Postgraduate CBCS Syllabus
of
Geography

TO BE EFFECTIVE FROM THE ACADEMIC SESSION 2021-22

Kanyashree University
September, 2021

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SYLLABUS STRUCTURE

Sem	Module	Code	Type	Subject	Marks	Credits
I	CC-101	GEOG-01-T	Th	Geomorphology & Geotectonics	50	4
	CC-102	GEOG-02-T	Th	Climatology	50	4
	CC-103	GEOG-03-T	Th	Economic Geography	50	4
	CC-104	GEOG-04-T	Th	Population & Settlement Geography	50	4
	CC-105	GEOG-05-T	Th	Social & Cultural Geography	40	4
	CC-106	GEOG-06-P	Pr	Geospatial Analysis (Visual)	50	4
II	CC-207	GEOG-07-T	Th	Hydrology & Oceanography	50	4
	CC-208	GEOG-08-T	Th	Soil & Biogeography	50	4
	CC-209	GEOG-09-T	Th	Historical & Political Geography	50	4
	CC-210	GEOG-10-T	Th	Regional Planning & Development	50	4
	CC-211	GEOG-11-P	Pr	Statistical Techniques	50	4
	CC-212	GEOG-12-P	Pr	Quantitative Techniques	50	4
III	CC-313	GEOG-13-T	Th	Geography of Hazards	50	4
	CC-314	GEOG-14-T	Th	Gender Geography	50	4
	CC-315	GEOG-15-T	Th	Regional Geography	50	4
	DSEC-316	GEOG-EL-X-16-T	Th	Elective Special Paper - I*	50	4
	GEC-317	—	Th	Elective Paper (Other Discipline)	50	4
	CC-318	GEOG-17-P	Pr	RS, GIS & GNSS (Digital)	50	4
IV	CC-419	GEOG-18-T	h	Philosophy in Geography		
	CC-420	GEOG-19-T	Th	Research Methods in Geography	50	4
	DSEC-421	GEOG-EL-X-20-T	Th	Elective Special Paper - II*	50	4
	DSEC-422	GEOG-EL-X-21-P	Pr	Elective Special Paper - III*	50	4
	DSEC-423	GEOG-EL-X-22-P	Pr	Elective Special Paper - IV*: Dissertation	50	4
	CC-424	GEOG-23-P	Pr	Field / Project Report	50	4
I–IV	—	—	—	24 Modules	1200	96
III	GEC-317	—	Th	Physical Landscape / Cultural Landscape (Elective for Other Disciplines)	50	4

Elective Special Papers: *Any one to be selected for Modules DSEC-316, DSEC-421–423 from the following

A. Fluvial Geomorphology

B. Urban Geography

c.

SEMESTER I

MODULE CC-101: GEOMORPHOLOGY & GEOTECTONICS (Theoretical – 50 marks / 4 credits)

Unit-I: Concepts in Geomorphology

1.1 Spatial scale, temporal scale, and related concepts: Systems, feedback, equilibrium, and threshold.

1.2 Morphogenetic regions. Models of slope evolution.

1.3 Measurement and monitoring of landform evolution in fluvial and coastal environments. Significance of process studies and simulation modelling.

1.4 Plate tectonics as a unified theory of global tectonics.

Unit-2: Rivers and River Basins

2.1 River hydraulics: flow and energy. Hydraulic geometry of streams.

2.2 Catchment processes and fluvial processes. Factors regulating entrainment, transportation, and deposition of sediments.

2.3 Adjustment of channel forms and patterns to morphodynamic variables.

2.4 Fluvial landforms: Genetic classification, ordering, formation, and evolution.

Unit-3: Evolution of Landforms

3.1 Coastal morphodynamic variables and their influence on evolution of coastal forms.

3.2 Classification and evolution of periglacial landforms.

3.3 Impact of Pleistocene on landform evolution.

3.4 Planetary geomorphology with special reference to Moon and Mars.

Unit-4: Applied Geomorphology

4.1 Application of geomorphology in feasibility assessment of engineering and industrials projects. Geomorphic approach to hazard studies.

4.2 Factors, vulnerability, consequences, and management of tsunamis and landslides.

4.3 Factors, vulnerability, consequences, and management of riverbank erosion, storm surges and floods.

4.4 Principles of integrated coastal management.

MODULE CC-102 CLIMATOLOGY (Theoretical – 50 marks / 4 credits)

Unit-1: Concepts of Weather and Climate

1.1 The climate system: Micro, meso and macro. Linkages of climate with other environmental systems

1.2 Role of heat and moisture in the atmosphere. Adiabatic processes and instabilities

1.3 The wind circulation systems: Primary, Secondary and Tertiary

1.4 Clouds: Formation and classification; Precipitation: Forms and functions

Unit-2: Tropical Climates and Weather Hazards

2.1 Tropical circulations: Hadley and Walker, ENSO phenomena

2.2 Tropical air mass; Convergence and divergence

2.3 The Asian Monsoon: Importance, characteristics, and prediction

2.4 Weather hazards – Heat and cold waves, thunderstorm, tornado, and cyclone: distribution, significance, and forecasting

