M. and Morgan, M. D. 1997 : Meteorology : The atmosphere and the Science of
- Musk, L.F. 1988: Weather Systems, Cambridge University Press, Cambridge.
- Oliver J. E. and Hidore J. J. (2002) Climatology: An Atmospheric Science, Pearson Education, New Delhi.
- Pant, G. B. and Kumar, R.K. 1997 : Climates of South Asia, John Wiley and Sons Ltd., Chichester.
- Pettersson, S. 1958: Introduction to Meteorology, McGraw Hill, Tokyo.
- Trewartha G. T. and Horne L. H. (1980) An Introduction to Climate, McGraw Hill, New York

Websites:

- India Meteorological Department: www.imd.gov.in
- Intergovernmental Panel on Climate Change: www.ipcc.ch
- World Bank Climate Change Knowledge Portal: sdwebx.worldbank.org/climateportal/index.cfm
- World Meteorological Organization: public.wmo.int/en

Group B : Soil and Biogeography (50 marks)

• **Suggested Readings:**

Soil Geography

- Biswas, T.D. and Mukherjee, S.K. 1997: Textbook of Soil Science, Tata-McGraw Hill.
- Brady, N.C. and Weil, R.R. 1996: The Nature and Properties of Soil, 11th edition, Longman, London.

- Buckman, H.R. and Brady, N.C. 1974: Nature and Properties of Soil, McMillan, New York.
- Bunting, A. 1965: Geography of Soil, Hutchinson, London.
- Daji, J.A., Kadam, J.R. and Patil, N.D. 1996: A Textbook of Soil Science, Media Promoters and Publishers Pvt Ltd, Mumbai.
- De, N.K. and Jana, N.C. 1997: Land – Multifaceted Appraisal and Management, Sribhumi Publishing Company, Kolkata.
- De N K and P Ghosh, (2013). Geography of Soils, Shribhumi Publishing House, 101B, Sitaram Ghosh Street, Kolkata - 700009
- Floth, H.D. 1990. Fundamentals of Soil science, 8th edition, John Wiley and Sons, New York.
- Forth Henry D. (1990). Fundamentals of Soil Science, 8th ed., John Wiley & Sons, New York
- Foth, H.D. and Schafer, J.W. 1980: Soil Geography and Land Use, John Wiley, New York.
- Joffe, J.S. 1965: ABC of Soil, Oxford Book Co., Kolkata.
- Morgan, R.P.C. 1995: Soil Erosion and Conservation, 2nd edition, Longman, London.
- Schwab. G.O. Fandmeir. D.D. and Eliot, W.J. (1996). Soil and Water Management Systems, 4th edition, John Wiley and Sons Inc. New York.
- Singer, M., Munns, D.N. (2005). Soils: An Introduction, 6th ed, Pearson.
- Weil, R.R. and Brady, N.C. (2016). The Nature and Properties of Soil, 15th edition, Pearson.
- White, R. (2006). Principles and Practice of Soil Science: The Soil as a Natural Resource, Blackwell.

Bio Geography

• Suggested Readings:

- Chapman J.L. and Reiss. J.J. (1993). Ecology: Principles and Applications, Cambridge University Press, Cambridge.
- Chapman, J.L. and Reiss, M.J. 1992: Ecology Principles and Applications, Cambridge University Press, Cambridge.
- Chiras D.D. Reganold J.P. and Owen, O.S. (2002). Natural Resource Conservation. Management for a Sustainable Future. 8th edition, Prentice Hall. Englewood Cliffs.
- Cox, C.B., Moore, P.D., Ladle, R. (2016). Biogeography: An Ecological and Evolutionary Approach, 9th ed,
- Dash, M.C. (2001). Fundamental of Ecology, 2nd edition, Tata McGrawHill, New Delhi
- Huggett, R. (1998). Fundamentals of Biogeography, Routledge, London:
- Joy, T. et al 1989: Human Impact on The Ecosystem, Oliver and Boyd, London.
- Kendeigh, S.C. 1975: Ecology with Special Reference to Man and animals, Prentice Hall, New York.
- Khinchi, Shyam S. (editor) 2015: Biodiversity Distribution and Conservation, Pointer Publishers, Jaipur.
- Kormondy, E.J. 1991: Concepts of Ecology, Prentice Hall India, New Delhi.
- Kormondy. E.J. (1996). Concepts of Ecology, 4th edition. Prentice-Hall, India. New Delhi.
- Lomolino, M.V., Riddle, B.R., Whittaker, R.J. (2016). Biogeography, 5th ed, Oxford University Press.
- MacDonald, G.(2001). Biogeography: Introduction to Space, Time, and Life, Wiley
- Myers. A.A. AND Giller. P.S. (editors) (1988). Analytical Biogeography: An Integrated Approach to the study of Animal and Plant Distributions. Chapman and Hall. London.
- Nebel, J.B. 1981: Environmental Science, Prentice Hall, New York.
- Odum E.P. (1997). Ecology: A Bridge between Science and Society, Sinaur Associates Inc. Publishers, Sunderland.
- Odum, E.P. 1971: Fundamentals of Ecology, W.B. Sanders, Philadelphia.
- Santra. A. (2006). Handbook on Wild and Zoo Animals, International Book Distributing Co.
- Sharma P.D. (1996). Ecology and Environment, 7th edition, Rastogi Publications, Mirat.
- Sharma, P. D. 1996: Ecology and Environment, 7th edition, Rastogi Publications, Meerut.
- Shukla, R.S. and Chandel, P.S. 1930: Plant Ecology and Soil Science, S Chand, New Delhi.
- Simmons, I. G. 1981: The Ecology of Natural Resources, ELBS/ Edward Arnold, London.

- Simmons, I.G. 1980: Bio-geographical Processes, George Allen and Unwin, London.
- Spellerberg, I. F. and Sarwyer, J. W. D. 1999: An Introduction to Applied Biogeography, Cambridge University Press, Cambridge.
- Watts, D. 2000: Principles of Biogeography: An Introduction to Functional Mechanisms of Ecosystems, McGraw Hill, London.
- Weddell, B.J. (2002). Conserving Living Natural Resources in the Context of a Changing World. Cambridge University Press. Cambridge.
- Whittaker, R.H. (1975). Communities and Ecosystems, MacMillan.
- World Wide Fund for Nature-India (Eastern Region) (1995). Nature Conservation Handbook. Calcutta

Paper 3: (100 marks) - Theoretical

Group A : Economic Geography (50 marks)

• Suggested Readings:

