DIRECTORATE OF DISTANCE EDUCATION

SYLLABUS
M.A. Course in Geography

VIDYASAGAR UNIVERSITY
MIDNAPORE - 721102

M.Sc. in Geography

PART 1

PAPER -I *(EXAMINATION TIME :4 HOURS) (100 MARKS)*

MODULE 1: GEO-TECTONICS & GEOMORPHOLOGY

Full Marks : 50 Number of lectures to be delivered for each module is 50.

Unit I

1. Theories of the origin of the earth.
2. Study of the interior of the earth and the earth's crust
3. Isostatic adjustments of the earth's crust
4. Doctrine of Uniformitarianism.

Unit -II

1. Plate Tectonics and Neo-tectonics.
2. Plate tectonics and Earthquakes
3. Plate tectonics and volcanism
4. Plate tectonics and Orogeny

Unit III

1. Evolution of landforms by the process - Fluvial,Glacial, Aeolian, Karst and Coastal.
2. Landforms developed by the interruptions of the Fluvial Cycle.
3. Sea level Changes and raised Beach features.

Unit -IV

1. Rocks and landforms
2. Processes of weathering, mass-wasting and erosion and resultant landforms.
3. Slope development and slope facets
4. Concept of grade, profile of equilibrium and base level.

Unit V

1. Concept of cycle of erosion(W.M.Davis, W.Penck and L.C. King).

2. Non-cyclic concept (Hack. Chorley and Schumm).
3. Applied geomorphology: Application of geomorphology in planning a development.

PAPER- I: MODULE 2: OCEANOGRAPHY & HYDROLOGY

Full Marks : 50 Number of Lectures to be delivered for each module is 5

Unit I

1. Study of the continental and oceanic crusts
2. Origin and permanncy of the ocean basins.
3. Ocean waters - Salinity and temperature and chemical compositions

Unit - II

1. Air-sea interactions; Ocean circulations
2. Dynamics of waves, tides and currents.
3. Marine ecosystem
4. Marine sediments

Unit -III

a. Onshore and offshore oceanic regions
b. Geomorphology of coastal regions
c. Coastal ecology-coastal dunes, mangroves and coral reefs.

Unit - IV

1. Hydrology - definition and relation with the environment.
2. Hydrological cycle, global and basin hydrology.
3. Estimation and measurement of hydrological parameters
4. Study of trace elements and dissol ed gases in water

Unit -V

1. Ground water studies - concept of aquifers, recharge and discharge
2. Concept of watershed and major watersheds in India.
3. Wetland Ecosystems.
4. Major wetlands of India and West Bengal.

PAPER -II : (EXAMINATION TIME : 4 HOURS)

MODULE-3 : CLIMATOLOGY

Full Marks : 50 Number of lectures to be delivered for each module is 50.

Unit-I

1. Scope and nature of climatology ; Climatology and meteorology.
2. Atmospheric composition- its evolution through phases, changes with height; Hydrostatic equation.
3. Green house gases - sources and characteristics.

Unit -II

1. Nature of Radiation and Radiation laws; Heat balance in the Earth-Atmosphere system.
2. Factors influencing vertical and horizontal distribution of temperature.
3. Various measures of atmospheric moisture content; Saturation, Unsaturation, and Supersaturation; vapour pressure; Adiabatic tempera ture changes; Lapse rates; Atmospheric stability and instability.

Unit - III

1. Factors influencing air motion; Surface and upper air circulations-thermal wind and jet streams.
2. Agro-meteorological terms-Methods & Measurement
3. Mechanism of precipitation.

Unit -IV

1. Dynamics of air masses-source areas and modifications.
2. Tropical cyclones and related hazards; Fronts and extra-tropical cyclones.
3. Thunderstorms and tornadoes.

Unit-V

1. Schemes of climatic classification-Stamp and Trewartha.

2. Global climatic changes and global warming.
3. ENSO phenomena.

MODULE-4 : ENVIRONMENT STUDY

Full Marks : 50 Number of lectures to be delivered for each module is 50

Unit -I

1. Concept of environmental systems; Components of physical environment and their interrelations.
2. Concept of ecosystem; components and structure of ecosystem; Food-chain and Food-web;Ecological pyramids.
3. Major ecosystems of the world.