Unit-3: Climate Change

3.1 Scientific evidence of climate change. Reconstruction of past climates

3.2 Theories of climate change. Prognostication of future climates

3.3 The climate cycle. Climate trends in the Holocene period

3.4 Recent trends of global climates: Implications and arguments

Unit-4: Applied Climatology

4.1 Approaches and techniques of weather forecasting with reference to the tropics: short, medium, and long range

4.2 Climate and agriculture: Agro-climatology – Water budget and Crop Calendar

4.3 Climate and settlements: Urban climatology – Urban Heat Island and Architecture

4.4 Climate and health: Bio-climatology – Human Comfort and morbidity

MODULE CC-103: ECONOMIC GEOGRAPHY (Theoretical – 50 marks / 4 credits)

Unit-1: Resources and Economics

1.1 Concept of resource, resistance, and neutral stuff. Resource-creating factors, Resource adequacy and concept of scarcity. Economic systems.

1.2 Ranking of world economies. Resource classification: Ackerman's scheme.

1.3 Limits to growth: Classical, neo-classical, and ecological economics.

1.4 Economic theories: Functional, sustainable development, resource, and inequality.

Unit-2: Agricultural Economy

2.1 Agricultural regions: Concepts and techniques of delineation.

2.2 Word agricultural systems, Agri-business.

2.3 Green revolution and food security in India.

2.4 Land tenure systems and land reforms in relation to Indian agriculture.

Unit-3: Industrial Economy

3.1 Theories of industrial location as proposed by Palander, Hoover, and Smith

3.2 Major industrial regions. Spatial distribution of manufacturing industries: Petroleum refining and textile.

3.3 Emerging industries with special reference to food processing and ICT in India.

3.4 Industrial policy of India. Role of liberalisation, privatisation, and globalisation.

Unit-4: Trade and Commerce

4.1 Economics of global trade: Balance of payment, role of GATT and WTO.

4.2 Regional blocs in international trade.

4.3 Market network and linkages: Market centres, periodic and daily marketing, retailing, and whole-selling, E-commerce.

4.4 Labour markets and mobility with special reference to India.

MODULE-CC-104: POPULATION & SETTLEMENT GEOGRAPHY (Theoretical – 50 marks / 4 credits)

Unit-1: Population Geography

1.1 Changing approaches to population geography. Contemporary trends.

1.2 Population, Demographic characteristics, reproduction, health and education- Challenges for developed and developing countries.

1.3 Critical review of population growth theories and models, demographic transition, and demographic dividend- critic.

1.4 Population Quality: Literacy, occupation, and health. Population composition.

Unit-2: Migration, Mobility and Displacement

2.1 Migration: Mobility transition model, policy response to demographic changes.

2.2 Population, social organisation, and governance: People as communities and citizens – People's rights in contemporary societies, enclaves, and their problems.

2.3 Population as social capital. Status of developed and developing countries.

2.4 Population and vulnerability: Displacement, diaspora, and identity crisis.

Unit-3: Classification of Settlements

3.1 Dichotomy of settlement: rural and urban.

3.2 Rural: classification, function of village and environment relationship.

3.3 Urban: definition, classes of town, classification on culture and function.

3.4 Rural-urban linkages in a metropolitan system in India.

Unit-4: Settlement Systems and Models

4.1 Central place theory and settlement hierarchy.

4.2 The rank size rule, the primate city, urban primacy.

4.3 Functional classification of cities: Harris, Nelson, and Mackenzie.

4. 4 Classification of rural settlement: Models of Champion and Gestalt.

MODULE CC-105: SOCIAL & CULTURAL GEOGRAPHY (Theoretical – 50 marks / 4 credits)

Unit-1: Society and Space

1.1. The changing nature of social geography – evolution of perspectives.

1.2. Social Processes and spatial form: Conceptual framework.

1.3. Changing Nature of Social Space: Modernity-post modernity, crisis of local-global.

1.4. Changing social order: fragmentation, segregation, and polarisation – post-industrial capital and society (urban space).

Unit-2: Social Justice and Social Geography of India

2.1. Social Justice: concept and theories.

2.2. Achieving social justice (welfare, well-being, and social security).

2.3. Social change in India – evolving scenario of caste-class divides and rural-urban divides.

2.4. Social Planning: Inclusive growth and its measures, spatial implications.

Unit-3: Cultural Geography: Concepts and Approaches

3.1. Evolution of cultural geography.

3.2. Components and structure of culture.

3.3. Understanding the theoretical intersects in brief: Historical materialism, feminism, post structuralism, culture of science and ethics.

