

**REVISED
SYLLABUS
FOR
M.A. COURSE
IN
GEOGRAPHY
(SEMESTER SYSTEM)**

To be implemented w.e.f. 2020-2021 Academic Session



**DEPARTMENT OF GEOGRAPHY
VIDYA-BHAVANA
VISVA-BHARATI
SANTINIKETAN – 731235 WEST BENGAL
INDIA**

SEMESTER SYSTEM -IN PG COURSE

There shall be full-time M.A. Course in Geography of two years' duration. There shall be Semester System spreading over four Semesters, each of six months. There shall be 1200 marks in total and each Semester shall carry 300 marks.

BASIC STRUCTURE

There shall be 24 Papers (15 Theoretical, 8 Practical and 1 Dissertation (Area-Study) to cover the whole Syllabus and each Semester shall contain 06 Papers. Each Paper carries 50 marks.

Each **Theory Paper** contains 3 units where Unit-1 carries 14 marks and Unit 2&3 carries 13 marks each. Internal assessment marks is 10 for each theory paper. Therefore marks distribution for each theory paper is $(14+13+13) = 40 + 10 = 50$ marks.

In case of **Practical Papers** compulsory questions are to be set one from each of the four Units ($4 \times 8 = 32$ marks). 8 marks are allotted for evaluation of Practical Laboratory Notebook: 4 marks + Viva-voce: 4 marks (Total 8 marks). 10 Marks shall be awarded on the basis of internal assessment. Therefore marks distribution for each Practical Paper is $(4 \times 8 = 32 \text{ marks}) + 8 \text{ marks} + 10 = 50$ marks.

The objective of learning in post graduate level is to promote multi disciplinary skills that can assist the allied discipline in research platform after the completion of the course.

Semster-I incorporates two physical geography based papers namely geomorphology and climate incorporating the emerging issues like sea level change and global warming while in agricultural geography and industrial geography, the students are familiarize with the theories and application of the lifeline of the human civilization. For developing the expertise in data analysis, quantitative techniques have been taught which have been used in respective theoretical subjects taught in this semester geography.

The objective of Semester- II is the extension of knowledge in theories if population settlement and human adoption to nature. In geographical thought paper, the students are familiarized with the major landmarks in development of geographic thought at different periods of time.

In IIIrd Semester, the students are sensitized with the core human geographies, namely social cultural, historical and political geographies with digital cartography and remote sensing to prepare themselves for regional analysis with application of modern techniques. Training has also given on research methodology and local level field study and report preparation as a base work of dissertation to be done in final semester.

In the IVth and Final Semester, fieldwork is emphasized with specialization keeping in view the multidisciplinary approach to knowledge in the present day scenario. Geoinformatics being a course at the interface of Geography is taught to make the students capable of using modern technologies for spatial analysis. As such analysis could be capable of practical use, techniques of regional planning have been exposed to the students in theoretical level in this semester. In area study the individual students have to deal with a given area in the context of the conceptual theoretical and empirical development applying all the techniques they have learnt as post graduate students of Department of Geography.

DISTRIBUTION OF MARKS
STRUCTURE OF THE SYLLABUS

	Full Marks	Theoretical	Practical
Semester I	300	200	100
Semester II	300	200	100
Semester III	300	200	100
Semester IV	300	150	150
Total Marks	1200	750	450

SEMESTER-I

Papers		Subjects	Marks	Duration of Examination
I	Theoretical	Geomorphology	50	3 Hours
II	Theoretical	Climatology	50	3Hours
III	Theoretical	Industrial Geography	50	3 Hours
IV	Theoretical	Agricultural Geography	50	3 Hours
V	Practical	Quantitative Techniques in Physical Geography (Geomorphology & Climatology)	50	4 Hours
VI	Practical	Quantitative Techniques in Industrial & Agricultural Geography	50	4 Hours

SEMESTER-II

Papers		Subjects	Marks	Duration of Examination
VII	Theoretical	Population Geography	50	3 Hours
VIII	Theoretical	Settlement Geography	50	3 Hours
IX	Theoretical	Landscape and Human Ecology	50	3 Hours
X	Theoretical	Geographical Thought	50	3 Hours
XI	Practical	Cartographic Techniques (Population and Settlement)	50	4 Hours
XII	Practical	Applied Statistical Techniques in Geography	50	4 Hours

SEMESTER-III

Papers		Subjects	Marks	Duration of Examination
XIII	Theoretical	Social & Cultural Geography	50	3 Hours
XIV	Theoretical	Historical & Political Geography	50	3 Hours
XV	Theoretical	Regions & Regional Entity of India & West Bengal	50	3 Hours
XVI	Theoretical	Remote sensing & Image Interpretation	50	3 Hours
XVII	Practical	Research methods and field work	50	4 Hours
XVIII	Practical	Remote sensing & Image Interpretation	50	4 Hours

SEMESTER-IV

Papers		Subjects	Marks	Duration of Examination
XIX	Theoretical	Regional Planning & Rural Development	50	3 Hours
XX	Theoretical	Geoinformatics	50	3 Hours
XXI	Theoretical	Special Paper(A,B,C, D,E,F)-Theory*	50	3 Hours
XXII	Practical	Special Paper(A,B,C, D,E,F)-Practical*	50	4 Hours
XXIII	Practical	Geoinformatics, Regional Planning & Rural development -Practical	50	4 Hours
XXIV	Dissertation	Area Study	50	Thesis writing

- A – Fluvial Geomorphology***
B – Terrain Evaluation*
C – Environmental Geography*
D – Urban Geography*
E -- Hydrology*
F -- Tourism Geography*

SEMESTER-I

Papers		Subjects	Marks	Duration of Examination
I	Theoretical	Geomorphology	50	3 Hours
II	Theoretical	Climatology	50	3Hours
III	Theoretical	Industrial Geography	50	3 Hours
IV	Theoretical	Agricultural Geography	50	3 Hours
V	Practical	Quantitative Techniques in Physical Geography (Geomorphology & Climatology)	50	4 Hours
VI	Practical	Quantitative Techniques in Industrial & Agricultural Geography	50	4 Hours

SEMESTER-I PAPER-I GEOMORPHOLOGY

Full marks-50

Exam duration: 3 hours

(For Exam 40 Marks, For Internal Assessment 10 Marks)

Objectives

- The objective of the course is to familiarize the students with the need for understanding of geomorphology with reference to certain fundamental concepts, focussing on the unity of geomorphology in the earth material and the processes. Process component of geomorphology is segmented into the processes of landscape evolution of different environment.
- Selected regional geomorphological characteristics of India will provide fundamental concepts of Indian physiographic characteristics.
- Applications of geomorphic techniques for societal requirements and to the conservation of environmental hazards are dealt with.

UNIT 1.0: CONCEPTS, APPROACHES AND MODELS IN GEOMORPHOLOGY

- 1.1 Principles of Geomorphology: Fundamental concepts; Recent trends in Geomorphology
- 1.2 Approaches to Geomorphology: Static, Dynamic, Environmental & Applied Aspects; Geomorphic Scale and Threshold
- 1.3 Models of Slope Development: Davis, Penck, King & Wood
- 1.4 Peneplain Concepts :Types of Peneplain and Erosion Surfaces other than Peneplain

UNIT 2.0 : GEOMORPHIC PROCESSES AND FORMS

- 2.1. Climatic Geomorphology: Concepts and Methods
- 2.2. Fluvial Processes and Forms: Humid, Tropical, Semi-arid & Arid Regions
- 2.3 Morpho-climatic Mechanism and Morphoclimatic Equilibrium
- 2.4. Concept of Morphogenetic Regions

UNIT 3.0: REGIONAL AND APPLIED GEOMORPHOLOGY

- 3.1. Concept of Regional Geomorphology: Nature and Scope
- 3.2 Bases and Criteria of Recognition of Geomorphic Units with examples from Meso & Micro Levels
- 3.3 Geomorphological Account of Ranchi Plateau, Kashmir Valley, Marushathali and Ganga-Delta
- 3.4 Applied Geomorphology: Contents and Applications