Unit-II

1. Environmental degradation and manifestations-land, water(surface and ground)and air.
2. Concept of managed environmental systems:(a) agricultural ecosystems and (b) urban ecosystems.

Unit -III

1. Components of socio-cultureal environment
2. Importance of socio-cultural environment for human welfare.
3. Relationship between physical and socio-cultural problems.

Unit-IV

1. Environment and development debate.
2. Environmental movements-Chipko, Silent valley,Narmada-Bachao Andolan.
3. Concept of sustainable development.

Unit -V

1. Environmental Ethics
2. Multi-purpose River Valley project in India
3. Environmental organizations (national and international) and their roles

PAPER -III : (EXAMINATION TIME : 4 HOURS)

MODULE-5 : SETTLEMENT STUDY

Full Marks : 50 Number of lectures to be delivered for each module is 50.

Unit- I

1. Evolution and growth of human settlement.
2. Settlement hierarchy : Christaller's central place theory, theory of Losch.
3. Spatial distribution of settlements : G.K.Zipf's rank-size rule and M. Jefferson's theory of Primate city.

Unit -II

1. Concept,types and patterns of rural settlement.
2. Rural house forms and types in India.
3. Concept of rural service centers

Unit - III

1. Concept of urban settlement definitions in different countries; Census categories of Indian urban centres
2. Processes of urbanisation
3. Morphological structure of cities-different theories.

Unit - IV

1. Functional classification of urban centers-different schemes of classification
2. Environmental problems in urban areas-with Indian examples.
3. Social lay-out in urban areas-with Indian examples.

Unit- V

1. Concept of conurbation, urban agglomeration.
2. Social area analysis of urban centers.
3. Concepts of urban sprawl and rural-urban fringe.

MODULE-6 : POPULATION STUDY

Full Marks : 50 Number of lectures to be delivered for each module is 50.

Unit - I

1. Nature of population Geography as an inportant branch of human Geography.
2. Population geography and demography.
3. Sources of population date and their nature and quality.

Unit -II

1. Population structure and composition: Types, spatial and temporal variation, determinants and its importance on different aspect of population with special reference to India.
2. Concepts of Population Characteristics and Composition.
3. Population related problems in developed and developing countries.

Unit -III

1. Dynamics of Population Change-fertility, mortality and migration (Concept, measures and determinants).
2. Migration: Types. streams of migration, and consequence of migration: Problems of dislocation.
3. Lee and Ravenstein Law's of migration.

Unit - IV

1. Theories and approaches of population growth: Malthus and Marx.
2. Concept of morbidity, Nutrition and famine.
3. Factors determining population growth and spatial distribution.

Unit-V

1. Demographic transition and its spatial dimension.
2. Concept of poverty and Human Poverty index.
3. Human development Index and its implications.

PAPER -IV : (EXAMINATION TIME : 4 HOURS)

MODULE-7 : LANDUSE PLANNING AND MANAGEMENT

ull Marks : 50 Number of lectures to be delivered for each module is 50.

nit -I

Concept of land use: factors governing land utilization and causing changes in land use pattern.

Pronciples of land use: after Graham, Lewis and Stamp

Importance of soil as a determinant of land use.

nit- II

Land reclamation: Alkaline soil; case studies in Sundarban and east kolkata;

Acidic soils of India; problems and reclamation .

Mountain and Desert soil of India. Problems and reclamation.

nit- III

Ownership, occupancy and Govt.control on land use.

Policy regarding wetland, urban land, river valley planning, Industrial and Mining.

Concept of wasteland and role of National Waste land Development board.

nit - IV

Objectives and principles, techniques and Methods of land use survey.

Land use Planning Methods and techniques (Rural & Urban)

nit -V

Land capability classification.

Environmental impacts of land use Changes.

Land use Planning in India.