3.4. Colonialism, neo-colonialism, and metropolitan culture: Patterns of dominance-dependence.

Unit-4: Cultural Identity and Processes

4.1. Cultural hearths and realms of the world: Contemporary scenario. Impacts of technology and mobility.

4.2. Processes of diffusion and acculturation.

4.3. Popular cultures, folk culture, and its revival.

4.4. India and its multicultural identity.

MODULE CC-106: GEOSPATIAL ANALYSIS (Practical – 50 marks / 4 credits)

Unit- I: Analyses of Topographical Maps

1.1 Comparative utility of topomaps, aerial photos and satellite images as sources of geographical data.

1.2 Preparation of altimetric frequency curves and hypsometric curves of drainage basins.

1.3 Extraction of radii of curvature and sinuosity and braiding indices of channels.

1.4 Determination of settlement hierarchy.

Unit-2: Analyses of Satellite Images

2.1 Common types of IRS and Landsat sensors and their suitability for analysis of geographical information. Indian referencing scheme of IRS sensors.

2.2 Extraction of physical features from satellite images of various resolution and band combinations.

2.3 Extraction of cultural features from satellite images of various resolution and band combinations.

2.4 Detection of change from multidated maps and/or images (including images captured from web-based earth observation programmes).

Unit-3: Preparation of Analytical Maps

3.1 Preparation of land capability maps.

3.2 Preparation of landslide risk zonation maps.

3.3 Preparation of flood risk zonation maps.

3.4 Preparation of coastal erosion vulnerability maps.

Unit-4: Laboratory Notebook and Viva Voce

SEMESTER II

MODULE CC-207 HYDROLOGY & OCEANOGRAPHY (Theoretical – 50 marks / 4 credits)

Unit-1: Hydrology - I

1.1 Water in earth: forms, occurrences, and properties.

1.2 Significance of the global hydrological cycle with special reference to global storage and transportation of heat.

1.3 Precipitation, evaporation, and transpiration in different landuse/landcover conditions. Modern methods of recording these attributes.

1.4 Hydrological data: Source, measurement, and analysis.

Unit-2: Hydrology - II

2.1 Water management in tropical farmlands: Techniques and approaches. Artificial rainmaking.

2.2 Water management in tropical cities: Techniques and approaches. Rainwater harvesting.

2.3 Principles of integrated basin management with reference to micro-watershed planning.

2.4 Consequences of river impoundment. Issues related to damming of large rivers.

Unit-3: Oceanography - I

3.1 Classification, characteristics, and origin of the major structural and morphological features of the ocean floor with particular reference to plate tectonics.

3.2 Bottom topography of Indian Ocean: characteristics and evolution.

3.3 Waves and tides: Genetic classification and models of formation.

3.4 Ocean circulation: classification and significance.

Unit-4: Oceanography - II

4.1 Water mass: origin, evolution, physical and chemical properties. Air-sea interactions.

4.2 Sea-level change: types, causes and implications.

4.3 Ocean as a resource: Anthropogenic utilisation of the oceans.

4.4 EEZ and CRZ: delimitation, significance, and policy issues.

MODULE CC-208: SOIL & BIOGEOGRAPHY (Theoretical – 50 marks / 4 credits)

Unit-1: Soil Geography

1.1 Soil as a component of Biosphere. Concept of land and soil. Plant-water-soil relationship.

1.2 Bio-functions of Soil; Soil organic matter, Soil organisms and Micro-organisms and their relationship with soil fertility.

1.3 Soil mineralogy and Soil nutrients. Role of physico-chemical properties in soil fertility and productivity.

1.4 Soil degradation and pollution: causes, processes, and consequences. Preventive, ameliorative and conservation measures.

Unit-2: Plant Geography

2.1 Plant ecology: habitat factors and plant responses to environment: adaptation, and climax: domestication of plants.

2.2 Phytogeographical regions. Concept of plant species, family and genera, taxonomy.

2.3 Consequences of deforestation and exploitation of targeted species. Forest conservation, social forestry, and participatory management of forest.

2.4 Concept of degeneration and regeneration of plants.

Unit-3: Zoo Geography

3.1 Theory of evolution of species and its criticisms.

3.2 Dispersal and migration of animals: Means and barriers.

3.3 Zoogeographical regions of the world.

3.4 Principles of animal ecology, wildlife management; relevance of sanctuaries with special reference to India.

Unit-4: Ecosystem and Ecology

4.1 Principles of physical and human ecology. Ecosystem models.

4.2 Concept of biological desert. Forms and functions of marine ecosystem.

4.3 International Biological Programme; Man and Biosphere Programme.

4.4 Biodiversity conservation with special reference to humid tropics.

MODULE CC-209: HISTORICAL & POLITICAL GEOGRAPHY (Theoretical – 50 marks / 4 credits)