SEMESTER - I
PAPER – II
CLIMATOLOGY

Full Marks: 50

Exam Duration: 3 Hours

(For Exam. 40 Marks, For Internal Assessment 10 marks)

Objectives:

- To provide the knowledge on the mechanism of the basic parameters of the atmospheric circulation.
- Recent changing trend of weather phenomena, causes of climate change and modification
- Emphasis to be given on the scope of applied climatology and climatic hazards

UNIT 1.0 DEFINITION AND ATMOSPHERIC CIRCULATION

- 1.1 Climatology: Nature and Scope, Relationship to other branches of Earth sciences, Methods of Climatic data investigation and techniques of forecasting
- 1.2 Lower atmospheric wind circulation: Trade Wind – origin, characteristics and influence on Tropical and Sub-tropical climates
- 1.3 Upper atmospheric wind circulation: Jet Stream – origin, characteristics and influence on Tropical and Sub-tropical climates
- 1.4 Ocean atmospheric wind circulation: El Nino - origin, characteristics and influence on Tropical and Sub-tropical climates

UNIT 2.0 ATMOSPHERIC MOISTURE

- 2.1 Rainfall: Theories of its origin, Spatial and Temporal patterns and changing trends
- 2.2 Monsoon Rain: Origin and characteristics with special reference to South East Asia and recent changing trend
- 2.3 Cyclonic rain: Tropical Cyclone, Nor'wester and Western Disturbances – origin, characteristics and changing trends
- 2.4 Acid rain: Causes, processes and consequences

UNIT 3.0 CLIMATIC CHANGE AND APPLIED CLIMATOLOGY

- 3.1 Climatic change: Natural causes, Climatic change through geological time scale, Indicators of past climate
- 3.2 Climatic modification: : Causes, Trend and Impacts on society and contemporary issues on Climatic change
- 3.3 Applied Climatology: Influence of climate on agriculture, settlement, architecture, human activity, culture and health; Bioclimatic and Agro-climatic regions: Identification and characteristics with special reference to India.
- 3.4 Climatic Hazards: Cloud burst, super cyclone, Desertification with special reference to India

SEMESTER - I
PAPER – III
INDUSTRIAL GEOGRAPHY

Full Marks: 50

Exam Duration: 3 Hours

(For Exam. 40Marks, For Internal Assessment 10 marks)

Objectives:

- To introduce nature, development and significance of manufacturing and its relation with the different input; development policies and industrialization in India
- To understand the locational major manufacturing activities with the support of various industrial location theories and models.

UNIT 1.0 CONTENTS, TOOLS AND BASIC INPUTS

- 1.1 Manufacturing as an economic activity: Definition, Scope and Approaches to the study of Industrial Geography:
- 1.2 Geonomic parameters of Land, Labour, Capital, Market and Organization as individual and collective determinants of industrial location.
- 1.3 Classification of industries : SIC and NIC
- 1.4 Types of raw materials and Industrial Location

UNIT 2.0 MARKET, TRANSPORTATION COST, LINKAGES AND INDIAN INDUSTRIAL SITUATION

- 2.1 Typology of Market : Modes of transportation, transportation cost and structure
- 2.2 Horizontal and vertical expansion possibilities of market : Target group and socio-economic behavioral factors of consumers, Agglomeration and Linkages
- 2.3 Industrialisation and industrial history in India; Industrial region in India
- 2.4 Indian industrial policies

UNIT 3.0 BASICS OF INDUSTRIAL LOCATION THEORIES

- 3.1 Industrial location theory: Alfred Weber, Importance of Critical Isodapane and labour locations
- 3.2 Concept of Market demarcation: Uniform and variable transport cost of Tord Palander's model
- 3.3 Industrial location theory proposed by August Lösch.
- 3.4 Space economy and concepts of Walter Isard's theory

SEMESTER - I
PAPER – IV
AGRICULTURAL GEOGRAPHY

Full Marks: 50

Exam Duration: 3 Hours

(For Exam. 40 Marks, For Internal Assessment 10 marks)

Objective:

- To familiarize students with the recent trends of study of Agricultural Geography with respect to the changing approaches
- To introduce the students with contemporary issues of agriculture and its impact of economy, environment and state of world food availability at world and regional levels
- To study the policies controlling the production and distribution of the products of agriculture and allied activities

UNIT 1.0 DIMENSIONS OF AGRI-ECOSYSTEM

- 1.1 Concept of Agri-ecosystem and its components: Physical and Human
- 1.2 Climate change and its impact on Agri-ecosystem
- 1.3 Classification of Land and Land use
- 1.4 Farming system and types of Farming Region

UNIT 2.0 FOCUS AND APPROACHES TO AGRICULTURAL GEOGRAPHY

- 2.1 Traditional Agricultural Geography
- 2.2 Behavioural approach in Agricultural Geography
- 2.3 Political economy approach to Agricultural Geography
- 2.4 Theories to explain agricultural changes

UNIT 3.0 CHANGING AGRICULTURAL SCENARIO AND POLICIES

- 3.1 Globalization: Concept and nature of agricultural crop production
- 3.2 Changes in farming system due to globalization: Productivist and Post-Productivist agriculture
- 3.3 Land use competition : Agricultural vs. non- agricultural
- 3.4 Geography of Hunger: dimensions and policies

SEMESTER - I
PAPER – V
QUANTITATIVE TECHNIQUES IN PHYSICAL GEOGRAPHY
(GEOMORPHOLOGY & CLIMATOLOGY)
PRACTICAL

Full Marks: 50

Exam Duration: 4 Hours

(For Exam. 40 Marks (Each Unit 8 marks), Internal Assessment 10 marks)

Objective:

- To introduce some basic morphometric methods to the students for the analysis of the physical attribute from the topographical sheets
- To train the students to handle climatological data to be used in forecasting processes.

UNIT 1.0 BASIN MORPHOMETRY

- 1.1 Delineation of Drainage Basins and Demarcation of water divides
- 1.2 Linear Properties of Drainage Basin Analysis
- 1.3 Aerial Properties of Drainage Basin Analysis
- 1.4 Relief Properties of Drainage Basin Analysis

UNIT 2.0 PHYSICAL MAPS AND DIAGRAMS

- 2.1 Hypsometric Analysis and hypsometric integral
- 2.2 Terrain Morphology including Slope Analysis
- 2.3 Identification of Erosion Surfaces
- 2.4 Geomorphic Mapping

UNIT 3.0 COMPUTAIN AND MAPPING OF CLIMATOLOGICAL PARAMETERS

- 3.1 Isanomal
- 3.2 Equipluves
- 3.3 Deviational graphs
- 3.4 Relative Temperature curves

UNIT 4.0 APPLIED CLIMATOLOGICAL TECHNIQUES

- 4.1 Water Budget
- 4.2 Station Model with the help of Synoptic data
- 4.3 Mapping of Bioclimatic zones
- 4.4 Mapping of Agro-climatic zones based on Aridity and Moisture Index

Viva-voce & Laboratory Note Book: 4 + 4 = 8

SEMESTER - I
PAPER – VI
QUANTITATIVE TECHNIQUES
(AGRICULTURE & INDUSTRY)
PRACTICAL

Full Marks: 50

Exam Duration: 4 Hours

(For Exam. 40 Marks (Each Unit 8 marks), Internal Assessment 10 marks)

Objective:

- To develop the ability for the qualitative analysis in agricultural and industrial geography
- To develop the skill to deal with the quantitative techniques in agricultural and industrial geography

UNIT 1.0 METHODS IN AGRICULTURAL GEOGRAPHY

- 1.1 Crop combination
- 1.2 Intensification of crops
- 1.3 Agricultural Efficiency Regions
- 1.4 Diversification of crops

UNIT 2.0 QUANTITATIVE TECHNIQUES IN AGRICULTURAL GEOGRAPHY

- 2.1 Lorenz's Curve
- 2.2 Gini's Coefficient
- 2.3 Location Quotient Analysis
- 2.4 Dissimilarity Index

