



SunRise University

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Recognized by UGC Act, 1956 u/s 2 (f)

SYLLABUS

M. Sc. IN GEOGRAPHY

PAPER CODE	PAPER NAME	INTERNAL	EXTERNAL	TOTAL
1MSGEO1	Quaternary Geomorphology	40	60	100
1MSGEO2	Hydrology and Oceanography	40	60	100
1MSGEO3	Contemporary Ideas in Human Geography	40	60	100
Total		120	180	300

Syllabus

1st Semester:

Quaternary Geomorphology

Unit I: Concepts and Techniques in Geomorphology: Definition of Quaternary; Quaternary Stratigraphy; Oxygen Isotope Stratigraphy, Biostratigraphy and Magneto Stratigraphy; Neotectonics; Process Geomorphology; System Approach and Feedback Mechanism; Hillslope Evolution Theories (Wood, Savigere, Young); Erosion Surface

Unit II: Channel Morphology and Drainage Basin: Flow Patterns in Open Channel; Velocity Distribution; Channel Geometry; Stream Power; Channel Processes and Forms; Channel Classification; Concept of Channel Stability; Concept, Delineation, and Utilities of Drainage Basin

Unit III: Geomorphological Processes and Landforms: Landform Development in the Quaternary – Glacial Cycles; Eustatic Changes; Glacial Isostasy; Periglacial Processes and Landforms; Dynamics of Fluvial Accretional Landforms

Unit IV: Applied Geomorphology: Scope; Anthropogenic Geomorphology; Geomorphology in Hazard Management; River Restoration; Urban Geomorphology

Unit V: Internal Assessment

Hydrology and Oceanography

Unit I: Hydrological Systems: Concept of Watershed; Rainfall-runoff Controls; Evapotranspiration, Infiltration and Runoff Fluxes; Groundwater Storage; Types and Characteristics of Aquifers; Fresh and Salt-Water Relationships in Coastal and Inland Areas

Unit II: Models and Theories in Hydrology: Stream-flow and Flood Relationships; Stage-Discharge Relationship; Theory of Groundwater Flow; Darcy's Law and Its Applications; Linear and Kinematic Wave Models; Overland Flow Model

Unit III: Physical Oceanography: Structural and Morphological Features of Ocean Floor; Waves - Propagation, Refraction, and Reflection; Tide Mechanism; Sea-level Change Types; Tsunami Wave Formation and Propagation

Unit IV: Dynamic Oceanography: Ocean Circulation; Ekman Spiral; Oceanic Eddies; Subtropical Gyres; Western Boundary Currents; Langmuir Current; Cycling and Air-Sea Exchange of Dissolved Gases; Thermohaline Circulations; Deep-Sea Ecology

Unit V: Internal Assessment

Contemporary Ideas in Human Geography

Unit I: Post World War Perspectives in Human Geography: Conceptualization of Space; Behavioural and Perception Studies; Locational Analysis; Theorization and Model Building; Colonialism and Post-colonialism; Structuralism and Post-structuralism; Modernism and Postmodernism

Unit II: Critical Perspectives in Modern Geography: Idealism, Phenomenology, and Existentialism; Radical Movement in Geography; Fordism and Post-Fordism; Neo-Marxism; Social Justice

Unit III: Changing Trends in Human Geography in the Late 20th Century: Humanistic Geography; Welfare Approach and Geography of Inequality; Geographies of Consumption; Diaspora, Identity Crisis and Ageing; Geography of Gender and Feminism

Unit IV: Emerging Ideas in Geographical Research: Emotional Geographies; Geography of Power; Security and Surveillance; Space-time Compression; Political Ecology; Iconography

Unit V: Internal Assessment

PAPER CODE	PAPER NAME	INTERNAL	EXTERNAL	TOTAL
2MSGE01	Synoptic and Applied Climatology	40	60	100
2MSGE02	Soil Science and Biogeography	40	60	100
2MSGE03	Spatial Dimensions of Human Culture and Society	40	60	100
Total		120	180	300

2nd Semester

Synoptic and Applied Climatology

- Unit I: Dynamics of Atmospheric Circulation:** Blackbody Radiation; Entropy and Enthalpy; Laws of Thermodynamics; Convergence-Divergence; Vertical Motion; Vorticity; Hydrostatic Equilibrium; Concepts of Primary, Secondary and Tertiary Circulations
- Unit II: Weather Disturbances and Hazards:** Easterly Waves; Heat and Cold Waves; ENSO and Calvin Waves; Thunderstorm; Tornado; Cloudburst
- Unit III: Climatic Changes, Policies and Mitigation:** Theories of Global Climate Changes; Evidences of Paleo-climate Changes; Climate Cycle; Climatic Changes during the Holocene; International Treaties and Protocols to Mitigate Climate Change - Nature and Impacts
- Unit IV: Applied Climatology:** Agro-climatology; Urban Microclimate; Synoptic Climatology; Weather Forecasting; Global Climate Models
- Unit V: Internal Assessment**