- Alexandersson, C, 1971: Geography of Manufacturing, Prentice Hall India, New Delhi.
- Berry, B.J.L., Conklin, E.C. and Ray, M. D. 1976: The geography of Economic Systems, Prentice Hall, New Jersey.
- Bradford, M.G. and Kent, W.A. 1977: Human Geography, Theories and Applications, Oxford University Press, Oxford.
- Gourtney, P. 1965: Plantation Agriculture, G. Bell and Sons, London.
- Guha, J.L. and Chattaraj, P.R. 1989: A New Approach to Economic Geography: A Study of Resources, World Press, Kolkata.
- Hartshorn, T.A. and Alexander, J.W. 1988: Economic Geography, Prentice Hall India, New Delhi.
- Isard, W. et al 1956: Location, Space and Economy, Technology Press of MIT and John Wiley, New York.
- Jones, C.F. and Darkenwald, G.G. 1954: Economic Geography, Macmillan, New York.
- Leong. G.C. and Morgan, G.C. 1975: Human and Economic Geography, Oxford University Press, Hong Kong.
- Miller, E. 1962: A Geography of Manufacturing, Prentice Hall, Englewood Cliff, N. J.
- Morgan, W.B. and Manton, R.J.C. 1971: Agricultural geography, Methuen, London.
- Paterson, J.H. 1976: Land, Work and Resources- An Introduction to Economic Geography, Edward Arnold, London.
- Pickering, K. and Owen, I.A. 1997. An Introduction to Global Environment Issues, 2nd edition, Routledge, London.
- Sen, A. 1990: Jibanjatra O Arthaniti (Bengali) Ananda Publishers, Kolkata.
- Simmons, I. G. 1981: The Ecology of Natural Resources, ELBS/ Edward Arnold, London.
- Singh, J., 1974: An Agricultural Atlas of India: A Geographical Analysis, Vishal Publications, Kurukshetra.
- Smith, D.N. 1971: Industrial Location- An Economical Geographical Analysis, John Wiley, New York.
- Thoman, R.S. and Corbin, P.B. 1968: Geography of Economic Activity, McGraw Hill, New York.
- Wheeler, J.O. and Muller, P.O., 1986: Economic Geography, John Wiley, New York.
- Zimmermann, E.W. 1956: World Resources and Industries, Harper Brothers, New York.

Group B : Social and Cultural Geography (50 marks)

• Suggested Readings:

- Ahmed, A. 2004 : Social Geography, Rawat Publication, New Delhi.
- Beaujeu Garnier, 1976: Methods and Perspective in Geography, Longman, London.
- Chapman, K. 1979: People, Pattern and Process – An Introduction to Human Geography, Edward Arnold Ltd., London.
- De Blij, H.J. and Murphy, A.B. 2002: Human Geography: Culture, society and space, 7th edition, John Willy and Sons, New York.

- Dickinson, R. E. 1964: City and Region, Routledge, London.
- Dwivedi R.L. 2004: Fundamentals of Political Geography, Chaitanya Publishing House, Allahabad.
- Guha, R. C. 2008: Social Ecology, Oxford University Press, California.
- Hussain, M. 1994: Human Geography, Rawat Publications Co., New Delhi.
- Jones, E. and Eyles, J. 1977: An Introduction to Social Geography, Oxford University Press, Oxford.
- Jones, Emrys 1965: Human Geography, Chatto and Windies, London.
- Kolars, J. E. and Nyestuen, J. D. 1974: Geography, McGraw Hill Book Co., New Work, London.
- Leong, G. C. and Morgan, G. C. 1975: Human and Economic Geography, Oxford University Press, Hong Kong.
- Rubenstein, J. M. and Becon, J. M. 1990: Cultural Geography, John Wiley and Sons Inc., New York.
- Spencer, J. E. and Thomas, W. L. 1969: Cultural Geography, John Wiley and Sons Inc., New York.

Paper 4: (100 marks) - Theoretical & Practical

Group A : Population and Settlement Geography (50 marks)

Suggested Readings:

- Agarwala, S.N. 1985: India's Population Problems, Tata McGraw hill, New Delhi.
- Barckley, L.W. 1985: Techniques of Population Analysis, John Wiley and Sons, N.Y.
- Beaujeu- Garnier, J 1966; Geography of Population, Longman, London.
- Bhende, A.A. and Kanetkar, T. 1978: Principles of Population Studies, Himalayan Publishing House, Mumbai.
- Carter, H. 1975: The Study of Urban Geography, Edward Arnold, London.
- Chandna, R.C. 1986: A Geography of Population, Kalyani Publishers, New Delhi.
- Clarke, J. I. 1972 Population Geography, Pergamon Press, Oxford.
- Daniel, P. and Hopkins, M. 1989: A Geography of Settlement, Oliver and Boyd, Essex.
- Daniels, P., Bradshaw, M. and Others, 2004: Human Geography, Pearson Education, New Delhi.
- Dickinson, R.E. 1964: City and Regions, Routledge & Keganpaul Ltd , London.
- Ghosh, S. 1998 : Settlement Geography, Orient Longman Ltd. , Kolkata.
- Hassan, M.H. 2005: Population Geography, Rawat Publications, New Delhi.
- Hudson, F.S. 1977: A Geography of Settlements, Macdonald & Evans Ltd., Plymouth.
- Johnson, J.H. 1977 Urban Geography- An Introductory Analysis, Pergamon press, Oxford.
- Johnston, R.J. 1984: Urban Geography, Penguin, London.
- Mandal, R.B. 2001: Introduction to Rural Settlements, Concept Publishing Company, New Delhi.
- Mayer, H.M. & Kohn, C.F. (editors) 1959: Readings in Urban Geography, The University of Chicago Press, Chicago.
- Pater, C. 1975: Demography: A Systematic Exposition, Jawahar Publishers and Distributors,
- Pathak, C.R. 2002: Spatial Structure and Process of Development in India, regional Science Association, Kolkata.
- Srinivasan, K. 1998: Basic Demographic Techniques and Application, Sage Publication, New Delhi.
- Srivastava, O.S. 1994: Demography and Population Studies, Vikash Publishing House Pvt. Ltd., New Delhi.
- Trewartha, G.T. 1969: A Geography of Population- World Patterns, John Wiley, New York.
- Trewartha, G.T. 1972: The Less Developed Realms-A Population Geography, McGraw Hill, New York.
- Woods R., 1979: Population Analysis in Geography, Longman, London.
- Zacharia, E. and Sinha, V.C., 1986 : Elements of Demography, Allied publishers Pvt Ltd, New Delhi
- Zelinsky, W. 1966: A Prologue to Population Geography, Prentice Hall India, New Delhi.

Group B : Quantitative Techniques (Practical) (50 marks)

- Basu, R. and Bhaduri, S. (editor) 2007: Contemporary Issues and Techniques in Geography, Progressive Publishers, Kolkata.
- Bennett, Gordon D. and Patton, Jeffrey C. 2005: Applied Human Geography, Kendall/Hunt Publishing Company, Iowa.
- Clark, W.A.V. and Hosking, P.L. 1986: Geographical Methods for Geographers, John Wiley and Sons, New York.
- Cole, J. P. and King, C.A.M., 1968: Quantitative Geography, Techniques and Theories in Geography, John Wiley & Sons Ltd, Glasgow.
- Croxton, F.E., Cowden, D.J. & Klein, S. 1969: Applied General Statistics, Prentice Hall of India Pvt. Ltd., New Delhi
- Dickinson, G.C. 1973: Statistical Mapping and Presentation of Statistics, Edward Arnold.
- Dury, G.H. 1972: Map Interpretation, Pitman Publishing, London.
- Goon, A.M., Gupta, M.K. & Dasgupta, B. 1992: Fundamentals of Statistics, Volume 1, The World Press Pvt. Ltd., Kolkata.
- Gregory, S. 1985: Statistical Methods and the Geographer, Longman, London.
- Hammond, R, and McCullagh, P. 1978: Quantitative Techniques in Geography: An Introduction, Oxford University Press, Oxford.
- Ishtiaque, M. 1989: Practical Geography, Heritage Publishers, New Delhi.
- Mahamood, A. 2008: Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi.
- Norcliffe, G.B. 1977: Inferential Statistics for Geographers-An Introduction, Hutchinson and Co., London. Oxford University Press, New Delhi.
- Pal, S.K. 1998: Statistics for Geo-Scientists- Techniques and Application, concept Publishing
- Pillai, R.S.N. and Bagavathi, 2003: Practical Statistics, S Chand & Co., New Delhi.
- Sarkar, A. 1997: Practical geography: A systematic Approach, Orient Longman Ltd., Hyderabad.
- Sirkin, Mark R. 2006: Statistics for Social Sciences, Sage Publications.
- Young, Pauline V. 2009: Scientific Social Surveys and Research, PHI Learning Pvt. Ltd., New Delhi.