Unit-1: Historical Geography: Conceptual Issues

1.1 Nature, scope, content, and approaches.

1.2 Development of historical geography as a discipline.

1.3 Major issues in the discourse of historical geography.

1.4 Sources of historical geography and cartographic materials.

Unit-2: Historical Geography of India

2.1 Development of the identity of India: Pilgrimage, population dynamics and sacred space.

2.2 Elements of historical geography and travel literature: Hiuen Tsang, Ibn–E–Batuta, Barnier.

2.3 Historical geography and environment: Resources, agriculture, industry, trade, and urbanisation.

2.4 Historical geography and society: Caste, tribe, religion, language, gender, and ideologies.

Unit-3: Political Geography: Conceptual Issues

3.1 Evolution of Political Geography: major theoretical influences.

3.2 Spatial perspectives: border, frontiers, buffer zones, core and periphery, regional identity.

3.3 Transitions in the Political economy: Imperialism decolonisation, post-colonisation, neo-liberalism, and globalisation.

3.4 Neo-Marxist critique – Harvey, Peet, and Smith

Unit-4: Issues in Political Geography and the Indian Polity

4.1 World Wars and strategic relations, geo-political context of cold war, emergence of superpowers.

4.2 Electoral Geography: overview of models. Political ecology: Tragedy of commons

4.3 India: Federalism, SAARC, and BRICS.

4.4 Interstate and Intra-national Issues: Water disputes.

MODULE CC-210: REGIONAL PLANNING & DEVELOPMENT (Theoretical – 50 marks / 4 credits)

Unit-1: Regional Planning - Concepts

1.1 Concept of region: Formal, functional, and planning; classification and delineation, regionalization.

1.2 Concept of multilevel planning: Local, regional, and national level planning.

1.3 Basic principles of regional planning.

1.4 Metropolitan concept: Metropolis, metropolitan area, metropolitan region, and megacity.

Unit-2: Regional Planning and Development

2.1 Models of regional development: Perroux Myrdal, Hirschman, Friedmann.

2.2 Indicators of regional development: economic, social, technological, and infrastructural.

2.3 Integrated regional development: Balanced vs. unbalanced development, rural-urban linkages.

2.4 Changing concept of development, concept of underdevelopment, efficiency-equity debate.

Unit-3:1 Strategies of Regional Development and Zonal Planning

3.1 Regional disparity; Convergence and divergence.

3.2 Regional imbalances: Identification of backward areas and policy issues.

3.3 Special Economic Zones – special reference to West Bengal.

3.4 Regional planning in India: DVC, National Capital Region, Kolkata, and tribal areas.

Unit-4: Regional Planning in India

4.1 Regional Policies: Five year plans; NITI Ayog.

4.2 Role of Institutions in regional development.

4.3 Micro-regional planning.

4.4 Pandemics and city planning.

MODULE CC-211: STATISTICAL TECHNIQUES (Practical – 50 marks / 4 credits)

Unit-1: Probability, Sampling and Test of Confidence

1.1 Probability theory and normal distribution.

1.2 Sampling theory and sampling error.

1.3 Scaling Techniques: Rank score, weighted score, Likert's opinionnaire.

1.4 Statistical Decision theory: Social Affinity Index (SAI), t-test, type i and type II errors, One-tailed and two-tailed tests.

Unit-2: Correlations and Statistical inferences

2.1 Partial and multiple correlations.

2.2 Factor analysis (centroid method).

2.3 Analysis of Variance (ANOVA).

2.4 Non-parametric tests: Chi-Square test, Mann-Whitney U test.

Unit-3: Computer Application in Data Processing and Representation

3.1 Data mining from internet sources: Preparation of an inventory.

3.2 Tabulation of data and its graphical representation: Population, land use, weather (any one).

3.2 Use of statistic.al formula: Central tendency, Dispersion, Co-efficient of Variation.

3.3 Fitting of trend lines: Bi-variate, time series.

Unit-4: Laboratory Notebook and Viva Voce

MODULE CC-212: QUANTITATIVE & FIELD TECHNIQUES (Practical – 50 marks / 4 credits)

Unit-1: Quantitative Analysis and Diagrams

1.1 Gini-coefficient and Lorenz curve.

1.2 Nearest neighbour analysis and occupational ternary diagram.

1.3 Exponential growth curve and population projection.

1.4 Index number and cumulative index curve.

Unit-2: Quantitative Mapping and Interpretation

2.1 Mean centre of population and its shift; Concentration of population about mean centre

2.2 Location quotient; Z-score.

2.3 Residual mapping; Crop combination analysis.

2.4 Population potential (gravity model); accessibility map (distance/ centrality matrix/ MAT).

Unit-3: Field Techniques

3.1 Observation Method: Traffic composition/flow, bio-diversity register, crop-composition.

3.2 Survey Schedule: Household Survey, market survey, passenger survey, tourist survey.

3.3 Field instruments: Portable weather station, Abney level, clinometer.

3.4 Land use study at micro-level using cadastral map.

Unit-4: Laboratory Notebook and Viva Voce

SEMESTER III

MODULE CC-313: GEOGRAPHY OF HAZARDS (Theoretical – 50 marks / 4 credits)