Soil Science and Biogeography

- Unit I: Pedogenic Processes and Forms:** Soil Mineralogy, Organic Matter and Humification; Base Exchange; Pedoturbation; Podo-transfer Processes; Concept of Soil Catena
- Unit II: Soils of Humid Tropics:** Origin, Types and Formative Processes (Leaching and Oxidation-Reduction); Resultant Features
- Unit III: Dynamic Biogeography:** Speciation, Diversification and Extinction; Evolution of Life through Geological Ages; Community; Succession and Climax; Concept of Seré; Pleistocene Megafauna Extinctions
- Unit IV: Spatial Dimensions in Biogeography:** Ecogeographic Rules; Habitat and Niche; Phytogeographic and Zoogeographic Kingdoms; Migration and Dispersal; Vicariance; Theory of Island Biogeography
- Unit V: Internal Assessment**

Spatial Dimensions of Human Culture and Society

Unit I: Evolution of Human Societies: Cultural Evolutionary Theory; Diffusion and Acculturation; Cultural Hearth and Cultural Realm; Role of Technology and Network Society; Gene Culture

Unit II: Dichotomies in Rural-Urban Societies: Contemporary Indian Rural Society: Caste Hierarchy and Segregation; Urban Society: Stratification and Occupational Divergence; Residential Segregation; Patterns of Dominance-Dependence

Unit III: Changing Socio-cultural Identities and Evolution of Landscapes: Tribal Societies – Culture and Recent Changes; Social Transformation; Tribal Movements and Conflicts

Unit IV: Cultural Transformation in Globalizing Cities: Metropolitan Consciousness and Cosmopolitanism; Neo-Liberalism and Global Capital; Neo-consumerism; Gated Communities; Cybercrime; Terrorism and Cities

Unit V: Internal Assessment

III rd semester

PAPER CODE	PAPER NAME	INTERNAL	EXTERNAL	TOTAL
3MSGEO1	Geo-informatics (Theory)	40	60	100
3MSGEO2	Theories and Models of Regional Development	40	60	100
3MSGEO3	GEO informatics practical	60	40	100
Total		140	160	300

III rd Semester

Geo-informatics

Unit I: Physics of Remote Sensing: Spectral Signature and its Response of Soil, Vegetation, Built-up and Water; Thermal Infrared Radiation Properties; Methods of Transferring Heat; Thermal Properties of Terrain; Hyperspectral Imaging; Microwave Sensors, RADAR, LiDAR Sensors and Functions

Unit II: Principles of Digital Image Processing: System Design Considerations; Pre-Processing of Satellite Image; Atmospheric, Radiometric and Geometric Correction and Enhancement Techniques; Look-Up Tables; Filtering–Low/ High Pass and Directional/Non-Directional; Band Ratio; Types of Indices; Change Detection; Pattern Recognition; Parametric and Non-Parametric Classifiers; Unsupervised and Supervised Classifications; Accuracy Assessment

Unit III: Database Management in GIS: GIS Data Sources and collection; Conversion from other Digital Sources, Attribute Data Input and Management; Metadata; Errors; Data Quality Assessment, Image Storage Formats; Data Retrieval and Compression; NSDI, GSDI; Raster Data and Structure, Vector Database; Topological Relationships; Relational Language

Unit IV: Modelling in GIS: Geodata visualization and analysis; 2/3/4th dimension viewing; Concept of Hyper Map; Virtual Images and Web GIS; Conceptual Models; Natural and Scale Analogue Models; Mathematical Models; Modelling the Decision Making Process; Visualization Model – TIN, DEM, DTM; Interpolation, Overlay, Buffering, and Neighbourhood Functions; Network Analyses

Unit V: Internal Assessment

Theories and Models of Regional Development

Unit I: Classical Theories: Marxian Theory; Harrod Domar Growth Model; Schumpeter's Theory; Rostov's Growth Stage Theory; Friedman's Core Periphery Theory

Unit II: Neo-classical Theories: Central Place Theory (Losch); Lewis Theory of Structural Change; Neo-colonial Dependency Models; Neo-classical Growth Theory (Solow)