UNIT 3.0 QUANTITATIVE TECHNIQUES IN INDUSTRIAL GEOGRAPHY

- 3.1 Index of economic base
- 3.2 Co-efficient of Localisation
- 3.3 Co-efficient of Geographical Association
- 3.4 Levels of Industrial Development

UNIT 4.0 STATISTICAL APPLICATIONS IN INDUSTRIAL GEOGRAPHY

- 4.1 Time-Series Analysis
- 4.2 Index of specialisation
- 4.3 Accessibility & Connectivity-Shortest path analysis
- 4.4 Chi-Square Analysis

Viva-voce & Laboratory Note Book: 4 + 4 = 8

SEMESTER- II

Papers		Subjects	Marks	Duration of Examination
VII	Theoretical	Population Geography	50	3 Hours
VIII	Theoretical	Settlement Geography	50	3 Hours
IX	Theoretical	Landscape and Human Ecology	50	3 Hours
X	Theoretical	Geographical Thought	50	3 Hours
XI	Practical	Cartographic Techniques (Population and Settlement)	50	4 Hours
XII	Practical	Applied Statistical Techniques in Geography	50	4 Hours

**SEMESTER-II
PAPER-VII
POPULATION GEOGRAPHY**

Full Marks: 50

Exam Duration: 3 Hours

For Exam. 40 Marks, For Internal Assessment 10 marks

Objectives:

- To introduce the students to the complex dimensions of population.
- To understand and evaluate the association between demographic and socio-economic attributes of population and the resultant levels of social well-being and economic development and
- To understand the role and relationship between population and food security in an ever changing space-time continuum.

UNIT 1.0 NATURE OF POPULATION GEOGRAPHY

- 1.1 Population Geography: Scope and Content, Population Geography and Demography
- 1.2 Sources of Population data: Census, Sample Survey- NSSO, NFHS, SRS, VRS, data reliability and errors.
- 1.3 World Population: Growth and Distribution, Population Composition and Characteristics
- 1.4 Concept of Population structure: Age-sex structure, occupational structure, dependency ratios.

UNIT 2.0 POPULATION DYNAMICS AND THEORETICAL UNDERSTANDING

- 2.1 Dynamics of population change: Fertility, Morbidity and Mortality
- 2.2 National and International migration: Concepts and Classification, Theories of Migration
- 2.4 Pre-Malthusian, Malthusian and Post Malthusian approaches, Demographic Transition
- 2.4 Neo-Classical, Biological, Social and other theories: with special reference to (Marx, Sadler, Ricardo and theory of optimum population

UNIT 3.0 POPULATION AND SOCIETY

- 1.1 Relationship between population growth and development
- 3.2 Population policies and planning in developed and developing countries
- 3.3 Population problems and environmental impacts.
- 3.4 Food security issues with special reference to India

SEMESTER – II
PAPER – VIII
SETTLEMENT GEOGRAPHY

Full Marks: 50

Exam Duration: 3 Hours

(For Exam. 40 Marks, For Internal Assessment 10 marks)

Objective:

- To familiarise the students with the conceptual theoretical and empirical development in settlement studies in Geography, and the current settlement scenario in India.
- To disseminate the knowledge relating to the form and pattern of settlement and to identify major problems and policies relating to rural and urban settlement.

UNIT 1.0 BASICS OF SETTLEMENT GEOGRAPHY

- 1.1 Origin and development of Settlement Geography: Approaches to the study of Settlement Geography.
- 1.2 Principles of settlement formation: Contribution of C.A. Doxiadis
- 1.3 Classification of settlements : Rural and Urban
- 1.4 Spatial organization of Settlements: Central Place Theory by W.Christaller

UNIT 2.0 GEOGRAPHY OF RURAL SETTLEMENT

- 2.1 Rural settlement: Types and Patterns
- 2.2 Environmental factors controlling distribution of Rural settlement
- 2.3 Morphology of Rural settlements in India
- 2.4 House types and their building materials in India

UNIT 3.0 GEOGRAPHY OF URBAN SETTLEMENT

AC

- 3.1 Evolution of cities
- 3.2 Concepts of Conurbation, Metropolis and Megalopolis
- 3.3 Settlement Systems: Primate city Settlement and Rank size rule
- 3.4 Policies of Urban Development in India

SEMESTER – II
PAPER – IX
LANDSCAPE AND HUMAN ECOLOGY

Full Marks: 50

Exam Duration: 3 Hours

(For Exam. 40 Marks, For Internal Assessment 10 marks)

Objective:

- To familiarize the students with the basic concept of interrelationship between man and landscape dynamic
- To comprehend the land evaluation method in response to the recent trends to the land capability
- To highlight the concept and dimension of human ecology for maintaining the ecological balance of the environment

UNIT 1.0 CONCEPTS, APPROACHES AND THEORIES IN LANDSCAPE ECOLOGY MB

- 1.1 Concepts of Landscape Ecology and Contribution of different disciplines
- 1.2 Hierarchy theory and structure of the landscape and Percolation Theory
- 1.3 Scaling patterns and processes across landscapes
- 1.4 Methods in Landscape Ecology

UNIT 2.0 PROCESSES AND PRINCIPLES OF LANDSCAPE DYNAMICS MB

- 2.1 Physical & Chemical Properties of Soil And Soil fertility
- 2.2 Soil Degradation: Methods of Conservation and Amelioration
- 2.3 Principles and methods of land use survey: Macro and Micro level
- 2.4 Land evaluation: Methods and techniques, methods of land capability classification (USDA, FAO, India)

UNIT 3.0 BASICS AND EMERGING DIMENSIONS OF HUMAN ECOLOGY MB

- 3.1 Development of human ecology: Concept and scope, Rural and Urban Human Ecosystems
- 3.2 Methods of human ecology: Ecological foot-print analysis. Application of ecological principle in human ecology - open and closed systems, Dimensions in society
- 3.3 Human ecology and resource utilization, Human ecology and population, Human ecology and sustainability. Concept of human ecological regions
- 3.4 Globalization and contemporary ecological issues: Case study from India and abroad

SEMESTER – II
PAPER – X
GEOGRAPHICAL THOUGHT

Full Marks: 50

Exam Duration: 3 Hours

(For Exam. 40 Marks, For Internal Assessment 10 marks)

Objectives:

- To introduce the students to the philosophical and methodological foundations of the subject and its place in the world of knowledge;
- to familiarize them with the major landmarks in development of geographic thought at different periods of time RP

UNIT 1.0 NATURE AND EXPLANATION IN GEOGRAPHY

- 1.1 Nature of Geography: Issues and explanations
- 1.2 Paradigms and paradigm shifts in Geography
- 1.3 Concepts on hypothesis : Laws, Theories and Models
- 1.4 Explanations in Geography: Views and Contributions

UNIT 2.0 DUALISM IN GEOGRAPHY

- 2.1 Regional vs. Systematic Geography
- 2.2 Physical vs. Human
- 2.3 Determinism vs. Possibilism
- 2.4 Ideographic vs. Nomothetic

UNIT 3.0 DEVELOPMENT IN GEOGRAPHY

- 3.1 Concept of Space in Geography
- 3.2 Quantitative Revolution : Empiricism and Fundamental assumption of Positivism
- 3.3 Behaviouralism, Humanism, Structuralism and Post-modernism
- 3.4 Radical approaches and Welfare Geography, Public policies in social well being

SEMESTER - II
PAPER – XI
CARTOGRAPHIC TECHNIQUES
PRACTICAL

Full Marks: 50

Exam Duration: 4 Hours

(For Exam. 40 Marks (Each Unit 8 marks), Internal Assessment 10 marks)

Objectives:

- To apprise the student with latest trends in the development of cartography as a tool in mapping thematic and quantitative data to facilitate spatial analysis and synthesis.
- To attempt regional synthesis by the use of cartographic techniques

UNIT 1.0 SOURCES AND METHODS OF DATA COLLECTION

- 1.1 Sources and Methods of Data Collection: Quantitative and Qualitative; Reliability and accuracy of data
- 1.2 Preparation of Questionnaire Schedules
- 1.3 Tabulation and Mapping of Population Data
- 1.4 Tabulation and Mapping of Land use data

