



SYLLABUS POST GRADUATE GEOGRAPHY

NETAJI SUBHAS OPEN UNIVERSITY

1, Woodburn Park, Kolkata-700 020

Tel.: 2283-5157

TeleFax: 033-2283 5082



SYLLABUS IN GEOGRAPHY

Structure of M. Sc. Part I

Paper 1

Group A : Geotectonics and Geomorphology (50 marks)

Group B : Hydrology and Oceanography (50 marks)

Paper 2

Group A : Climatology (50 marks)

Group B : Soil and Biogeography(50 marks)

Paper 3

Group A : Economic Geography (50 marks)

Group B : Social and Cultural Geography (50 marks)

Paper 4

Group A : Population and Settlement Geography (50 marks)

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

Paper 5

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

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

SYLLABUS IN GEOGRAPHY

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 - (50 marks)

Group B : Special Paper - Applied Issues - (50 marks)

Paper 9 (100 marks) - Theoretical and Practical

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

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

Paper 10 (100 marks) - Practical

Group A : Special Paper (50 marks) - Practical

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



SYLLABUS POST-GRADUATE GEOGRAPHY PART I

Paper 1

GROUP A (50 Marks)

Geotectonics

1. Modern theories of the origin of the earth
2. Isostasy and related theories
3. Vulcanicity and related landforms
4. Plate tectonics and mountain building (with spl. ref. to the Himalayas)

Geomorphology

1. Development of modern concepts in geomorphology (with spl. ref. to India)
2. Non-cyclic concept and process geomorphology
3. Concept of grade, profile of equilibrium and base level
4. Theories of slope evolution

GROUP B (50 Marks)

Hydrology

1. Estimation and measurements of hydrological parameters
2. Unit hydrograph and its application
3. Wetland ecosystem of India and West Bengal
4. Criteria for river-basin management

Oceanography

1. Distribution of ocean water over the globe. Salinity and temperature of ocean water
2. Coastal geomorphology - mangroves and coral reefs
3. Morphology of the oceans : ridges, submarine canyons and oceanic deposits
4. Marine resources



Paper 2

GROUP A – Climatology (50 marks)

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.
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
3. Global warming - causes and consequences, impact on global water balance. El Nino and La Nina/ ENSO phenomena - mechanism and impact on biosphere
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.

GROUP B–Soil and Biogeography (50 marks)

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. Soil nutrients and soil organisms - their role in determining soil fertility; Degradation of soil - processes, causes and consequences; methods of soil conservation.
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.
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. Scope, content and recent trends in Economic Geography. Classification of economies, spatial organisation of economic activities, sectors of economy - Primary, Secondary and Tertiary.
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.

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).
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 globalisation on Indian economy.

GROUP B – Social and Cultural Geography (50 marks)

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. 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.
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.
4. Cultural diversity. Race, religion, language and ethnicity; Tribal groups; global review with special reference to India; Rural-urban cultural differentials; Impact of globalisation on regional culture.

Paper 4

GROUP A : Population and Settlement Geography (50 marks)

Population Geography

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;
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

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.
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.

GROUP B : Quantitative Techniques (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)

Concept of thematic mapping; types of thematic maps. 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)

GROUP B - Map Interpretation and Field Technique (50 marks)

- a) Interpretation of topographical sheets
- b) Interpretation of aerial photograph
- c) Interpretation of satellite imagery
- d) Preparation of questionnaire schedule



SYLLABUS POST-GRADUATE GEOGRAPHY PART II

Paper 6

GROUP–A (50 MARKS) : GEOGRAPHICAL THOUGHT

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.

GROUP-B (50 marks) : HISTORICAL AND POLITICAL GEOGRAPHY

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; Trade accounts of Huen Tsiang and Ibn-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 Gateway 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 Heart land and Rim land: 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 (50 MARKS): ENVIRONMENTAL ISSUES IN GEOGRAPHY

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 Kytoprotoocol and Montreal Protocol.
- 2.4 Environmental impact of big dams and urban- industrial expansion.

GROUP B (50 MARKS) : REGIONAL PLANNING AND DEVELOPMENT

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 9
GROUP A (50 MARKS)
REGIONS AND REGIONAL PROBLEMS OF INDIA

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, 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.

GROUP B (50 MARKS):
REMOTE SENSING AND GEOGRAPHICAL INFORMATION SYSTEM
PRACTICAL

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).

PAPER 8A

ADVANCED GEOMORPHOLOGY

MODULE (Theoretical): General Principles

50 marks**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 Systems 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, planforms 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 periglacial processes and forms

- 3.1 : Coastal morphodynamics: factors, characteristics and relative dominance of wave, tidal and fluvial processes in coasts.
- 3.2 : Processes and effects of longshore drift, bioturbation, 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 : Periglacial processes : Formation, system of change and classification of periglacial landforms.

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 8B

MODULE (Theoretical): Applications and Case Studies 50 marks

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 Coast Zone Management with reference to Coastal Regulation Zones.

2. Case studies of landforms and landuse

- 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 interfluvium 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 10A

ADVANCED GEOMORPHOLOGY (PRACTICAL) 50 marks

1. Analysis of drainage basin morphometry and channel aspects from topographical maps 14 marks

- 1.1 : Computation of stream order (Strahler's method), bifurcation ratio, drainage 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 14 marks

- 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 photopairs using parallax bar

3. Velocity, discharge and sediment load analysis 14 marks

- 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 8 marks

PAPER 8A

URBAN GEOGRAPHY Full Marks-50

UNIT I : 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.



UNIT II : 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 centers.

UNIT III : 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.

UNIT IV : 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 8B

URBAN GEOGRAPHY Full Marks-50

UNIT I : 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.

UNIT II : 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.

UNIT III : 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.

UNIT IV: Urban Management

- 4.1 Urban Governance—evolution of local self-government in India.



- 4.2 Millennium development goals.
- 4.3 Mega city Programmes ; G I S and Information Management.
- 4.4 Management of urban facilities. Participatory urban management ; Governance in peri-urban and fringe areas.

PAPER 10A

URBAN GEOGRAPHY PRACTICAL

FULL MARKS :50

1.0 Selected Statistical Techniques :

- 1.1 Regression Analysis.
- 1.2 Time Series Analysis.
- 1.3 Lorezn 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.