MODULE-8 : RESOURCES USE AND MANAGEMENT

Full Marks : 50 Number of lectures to be delivered for each module is 5

Unit-I

1. Concept of resource as related to economic, technological and cultu development stages.
2. Classification of resource according to biogenesis, renewability, availability and distribution conditions (Diversity & Disparity).
3. Concept of economic, social and environmental sustainability

Unit - II

1. Pattern and use of major resources :
2. Land resources use misuse, measures to check soil erosion.
3. Use and misuse of water resources and related hazards, marine resources and hazards from pollution (Including marine resource)

Unit - III

1. Use and misuse of forest resource,
2. Concept of social forestry and joint forest management.
3. Agricultural resources: role to meet the nutritional requirements of t world population, supply raw materials for the industries, alternative conservation and alternative methods of production.

Unit -IV

1. Mineral resources : Techniques of maintaining the reserve level by adopting scientific conservation and recycling process.
2. Energy resources: necessities for increasing reliance on conventiona to non-conventional resources.
3. Industrial resources: Linkage with other resource basis inter-regiona transfer of resource and social adaptation of technology.

Unit-V

1. Human resource development and patterns of use.
2. Disparities in development between develope and developing countries.
3. Disparities arising from national and international policies.

PAPER -V : (PRACTICAL)

MODULE-9 : GROUND SURVEY AND AERIAL PHOTO INTERPTREATION

Full Marks : 50 Number of lectures to be delivered for each module is 50.

Unit-I

1. Contour Survey on the basis of leveling by Dumpy Level and Prismatic Compass.
2. Traverse Survey by (i) Plane Table (Intersection Method) and (ii) Prismatic Compass.

Unit -II

1. Determination of height by Transit Theodolite (Base Inaccessible method).
2. Survey of roads in a study area by a GPS handset and preparation of a road map.

Unit -III

1. Advantages of Aerial photographs over conventional on-the ground observations, Types, scales and ground coverage, Basic Negative-to Positive Photographic Sequence, Black & White Films, Colour Films.
2. Aerial cameras, film exposures (numerical problems), stereoscopy, pseudoscopy, lens stereoscope, Mirror stereoscope, image parallax and determination of height.

Unit - IV

1. Air Photo Interpretation; shape, size, pattern, tone, texture, shadows and site.
2. Monoscopic and stereoscopic Interpretation of airphotos for geomor phic land use features

Unit-V

PRACTICAL NOTE BOOK AND VIVA-VOCE

MODULE-10 : QUANTITATIVE METHODS IN GEOGRAPHY

Full Marks : 50 Number of lectures to be delivered for each module is 50

Unit- I

1. Sampling and summarizing Geographical date: Types of sampling methods, Estimates from sample.
2. Measuring inequality-Lorens Curve.
3. Analysis of combination: Weaver's Combination Index.

Unit-II

1. Probability: Concept and definitions, Laws of Addition and Multiplication.
2. Concept of Probability distribution; Normal Probability distributiion.
3. Properties of Normal Curve.

Unit-III

1. Bi-variate distribution and Correlation: Scatter diagrams and regression analysis.
2. Measures of Correlation: Product Moment Correlation coefficient and Spearman's Rank correlation coefficient.
3. Hypothesis Tests X^2 test and student's T-test.

Unit- IV

1. Nearest Neighbour Analysis.
2. Shortest path analysis.
3. Transport connectivity Indices.

Unit -V

PRACTICAL NOTE BOOK & VIVA-VOCE

M.Sc. in GEOGRAPHY

PART - II

PAPER - VI

(Examination TIME : 4 HOURS)

Module - 11 : GEOGRAPHYCAL TIHOUGHTS

nit- I

The field of Geography; its place in the classification of Sciences vis-a vis other Disciplines; Geography as a Social Science, Physical and Human Geography.

nit-II

Dualisms and dichotomies in Geography; Determinism and Posdsibilism, Systematic(Nomothetic) and Regional (Ideographic) Geography.

nit-III

Relationship between systematic Sciences and Regional Geography; Environmental determinism. possiblism and ecological approach. Encyclopaedism, Positivism, Development of Behavioural Geography, Quantitive Revolution and Geographical Information System, Development of Critical Social Geography - Radicalism.

nit- IV

Welfare Geography and Gender issues, Post Modernism in Geography.

nit-V

Concept of Space in Geography-Marital space and Social space; Advances in geographdical research.