UNIT 2.0 MAPPING TECHNIQUES AND ANALYSIS

- 2.1 Analysis of Geological Maps, Topographical Maps, Ordnance Map, Mouza Maps
- 2.2 Centographic measures: Spatial mean and Spatial Standard Deviations
- 2.3 Population Potential Surface
- 2.4 Socio-economic Disparity

UNIT 3.0 SETTLEMENT – IDENTIFICATION OF PATTERNS, DISTRIBUTION & MAPPING

- 3.1 Density and Concentration analysis from Topographical maps
- 3.2 Index of Primacy
- 3.3 Nearest Neighbour Analysis (NNA)
- 3.4 Study of settlement from satellite images

UNIT 4.0 POPULATION – DISTRIBUTION, COMPOSITION, DYNAMICS & ANALYSIS

BLY

- 4.1 Growth rates
- 4.2 Z-score
- 4.3 Residual Mapping
- 4.4 Population Projection using $Y_c = a + bx$

Viva-voce & Laboratory Note Book: 4 + 4 = 8

SEMESTER - II
PAPER – XII
APPLIED STATISTICAL TECHNIQUES IN GEOGRAPHY
PRACTICAL

Full Marks: 50

Exam Duration: 4 Hours

(For Exam. 40 Marks (Each Unit 8 marks) Internal Assessment 10 marks)

Objectives:

- To introduce some basic statistical procedures to the students to be applied to various themes in geography.
- To indicate the assumptions, limitations and interpretation of these procedures and results.
- To train the students to handle these statistics towards analyzing the geographical problems.

UNIT 1.0 ELEMENTS OF STATISTICAL INFERENCE

1.1 Need of Statistics in Geography

1.2 Levels of measurements in Statistics, Parametric & non-parametric Tests

1.3 Central Tendencies, Dispersions and Higher Order Moments

1.4 Spatial Statistics- Central Tendencies and Dispersion

UNIT 2.0 SAMPLE AND SAMPLING RP

2.1 Sampling theory and implication

2.2 Sample Design and Units

2.3 Sampling Methods

2.4 Sample size and estimates from sample

UNIT 3.0 NON-PARAMETRIC STATISTICAL METHODS BLY

3.1 One-sample Chi-Square Test

3.2 Chi-Square Test for two or more independent samples

3.3 The Phi Co-efficient

3.4 Spearman's Co-efficient of Rank Correlation

UNIT 4.0 PARAMETRIC METHODS

4.1 Analysis of Variance –One-way and Two-way(ANOVA-I & ANOVA-II)

4.2 Pearson's Product moment Coefficient of Correlation

4.3 Linear Regression; Explained and Unexplained variations

4.4 Factorial Analysis and Principal Component Analysis

Viva-voce & Laboratory Note Book: 4 + 4 = 8 marks

SEMESTER-III

Papers		Subjects	Marks	Duration of Examination
XIII	Theoretical	Social & Cultural Geography	50	3 Hours
XIV	Theoretical	Historical & Political Geography	50	3 Hours
XV	Theoretical	Regions & Regional Entity of INDIA & West Bengal	50	3 Hours
XVI	Theoretical	Remote sensing & Image Interpretation	50	3 Hours
XVII	Practical	Research Method And Field Work	50	4 Hours
XVIII	Practical	Remote sensing & Image Interpretation	50	4 Hours

SEMESTER – III
PAPER – XIII
SOCIAL AND CULTURAL GEOGRAPHY

Full Marks: 50

Exam Duration: 3 Hours

(For Exam. 40 Marks, For Internal Assessment 10 marks)

Objectives:

- to familiarize the students with the understanding of the society through concepts and social theory, philosophical approaches and spatial processes;
- to examine the process of social region formats in India with the help of social cultural and historical factors;
- to review problems and suggest alternatives to improve the social well-being in environmentally problematic areas.
- to understand diversity of cultures in the world as well as in India;
- to understand the relationship between cultures and pattern of living and economic development

UNIT 1.0 BASES OF SOCIAL GEOGRAPHY

- 1.1 Social Geography – Definition, scope and approaches
- 1.2 Social Structure and Hierarchies: Understanding Class; Caste and Tribes in India
- 1.3 Social space; Division of labour
- 1.4 Gender and Geography

UNIT 2.0 BASES OF CULTURAL GEOGRAPHY

- 2.1 Concept of Culture in Cultural Geography
- 2.2 Nature of Cultural Geography
- 2.3 Concept of Cultural Hearth, Cultural Landscape, Cultural Region
- 2.4 Popular Culture, Folk Culture and Indigenous Culture

UNIT 3.0 CONTEMPORARY CULTURAL ISSUES IN SOCIETY

- 3.1 Relevance of the principles of Gandhi and Tagore on present day society
- 3.2 Concept of Cultural Heritage ; Acculturation and its impacts on society
- 3.3 Subaltern cultures ;Tribal responses in India on development
- 3.4 Policies of Tribal Development in India

SEMESTER – III**PAPER – XIV****HISTORICAL AND POLITICAL GEOGRAPHY****Full Marks: 50****Exam Duration: 3 Hours***(For Exam. 40 Marks, For Internal Assessment 10 marks)***Objectives:**

- To familiarise the students in consulting basic sources for understanding historical geography with special reference to India during different historical periods.
- to expose the students to the strategic importance of geographical parameters in the Political Science at global, regional and local level;
- to sensitize the students to geopolitical dimensions and the understanding of conflicts and regional cooperation; and
- to make them familiar with the political geography of Association of Countries.

UNIT 1.0 HISTORICAL GEOGRAPHY

- 1.1 Nature, scope and contents of Historical Geography
- 1.2 Concepts in Historical Geography: Historiography and Historicism
- 1.3 Historical Geography of Mahajanapadas of ancient India
- 1.4 Historical Geography of Ancient Bengal (up to colonial period)

UNIT 2.0 POLITICAL GEOGRAPHY

- 2.1 Geo-political theories – Heartland and Rimland
- 2.2 Geographical perspective of State, Nation and Nation States
- 2.3 Frontiers and Boundaries, Core-Periphery Concepts
- 2.4 Strategic, Regional and Economic Alliances: Commonwealth, SAARC, EU: Impact of BREXIT

UNIT 3.0 GEOPOLITICAL ISSUES

- 3.1 Geo-political setting and boundary conflicts between India and its neighbours
- 3.2 Regionalism, and Geographies of Socio-political movements
- 3.3 Electoral Geography – Voting behaviour and patterns
- 3.4 Government as an agent of geographical change: One Belt One Road policy of China and its geopolitical implication

SEMESTER – III
PAPER – XV
REGIONS AND REGIONAL ENTITY OF INDIA AND WEST BENGAL

Full Marks: 50

Exam Duration: 3 Hours

(For Exam. 40 Marks, For Internal Assessment 10 marks)

Objectives:

- To understand India in terms of various regional divisions, their important characteristics, Intra-regional and inter-regional linkages; to analyse the natural and human resource endowments, their conservation and management;
- To sensitize the students with development issues and policies and programmes designed for regional development.

UNIT 1.0 REGIONALISATION IN INDIA: BASES AND CHARACTERISTICS

- 1.1 Basis of regionalization in India
- 1.2 Physico-economic regions
- 1.3 Socio-cultural regions
- 1.4 Planning regions

UNIT 2.0 REGIONAL ENTITY

- 2.1 Chotanagpur Plateau: Potentialities, problems and prospects of industrial development
- 2.2 Lower Ganga Plain: Potentialities, problems and prospects of agricultural and industrial development
- 2.3 The Indian Islands: Tourist region and ecological protection
- 2.4 Dandakaranya: Ethnic identity, backwardness and prospects

UNIT 3.0 REGIONAL ENTITY OF WEST BENGAL

- 3.1 Sundarbans: Hydro-morphological characteristics and Relevance of Bio-Diversity
- 3.2 Rarh Bengal: Dynamic characteristics of ravine land and Management Strategies
- 3.3 North Bengal Plain: Tourism Potentiality and Environmental issues
- 3.4 Darjeeling Himalaya: Ethnic diversity and Livelihood Pattern

SEMESTER – III
PAPER – XVI
REMOTE SENSING AND IMAGE INTERPRETATION

Full Marks: 50

Exam Duration: 3 Hours

(For Exam. 40 Marks, For Internal Assessment 10 marks)

Objectives:

- to introduce to the students the basic principles of Remote Sensing;
- to outline the application of remote sensing.