Paper 5: (100 marks) - Practical

Group A : Preparation of thematic Maps (Practical) (50 marks)

• Suggested Readings:

- Anson, R. W. and Ormerling, F. J. 1993: Basin Cartography, Elsevier Applied Science Publishers. London.
- Cuff J. D. and Mattson M. T., 1982: Thematic Maps: Their Design and Production, Methuen Young Books
- Dent B. D., Torguson J. S., and Holder T. W., 2008: Cartography: Thematic Map Design (6th Edition), Mcgraw-Hill Higher Education
- Dorling, D. and Fairbirn, D. 1997: Mapping Ways of Representing the World, Longman. England.
- Gupta K. K. and Tyagi V. C., 1992: Working with Maps, Survey of India, DST, New Delhi.
- Mishra R. P. and Ramesh A., 1989: Fundamentals of Cartography, Concept, New Delhi.
- Monkhouse F.J. and Wilkinson, H.R. 1971: Maps and Diagrams: Their Compilation and Construction, B.I. Publications Private Limited, New Delhi.
- Rampal, K.K. 1999: Handbook of Aerial Photography and Interpretation, Concept Publishing Co., New Delhi.
- Sarkar, A. (2015) Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi
- Singh R. L. and Singh R. P. B., 1999: Elements of Practical Geography, Kalyani Publishers.
- Slocum T. A., McMaster R. B. and Kessler F. C., 2008: Thematic Cartography and Geovisualization (3rd Edition), Prentice Hall.
- Tyner J. A., 2010: Principles of Map Design, The Guilford Press.

Group B : Map Interpretation and Field Techniques (Practical) (50 marks)

• Suggested Readings:

- Behavioural Sciences, eds. by F. Pryczak and R. Bruce Pryczak, Publishing: Los Angeles.
- Conway, Eric D. 1997: An Introduction to Satellite Image Interpretation, Maryland Space Grant Consortium.
- Creswell J., 1994: Research Design: Qualitative and Quantitative Approaches Sage Publications.
- Dikshit, R. D. 2003. The Art and Science of Geography: Integrated Readings. Prentice-Hall of India, New Delhi.
- Evans M., 1988: —Participant Observation: The Researcher as Research Tool in Qualitative Methods in Human Geography, eds. J. Eyles and D. Smith, Polity.
- Held, B. 2010: Microsoft Excel Functions & Formulas, Wordware Publishing, Inc.
- Hoffman, Robert R. and Markman, Arthur B. 2001: Interpreting Remote Sensing Imagery, CRC Press.
- Jensen, J.R., 2000: Remote Sensing of the environment: An earth resource perspective, prentice Hall, upper saddle river, N.J.
- Kraak M.-J. and Ormeling F., 2003: Cartography: Visualization of Geo-Spatial Data, Prentice-Hall.
- Lillesand, M. and Kieffer, R.W.2003: Remote sensing and Image Interpretation, 5th Edition, Wiley, New York.
- Lueder, Donald R. 2008: Aerial photographic interpretation: principles and applications, McGraw Hill Publication.
- Monkhouse F.J. and Wilkinson, H.R. 1971: Maps and Diagrams: Their Compilation and Construction, B.I. Publications Private Limited, New Delhi.
- Rampal, K.K. 1999: Handbook of Aerial Photography and Interpretation, Concept Publishing Co., New Delhi.
- Robinson A., 1998: "Thinking Straight and Writing That Way", in Writing Empirical Research Reports: A Basic Guide for Students of the Social and
- Sarkar, A. 1997: Practical geography: A systematic Approach, Orient Longman Ltd., Hyderabad.

Structure of M.Sc. Part- II

Paper 6: (100 marks) - Theoretical

Group A : Geographical Thought (50 marks)

• Suggested Readings:

- Adhikari, S. (1992). Geographical Thought. Allahabad: Chaitanya Pub. House.
- Blis, H. J. (1971). Geography Regions and Concepts. New York: John Wiley of Sons INC.
- Bunge, W. 1962: Theoretical Geography, Glenerp, London.
- Chorley, R., & Haggett, P. (1965). Frontiers in Geographical Teaching. Oxford: OUP.
- Coffey, W. (1981). Geography - Towards a General Spatial System Approach. USA: British Library Cataloguing in Pub.Data.
- Dhunbar, G.S. (editor) 1991: Modern geography: An Encyclopedic Survey, St. James Press, Chicago.
- Dickinson, R. (1969). Makers of Modern Geography. Ludhiana: Lyall Book Depot.
- Dikshit, R. (2006). Geographical Thought - A Contextual History of Ideas. New Delhi: Prentice Hall of India Private Limited.
- Dikshit, R.D. (editor) 1994: The Art and Science of Geography: Selected Readings, Prentice Hall India Ltd., New Delhi.
- Dunbar, G. (1991). Modern Geography: An Encyclopedic Survey. Chicago: St. James Press.
- Freeman, T. (1971). A Hundred Years of Geography. London: Gerald Duckworth & Co.Ltd.
- Gregory D. And Walford, R. (editors) 1998: Horizons in Human Geography, Macmillan, London.
- Hartshorne, R. (1968). Perspectives on the Nature of Geography. John Murray, London: Association of American Geographers, Great Britain.
- Hartshorne, R. (2002). The Nature of Geography. New Delhi: Rawat Pub.Co.

- Harvey, D. (1979). *Social Justice and the City*. Great Britain: The Pitman Press, Bath.
- Harvey, D. (2003). *Explanation in Geography*. New Delhi: Rawat Pub.Co.
- Harvey, E., & Holly, B. P. (2002). *Themes in Geographical Thought*. New Delhi: Rawat Pub.Co.
- Hussain, M. (1995). *Evolution of Geographical Thought*, 3rd edition. New Delhi: Rawat Pub.co.
- Johnston, R. (2000). *Geography and Geographers*. London: Oxford University Press, New York. Edward Arnold.
- Johnston, R.J., Gregory, D., Pratt, G. and Watts, M. 2000: *The Dictionary of human Geography*, 4th edition, Blackwell Pub. Ltd., London.
- Lahiri-Dutt, K. (2002). *Bhogal Chintar Vikash*. World Press.
- Legg, S. (2007). *Spaces of Colonialism*. UK: Blackwell Publishing.
- Massey, D. (1994). *Space, Pace and Gender*. Minnesota: University of Minnesota Press.
- Matthews, J.A. and Herbert, J.A. 2004: *Unifying Geography: Common Heritage, Shared Future?* Routledge, London.
- Messy, D., & Allen, J. (1984). *Geography Matters: A Reader*. Cambridge: Cambridge University Press.
- Moss, P. (2002). *Feminist Geography in Practice Research and Methods*. UK: Blackwell Pub.Co.
- Murdoch, J. (2006). *Post-Structuralist Geography*. New Delhi: Sage Publications Limited.
- Pandey, P. (1983). *Modern Geographical Trends*. New Delhi: Today's and Tomorrow's Printers and Publishers.
- Peet, R. (2003). *Radical Geography*. New Delhi: Rawat Pub.Co.
- Peet, R., & Thrift, N. (1989). *New Models in Geography*. Boston, Sydney, Wellington: Unwin Hyman.
- Peet, R. 1998: *Modern Geographical thought*, Blackwell, London.
- Raju, S., & Lahiri-Dutt, K. (2011). *Doing Gender Doing Geography Emerging Research in India*. UK: Routledge.
- Rana, L. (2008). *Geographical Thought - A Systematic Record of Evolution*. New Delhi: Concept Publishing Company.
- Smith, D. (1994). *Geography and Social Justice*. Oxford, UK & Cambridge, USA: Blackwell.
- Soja, E. (2003). *Postmodern Geographies*. UK: British Library Cataloguing in Publication Data.
- Stoddart, D. (1986). *On Geography and Its History*. Oxford: Basil Blackwell.