Unit-1: The Nature of Hazards

1.1 Hazard and disaster: Definition and classification.

1.2 Paradigms of hazards.

1.3 Hazard probability, risk assessment and management.

1.4 Hazard management bodies of India and West Bengal.

Unit-2: Physical Hazards: Nature and Management

2.1 Tectonic hazards: Earthquake and land subsidence.

2.2 Geomorphic hazards: Coastal erosion and glacial lake outburst flood.

2.3 Climatic hazard: Drought and forest fire.

2.4 Environmental hazards: Groundwater arsenic contamination and saline intrusion.

Unit-3: Technological Hazards: Nature and Management

3.1 Hazards related to water utilisation: Groundwater depletion and dam burst.

3.2 Industrial hazards: Chemical and gas leaks.

3.3 Transport-related hazards: Road accidents.

3.4 Urban hazards: Pollution and fire.

Unit-4 Social and Biological Hazards: Case Studies from West Bengal

4.1 Human trafficking.

4.2 Food shortage and famine.

4.3 Human–animal conflict.

4.4 Vector-borne diseases.

MODULE CC-314: GENDER GEOGRAPHY (Theoretical – 50 marks / 4 credits)

Unit-1 Introduction to Gender Geography

1.1 History and development of gender geography, women's studies to gender studies: A Paradigm Shift.

1.2 Sex and gender, types of gender, gender stereotyping and gender discrimination.

1.3 Definition and understanding of masculinities, politics of masculinity and power.

1.4 Gender roles biological vs. cultural determinism, private vs. public dichotomy.

Unit-2: Gender and Society

2.1 Gender and family: Gender division of labour and asymmetric role structure. Gender role socialization and formation of identity.

2.2 Segmented labour market and labour force participation, occupational segregation, and wage discrimination.

2.3 Gender disparity in education, gender bias in school curriculum knowledge, education goals from gender perspective.

2.4 Patriarchy and gender-power, capitalism, and gender.

Unit-3: Gender and Economy

3.1 Women and work: Women in primary, secondary, and tertiary sectors, invisibility of women's work, problems in measurement.

3.2. Gendered jobs and Social Inequality, sex segregation at workplace.

3.3 Women's participation in organized sector, gender discrimination, marginalization, and glass ceiling.

4.4 Globalization and its impact on gender.

Unit-4: Gender Empowerment

4.1 Empowerment of women at various levels; village to parliament.

4.2 Access to economic opportunities.

4.3 Access to reproductive health services.

4.4 Involvement in decision making process environmental issues.

MODULE CC-315: REGIONAL GEOGRAPHY (Theoretical – 50 marks / 4 credits)

Unit-1: India – Selected Regional Issues

1.1 Tectonics and environmental problems of the Eastern Himalaya.

1.2 Geo-diversity and resource utilisation of the Indian Coasts.

1.3 Problems of the arid and semi-arid regions of India.

1.4 Ethno-cultural diversity of the Northeast India. Impact of globalisation on the diversity.

Unit-2: India – Issues of Regional Disparities

2.1 Infrastructure development in India: Rural-urban dichotomy.

2.2 Socio-economic disparities: North–South, East–West.

2.3 Employment scenario and labour migration in India.

2.4 Gender discrimination and empowerment.

Unit-3: Ganga Delta – Physical Aspects

3.1 Tectonic and stratigraphic evolution of the Bengal Basin.

3.2 Ganga delta: Quaternary evolution and geomorphic classification.

3.3 Drainage system of the Indian Ganga delta: characteristics and changes in the last 250 years. Water resources: status and issues.

3.4 Indian Sundarban: Tidal hydrodynamics and impact on land use change; biodiversity conservation in mangrove ecosystem.

Unit-4: Ganga Delta – Human Aspects

4.1 Population: Growth, migration, distribution and changing composition.

4.2 Agriculture: Crop combination, problems, and prospects.

4.3 Industrialisation and urbanisation: Infrastructural development, problems, and recent trends.

4.4 Human development: Progress and disparity.

MODULES-DSEC-1 A–B: SPECIAL PAPER (ELECTIVE–THEORETICAL)

MODULE DSEC-316 A (ELECTIVE): FLUVIAL GEOMORPHOLOGY – I (Theoretical – 50 marks / 4 credits)

Unit-1: Concept and Approaches

1.1 Fluvial geomorphology: Quantitative and modern approaches, chronology of development.

1.2 Fluvial system components and variables, scale in fluvial geomorphology, threshold, feedbacks, equilibrium.

1.3 Drainage Basin: Hydrological components, form and processes and factors affecting hydrological response of a basin.

1.4 Channel equilibrium, channel adjustment and channel restoration.

Unit-2: River Hydrology

2.1 Channel flow: Energy and velocity principle in flow, flow resistance, flow behaviour, forces driving and resisting the flow.