UNIT 1.0 BASIC CONCEPTS OF REMOTE SENSING

- 1.1 Definition and stages of Remote Sensing
- 1.2 Basic Concepts in Remote Sensing – EMR Spectral Regions and their characteristics
- 1.3 Thermal Laws of Radiation, Transmission, Spectral Signature
- 1.4 Sensors, Platforms and Products

UNIT 2.0 BASICS IN AERIAL PHOTOGRAPHY

- 2.1 Basic Information and Specification in Aerial Photography
- 2.2 Types of Aerial Photographs and Scales of Aerial Photo and Satellite Imageries
- 2.3 Geometry of Aerial Photographs – Projection, Tilt and Swing
- 2.4 Relief Displacement and Parallax

UNIT 3.0 IMAGE INTERPRETATION AND APPLICATIONS

- 3.1 Image Interpretation, Photo Elements, Techniques and Activities in Image Interpretation
- 3.2 Digital Image Interpretation and Multi Band concept of Image Interpretation
- 3.3 Use of Remote Sensing in Land Use/Land Cover/Space Use Analysis
- 3.4 Application of Remote Sensing to Geomorphological Studies

SEMESTER-III
PAPER-XVII
RESEARCH METHOD AND FIELD WORK
PRACTICAL

Full Marks: 50

Exam Duration: 4 Hours

(For Exam 40 Marks, (Each unit 8 Marks) For Internal Assessment 10 marks)

Objectives:

- Skill development for field work in geographical research
- Development of the ability to pursue a research project

UNIT: 1.0 INTRODUCTION TO RESEARCH

- 1.1 Introduction to scientific research: Needs and Significance
- 1.2 Concept and approaches of research in geography: Inductive versus Deductive, Fundamental versus Applied, Case specific and Action research
- 1.3 Research methodologies in geography: Qualitative and Quantitative
- 1.4 Preparation of interview and questionnaire schedules

UNIT: 2.0 ESSENTIALS IN RESEARCH PROCESS

- 1.1 Review of Literature: Identification and selection of research gaps
- 1.2 Hypothesis: Formulation and Testing
- 1.3 Sampling and statement of problem
- 1.4 Citation, Bibliography and References

UNIT 3.0 FIELD WORK USING EQUIPMENTS AND INSTRUMENTS

- 3.1 Determination of NPK and soil pH
- 3.2 Use of Clinometer
- 3.3 Use of Abney Level
- 3.4 Traversing by theodolite

UNIT 4.0 FIELD SURVEY AND REPORT WRITING

- 4.1 Research gap identification, hypothesis formation
- 4.2 Physical aspects
- 4.3 Socio-cultural aspects
- 4.4 Socio-economic aspects

Viva-voce & Laboratory Note Book: 4 + 4 = 8 marks

SEMESTER - III
PAPER – XVIII
REMOTE SENSING AND IMAGE INTERPRETATION
PRACTICAL

Full Marks: 50

Exam Duration: 4 Hours

(For Exam. 40 Marks (Each Unit 8 Marks), Internal Assessment 10 marks)

Objectives:

- to introduce to the students the basic principles of aerial photograph and its interpretation;
- to indicate the methods of visual and digital interpretations of satellite imageries.

UNIT 1.0 INTRODUCTION

- 1.1 Introduction of Remote Sensing Instruments
- 1.2 Test of Stereovision
- 1.3 Scale Determination of Air Photographs
- 1.4 Scale Determination of Satellite Imageries

UNIT 2.0 GEOMETRY OF AIR PHOTOGRAPHS

- 2.1 Construction of Fiducial Marks, Principal Point, Flight Line, and Match Line
- 2.2 Construction of Overlaps
- 2.3 Identification of Defined Objects Using Photo Elements
- 2.4 Preparation of Overlays

UNIT 3.0 AERIAL PHOTOGRAPH INTERPRETATION AND ANALYSIS

- 3.1 Concept and application of Remote Sensing, Comparative assessment of topographical maps, aerial photos and satellite images in representation geographical data
- 3.2 Inventory of various cultural features from Air Photo
- 3.3 Air Photo Interpretation for Land use/Land Cover Mapping
- 3.4 Air Photo Interpretation for Traffic Analysis

UNIT 4.0 INTERPRETATION OF SATELLITE IMAGES

- 4.1 Inventory of various physical features from satellite imagery
- 4.2 Geomorphological Mapping and Analysis using Satellite imagery
- 4.3 Land use/Land cover Analysis using Satellite image
- 4.4 Image Georeferencing space use mapping using Satellite imagery

Viva-voce & Laboratory Note Book: 4 + 4 = 8 marks

SEMESTER-IV

Papers		Subjects	Marks	Duration of Examination
XIX	Theoretical	Regional Planning & Rural Development	50	3 Hours
XX	Theoretical	Geoinformatics	50	3 Hours
XXI	Theoretical	Special Paper(A,B,C,D,E,F)-Theory*	50	3 Hours
XXII	Practical	Special Paper(A,B,C,D,E,F)-Practical*	50	4 Hours
XXIII	Practical	Geoinformatics, Regional Planning & Rural Development -Practical	50	4 Hours
XXIV	Dissertation	Area Study	50	Thesis writing

- A – Fluvial Geomorphology***
B – Terrain Evaluation*
C – Environmental Geography*
D – Urban Geography*
E - Hydrology*
F -- Tourism Geography*

SEMESTER – IV
PAPER – XIX
REGIONAL PLANNING AND RURAL DEVELOPMENT

Full Marks: 50

Exam Duration: 3 Hours

(For Exam. 40 Marks, For Internal Assessment 10 marks)

Objective:

- To understand and evaluate the concept of region in geography and its role and relevance in regional planning;
- To identify the causes of regional disparities in development, perspectives and policy imperatives
- To understand the policy implications on regional, rural and urban planning with reference to India

UNIT 1.0 CONCEPTUAL DEFINITION

- 1.1 Concept of Region, Delineation of Regions
- 1.2 Planning – Principles, needs and objectives
- 1.3 Regionalisation and delineation of regions, Delineation of Formal and Functional Regions
- 1.4 Concept of Regionalism, Planning region and Regional planning

UNIT 2.0 PLANNING – ITS TYPES AND FRAMEWORK

- 2.1 Social purposes of planning –NITI-Aayog and ministry of tribal affair
- 2.2 Planning Process – Disparities in India, Interstate planning
- 2.3 Physical Planning regions – River linking projects in India, Multipurpose River Valley region
- 2.4 International issues and planning - River water sharing, Ocean resource zonation (UNCLOS)

UNIT 3.0 PLANNING IN INDIA

- 3.1 Regional development in India: strategies, problems and prospects
- 3.2 Planning in India – goals and achievements
- 3.3 Rural development policies and planning in India and Panchayati Raj.
- 3.4 Urban development policy and planning in India

SEMESTER – IV
PAPER – XX
GEOINFORMATICS

Full Marks: 50

Exam Duration: 3 Hours

(For Exam. 40 Marks, For Internal Assessment 10 marks)

Objectives:

- to introduce Geoinformatics as a tool of spatial science.
- to indicate the basic elements of GIS and GPS .