Group B : Historical and Political Geography (50 marks)

- Adhikari, Sudepta (2002) *Political Geography*, Rawat Publications, New Delhi
- Agnew, John (1997) *Political Geography: A Reader*, Arnold, London
- Blacksell, M. 2006: *Political Geography*, Psychology Press.
- Cox, Kevin R. (2002) *Political Geography: Territory, State, and Society*, Blackwell Publishers, Oxford.
- Dikshit, R.D. 1999: *Political Geography*, Tata-McGraw Hill Education, New Delhi.
- Diwedi, R.L. 2004: *Fundamentals of Political Geography*, Chaitanya Publishing House, Allahabad.
- Freeman, T. W., 1961: *Hundred Years of Geography*, Gerald Duckworth and Co., London.
- Gallaher, C., Dahlman, Carl T. and Others, 2009: *Key Concepts in Political Geography*, Sage.
- Husain Majid (1994) *Political Geography*, Anmol Publications Pvt. Ltd.
- Jones, M., Jones R. and Others, 2014: *An Introduction to Political Geography: Space, Place and Politics*, Routledge.
- Kasperson, Roger E. and Minghi, J.V. 2011: *The Structure of Political Geography*, Transaction Publishers.
- Pound, J. 1990: *Introduction to Political Geography*, Oxford Publication.
- Pounds, Norman J.G. (1963) *Political Geography*, Mc Graw Hill Book Company

Paper 7: (100 marks) - Theoretical

Group A : Environmental Issues in Geography (50 marks)

- Chandna R. C., 2002: Environmental Geography, Kalyani, Ludhiana.
- Cunningham W. P. and Cunningham M. A., 2004: Principals of Environmental Science: Inquiry and Applications, Tata Macgraw Hill, New Delhi.
- Goudie A., 2001: The Nature of the Environment, Blackwell, Oxford.
- Government of India. (1997) Vulnerability Atlas of India. New Delhi, Building Materials & Technology Promotion Council, Ministry of Urban Development, Government of India.
- Kapur, A. (2010) Vulnerable India: A Geographical Study of Disasters, Sage Publication, New Delhi.
- Miller G. T., 2004: Environmental Science: Working with the Earth, Thomson BrooksCole, Singapore.
- Modh, S. (2010) Managing Natural Disaster: Hydrological, Marine and Geological Disasters, Macmillan, Delhi.
- MoEF, 2006: National Environmental Policy-2006, Ministry of Environment and Forests, Government of India.
- Odum, E. P. et al, 2005: Fundamentals of Ecology, Ceneage Learning India.
- Singh S., 1997: Environmental Geography, Prayag Pustak Bhawan. Allahabad.
- Singh, R. B. (ed.), (2006) Natural Hazards and Disaster Management: Vulnerability and Mitigation, Rawat Publications, New Delhi.
- Singh, R.B. (2005) Risk Assessment and Vulnerability Analysis, IGNOU, New Delhi. Chapter 1, 2 and 3
- Singh, R.B. (Eds.) (2009) Biogeography and Biodiversity. Rawat Publication, Jaipur
- Singh, R.B. and Hietala, R. (Eds.) (2014) Livelihood security in Northwestern Himalaya: Case studies from changing socio-economic environments in Himachal
- Sinha, A. (2001). Disaster Management: Lessons Drawn and Strategies for Future, New United Press, New Delhi.
- Stoltman, J.P. et al. (2004) International Perspectives on Natural Disasters, Kluwer Academic Publications. Dordrecht.
- UNEP, 2007: Global Environment Outlook: GEO4: Environment for Development, United Nations Environment Programme.

Group B : Regional Planning and Development (50 marks)

Suggested Readings:

- Brock, J.O.M. and Webb, J.W. 1973: A Geography of Mankind, McGraw Hill, New York.
- Chand, M. and Puri, V.K. 2004: Regional Planning in India, Allied Publishers, New Delhi.
- Chandana, R.C. 2005: Regional Development and Planning, Kalyani Publishers, New Delhi.
- Di Blij, H. and Muller, O. 1993: Geography: Regions and Concepts, John Wiley and Sons, N.Y.
- Gore, M.S. 1985: Social Aspects of Development, Rawat Publications, Jaipur.
- Human Development Report: Published annually by Oxford University Press.
- Isard, W. et al 1960: Methods of Regional Analysis, Technology Press of MIT and John Wiley, New York.
- Jackson R.H. and Husman, L.E. 1991: World Regional Geography: Issues for Today, John Wiley and Sons, N.Y.
- Jhingan, M.L. 1978: Economics of Development and Planning, Vikash Publishing House, New Delhi.
- Kulkarni, A.R. 1872: Growth Centres in Regional Planning, Mouton and Co., Paris.
- Mishra, R.P. 2002: Regional Planning: Concepts, Techniques, Policies and Case Studies, Concept Publishing Co., New Delhi.
- Nagle, G. and Spencer, K. 1997: Sustainable Development, Hodder and Stoughton, London.
- Sayer, J., Campbell, B. 2003: The Science of Sustainable Development: Local Livelihoods and the Global Environment, Cambridge University Press, Cambridge.
- Sharma, P.R. (editor) 1993: Regional Policies and Development in the Third World, Rishi Publication, Vranasi.
- Sundaram, K.V. 1997: Decentralized Multilevel Planning: Principles and Practice, Concept Publishing Co., New Delhi.

Paper 8: (100 marks) - Theoretical

Group A: Special Paper- Theoretical Issues (Geomorphology/Urban Geography)- (50 marks)