Module - 12

REGIONAL DEVELOPMENT & MULTILEVEL PLANNING

Unit - I

1. Definition and typology : formal and functional, nodal, uniform single purpose, special purpose and composite regions and hierarchy of regions.
2. Historical review of regional approach in Geography in developing countries.

Unit - II

1. Formal Regions : physigraphic, agro-climatic and cultural with special reference to India; Functional Regions in India: city region industrial region, and administrative regions;
2. Special Purpose Regions: River vally, micro-watershed, metropolitan; Problem regions : hilly regions, coastal regions, drought-Prone and flood-affected regions, tribal regions.

Unit - III

1. Regional development strategies: centralized and decentralized, multi level planning(rural /urban); people's participation in the planning process (Panchayati Raj institution).
2. Structure of underdevelopment- colonial and post-colonial India.

Unit - IV

1. Definition of planning region in the national context; indicators of development and their date Sources; measuring levels for regional development and disparities.
2. Regional disparities in India : demographic, social and economic disparities.

Unit - V

1. Assessment of Regional Development policies in India - problems and prospects.
2. India's Five year Plans- Goals & Objectives.

PAPER -VII

Module - 13:

GLOBAL ENVIRONMENTAL ISSUES - POLLUTION AND HAZARDS :

Unit - I

1. Population growth Technology and Environment.
2. Rapid urbanization-global economic preasure-scarcity of natural resources - Global resourses crisis.
3. Hazard in the environment : Concept of Hazard, Vulnerability and Disaster.

Unit -II

Dimensions of disaster, risk assessment and causes, effects and loss sharing adjustments of typical hazards :

1. Tectonic hazards - Earthquake
2. Geomorphological hazards - Landslides and River bank erosion
3. Hydrological hazards - Flood and Drought
4. Bio-physical hazards - Epidemics
5. Techonological hazards - Industrial accidents and nuclear radiation leakage
6. Social hazards- Poverty & Crime.

Unit - III

1. Global concerns : Global warming and its various implications. Acid rain and ozone depletion.
2. Non-degradable waste and its disposal.
3. Pollution: Air, water, land , noise.

4. Soil degradation: Erosion, Salinisation, Alkalinisation, Desertif tion and Deforestation, Quarrying & Mining.

Unit - IV

1. Pollution control strategies.
2. Recycling, renewable energy uses.
3. Conservation of Biodiversity with special reference India(problems of agricultural development and regeneratio forest and maintenance of Biodiversity - Wild , Aquatic & Agri ture.

Unit - V

1. Environmental policy.
2. Legislation on Water, Air, Noise, Environmental Protection Act v Special reference to Legislation in India.
3. Environmental Impact Assessment (EIA)
4. Environmental Mangement Planning (EMP)

Module - 14 :
POLITICAL AND ECONOMIC GEOGRAPHY

Unit - I

1. Geographical perspective on formation of state, nation and nati state, core and peripheral areas, capital frontiers and boundar border lands and buffer zones, buffer states, land locked natio
2. Geostrategic views-Heartland and Rimland theories.

Unit - II

1. Partition of India and its implication
2. Reorganization of Indian states since independence.
3. International and interstate water dispute in Indian subcontinen

Unit - III

1. Economic Geography in the era of globalization-agriculture, industry and trade.
2. Ranking of world economics. Policies of world resources with special reference to energy resources, economic, political military blocks; political geography of foreign trade.

Unit -IV

1. Significance of trade in regional and national economy; balance of payment and international trade - GATT, WTO and Intellectual Properity Right; Impact of privatization and liberisation.
2. Impact of Information Technology on trade.

Unit - V

1. Concept of distance, accessibility and connectivity : Inter-regional and Intra-Iregional.
2. Modes of transportation and transport costs: comparative cost advantages.