UNIT 1.0 SCOPE, CONTENTS AND PURPOSES OF GEOINFORMATICS

- 1.1 Definitions and Contents of Geoinformatics
- 1.2 History and Architecture of Computers
- 1.3 Data Formats and Database Management System
- 1.4 Data Communications and Applications

UNIT 2.0 GEOGRAPHIC INFORMATION SYSTEM (GIS)

- 2.1 Introduction and Equipment for GIS
- 2.2 GIS Data Model and Structure
- 2.3 GIS and Remote Sensing integration and spatial data analysis
- 2.4 GIS Applications in Geographical Studies

UNIT 3.0 GLOBAL POSITIONING SYSTEM AND GRAPHICS

- 3.1 Basics of GPS and GNSS
- 3.2 Components of GPS
- 3.3 Use of GPS
- 3.4 DGPS : Concept and application

SEMESTER – IV
PAPER – XXI
FLUVIAL GEOMORPHOLOGY
(SPECIAL PAPER)

Full Marks: 50

Exam Duration: 3 Hours

(For Exam. 40 Marks, For Internal Assessment 10 marks)

Objectives:

- The rivers being the major geomorphic agent of erosion, the course assumes significance as it mainly deals with an understanding of the fluvial forms and processes. The evolution of drainage pattern and alluvial channels are governed by the forces resisting and driving the flow of water. The students are introduced to the activities of these two forces and their resultant effects on the flow patterns, sediment load and channel patterns.
- The use of rivers and the landscape develop certain feedback mechanism within the system which have the ability to alter the human vis-à-vis fluvial environments.

UNIT 1.0 HYDROLOGICAL CHARACTERISTICS OF RIVER BASIN

- 1.1 Fluvial Geomorphology: Nature. scope and present trend of study. Concept and components of Fluvial System.
- 1.2 Channel Flow: Types, factors , energy principle in open channel flow.
- 1.3 Sediment load: Processes of entrainment and transport, types of load
- 1.4 Fluvial Geomorphology: Nature. Scope and present trend of study. Concept and components of Fluvial System.

UNIT 2.0 MORPHOMETRICAL PROPERTIES OF RIVER BASIN

- 2.1 Properties
- 2.2 Models of channel initiation
- 2.3 Causes of concavity of channel
- 2.4 Morphometric methods for quantitative analysis of drainage basin- merits

UNIT 3.0 RIVER BASIN MANAGEMENT ISSUES

- 3.1 Watershed Management Programmes- importance, policies and techniques with special reference to India
- 3.2 Dams, embankments and irrigation canals – effect on changing hydromorphological character of the river basin with special reference to India
- 3.3 Flood management strategies - impact on the flood plain morphology with special reference to north and south Bengal
- 3.4 River bank erosion abatement strategies – effect on geo-hydrological character of the rivers with special reference to river Ganga and rivers of south Bengal

SEMESTER – IV
PAPER – XXI
(SPECIAL PAPER)
TERRAIN EVALUATION

Full Marks: 50

Exam Duration: 3 Hours

(For Exam. 40 Marks, For Internal Assessment 10 marks)

Objectives:

- to introduce to the students with the basic principles of terrain evaluation;
- to outline the application of morphometric techniques in terrain analysis.

UNIT 1.0 SCOPE, CONTENTS AND PURPOSES

- 1.1 Concept and meaning of Terrain Evaluation
- 1.2 Definition of Terrain and Terrain Characteristics
- 1.3 Terrain Elements – Relief, Drainage, Geology, Tectonics, Soils
- 1.4 Scope and Purpose of Terrain Evaluation

UNIT 2.0 MORPHOMETRIC ANALYSIS OF TERRAIN AND TERRAIN CLASSIFICATION

- 2.1 Morphometric Techniques: Relief and Drainage Morphometry
- 2.2 Terrain Classification: CSIRO, Oxford MEXE Method, Pattern and Facets method
- 2.3 Terrain Data Collection and Processing
- 2.4 Use of Geoinformatics in Terrain Data collection and Terrain Resource Mapping

UNIT 3.0 TERRAIN EVALUATION APPLICATIONS

- 3.1 Terrain Evaluation for Civil Purpose: Site Selection and Route Location
- 3.2 Dam Site and Reservoir Construction, Bridge construction, Forestry and Mineral exploration
- 3.3 Terrain Evaluation of selected regions: Case Studies (Methods and Approaches)
- 3.4 A part of Garhwal Himalaya and a part of Rajmahal Highlands

SEMESTER – IV
PAPER – XXI
(SPECIAL PAPER)
ENVIRONMENTAL GEOGRAPHY

Full Marks: 50

Exam Duration: 3 Hours

(For Exam. 40 Marks, For Internal Assessment 10 marks)

Objectives:

- to familiarize the students with aspects of environmental change in global, national and local level
- To understand the anthropogenic impacts on physical environment.
- To orient the students on measures taken for environmental protection.

UNIT 1.0 CONTENTS OF ENVIRONMENTAL GEOGRAPHY

- 1.1 Definition, concept, scope and contents of Environmental Geography
- 1.2 Environmental consensus at the National and International levels
- 1.3 Concept of Ecology; Ecosystem, Ecotone and Biomes
- 1.4 Ecotourism and its global importance with examples

UNIT 2.0 ENVIRONMENTAL DEGRADATION

- 2.1 Concept, types and processes of environmental degradation
- 2.2 Environmental degradation through agricultural development, deforestation and desertification
- 2.3 Environmental Hazards – flood and drought
- 2.4 Global environmental issues – Global warming and Biodiversity conservation

UNIT 3.0 ENVIRONMENT AND DEVELOPMENT – RELATED ISSUES

- 3.1 Environment and Development – Issues related
- 3.2 UN Conferences on Environment and Development – Summits of 1972, 1992 and 2002
- 3.3 Environmental monitoring programme – Environment Impact Assessment (EIA)
- 3.4 Environmental management (with special reference to India)

SEMESTER – IV
PAPER – XXI
(SPECIAL PAPER)
HYDROLOGY

Full Marks: 50

Exam Duration: 3 Hours

(For Exam. 40 Marks, For Internal Assessment 10 marks)

Objectives:

Water is an integral part of all living things in the world. Hence it is necessary to make the students to understand the significance of a systematic study on fresh water resources and occurrence, flow, storage and utilization. The students also should be able to realize the importance of judicious utilization and conservation of water and its availability over space and its temporal dimensions.

UNIT 1.0 CONCEPT AND APPROACHES OF SURFACE HYDROLOGY

- 1.1 Global hydrological cycle- significance in response to global storage and transportation of heat
- 1.2 Estimation and measurement of hydrological parameters-softness and hardness, alkalinity, pH, salinity, temperature, turbidity, nutrients, trace elements and dissolved gases.
- 1.3 Delineation, properties and significance of drainage basin as hydrological units.
- 1.4 Runoff: Components and cycle, stream rises and subsurface flow.

UNIT 2.0 PROPERTIES OF GROUND WATER HYDROLOGY

- 2.1 Components, factors and significance of ground water hydrology
- 2.2 Processes and laws controlling movement and storage of ground water
- 2.3 Physical and chemical properties of ground water
- 2.4 Surface and subsurface geophysical methods of exploration

UNIT 3.0 MANAGEMENT OF SURFACE AND GROUND WATER

- 3.1 Water management of tropical farmland: techniques and approaches, Artificial rain making
- 3.2 Water management in tropics: Techniques and approaches, Rain water harvesting
- 3.3 Principles of Integrated Basin Management with reference to micro watershed planning
- 3.4 Present trend and problems of major wetlands of India and West Bengal

SEMESTER – IV
PAPER – XXI
(SPECIAL PAPER)
URBAN GEOGRAPHY

Full Marks: 50

Exam Duration: 3 Hours

(For Exam. 40 Marks, For Internal Assessment 10 marks)

Objectives:

The objectives of this course is to make the students

- understand the process of urbanization and origin, growth and classification of urban settlements with relevant theories and models;
- examine the changing economic base and structure of the contemporary cities;
- relate urbanization process and the evolution of urban system;
- examine the contemporary urban issues and suggest new urban planning and urban policy perspectives.