Geomorphology

- Basu, R. and Bhaduri, S. (editor) 2007: Contemporary Issues and Techniques in Geography, Progressive Publishers, Kolkata.
- Bland, W. And Rolls, D. 1998. Weathering, Hodder & Stonagnton.
- Bloom A. L. (2001) Geomorphology: A Systematic Analysis of Late Cenozoic Landforms, Prentice-Hall of India, New Delhi
- Bridges E. M. (1990) World Geomorphology, Cambridge University Press, Cambridge.
- Burbank, D.G. and Anderrson, R.S. 2001. Tectonic Geomorphology: A Frontier in Earth Science, Blackwell Science Inc. London.
- Christopherson, Robert W. (2011). Geosystems: An Introduction to Physical Geography, 8 Ed., Macmillan Publishing Company
- Cox, A. and Hart, R.B. 1986: Plate Tectonics: How it Works, Blackwell Scientific publications, Oxford.
- Duff, P.M.D. (editor) 1993: Holmes' Principle of Physical Geology, Taylor & Francis.
- Faniran, A. And Jeje, L.K. 1983. Humid Tropical Geomorphology, Longman, London.
- Gabler R. E., Petersen J. F. and Trapasso, L. M.,(2007). Essentials of Physical Geography (8th Edition), Thompson, Brooks/Cole, USA.
- Garrett N. (2000). Advanced Geography, Oxford University Press.
- Goudie, A. (1984) The Nature of the Environment: An Advanced Physical Geography, Basil Blackwell Publishers, Oxford.
- Gregory, K.J., Lewin, J. (2014). The Basics of Geomorphology: Key Concepts, Sage.
- Harvey, A. (2012). Introducing Geomorphology: A Guide to Landforms and Processes, Dunedin
- Hugget R.J. (2007). Fundamentals of Geomorphology, Routledge
- Husain M. (2002) Fundamentals of Physical Geography, Rawat Publications, and Jaipur.
- Kale V. S. and Gupta A. (2001). Introduction to Geomorphology, Orient Longman, Hyderabad.
- Kearey, P., Klepeis, K.A., Vine, F.J. (2011). Global Tectonics, 3rd ed, Wiley-India.
- Knighton A. D. (1984). Fluvial Forms and Processes, Edward Arnold Publishers, London.
- Knighton, D. 1998. Fluvial Forms and Processes: A new Perspective, Arnold, London.
- Ollier, C.D. 1981: Tectonics and Landforms, Longman, London.
- Sanders, J.E. 1981: Principles of Physical Geology, Wiley Scince.
- Selby, M.J. (2005). Earth's Changing Surface, Oxford University Press.
- Selby, M.J. 1985. An Introduction to geomorphology, Clarendon, Oxford.
- Sil A.K. (2018). Geotectonics and Geomorphology, Vol. I, The Himalayan Books, Kolkata
- Singh, S. Geomorphology, Prayag Pustak Bhavan, Allahabad.
- Skinner, Brian J. and Porter S.C. (1987). Physical Geography, John Wiley and Sons
- Skinner, Brian J. and Stephen C. Porter (2000), The Dynamic Earth: An Introduction to physical Geology, 4th Edition, John Wiley and Sons.
- Small, R.J. 1978: The Study of Landforms, Cambridge University Press, Cambridge.
- Strahler A. N. and Strahler A. H. (2008). Modern Physical Geography, John Wiley & Sons, New York.
- Strahler, A.N. and Strahler, A.H. 1984: Elements of Physical Geography, John Wiley, New York.
- Summerfield, M.A. (editor) 1991, Global Geomorphology: An Introduction to the Study of Landforms, John Wiley and Sons Ltd., New York.
- Tarbuck, E.J., Lutgens, F.K. and Tasa, D. 2003: Earth Science, 10th edition, Prentice Hall, Englewood Cliffs.
- Thronbury, W.D. 1969. Principles of Geomorphology, Wiley Easterb Limited, New Delhi.
- Woodroffe, C.D. 2002. Coasts: Form, process and Evolution, Cambridge University Press, Cambridge.
- Woolridge, S.W. and Morgan, R.S. 1959. Outline of Geomorphology: The Physics, Basis of Earth, Longman, London.
- Mathur, S.M. 1986, Physical Geology of India, National Book Trust, New Delhi.
- Sen, P.K. and Presad, N. 2002, An Introduction to Geomorphology of India, Allied Publishers, Delhi.

Urban Geography

- Fyfe N. R. and Kenny J. T., 2005: The Urban Geography Reader, Routledge.
- Graham S. and Marvin S., 2001: Splintering Urbanism: Networked Infrastructures, Technological Mobility and the Urban Condition, Routledge.
- Hall T., 2006: Urban Geography, Taylor and Francis.
- Johnston R. (2001) Urban Geography, Taylor and Francis
- Kaplan D. H., Wheeler J. O. and Holloway S. R., 2008: Urban Geography, John Wiley.
- Knox P. L. and McCarthy L., 2005: Urbanization: An Introduction to Urban Geography, Pearson Prentice Hall New York.
- Knox P. L. and Pinch S., 2006: Urban Social Geography: An Introduction, Prentice-Hall.
- Pacione M., 2009: Urban Geography: A Global Perspective, Taylor and Francis.
- Pred A (2017) City-systems in advanced economies: past, present and future development, Routledge
- Ramachandran R (1989): Urbanisation and Urban Systems of India, Oxford University Press, New Delhi
- Ramachandran, R., 1992: The Study of Urbanisation, Oxford University Press, Delhi
- Rodrigue J.P.(2020) The geography of transport systems, Taylor and Francis
- Vries J.D. (2013) European urbanization, Taylor and Francis

Group B : Special Paper - Applied Issues (Geomorphology/Urban Geography)- (50 marks)

Geomorphology

- Basu, R. and Bhaduri, S. (editor) 2007: Contemporary Issues and Techniques in Geography, Progressive Publishers, Kolkata.
- Bennett, Gordon D. and Patton, Jeffrey C. 2005: Applied Human Geography, Kendall/Hunt Publishing Company, Iowa.
- Clark, W.A.V. and Hosking, P.L. 1986: Geographical Methods for Geographers, John Wiley and Sons, New York.
- Cole, J. P. and King, C.A.M., 1968: Quantitative Geography, Techniques and Theories in Geography, John Wiley & Sons Ltd, Glasgow.
- Croxton, F.E., Cowden, D.J. & Klein, S. 1969: Applied General Statistics, Prentice Hall of India Pvt. Ltd., New Delhi
- Dickinson, G.C. 1973: Statistical Mapping and Presentation of Statistics, Edward Arnold.
- Dury, G.H. 1972: Map Interpretation, Pitman Publishing, London.
- Goon, A.M., Gupta, M.K. & Dasgupta, B. 1992: Fundamentals of Statistics, Volume 1, The World Press Pvt. Ltd., Kolkata.
- Gregory, S. 1985: Statistical Methods and the Geographer, Longman, London.
- Hammond, R, and McCullagh, P. 1978: Quantitative Techniques in Geography: An Introduction, Oxford University Press, Oxford.
- Ishtiaque, M. 1989: Practical Geography, Heritage Publishers, New Delhi.
- Mahamood, A. 2008: Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi.
- Mathur, S.M. 1986, Physical Geology of India, National Book Trust, New Delhi.
- Mottana, A., Crespi, R. and Others 1977: Guide to Rocks and Minerals, Simon & Schuster Inc.
- Norcliffe, G.B. 1977: Inferential Statistics for Geographers-An Introduction, Hutchinson and Co., London.
- Pal, S.K. 1998: Statistics for Geo-Scientists- Techniques and Application, concept Publishing Company, New Delhi.
- Pillai, R.S.N. and Bagavathi, 2003: Practical Statistics, S Chand & Co., New Delhi.
- Sarkar, A. 1997: Practical geography: A systematic Approach, Orient Longman Ltd., Hyderabad.
- Sen, P.K. and Presad, N. 2002, An Introduction to Geomorphology of India, Allied Publishers, Delhi.
- Sirkin, Mark R. 2006: Statistics for Social Sciences, Sage Publications.
- Young, Pauline V. 2009: Scientific Social Surveys and Research, PHI Learning Pvt. Ltd., New Delhi.