2.2 Flow generation, stream flow velocity and fluid shear stress, upstream and downstream variation of discharge.

2.3 Fluvial process: stream power, erosion process, sediment entrainment process and transport, bed load transport.

2.4 Sediment transfer-control on sediment yield, discharge and sediment transfer, sediment budgets.

Unit-3: Channel Morphology

3.1 Channel Geometry: channel geomorphic units, morphological and hydrological factors.

3.2 Alluvial channel form: morphology and behaviour of straight, meander and braided channel.

3.3 Channel Change: spatio-temporal changes of channel configuration and channel bed forms.

3.4 Channel engineering: implication to flow regime and morphology.

Unit-4: Drainage Basin Quantification

4.1 Models of channel initiation and channel evolution.

4.2 Empirical and genetic models of drainage pattern.

4.3 Quantitative analysis of drainage basin and its applicability.

4.4 Application of remote sensing and GIS in drainage basin analysis.

MODULE DSEC-316 B (ELECTIVE): URBAN GEOGRAPHY – I (Theoretical – 50 marks / 4 Credits)

Unit-1: Concept and Changing Perspectives

1.1 Emergence of urban geography as a discipline: changing approaches and methodological foundations.

1.2. Origins of the cities: ancient and medieval (the city in history).

1.3 Economic, social, and political forces behind urban growth over time and space.

1.4 Perception of urban space, derivative sources and changing emphasis.

Unit-2: Urbanisation Processes and Policies

2.1 Urbanisation processes and policies relative to industrialisation and economic development and non-economic parameters—metropolis to megalopolis and ecumenopolis.

2.2 Urbanisation in Developed and Developing countries.

2.3 Conurbation, rural-urban fringe, suburbanisation process; centrifugal and centripetal forces of migration.

2.4 National policies on urbanisation. Urbanisation in India. Economic and Human Development.

Unit-3: Size, Spacing, and Hierarchy

3.1 Urban Economic Base theory, multiplier effect.

3.2 Size-spacing of urban places: rank-size rules. Urban hierarchy: Primate to log-normal distribution of urban places in relation to level of economic development.

3.3 Core-periphery relations, growth pole and hinterland relations.

3.4 Central place theory and its extensions.

Unit-4 Morphology and Structure

4.1 Urban morphology: land use and the economics of land use change.

4.2 Social space and polarisation: meaning, differentiation, congregation, and segregation.

4.3 Neighbourhood changes and residential mobility.

4.4 Social justice and the city.

MODULE GEC-317: ELECTIVE PAPER – OTHER DISCIPLINE (Theoretical – 50 marks / 4 credits)

MODULE CC-318: RS GIS & GNSS (Practical – 50 marks / 4 credits)

Unit-1: Remote Sensing

1.1 Georeferencing using ortho-images and GNSS data.

1.2 Generation of spectral library of LU/LC features from L3 and TM data.

1.3 Image classification.

1.4 Change detection from multidated maps and images.

Unit-2: Geographical Information System

2.1 Raster to vector conversion.

2.2 Spatial analysis through vector overlay.

2.3 Preparation of annotated thematic maps.

2.4 Preparation of DEM from spot heights, contours and SRTM data.

Unit-3: Global Navigation Satellite System

3.1 Principles of GNSS positioning with special reference to GPS.

3.2 Collection and retrieval of GNSS positions.

3.2 Preparation of maps from GNSS data.

3.3 Length and area measurements from GNSS data.

Unit-4: Laboratory Notebook and Viva Voce

SEMESTER IV

MODULE CC-419: PHILOSOPHY OF GEOGRAPHY (Theoretical – 50 marks / 4 credits)

Unit-1: Development in Modern Geographical Thought

1.1 Place of Geography in the classification of knowledge after Varenius and Kant. Evolution of Geography as a spatial science.

1.2 Positivism in Geography: Explanation and search for scientific routes.

1.3 Critiques of positivism. Crisis of modernity.

1.4 Shift towards critical perspectives.

Unit-2: Emergence of Critical Perspectives

2. 1 Behavioural, radical, and humanistic geography.