PAPER -VIII, SPECIAL PAPER THEORY : (ANY ONE)
Option - 1

Advanced Agricultural Geography and Advanced Pedology

Module - 15: Advanced Agricultural Geography

Unit - I Agriculture in Indian :

1. Landuse pattern and regional pattern of productivity in India.
2. Green revolution, shifting cultivation, wasteland development, foder culture and white revolution-their impact and consequences.
3. Indian agricultural policies, management and planning.

Unit - II Determinants and Principles of Agricultural Landuse

1. Determinants of agricultural landuse: Physical , economic, socia and technological.
2. Cropping pattern, crop concentration, degree of commercialization diversification and specialization, efficiency and prodectivity, crop combination region and agricultural development.
3. Agricultural development : Pattern in developed and developing countries.

Unit - III: EMERGING ISSUES

1. Food security : Minotoring performance of major crops of India fo forecasting production Acreage & Yield estimation by Remote Sensing.
2. Environmental impact of irrigation,fertilizers, pesticides and tech nological know-how.
3. Employment in agricultural sector : Land-less labours, workers, chil dren, occupational health and agricultural activity.
4. Precision Farming - Use of modern technology : Remote Sensing GIS & GPS.

Module - 16: Advanced Pedology

Unit - I Constituents and properties of soil influencing plant growth

1. Soil reactions: Soil acidity, alkalinity, salinity and their effects o plant growth.
2. Soil plasma: Organic and Inorganic origin, constitution, properties and types of soil clay. Classification of clay minerals.
3. Soil nutrients : Macro-and micro-nutrients, nutrient transformation and fixation in soil. Principle of base exchage and its relation with fertility.
4. Soil fertility and productivity : Roles of irrigation,inorganic

fertilizers,organi cmanures, including other bio-fertilisers in augmenting soil fertility. Nitrification and denitrification.

t - II Soil Genesis, Survey, Classification and Mangement

Processes of soil formation and soil development : Physical, Chemical, Flora, fauna, Climate, Relief, Time.

Pedogenic processes- Theories on formation of mahjor soil of the world: podsolisation, laterisation, Lessivage, calcification, gleisation etc. Sub types of major zonal soils.

Soil degradation : factors, processes, and resultant forms in different parts of India.

t - III Modern Trends

Classification of soils: Soil Taxonomy.

Generation of derivatives : Land capability, land irrigability, soil irrigability, soil suitability, hydrological grouping of soils.

Role of Remote Sensing in soil maping - Prospects & limitations.

Integrated soil and water management - concept of sustainable development.

Option - 2

Coastal Management

Module - 15:

Coastal Management : Physical Aspects.

t - I

Definition of coastal zone and related nomenclature.

Coastal processes : Wave, tide and wind. Coastal currents and cells.

t - II

Coastal morphodynamics : Macro, macro and biogenic forms. Sys-

tems of change in coasts: cyclical and progressive. Classifica
of coasts based on processes and sediment.

Unit - III

Coastal biogegoraphy with special reference to sea weeds , n
groves, dune vegetation and corals . Their ecological and econo
significance.

Unit -IV

1. Natural coastal hazards and their management : Sea level
erosion, sedimentation and tropical cyclones;

Unit - V

1. Techniques of monitoring changes in coastal processes
landforms

Module - 16

Coastal Management : HumanAspects :

Unit -I

1. Coastal regulations with special reference to India.
2. Monitoring Surface waters in Coastal Regulatory Zone (CRZ

Unit- II

1. Human utilization of coasts, environmental impacts and man
ment :Navigation, mining, fishing and fishprocessing, of -shor
exploitation, reclamation and tourism.
2. Application of Remote Sensing with special reference to Fish
3. Study of Chlorophyll in water

Unit - III

1. Coastal engineering and its impacts: Ports and harbours, meas
for prevention of erosion and sedimentation.

Study of Suspended mineral in water.

it- IV

Coastal pollution : Sources, impacts and management.

Study of chlorophyll in water.

it -V

Integrated Coastal Management : Concepts, techniques and applications.