Urban Geography

- Croxton F.E. and Cowden D.J (1962) Applied General Statistics, Prentice Hall, London
- Fukuda-Parr, S and Shiva Kumar, A.K. (editors) 2003: Readings in Human Development, Oxford University Press, New Delhi.
- Fyfe N. R. and Kenny J. T., 2005: The Urban Geography Reader, Routledge.
- Graham S. and Marvin S., 2001: Splintering Urbanism: Networked Infrastructures, Technological Mobility and the Urban Condition, Routledge.
- Hall T., 2006: Urban Geography, Taylor and Francis.
- Johnston R. (2001) Urban Geography, Taylor and Francis
- Kaplan D. H., Wheeler J. O. and Holloway S. R., 2008: Urban Geography, John Wiley.
- Knox P. L. and McCarthy L., 2005: Urbanization: An Introduction to Urban Geography, Pearson Prentice Hall New York.
- Knox P. L. and Pinch S., 2006: Urban Social Geography: An Introduction, Prentice-Hall.
- Pacione M., 2009: Urban Geography: A Global Perspective, Taylor and Francis.
- Pred A (2017) City-systems in advanced economies: past, present and future development, Routledge
- Ramachandran R (1989): Urbanisation and Urban Systems of India, Oxford University Press, New Delhi
- Ramachandran, R., 1992: The Study of Urbanisation, Oxford University Press, Delhi
- Rodrigue J.P.(2020) The geography of transport systems, Taylor and Francis
- Sassen S., 2001: The Global City: New York, London and Tokyo, Princeton University Press.
- Singh, R.B. (Ed.) (2015) Urban development, challenges, risks and resilience in Asian megacities. Advances in Geographical and Environmental Studies, Springer
- Singh, R.B. (Eds.) (2001) Urban Sustainability in the Context of Global Change, Science Pub., Inc., Enfield (NH), USA and Oxford & IBH Pub., New Delhi.
- Vries J.D. (2013) European urbanization, Taylor and Francis

Paper 9: (100 marks) - Theoretical and Practical

Group A : Regional Problems of India (50 marks)- Theoretical

• Suggested Readings:

- Basu D.N. and Guha G.S.(1996) Agro-Climatic Regional Planning in India, Concept Pub.
- Dutta, R. And Sundaram, K.P.M. 1999: Indian Economy, S. Chand and Cooperation Limited, New Delhi. edition, Vikash Pub. House pvt. Ltd, New Delhi.
- Husain Majid (2022) Geography of India, McGraw Hill
- Khullar, D.R. 1999: A Comprehensive Geography of India, Kalyani Publishers, New Delhi.
- Kumar, R. 1985: Fundamentals of Historical Geology and Stratigraphy of India, Wiley- Eastern, New Delhi.
- Mamoria, C.B. 1996: Economic and Commercial Geography of India, revised edition, Shivalal Aggarwala and Co., Agra.
- Mathur, S.M. 1986: Physicalgeogy of India, National Book Trust, New Delhi.
- Misra, R.P (1974) Regional Planning, Concept Pub.
- Pathak, C.R. 2002: Spatial Structure and Process of Development in India, regional Science Association, Kolkata.
- Ramchandran, R. (1989) Urbanization and Urban System in India, OUP Publishers, Delhi.
- Ray Chaudhuri, J. 2001: An Introduction to Development and Regional Planning, Orient longman Ltd., Hydrabad.
- Sen Gupta (1968) Economic Regionalization of India: Problems and Approaches, Registrar General, India.
- Shanmugam K.R. (2010) Population Dynamics and Human Development, Bookwell, New Delhi
- Shiva, V. 1992: The Violence of the green revolution: Agriculture, Ecology and Politics in the
- Singh, R.L (1971) India; A Regional Geography, National Geographical Society of India, Varanasi

- Singh, R.L. (editor) 1971: India; A Regional Geography, national Geographical Society of India/UBS pub. Dictributors Ltd., New Delhi.
- Southm, 2001 reprint, Other India Press, Mapusa.
- Wadia, D.N. (2010) Geology of India, Macmillan Pub

Group B : Remote Sensing and GIS (Practical) (50 marks)

• Suggested Readings:

- Burrough, P.A., 1998: Principles of Geographical Information system for land resources assessment, 2nd edition, Oxford University press, New York.
- Campbel, J.B. 1996. Introduction to Remote Sensing, 2nd Edition, Taylor & Francis, London 622p
- Campbell, J.B. 1996: Introduction to Remote Sensing, 2nd Edition, Taylor & Francis, London.
- Chairsman, N. 1992. Exploring Geographical Information Systems, John Willey and Sons Inc., new York
- Chor Pang Lo, 2009, Concepts and Techniques of Geographic Information System, Prentice Hall.
- Curram, P.J. 1980: Multispectral remote sensing of vegetation amount, progress in Physical Geography.
- Curram, P.J. 1988: Principles of Remote Sensing, FIBS Edn., Longman group, U.K. Ltd.
- Davis S.M.et al (1978) Remote sensing: the quantitative approach, Harvard, New York
- Demers, M.N. 1997: Fundamentals of geographic information system, Wiley, New York.
- Guha, P.K. 2003: Remote Sensing for the Beginner, Affiliated East-West Press Pvt. Ltd., New Delhi.
- Jain A.K. (1989) Fundamentals of digital image processing, Prentice Hall
- Jatin Pandey and Darshana Pathak, 2013, Geographic Information System, TERI Publishing House.
- Joseph George, 2003: Fundamental of Remote Sensing, University Press (India) Pvt. Ltd., Hyderabad.
- Laurini, R. And Thompson. D. 1992: Fundamentals of Spatial Information System, London,
- Lillesand, t.M. and Kieffer, R.W.2003: Remote sensing and Image Interpretation, 5th Edition, Wiley, New York.
- Michael N. Demers, 2012, Fundamentals of Geographic Information Systems, Willy.
- Narayan, L.R.A. 1999: Remote Sensing and Its Application, Universities Press (India) Ltd., Hyderabad.
- Niblack W (1985): An introduction to digital image processing, Strandberg pub, co.

• Paper 10: (100 marks) - Practical

Group A : Special Paper (Geomorphology/Urban Geography)- (Practical) (50 marks)

• Geomorphology

- Basu, R. and Bhaduri, S. (editor) 2007: Contemporary Issues and Techniques in Geography, Progressive Publishers, Kolkata.
- Bennett, Gordon D. and Patton, Jeffrey C. 2005: Applied Human Geography, Kendall/Hunt Publishing Company, Iowa.
- Clark, W.A.V. and Hosking, P.L. 1986: Geographical Methods for Geographers, John Wiley and Sons, New York.
- Cole, J. P. and King, C.A.M., 1968: Quantitative Geography, Techniques and Theories in Geography, John Wiley & Sons Ltd, Glasgow.
- Croxton, F.E., Cowden, D.J. & Klein, S. 1969: Applied General Statistics, Prentice Hall of India Pvt. Ltd., New Delhi
- Dickinson, G.C. 1973: Statistical Mapping and Presentation of Statistics, Edward Arnold.
- Dury, G.H. 1972: Map Interpretation, Pitman Publishing, London.
- Fukuda-Parr, S and Shiva Kumar, A.K. (editors) 2003: Readings in Human Development, Oxford University Press, New Delhi.
- Goon, A.M., Gupta, M.K. & Dasgupta, B. 1992: Fundamentals of Statistics, Volume 1, The World Press Pvt. Ltd., Kolkata.

- Gregory, S. 1985: *Statistical Methods and the Geographer*, Longman, London.
- Hammond, R, and McCullagh, P. 1978: *Quantitative Techniques in Geography: An Introduction*, Oxford University Press, Oxford.
- Ishtiaque, M. 1989: *Practical Geography*, Heritage Publishers, New Delhi.
- Mahamood, A. 2008: *Statistical Methods in Geographical Studies*, Rajesh Publications, New Delhi.
- Norcliffe, G.B. 1977: *Inferential Statistics for Geographers-An Introduction*, Hutchinson and Co., London.
- Pal, S.K. 1998: *Statistics for Geo-Scientists- Techniques and Application*, concept Publishing Company, New Delhi.
- Pillai, R.S.N. and Bagavathi, 2003: *Practical Statistics*, S Chand & Co., New Delhi.
- Sarkar, A. 1997: *Practical geography: A systematic Approach*, Orient Longman Ltd., Hyderabad.
- Sirkin, Mark R. 2006: *Statistics for Social Sciences*, Sage Publications.
- Young, Pauline V. 2009: *Scientific Social Surveys and Research*, PHI Learning Pvt. Ltd., New Delhi.