2.2 Post modernity and the production of space after Lefebvre, Harvey, and Soja.

2.3 The cultural turn. Feminist Geography: Space, place, and identity.

2.4 Chronological geographies of gender.

Unit-3: Changing Trends and Dimensions

3.1 Geography of inequality.

3.2 Colonial and post-colonial interpretations in geography.

3.3 Geography in the era of globalisation: Political-economic perspectives in spatial relations.

3.4 Select ideas of environment and human geography: Contesting environment and socialising nature.

Unit-4: Contemporary Pedagogies and Research Frontiers in Geography

4.1 Revival of classical paradigm.

4.2 New social geographies: Clustering and segregation, hybrid geography, mental map, and local imaginaries.

4.3 Geography of power and regional identity.

4.4 Spatial dimension of political ecology.

MODULE CC-420: RESEARCH METHODS IN GEOGRAPHY (Theoretical – 50 marks / 4 credits)

Unit-1: Research in Geography

1.1 Meaning and objectives of geographical research.

1.2 Identification of research problems in geography.

1.3 Selection of study area, raising research questions and framing research design.

1.4 Literature review, formulation of hypothesis, preparation of inventory.

Unit-2: Research Ethics and Research Methodology

2.1 Ethics in research and publication: Authorship, plagiarism, research fraud

2.2 Ethics in research and publication: Simultaneous submission, salami submission, competing interests

2.3 Methods of data collection: primary and secondary; preparation and use of questionnaire and survey schedule; tabulation.

2.4 Quantitative and qualitative methods in geography, their application.

Unit-3: Selected Research Methods in Geography

3.1 Elevation mapping and profiling using free data.

3.2 Administrative and thematic mapping using free data.

3.3 Visual Methods: compositional interpretation, photo-elicitation, and documentation of visual materials.

3.4 Oral History: learning to listen, principles and best practices, sound mapping.

Unit-4: Preparation of Research Proposal and Dissertation Writing and Presentation

4.1 Style of referencing and preparation of bibliography and appendices. Front- and end-matters of dissertations.

4.2 Styles of technical writing: research proposal, reports, articles, and thesis. Significance of abstracts.

4.3 Workflow in scientific publication. Selecting right journal(s) for publication.

4.4 Seminar presentation: Approaches and time management.

Modules DSEC-2 A–B: SPECIAL PAPER (Elective–Theoretical)

MODULE DSEC-421 A (ELECTIVE): FLUVIAL GEOMORPHOLOGY – II (Theoretical – 50 marks / 4 credits)

Unit-1: Fluvial Landforms

1.1 Alluvial Terrace: Evolution and Characteristics with special reference to Tista Basin

1.2 Alluvial Fan: Evolution and Characteristics with special reference to Kosi Basin

1.3 Flood Plain: Evolution and Characteristics with special reference to Lower Ganga Basin

1.4 Delta Plain: Evolution and Characteristics with special reference to Subarnarekha delta

Unit-2: Fluvial Hazards

2.1 River floods: Causes, consequences, viability of management strategies with special reference Southern West Bengal.

2.2 Riverbank erosion: Causes, consequences, viability of management strategies with special reference to River Ganga

2.3 River shifting: Causes, consequences, viability of management strategies with special reference to Himalayan Foothills River Torsa

2.4 River Pollution: Causes, Consequences, Viability of Management Strategies with special reference to Bhagirathi-Hugli River

Unit-3: Anthropogenic Impacts on River Health

3.1 Effect of Dams, Reservoirs and Bridges on morphological and hydrological character of river basin

3.2 Effects of Irrigation and Navigation canals on morphological and hydrological character of river basin

3.3 Effect of Urbanization and Industrialization on morphological and hydrological character of river basin

3.4 Drainage basin response to climate change

Unit-4: River Basin Management

4.1 Watershed management: Approaches and principles with reference to India

4.2 Flood plain management: Approaches, evaluation of existing strategies of Eastern India

4.3 Interlinking of rivers: Issues, evaluation, consequences with reference to India

4.4 River water sharing: Interstate and International Issues with case studies

MODULE DSEC-421 B (ELECTIVE): URBAN GEOGRAPHY – II (Theoretical – 50 marks / 4 credits)

Unit-1: Urban economy

1.1 Urban economic base theory.

1.2 Urban economic activities – Formal and informal

1.3 Urban poverty and its management

1.4 Impact of structural reforms on urban economy in India

Unit-2 Urban Social and Environmental issues

2.1 Social Problems of cities: Slums and squatter settlements and crime

2.2 Urban Environmental Issues: Different forms of pollution, solid waste management, ecological footprints in cities

2.3 Urban housing and Infrastructural problems

2.4 Concept of sustainable cities with special reference to India

Unit-3: Urban Planning in India

3.1 Historical development of urban planning in India

3.2 Master plan approach for urban development (Mumbai and NCR)

3.3 National Commission on Urbanisation (NCU), Integrated Development of Small and Medium Towns (IDSMT), Jawaharlal Nehru National Urban Renewal Mission (JNNURM).