UNIT 1.0 CONCEPT AND APPROACHES

- 1.1 Urban Geography-Definition, scope and contents
- 1.2 Approaches to the study of Urban Geography and its recent trends
- 1.3 Origin and growth of Urban settlements – Ancient, Medieval, Renaissance, Modern and Post-modern
- 1.4 Processes of Urbanisation

UNIT 2.0 URBAN SYSTEM

- 2.1 Urbanism, Urban Ecology
- 2.2 Urban Systems – Primate City, Conurbation, Metropolis. Megalopolis, Ecumenopolis
- 2.3 Urban Space, Decision Making Processes
- 2.4 Central Place Theory. Theories of Urban Morphology

UNIT 3.0 SPATIAL RELATIONS AND URBAN PLANNING

- 3.1 City-region, Urban Field, Rural-Urban Continuum
- 3.2 Core-Periphery Relations
- 3.3 Urban Economic Base - Basic/non-basic, Formal and Informal sectors
- 3.4 Urban Policies of India

SEMESTER - IV
PAPER- XXI
(SPECIAL PAPER)
TOURISM GEOGRAPHY

Full Marks: 50

Exam Duration: 3 Hours

(For Exam. 40 Marks, For Internal Assessment 10 marks)

Objectives:

The objectives of this course are:

- to familiarize the students with aspects of tourism which have a bearing on subject matter of geography;
- to orient the students to the logistics of tourism industry and the role of tourism in regional development;
- to understand the impact of tourism on physical and human environment.

UNIT 1.0 BASICS OF TOURISM GEOGRAPHY

- 1.1 Definition and Concept of Tourism- Tourism as a subject of multidisciplinary research
- 1.2 Nature, scope and development of Geography of Tourism- Tourism Geography as distinct from Tourism Management
- 1.3 Evolving Tourism Typologies; Concepts and Practices of Nature tourism, Adventure tourism, Agri tourism, Wildlife tourism, Educational tourism, Heritage tourism, Ethnotourism, Religious tourism, Medical tourism, Geotourism
- 1.4 Tourism in the context of Globalization; Tourism as a system; Role of Hotel, Transport Industry, Tour Operators and Travel Agents

UNIT 2.0 TOURISM AND DEVELOPMENT

- 2.1 Tourism as an instrument for Backward Area Development -Role of tourism in poverty alleviation
- 2.2 Community involvement in Tourism Planning-case studies from National Parks
- 2.3 Tourism and rural development - case studies from India
- 2.4 Models in Tourism Studies -Irradex and Life cycle model

UNIT 3.0 TOURISM AND ENVIRONMENT

- 3.1 Impact of tourism on Habitat, Economy and Society-Tourism and Climate change
- 3.2 Agenda 21 and Tourism Industry- Mass tourism vs Ecotourism
- 3.3 Tourism Carrying Capacity- Indicators of Sustainable Tourism
- 3.4 Techniques of Visitor Management under Green Tourism- Concept of Destination Planning

SEMESTER – IV
SPECIAL PAPER PRACTICAL
PAPER – XXII
FLUVIAL GEOMORPHOLOGY

Full Marks: 50

Exam Duration: 4 Hours

(For Exam. 40 Marks (Each Unit 8 Marks), Internal Assessment 10 marks)

Objectives:

- Field work in drainage basin for primary data collection
- Analysis of geo-hydrological data obtained from primary and secondary sources

UNIT 1.0 TECHNIQUES OF DRAINAGE BASIN ANALYSIS

- 1.1 Identification of drainage and channel patterns on topographical map/imageries and interpretation.
- 1.2 Morphometric methods of drainage basin analysis.
- 1.3 Verification of laws of drainage composition.
- 1.4 Computation of long profile of a channel with exponential curve.

UNIT 2.0 TECHNIQUES OF FLOOD ANALYSIS

- 2.1 Computation, preparation and interpretation of Annual and Storm hydrograph
- 2.2 Unit hydrograph
- 2.3 Flood frequency and flood probability graph
- 2.4 Recurrence interval and Rating Curve

UNIT 3.0 FIELD TECHNIQUES WITH INSTRUMENTS

- 3.1 Computation of the cross profiles of the river
- 3.2 Measurement of stream discharge and flow pattern
- 3.3 Analysis of shapes sizes of collected river sediments
- 3.4 Field mapping of river meander plan with the aid of GPS

UNIT 4.0 MAPPING TECHNIQUES OF DRAINAGE BASIN

- 4.1 Preparation of geomorphological map of the drainage basin
- 4.2 Preparation of River Flood Map on the basis of collected data
- 4.3 Preparation of Flood Risk Zone with the aid of GIS techniques
- 4.4 Preparation of River bank erosion map and vulnerable zone with the aid of GPS and GIS techniques

Viva-voce & Laboratory Note Book: 4 + 4 = 8 marks

SEMESTER – IV
SPECIAL PAPER PRACTICAL
PAPER – XXII
TERRAIN EVALUATION

Full Marks: 50

Exam Duration: 4 Hours

(For Exam. 40 Marks, For Internal Assessment 10 marks)

Objectives:

- Application of advanced geomorphic techniques for terrain analysis.
- Use of maps, air photos and satellite images in terrain evaluation

UNIT	1.0	TERRAIN ELEMENTS AND CHARACTERISTICS
	1.1	Data Sources and Mapping Bases
	1.2	Identification of Terrain Elements
	1.3	Scale of Mapping Bases
	1.4	Determination of Terrain Characteristics
UNIT	2.0	TERRAIN MORPHOLOGY
	2.1	Valley Form Analysis
	2.2	Slope Analysis
	2.3	Morphometric Analysis of Terrain
	2.4	Land system Mapping (CSIRO Method)
UNIT	3.0	USE OF REMOTE SENSING AND GIS
	3.1	Air Photo/ SI interprétation for Terrain Elements Identification
	3.2	Air Photo/SI for Land use/Land Cover Mapping
	3.3	Use of Satellite Imagery in Geomorphology
	3.4	Use of Satellite Imagery in water resource Studies
UNIT	4.0	TERRAIN CLASSIFICATION
	4.1	Determination Morpho Units
	4.2	Pattern and Facets Mapping
	4.3	Identification of Geomorphic Units
	4.4	Terrain Evaluation of Drainage Basin for Environmental Management

Viva-voce & Laboratory Note Book: 4 + 4 = 8 marks

SEMESTER – IV
SPECIAL PAPER PRACTICAL
PAPER – XXII
ENVIRONMENTAL GEOGRAPHY

Full Marks: 50

Exam Duration: 4 Hours

(For Exam. 40 Marks (Each Unit 8 Marks), Internal Assessment 10 marks)

Objectives:

The objectives of this course is to make the students

- To examine the contemporary environmental issues with application of qualitative and quantitative techniques.
- Environmental mapping

UNIT 1.0	ANALYSES AND MAPPING OF HYDROLOGICAL AND PEDOLOGICAL DATA
1.1	Analyses of Pedological data (on collected soil samples)
1.2	Preparation of maps with above results
1.3	Mapping of Spatial Environmental Systems from Hydrographic data for Pre-monsoon season
1.4	Mapping of Spatial Environmental Systems from Hydrographic data for Post-monsoon season
UNIT 2.0	MAPPING UPON PHYSIOGRAPHIC DATA
2.1	Mapping of features upon Relief aspects
2.2	Mapping of features upon Areal aspects
2.3	Mapping of socio-cultural aspects upon Demography
2.4	Mapping of socio-cultural aspects upon Population
UNIT 3.0	STATISTICAL ANALYSES AND MAPPING
3.1	Statistical analyses of physiographic data
3.2	Mapping based on statistical analyses of physiographic data
3.3	Statistical analyses of socio-cultural data
3.4	Mapping based on statistical analyses of socio-cultural data
UNIT 4.0	PROGRAPMMING OF ENVIRONMENTAL INFORMATION SYSTEM
4.1	Preparation of maps on environmental information from District Census Handbook - Population distribution map
4.2	Preparation of maps on environmental information from District Census Handbook - Infrastructural systems
4.3	Environmental Impact Assessment based on selected area - EIA on Rural environment
4.4	Environmental Impact Assessment based on selected area - EIA on Urban environment