• **Urban Geography**

- Fyfe N. R. and Kenny J. T., 2005: *The Urban Geography Reader*, Routledge.
- Graham S. and Marvin S., 2001: *Splintering Urbanism: Networked Infrastructures, Technological Mobility and the Urban Condition*, Routledge.
- Hall T., 2006: *Urban Geography*, Taylor and Francis.
- Kaplan D. H., Wheeler J. O. and Holloway S. R., 2008: *Urban Geography*, John Wiley.
- Knox P. L. and McCarthy L., 2005: *Urbanization: An Introduction to Urban Geography*, Pearson Prentice Hall New York.
- Knox P. L. and Pinch S., 2006: *Urban Social Geography: An Introduction*, Prentice-Hall.
- Pacione M., 2009: *Urban Geography: A Global Perspective*, Taylor and Francis.
- Ramachandran R (1989): *Urbanisation and Urban Systems of India*, Oxford University Press, New Delhi
- Ramachandran, R., 1992: *The Study of Urbanisation*, Oxford University Press, Delhi
- Sassen S., 2001: *The Global City: New York, London and Tokyo*, Princeton University Press.
- Singh, R.B. (Ed.) (2015) *Urban development, challenges, risks and resilience in Asian megacities. Advances in Geographical and Environmental Studies*, Springer
- Singh, R.B. (Eds.) (2001) *Urban Sustainability in the Context of Global Change*, Science Pub., Inc., Enfield (NH), USA and Oxford & IBH Pub., New Delhi.
- Johnson, J.H. 1977 *Urban Geography- An Introductory Analysis*, Pergamon press, Oxford.
- Johnston, R.J. 1984: *Urban Geography*, Penguin, London.

Group B : Field Report oriented Dissertation (Practical) (50 marks)

- Baker R.P and Howell A.C (1938) *Preparation of Reports*, Ronald Press, New York
- Beaumont, J.R. and Williams, S.W. 1983. *Project Work in the Geography Curriculum*, Croom Helm, London
- Creswell J., 1994: *Research Design: Qualitative and Quantitative Approaches* Sage Publications.
- Dikshit, R. D. 2003. *The Art and Science of Geography: Integrated Readings*. Prentice-Hall of India, New Delhi.
- Evans M., 1988: "Participant Observation: The Researcher as Research Tool" in *Qualitative Methods in Human Geography*, eds. J. Eyles and D. Smith, Polity.
- Ghosh B.N.(1982) *Scientific Methods and Social Research*, Sterling Pub. New Delhi
- Gibbons J.D. (1971) *Nonparametric Statistical Inference*, Tokyo, McGraw-Hill
- Kitchen R and Tate N (2013) *Conducting research in human geography: theory, methodology and practice*, Taylor and Francis
- Kothari C.R (2007) *Research Methodology: Methods and Techniques*, New Age International Pub. New Delhi

- Monkhouse, F.J. and Williamson, R.H. (1963): Maps and Diagrams: Their Compilation and Construction, Methuen, London
- Mukherjee, Neela 2002. Participatory Learning and Action: with 100 Field Methods. Concept Pubs. Co., New Delhi
- Narasinha Murthy, R.L. (2014) Research Methodology in Geography, Concept, New Delhi
- Robinson A., 1998: "Thinking Straight and Writing That Way", in Writing Empirical
- Saha, P.K. and Basu, P. (2009): Advanced Practical Geography, Books and Allied (P) Ltd., Kolkata
- Sarkar, A. (2008): Practical Geography: A Systematic Approach, Orient BlackSwan, Kolkata
- Stoddard R. H., 1982: Field Techniques and Research Methods in Geography, Kendall/Hunt.
- Wolcott, H. 1995. The Art of Fieldwork. Alta Mira Press, Walnut Creek, CA
- Beaumont, J.R. and Williams, S.W. 1983. Project Work in the Geography Curriculum, Croom Helm, London
- Wolcott, H. 1995. The Art of Fieldwork. Alta Mira Press, Walnut Creek, CA Yeates M., 1974: An Introduction to Quantitative Analysis in Human Geography

c. Faculty & Support Staff requirement:

Sl. No.	Faculty	Name of the Faculty	Work at (HQ/RC)	Number
1	Associate Professor	Dr. Chhanda Dana Kundu	RC - 1	1
2	Associate Professor	Dr. Ajit Kumar Sil	RC - 1	1
3	Associate Professor	Smt. Dipali Kundu	RC - 1	1
4	Assistant Professor	Dr. Biraj Kanti Mondal	RC - 1	1
5	Assistant Professor	Smt. Tinki Kar Bhattachya	RC - 1	1

d. Support Staffs:

Sl. No.	Office Staff (Designation)	Work at (HQ/RC)	Number
1	Junior Assistant	HQ - 1	1
2	Junior Assistant Cum Typist	RC - 1	1

e. Instructional Delivery Mechanisms:

Mode of Delivery type	Delivery Mechanism	Provided (Yes/No)	Detailed Information (Please Mention the Activity Hour)
Face to face mode	PCP	Yes	18 hrs for 50 Marks -Theory 36 hrs for 50 marks – Practical.
	Tutorial/SpecialClass/Remedial Classess/ECP	Yes	Online remedial and tutorial classes are provided about 10-15 hours per batch of part 1 & part-II separately. The e-resources are provided.
	Seminar /Research Colloquium	Yes	Students are actively participating in the seminar conducted by the University.
	Workshop	Yes	Students are actively participating in the workshops.
	School based activities and Internship	No	
	Micro Teaching Sessions	No	

	Laboratory Based Practical	Yes	216 hrs - Practical
	Field work including Visits	Yes	36 hrs for PCPs and approximately 10-12 days spent on the field work.
	Extension Activities / Community Outreach Programme	No	
Self-Learning	SLMs	Yes	The printed SLMs are provided to the students during the counselling of admission. The e-SLMs are also available in the University website.
	Reference Books	Yes	The lists of references are available in each and every SLM and a list of which is also available in the websites. Moreover, some references are also suggested during the PCPs.
ICT/ Digital Wellness of Students	Online (Web driven/Mobile App)	Yes	Using NSOU app, Google meet, Whats app group
	Offline DVD/SD card?USB Drive	Yes	USB drive
	Telecommunications	yes	Support services are given
	Social Media (Facebook page/ Instagram/ Twitters/ Google Groups etc.)		Facebook page, Whats app group
Blended	Smart Classrooms	Yes	It is available and used during the PCPs at Kalyani R.C. of University.
	Flipped Learning	Yes	It was supported for the student's benefits.

vi. Procedure for admissions, curriculum transaction and evaluation:

University frames its policy related to admission entry criteria, method of admission, conduction of admission through the Admission Committee (statutory body) following the guideline of the UGC (Open and Distance Learning and Online Programmes) Regulations, 2020 and Department of Higher Education, Govt. of West Bengal. Admissions are conducted entirely through Online mode centrally by the University.

Information Circulation Policy:

All information related to the programme like admission policy, eligibility, fee structure, course curriculum, medium of instruction, method of instruction, evaluation method, SLMs etc. are transacted through prospectus, brochure, official notification etc.

Learner Support Services:

Learner support services are provided by the University at three level of functioning of the Open University architecture i.e. Learner Support Centre (LSC), Regional Centre and Head Quarter.