Unit III: Contemporary Models: Industrial Complex Theory; Coastal Penetration Model (Garrison); Kuznets Growth Model

Unit IV: Emerging Issues on Regional Development: Capacity Building; Role of Institution and Leadership; Impact of ICT and Decisions Support Systems

Unit V: Internal Assessment

Geo-informatics (Practical)

Unit I: Digital Image Processing: Reading and Displaying satellite data from BIL, BSQ, and BIP Formats; Generating True, False and Pseudo Colour Composite; Determination of Area of Interest; Geometric Correction of Satellite Image; Enhancement using Different Filters; Image Fusion; Mosaic; Image Subset; Principal Component Analysis; Band Rationing

Unit II: Digital Image Analyses: Unsupervised Classification; Supervised Classification; Accuracy Assessment; Class Editing; Image Statistics Generation; Change Detection Study; Class Export to Vectors; Layout Preparation

Unit III: Data Analyses in GIS: Measurements of Lengths, Perimeter and Area; Buffering and Neighbourhood Functions; Raster and Vector Overlay - Point-on-polygon, Line-on-polygon and Polygon-on-polygon; Spatial Interpolation; Analysis of Surfaces – Network Analysis (Shortest Path Problem, Travelling Problem, Location and Allocation of Resources)

Unit IV: Geo-statistical Analyses: Spatial Autocorrelation - Computation of Geary's S and Moran's I; Triangulation; Inverse Distance Average; 3D Splines; Krigging and Variogram; Kernel Density Estimation; Geographically Weighted Regression

Unit V: Internal Assessment

PAPER CODE	PAPER NAME	INTERNAL	EXTERNAL	TOTAL
4MSGEO1	Geography of Hazards	40	60	100
4MSGEO2	Geography of Leisure and Tourism	40	60	100
4MSGEO3	Dissertation	60	40	100
Total		140	160	300

Geography of Hazards

Unit I: Hazards in Spatial Context: Distribution, Origin and Spread of Hazard over Space and Time; Global Marine Pollution; Impact of Plantation Agriculture and Green Revolution; Epidemic Outbreak

Unit II: Society, Technology and Hazards: Hazard and Development Paradoxes; Social Response to Hazards; Hazards and Community Adaptability; Brown and Green Technology; Understanding Exposure, Vulnerability, Risk, Resilience and Mitigation

Unit III: Origin, Nature and Mitigation: Arsenic, Fluoride and Nitrate Pollution; Municipal Solid Wastes; Mining Hazard; Urban Floods; Plastic Pollution; Sound Pollution; Nuclear Fallout

Unit IV: Management of Hazards: Roles of Public and Private Organizations, NGOs and International Donor Bodies; Management of E-wastes; Mitigation of Plastic Pollution; Role of ICT in Hazard Management

Unit V: Internal Assessment

Geography of Leisure and Tourism

Unit I: Basic Concepts of Tourism Geography: Scope and Content; Concept of Leisure, Recreation and Tourism; Types of Tourism; Tourism as an Interdisciplinary Study

Unit II: Tourism and Development: Changing Spatial Patterns of International Tourism; Infrastructure Development and Tourism; Environmental Consequences of Tourism Development; Tourism and Economic Development in Developing Countries

Unit III: Sustainable Tourism Planning: Ethical and Esthetical Issues in Tourism; Tourism Planning; Eco-tourism; Adventure Tourism; Geo-heritage and Geomorphosites; Tourism and Sustainable Rural Development

Unit IV: Leisure and Recreation in Cities: Outdoor Recreational Resources; Parks, Open Spaces, and Common Spaces in Cities; Sports and Cultural Tourism

Unit V: Internal Assessment

Dissertation

General Guide Lines for preparing the write-up:

1. The final report should cover the following aspects. a. Introduction to the problem. b. Aims and objectives of the study. c. Methodology d. Results and Analysis. e. Conclusions f. References/ Bibliography
2. Computer typed Report duly endorsed by the Supervisor(s) is to be produced individually by the students. Report should be typed with 1.5 Line Spacing, Arial/ Times New Roman/ Calibri Font, and 12 Font Size (Table and Figure Entries of 10 Font Size).
3. The list of references should be given at the end in the format - author(s) name, year, article/ book title, journal name, publisher name (book), place of publication, journal volume and page numbers
4. Every table, figure, photograph should have a caption and with references.
5. The total number of pages should be maximum 50 including text, figures, tables, photographs, references and appendices. Maximum word limit is 10,000.