3.4 Urban governance in India with special reference to 74th constitutional amendment

Unit-4: Planning and Governance: Kolkata

4.1 History of planning

4.2 Planning problems and issues: Land use and space-use, slums, transport

4.3 Expansion and new townships

4.4 The urban ecosystem: Urban geo-hydrology, floods, wetlands

MODULES DSEC-3 A–B: SPECIAL PAPER (ELECTIVE–PRACTICAL)

MODULE DSEC-422 A (ELECTIVE): FLUVIAL GEOMORPHOLOGY – III (Practical – 50 marks / 4 credits)

Unit-1: Drainage Basin Analysis

1.1 Morphometry: Stream ordering, bifurcation ratio, law of stream frequency, infiltration number, basin shape analysis, hypsometry, and sub-basin priority

1.2 Computation of long and cross profiles of drainage basin; rating curve, discharge plotting, isovels, calculation of stream energy,

1.3 Analysis of precipitation data, preparation of water budget graph (recharge, discharge, surplus and deficit)

1.4 Surface runoff estimation: Empirical methods, SCS curve number method

Unit-2: Channel Morphology Analysis

2.1 Measurement of channel stability: entrenchment ratio and w/d ratio, stability rating, sinuosity index and braiding index, radii of curvature, arc angle, near bank stress

2.2 Channel cross profile, width-depth ratio, channel thalweg, hydraulic radius, maximum depth, and velocity; depth-velocity profile, flow properties

2.3 Analysis of bank sediments by sieving, sediment rating curve, and channel bed forms

2.2 Measurement of riverbank hazards using BEHI parameters after Rosgen

Unit-3: Fluvial Hazard Analysis

3.1 Computation and preparation of annual hydrograph, techniques of base flow separation

3.2 Preparation of river flood hazard zonation map and Flood probability analysis: Weibull and Gumbel's methods

3.3 Preparation of riverbank erosion map and vulnerable zone with the aid of toposheets, GNSS, satellite images and GIS

3.4 Estimation of river pollution-measurement of BOD, COD, pH, dissolved solids (TDS), dissolved oxygen, nitrate etc.

Unit-4: Laboratory Notebook and Viva-Voce

MODULE DSEC-422 B (ELECTIVE): URBAN GEOGRAPHY – III (Practical – 50 marks / 4 Credits)

Unit-1: Field Survey in Urban Geography

1.1 Tools and techniques for field work in urban areas

1.2 Methods of morphological studies

1.3 Techniques of identifying sphere of influence

1.4 Urban ethnography – Interview, FGD

Unit-2: Analysis of Urban Phenomena

2.1 Quality of life index for urban residential areas

2.2 Inequality mapping – Gini, index of dissimilarity

2.3 Social area analysis

2.4 Rank-size distribution of cities, urban primacy

Unit-3: Mapping of Urban Areas using RS/GIS

3.1 Land use land cover change detection

3.2 Amenities Information map of any ward

3.3 Urban expansion mapping

3.4 Classification of Road network

Unit-4: Laboratory Notebook and Viva-Voce

MODULE DSEC-423 (ELECTIVE): SPECIAL PAPER–IV: DISSERTATION (Practical–50 marks / 4 credits)

To be evaluated on the basis of report (15 marks) and viva on presentation (10 marks)

MODULE CC-414: FIELD / PROJECT REPORT (Practical–50 marks / 2 credits)

To be evaluated on the basis of group discussion and grand viva

GENERIC ELECTIVE COURSES FOR OTHER DISCIPLINES

MODULE GEC-317 A: PHYSICAL LANDSCAPE (Theoretical – 50 marks / 4 Credits)

Unit-1: Cartography

1.1 Concept and application of maps, scales, and projections
1.2 Concept and application of remote sensing, geographical information system and global satellite navigation system

Unit-2: Climatology

2.1 Indian Summer Monsoon: Variabilities and adaptation
2.2 Climate change and its consequences: The South Asian perspective

Unit-3: Tropical Geomorphology

3.1 Fluvial processes and landforms in humid tropics
3.2 Coastal processes and landforms in humid tropics

Unit-4: Geography of Hazards

4.1 Hazards: Concept and classification
4.2 Case studies from West Bengal: Landslide, flood, coastal / riverbank erosion

MODULE GEC-317 B: CULTURAL LANDSCAPE (Theoretical – 50 marks / 4 Credits)

Unit-1: Population and Ekistics

1.1 Population dynamics and challenges of the 21st Century
1.2 Rural–urban linkages, liveable cites

Unit-2: Social and Cultural Geography

2.1 Concepts of social processes, social well-being
2.2 Cultural segregation, cultural turn

Unit-3: Regional Planning

3.1 Concept and types of regions
3.2 Bases of regional classification of India

Unit-4: Models in Human Geography

4.1 Systems approach to geographical studies
4.2 Sustainable development goals for human welfare