Following the UGC (Open and Distance Learning and Online Programmes) Regulations, 2020 LSCs are provide various learner support services in order to facilitate the acquisition of teaching-learning experience for its enrolled learners throughout at various phases of learners' study life cycle. LSC also main contact points for access by the learners, responsive and facilitating information centres, arranging contact sessions and other operations like processing of assignments etc.

University has constituted Learner's Facilitation Centre (LFC) at each Regional Centres to provide various support services. Beside that University has also provided learners support services through web based platform/ telephone/ email/ instant messaging services.

Transaction of Curriculum and Academic Planner:

The whole curriculum of the programme is well structured and well designed with the updated syllabus structure. The curriculum transaction involves the face to face PCP sessions through chalk and talk method, use of Power Point presentations, web-based lessons, animated videos, etc. The PCP sessions would be such that the learner should participate actively in the discussion. Apart from this ICT enables online supports are provided for better understanding of the subject.

For practical courses exclusive study materials containing the requirements, procedure for the experiments are issued to the learners. In the laboratory, instruction would be given for the experiments followed by demonstration and finally the learners have to do the experiments individually.

Curriculum transaction is through Online and or Offline modes as detailed above and all academic activities are conducted following the programme is following the below mentioned activity planner during the academic session:

Name of the Activity	Tentative months schedule (specify months) during Year			
	From (Month)	To (Month)	From (Month)	To (Month)
Admission	Jun	Jul	NA	NA
Distribution of SLM	Jul	Aug	NA	NA
Contact Programmes (counselling, Practical, etc.)	Aug	Oct	Jan	Mar
Assignment Submission	Oct	Nov	Mar	Apr
Evaluation of Assignment	Nov	Nov	Apr	Apr
Examination	Nov	Dec	May	Jun
Declaration of Result	Dec	Dec	Jun	Jun
Renewal/ Re-registration	NA	NA	Jun	Jul

Evaluation:

Evaluation is on a 2-tier basis, divided into Assignment submission (online mode) and Term End Examinations (Offline mode). The weightage is as follows:

Assignment – 20 marks

Term End Examination – 80 marks

Total marks for each course – 100

Assignment / Internal Assessment/ Continuous Assessment / Formative Assessment: Assignment submission is the first interaction between the learner and the teacher. It has a very important role to play in the teaching-learning process in distance education. So, submission of Assignment is mandatory for all learners. The assignment responses reflect what the learners have understood and learnt. The assignment answer scripts are returned to the learners so that the assignment answers serve the purpose of providing feedback to the learners and inform them their strengths and weaknesses. Learners will be required to submit assignment for each course and the marks obtained on evaluation of those assignment courses will be entered into his/her individual record of performance. This will constitute 30% (maximum) of the Full marks in the course as per University Grants Commission (Open and Distance Learning Programmes and Online Programmes) regulations, 2020. All the Marks secured by the learners will be progressively entered into the result card. Every learner is required to submit the assignment courses before each Term-End Examination. In practical course of Science stream, there is no assignment.

Term-End Examinations: Minimum 70% of the total credit points of the course (except practical course where it is 100%) would be reserved for Term-End Examination as per University Grants Commission (Open and Distance Learning Programmes and Online Programmes) Regulations, 2020. Minimum qualifying marks in each course is 30% (Term End Examination Marks + Assignment Marks).

Waive of Programme Fee:

University waive of full course fee for transgender learners.

vii. Requirement of the laboratory support and Library Resources:

To educate the students in more scientific way, a rhythmic practical class programme has been introduced. NSOU provides the necessary laboratory facilities to the students in their respective study centres. For Post- Graduate also the practical classes are held in the respective study centre. Two papers of 50 marks each is held in the own Geography laboratory (one for general practical and one for RS-GIS practical with the hands on training of RS-GIS softwares) of the University situated at the Kalyani Campus. Besides this, a smart class room is available in the Kalyani R.C. and used to conduct the practical PCPs.

Library facility is one of important services in any higher educational institution. In addition to the Self Learning Materials (SLMs) and other learning resources the University provides library facility to all of its registered learners. The Library Department, Netaji Subhas Open University is located at Kalyani Campus.

Further, to cater to the needs of huge number of registered students, the University needs unlimited libraries to provide educational support to everyone. To cope with the situation, the University has initiated the process of setting up a strategic partnership with the existing network of Public Libraries that are available in the State of West Bengal to offer educational support to our learners all over the State. This initiative taken by NSOU is the first of its kind in the country.

viii. Cost estimate of the programme and the provisions:

Total course fee is Rs. 36,000/- (Excluding Examination and Studentship Renewal Fees). An approximate distribution of expenditure is given below to get prior view:

Assigned Head	Sub Head	% of Expenditure
Development	SLM Preparation and Development Cost	7
	SLM Printing	44
Maintenance & Programme Delivery	Maintenances Grant	5
	Counselling/ PCP/ Lab Counselling	25
	Delivery Charges	4
	Other Overhead Expenses	8
ICT Support	Admission Processing	1
	ICT Support Services	5
	Computer Training	1

ix. Quality assurance mechanism and expected programme outcomes:

Centre for Internal Quality Assurance (CIQA) as per UGC (Open and Distance Learning and online programme) Regulations, 2020 to ensure the delivery of high quality programmes to its learners and CIQA has the following functions:

- ✓ Facilitating the creation of a learner-centric environment conducive for quality education and faculty maturation to adopt the required knowledge and technology for participatory teaching and learning process.
- ✓ Arrangement for feedback responses from stakeholders, such as Learners, alumni, employers, and community members, is gathered through surveys, focus groups, and other methods to

ensure that the program is meeting the needs of the community and to identify areas for improvement.

- ✓ Dissemination of information on the various quality parameters of the University.
- ✓ Development of quality culture in the University, and encourage creativity and innovation among the faculty and staff.
- ✓ Organization of inter and intra Schools/ Institutional workshops, seminars on quality related themes and promotion of quality circles.
- ✓ Documentation of the various programmes / activities of the School leading to quality improvement
- ✓ Acting as a nodal agency of the institution for quality-related activities, including adoption and dissemination of good practices.

Moreover, CIQA records activities undertaken on quality assurance along with the preparation of the PPRs and Annual Reports. The program aims to make learners knowledgeable, proficient and competent enough to secure good job opportunities as well as take up further research work.

Board of Studies (BOS): Board of Studies ensure quality of the Curriculum of Bachelor's Degree Programme in Geography as per University norms. BOS plays a vital role as the following

- ✓ Curriculum review and development of quality Self Learning Materials (SLMs) in print under Choice Based Credit System (CBCS) system. The curriculum is reviewed regularly to ensure that it is up-to-date and relevant to the needs of learners.
- ✓ Learner's assessment and evaluation process through a variety of methods, including exams, assignments. This helps to ensure that Learners are meeting the learning outcomes of the Programme.

Expected Programme outcomes:

The greatest opportunity of the post graduate geography course is that learners are able to build themselves for the research work in this field after successful completion of the course. Moreover, the learners are able to increase their knowledge base in the domain of geography which enhances their employability in various fields. The working person may also take this course for their vertical and horizontal mobility in their work place. A fresh graduate of geography honours may join this course to increase their employability in education and industrial sectors. The greatest strength of geography, as a discipline is its ability to integrate and apply knowledge across the interface of the Earth's social and environmental systems. In Geography, we don't just learn in the classroom; we provide students with opportunities to learn relevant skills and apply their knowledge to real-world challenges. Our field courses are designed to give students an opportunity to do just that: learn valuable field skills, apply classroom knowledge, and connect to the many organizations and issues that require geographic and environmental expertise.