West Bengal coasts: Major environmental issues, problems and their management.

Application of Remote Sensing with special reference of Fishery.

Option - 3
Regional and Urban planning
Module - 15
Regional Development

it - I

Concept of growth, development, poverty and underdevelopment

Regional Environmental Issues.

it - II

Regional development perspectives : Colonial period (Dependence theories)

it - III

Growth Pole theories and the developing world.

it - IV

Agropolitan Development, Basic Needs Approach

Unit -V

1. Regional Planing Strategies : regional plans of developed & de oping countries. Regional plans in India with examples.

Module - 16

Urban Geography

Unit - I

1. Concepts and definitions : Urban, urbanism
2. Origin & growth of urban settlements :Bases & process urbanization

Unit -II

1. Major influence in urban planing : ancient, oriental, Europe American
2. Urbanization in India: a historical perspective

Unit - III

1. Features of metropolitan development (with special reference India)
2. Uran Economy : basic, non-basic functions, changin urban fu tions; role of informal sector

Unit-IV

1. Issues of urban environment : poverty, crime, infrastructure, spra renewal, pollution & health
2. Uran Environmental Problems in West Bengal

Unit - V

1. Brief introduction of Remote Sensing applications on Urb landscape.

Option - 4

emote Sensing (RS) & Geographic Information System (GIS)

Module - 15

SIC CONCEPTS

Physics of Remote Sensing

Fundamental laws governing th science - Sources of Energy, Electromagnetic Radiation, Radiation laws, (Wavelength-frequency-energy relationship of EMR,Stefan-Boltzman law, Wien's law, Kirchhoff's law etc.,numerical problems). Definitions, Requirements, Stages, Black body and Real body. Radiant temperature & Kinetic temperature, Atmospheric interaction.

Satellite Platforms and Sensors

ics- Kepler's laws, Major-Semimajor axis & Eccentricity, Velocity, Perid(Numerical problems), Historical development, Launch Vehicle, Indian scenario,

Types of platform for civilian applications, Advantages and Disadvantages, Characteristics of various satellite platform Physical principles and characteristics of major sensors, Resolutio, Date storage, dissemination & Processing, Ideal Remote Sensing system & Real Remote Sensing System.

Aerial Photography & Photogrammetry

Historical development, Definitions of key terminology, Types of aerial photographs, Geometry of Single Aerial Photographs, Scale,Lens distortions, Relief distortion and Tilt distortions, Rectification, Ortho Rectification, Film density & Characteristics curve, Colour Infrared films , Film resolution, Filters, Stereo Photogrammetry -Various Photogrammetric activities, Conditions for Stereovision, Photographic overlap, Image Parallax, Flight Planning.

4. Stellite Systems

Whiskbroom Systems : LANSAT series
Pushbroom Systems : SPOT, IRS series
Microwave Systems : ERS, RADARSAT
Coarse resolution /Meteorological Satellite System : NOAA, IN
Very high resolution Remote Sensing Systems : Earlybird
Quickbird, IKONOS, Overview - 3,4

Module - 16

Advanced techniques & applications

1. **A brief introduction to Thermal Remote Sensing**

Fundamentals of Thermal Remote sensing : Sensing Radiant T
perature, Black body Radiation, Radiation from real materials,
sors, utility.

2. **Microwave Remote sensing /Laser**

Concept, Advantages and Disadvantages vis-a-vis Optical syste
Spatial resolutions, Real aperture and Synthetic aperture Ra
stereoscopy, parallax, passive systems, Lidar.

3. **A brief introduction to Hyperspectral Remote Sensing**

Concept, sensors, utility

4. **Digital Image Processing**

Preprocessing/Georeferencing, Data enhancement, Den
slicing, Data compression, Spectral pattern recognition(Supervi
Unsurpervised, NDVI etc.), Filtering, Output generation.

5. **Geographic Information System**

Basic Concepts : An overview of the development of the GIS fi
Data Sources, Data capture (Manual and automatic digitizatio
analog data),vector and raster structures, Hardware configurat
Software requirements, DBMS, Data analysis (overlay, buffer
etc.)Data output, Query of a GIS.