Viva-voce & Laboratory Note Book: 4 + 4 = 8 marks

SEMESTER – IV
SPECIAL PAPER PRACTICAL
PAPER – XXII
HYDROLOGY

Full Marks: 50

Exam Duration: 4 Hours

(For Exam. 40 Marks (Each Unit 8 Marks), Internal Assessment 10 marks)

Objectives:

- Field work in hydrology for primary data collection
- Analysis of hydrological data obtained from secondary sources

UNIT 1.0 PREPARATION OF MAPS AND CHARTS

- 1.1 Computation and preparation of Isohyetal map
- 1.2 Computation and preparation of Rainfall hyetograph and Annual hydrograph
- 1.3 Computation and preparation of Storm hydrograph and Unit hydrograph
- 1.4 Computation of Run off Coefficient

UNIT 2.0 QUANTITATIVE TECHNIQUES

- 2.1 Calculation of evaporation rate on the basis of Priestley - Taylor method
- 2.2 Computation of soil moisture flux
- 2.3 Preparation of water budget graph (Recharge, discharge, surplus and deficit calculation)
- 2.4 Aridity Index

UNIT 3.0 MORPHOMETRIC ANALYSES

- 3.1 Morphometric analysis of the drainage basin
- 3.2 Analysis of stream network and laws of interrelationship
- 3.3 Basin morphometry – morpho-units
- 3.4 Sinuosity Index

UNIT 4.0 HYDROGRAPH ANALYSES

- 4.1 Computation of discharge from field data
- 4.2 Determination of storage outflow function of a reservoir
- 4.3 Determination of the probability of discharge
- 4.4 Preparation of Rating curve

Viva-voce & Laboratory Note Book: 4 + 4 = 8 marks

SEMESTER – IV
SPECIAL PAPER PRACTICAL
PAPER – XXII
URBAN GEOGRAPHY

Full Marks: 50

Exam Duration: 4 Hours

(For Exam. 40 Marks (Each Unit 8 Marks), Internal Assessment 10 marks)

Objectives:

- To provide the applied knowledge on qualitative and quantitative technique and preparation of urban information system using GIS
- To develop skills for conducting field work in urban geography

UNIT 1.0 FUNCTIONAL IDENTIFICATION

- 1.1 Index of urbanisation
- 1.2 Urban Occupational Diversity & Specialisation
- 1.3 Functional Classification
- 1.4 Social Area Analysis

UNIT 2.0 QUANTITATIVE ANALYSIS

- 2.1 Network Analysis (Konig, Shembel, Alpha, Beta, Gamma and Dispersion index)
- 2.2 Centrality Index
- 2.3 Spacing ratio
- 2.4 Delineation of sphere of influence

UNIT 3.0 URBAN GEOINFORMATICS: TECHNIQUES , INTERPRETATION AND ANALYSIS

- 3.1 Georeferencing, digitization and attachment of attribute data
- 3.2 Landuse inventory, classification, mapping (visual and digital), area calculation
- 3.3 GIS data analysis- buffer and network
- 3.4 Integration of GIS data , urban growth analysis

UNIT 4.0 FIELD WORK IN URBAN GEOGRAPHY

- 4.1 Primary data collection through questionnaire survey
- 4.2 Census data analysis
- 4.3 Urban land use mapping and ground truth verification
- 4.4 Social area analysis/ CBD morphology

Viva-voce & Laboratory Note Book: 4 + 4 = 8 marks

SEMESTER - IV
SPECIAL PAPER PRACTICAL
PAPER - XXII
TOURISM GEOGRAPHY

Full Marks: 50

Exam Duration: 4 Hours

(For Exam. 40 Marks (Each Unit 8 Marks), Internal Assessment 10 marks, Lab Notebook & Viva voce-8 marks)

Objectives:

- Application of geoinformatics in spatial analysis of tourism phenomena
- Development of skills in fieldwork for tourism geographic research

UNIT 1.0 APPLICATION OF GEOINFORMATICS IN TOURISM GEOGRAPHY

- 1.1 Image mosaic and subsetting for areas of tourist interest
- 1.2 Supervised classification of satellite image of sanctuaries and national parks
- 1.3 NDVI and its application in tourism geographical research
- 1.4 Generation of DEM of an area of tourist interest

UNIT 2.0 GIS IN TOURISM MAPPING

- 2.1 Preparation of tourist literature applying techniques of digital cartography
- 2.2 GIS based thematic mapping of tourism infrastructure and superstructure
- 2.3 Application of network analysis in tourist town
- 2.4 Vulnerability mapping of mountain and coastal destinations

UNIT 3.0 STATISTICAL ANALYSIS

- 3.1 Accessibility and Connectivity Analysis of Tourism Hubs
- 3.2 Tourism Forecasting
- 3.3 Application of Statistical softwares in tourism data analysis
- 3.4 Application of statistical techniques for hypothesis testing in tourism research

UNIT 4.0 FIELD VISIT FOR APPLICATION OF SURVEY TECHNIQUES

- 4.1 Designing Questionnaires with application of Likert's Scale
- 4.2 Ethnographic survey - Interview and focus group discussion
- 4.3 Application of Total Station in Destination Mapping
- 4.4 Implication of TALC model on destination visited

SEMESTER – IV
PAPER – XXIII
GEOINFORMATICS, REGIONAL PLANNING AND RURAL DEVELOPMENT
PRACTICAL

Full Marks: 50

Exam Duration: 4 Hours

(For Exam. 40 Marks , For Internal Assessment- 10 marks)

Objectives:

- Development of skills for visual interpretations of satellite imageries
- Application of GIS software for digital cartography
- Use of quantitative techniques for regional planning and rural development

UNIT 1.0 DIGITAL INTERPRETATION OF SATELLITE IMAGES

- 1.1 LULC classification and change detection analysis
- 1.2 Application to vegetation analysis
- 1.3 Application to Water Resource Studies
- 1.4 Ground truth verification using GPS

UNIT 2.0 INTRODUCTION TO GIS AND ITS APPLICATION

- 2.1 Familiarization with GIS Softwares
- 2.2 Spatial data entry and editing
- 2.3 Vector based spatial data analysis
- 2.4 Map layout preparation

UNIT 3.0 REGIONAL PLANNING

- 3.1 Gravity Model (Reilly's method)- Decadal change
- 3.2 Ternary Diagram-level of development country wise
- 3.3 Regionalization- Biparameter graphical representation
- 3.4 Regionalization- Multi parametric data integration

UNIT 4.0 RURAL DEVELOPMENT

- 4.1 Centrality Index
- 4.2 Rurban Index
- 4.3 Scalogram of rural settlements
- 4.4 Taxonomic analysis

Viva-voce & Laboratory Note Book: 4 + 4 = 8 marks

SEMESTER – IV
DISSERTATION (AREA STUDY)
PAPER – XXIV

Objectives:

- To develop the ability to pursue research works on empirical basis.
- To train the students for the preparation of a comprehensive research report based on field work and analysis of primary and secondary data

Individual student will have to submit a Master's Thesis (Dissertation) of 50 Marks in total which will have 30 Marks for Dissertation, 10 Marks for Seminar presentation and Viva-voce and 10 Marks Internal Assessment (to be given by the concerned supervisor).

A Dissertation (Master's Thesis) on any branch of Geography will be a comprehensive work based on conceptual aspects, field work and analysis of primary and secondary data in the laboratory. Dissertation should contain the objectives, sources of information, Web Resources, methods and approaches. Interrelations between different aspects of the study should be the focus of the dissertation. Text of the dissertation should not exceed 10,000 words and should ideally be divided into the following sections: Introduction, Statement of problem(s) and Objectives -Methodology, Information and Analysis, Results, Discussions, Conclusions, References/Bibliography and Appendices (if any). Maps, diagrams and sketches, excluding photographs, should not exceed 50 pages of A4 size paper typed on one and half space and 12 font size format. It is to be produced individually by the students and this must be stated clearly in a certificate from the supervisor(s) and Head of the Department of Geography.

Dissertation (written) and Seminar presentation including viva-voce marks will be given by internal examiner (supervisor) and external examiner jointly.