Introduction to ARC/INFO GIS software - a leading commercial software

Integration of GIS and Remote Sensing with a couple of case studies.

Basic Theory of GPS Surveying

Concepual framework. Space segment, Ground segment, Control segment, Stellite Triangulation, Us Dept. of Defense policy, DGPS, Uses.

Application of Remote Sensing

Comperative assessment of SOI topsheet, Aerial photograph and Sattelite date for representation of Geographical data.

Remote Sensing in Landuse/land cover applications

Remote Sensing in Soil & Agricultureal Applications

Remote Sensing in Geomorphic Mapping

Remote Sensing in watershed management

ption -5

ural Development

odule - 15

entification and Characteristics of Rural Environment

Theoritical framework of rural development and geographical perspective : Rural economy under different Production system - experiences of developed and developing world with examples.

Dimensions of rural economy; Non -urban land use-agriculture and complementary uses of land; animal husbandry, dairying, poulrty, fishing, forestry, market gardening and agro-based industries; Problems of developmnt related to labour, capital, market, scale and infrastructure.

Rural labour force with special reference to gender, migration and socio-cultural dimensions.

Analysis of rural settlement : Cause and effect associations, disribution of rural settlements with Special reference to size and

speacing; Rural service centres - Nature and hierarchy of n
settlement of market centres and growth centres - Cenral P
Theroy-Concept of rural urban continuum.

Module - 16

Evolution of Rural Development in India

1. Evolution of rural development concept in India; Research
Development during plan periods-Objectives and approaches.
2. Land reform in India-Abolition of Jamindari system; Land Ceil
Act and emerging production Relations.
3. Concept of Panchyati Raj-of Panchayati Raj in rural developm
and planning.
4. Objectives and strategies of planning at disrict, block and villa
levels; people's development : Area approach, Target Group a
proach and Target Sector approach.
5. Models of rural development : Experience of Panjab, Kerala, W
Bengal abd Bihar.

PAPER IX - PRACTICAL

MODULE - 17 (SPECIAL PAPER FIELD - PRACTICAL)

Field Report-Dissertation work on Special Paper

(Field Report on specific project (s)selected from the themes mentione
below)

Option - 1

Advance Agriculturel Geography & Advanced Pedology

1. Monitoring performance of major crops of a block in a particula
season for forecasting production Crop Acreage & Production es
timation (CAPE) by Remote Sensing using SAC (Space Applica
tion Centre, ISRO, Ahmedabad)methodology.

2. Analysis of crop suitability in the study area based on the soil category, climate and the available resources / technological inputs using GIS.
3. Mapping of seasonal / round the year crop distribution of a specific study area with the help of toposheet, satellite FCC and field traverse
4. Mapping of soil categories from FCC by visual interpretation and finalization of categories by field traversing and profie sample studies.

Option -2

CoastalManagement (Field Report on Non-RIVERINE Coastal Environments)

1. Mapping of the forms of coastline changes (non-reverine).
2. Demographic changes along with the coasts based on Census date.
3. Analysis of one specific problem based on field observation and primary survey with a prepared questionnaire.

Option-3

Regional and Urban Planning (Field Report on a specific problem of an urban area, e.g. Small town or a few wards of a big city, based mainly on primary data)

1. Identification of Study area and problem.
2. Data base, preparation of questionnaire, field survey, analyses of the survey data and mapping.

Option - 4

Remote Sensing & GIS

1. **Remote Sensing in Earth Sciences**

Geomorphic Mapping : Visual interpretation of landforms , Basic concepts, Recognition elements. Interpretation of drainge patern, erosion and deposition landforms.

2. **Remote Sensing in Agricultural Applications**

Soils mapping, Crop mapping /Crop stress determination

3. **Remote Sensing in land and Water Management**

Land use /Land cover planing, Land resources management

Water Resources: Surface water-ground water, water deciphering quality inventory and monitoring, quantity assessment

Watershed Management : Morphometric Analysis , Hydro morphogeologic interpretation techniques for targeting ground water potential zones in alluvial, sedimentary and hard rock areas flood Assessment and watershed Management.

4. **Remote Sensing in Forest Management**

Forest density mappig, Forest type mapping

5. **Remote Sening in Urban and Rural Development**

Mapping of human habitation, type

6. **Remote Sensing in Coastal Management**

Coastal land use, spatial and temporal changes, SST, Phytoplankton as sessment, Sediment assessment.

Option - 5

Rural Development (Field Report on a specific problem of a defined rural area, e.g. Micro-Watershed/Block Level Mouza Level, based mainly on primary data.

1. Indentification of Study area and problem.
2. Data base, field observation and survey (with a prepared questionnaire), analyses of the survey data and mapping

MODULE - 18

Group - A: Remote Sensing (RS)

Unit - I

1. Historical development of Remote Sensing as a technology relevance of Remote Sensing in Geography, Concepts and basi requirements.
2. Satellite remote sensing : Platforms & Sensors, orbital characteristics, Whiskbroom scanners, Pushbroom scanners, and dat products.

Unit -II

3. Image Processing : Visual and digital; Significance of secondary/ in-situ data, Ground Truth Verificatio. Processing /Rectification and retoration; data enhancement, Spectral pattern recognition, microwave sensing : SLAR Imageries, elements of passive microwave sensing.

Unit -III

4. Remote sensing applications and mapping in India- Case studies (e.g Land use and planning, forest managemen, waseland managemen etc.).
5. Application : use of satellite imagery and other categories of maps for GIS (e.g., Land use and planning , forest management, waste-land management etc.)

Unit - IV

Group - B: Geographical Information System (GIS)

1. Concept of GIS, maps & spatial information, dynamics and selection of spatial information, concept of spatial and non-spatial data, computer environment for GIS (hardware & software requirement).
2. Spatial data : raster-vector structure -conversion & comparision.

Unit -V

3. Elements of GIS: data capture, verification & processsing, storage & maintenance, data manipulation, analysis, overlay analysis.
4. Integration of GIS, remote sensing and GPS date .

PAPER -X-PRACTICAL

Module - 19: Computer Applications - Numerical Data Processing

Unit -I

1.0 COMPUTATION, SORTING AND FORMATING OF SPREADSHEETS

1.1 Derivation of rank, mean, median and mode

1.2. Computation of standard deviation, sample variation and moving average.
1.3. Derivation of correlation, covariance and regression.
1.4. Use of <if-then>function, F-test, t-test and z-test.

Unit -II

2.0. PREPARATION OF ANNOTATED DIAGRAMS
2.1. Simple and compound bar and line graphs.
2.2. Pie and doughnut diagrams.
2.3. Scatter diagrams.
2.4. Histograms

Unit - III

3.0 PREPARATION OF ANNOTATED GRAPHIC FILES
3.1. Cleaning and editing of scanned files
3.2. Creation of layers

Unit-IV

3.3. Digitisation of scanned files.
3.4. Annotation of scanned and digitized files.

Unit -V

4.0. PRACTICAL NOTEBOOK AND VIVA-VOCE

Module - 20

Methodology Environmental Research & Themetic Mapping of Environments.

Group -A - Methodology of Environmental Research

Unit - I

1. Research Paradigms.

2. Identification of Research Problems and specification of the Objectives of the Study.
3. Development of theoretical background-literature survey.
4. Methods of data collection: Questionnaire and schedule.

Unit- II

5. Report writing.
6. Methods of writing Notes,References, Bibiliography.
7. Examples on some problems of environmental research using tools of Remote Sensing and GIS

Group - B : Thematic Mapping of Environments

Unit - III

Physical :

Mapping on themes covering physical attributes : Relief, Morphometry (Relative Relief, Dissection Index, Ruggedness Index, Drainage Density. and Hypsometry), Climatology, Flora and Fauna

Unit -IV

Cultural :

Mapping on themes covering cultural attributes : Settlement, road network, embankments, tanks etc, Flora & Fauna, Climatology.

PRACTICAL NOTEBOOK AND VIVA-VOCE