GEOGRAPHY (HONOURS)

SEMESTER-I

CC-1 : GEOMORPHOLOGY
(Credits: Theory - 04, Practical - 02) - MARKS – 70
Theory: 40 Classes (1hr duration)

Unit – I

a. Definition and scope of geomorphology, Fundamental Concept of Geomorphology and recent changes
b. Structure and composition of the Earth's interior: Thermal and Physical State of the Earth's Interior with special reference to Seismological Evidence, Zoning (Sues's model) Crust, mantle, Core
c. Theories of Isostasy: Models of Pratt and Airy

Unit – II

a. Rocks: Origin, characteristics, and Classification (Igneous, Sedimentary, Metamorphic)
b. Earth Movement: Eustatic and Isostatic, Endogenetic and Exogenetic
c. Structure and landform: Types of Folds and Faults, Rift Valleys, Horst and Graben
d. Earthquake: Distribution, Characteristics of Seismic Waves,
e. Volcanism: Causes and Effects, Types of Volcano, Volcanic Landform (Extrusive and Intrusive)

Unit – III Earth movement

a. Continental Drift Theory by Wegner and related evidences
b. Sea Floor Spreading, Plate Tectonics (Concept, Distribution of Plates, Types of Plate; Plate Convergence and Divergence, Causes of Plate Movement)
c. Geosynclines, concept, classification, and stages of mountain building
d. Kober's theory of mountain building and Convection Current Theory of Holmes

Unit – IV

a. Factors and Types of Weathering
b. Mass wasting: Meaning and Concept, Classification and Factors, Types of Mass movement
c. Morphological evolution of landforms: Davis and Penck, King

Unit – V Evolution of Land Forms

a) Fluvial processes and related landforms
b) Underground water and Karst topography
c) Aeolian landscape: depositional and erosional features
d) Glacial erosion: Erosional and depositional landforms

GEOG LAB - CORE - I: GEOMORPHOLOGY
20 Classes (2hr duration)
MARKS – 30 (2 Credits)

1. Study of symbols and techniques of representation of relief features and Geomorphic Interpretation of topographic Maps.
   a. Representation of Relief features: Hill. Plateau, Valley, Col, Knoll, Ridge, Escarpment
   b. Drawing of Serial, superimposed, composite and projected profiles.
   c. Drawing long profile and cross profile of a river
   d. Study of drainage pattern; Dendritic, Trellised, Radial using stream order and bifurcation ratio.
   e. Measurement of drainage density and texture of topography
   f. Use of Rotameter and planimeter and graphic methods in measurement of area and length
2. Interpretation of Geological Maps: Dip, Strike, bedding plain, unconformity, disconformity, outcrop, geological structure (Fold & Fault), dyke, sills, geological history and stratigraphic succession.
3. Practical record and Viva.

SEMESTER-I

CC-2 : PRINCIPLES OF CARTOGRAPHY
(Credits: Theory - 04, Practical - 02) - MARKS – 70
Theory: 40 Classes (1hr duration)

Unit – I : Nature and Scope of Cartography

a. Meaning and Definition of Cartography, Concept of Spatial Visualisation and Cartographic Communication, Maps, Charts and Diagrams, Scope of Cartography.
b. Need and Purpose for Maps: Explaining Patterns, Comparison and Analysis, Decision Making, Maps as Interfaces with Database, Conditions for proper use of Maps.
c. Definition & Basic Characteristics of Maps: Location, Attributes, Reductions and Generalisation, Abstraction, Transformation, Scale, Map Projection, Symbolism, Colours and Shadings.
d. Types of Maps: Classes by Scale, Classes by Function, Classes by theme, Cadastral Maps, Topographic Maps, Wall Maps, Atlases, Three Dimensional / Raised Relief Maps.
e. Map Scale Types and their Function: Statement, Graphical, R.F., Diagonal Scale, Vernier Scale, Principles of Map enlargement and reduction,

Unit – II: History of Cartography and Map Making

a) Development of Cartography in Ancient Period: primitive cartography, Greek Cartography, Roman Cartography, Indian Cartography
b) Cartography in Medieval Period: Early Medieval Time, Late Medieval Time
c) Development of Cartography in Modern Period: Development during Early 20th Century, Development after 2nd world War

Unit –III: Earth-Map Relationship and Geodesy

a. Shape and dimension of the Earth, Properties and Cartographic use of Geoid, ellipsoid and Spheroid, true, magnetic and grid north.
b. Geographic coordinates: Latitudes and Longitudes, Prime-meridian, International date line, Local time, GMT & IST
c. Properties of Graticules: Distance on the Sphere and Great Circles, Directions, Area
d. Grid reference system

Unit – IV: Map Projection

a. Types and characteristic of map projection, properties and use of different projections, Choice of Map Projections,
b. Principle, Properties and uses of following projections:
   (i) Cylindrical equal area projection
   (ii) Simple conical Projection with two standard parallel,

(iii) Zenithal Projections: Stereographic, and Gnomonic
(iv) Conventional Projections: Mercator's Projection.

Unit – V : Ground Survey and positioning

a) Principles of surveying: measuring angle, altitude and distance, Traditional survey methods and automated survey systems
b) Principles of Prismatic compass and Plane table surveying and leveling
c) Geodetic survey: use of theodolite, determination of height, Triangulation
d) GPS and DGPS, Total Station in ground survey

GEOG LAB - PRINCIPLES OF CARTOGRAPHY (C 2)
20 Classes (2hr duration)
MARKS – 30 (2 Credits)

1. Use of Scale in Maps:
   a. Construction and use of Graphical Scale, R.F., Statement Scale, Diagonal Scale
2. Concept of Spheroid and Geoid: Coordinate and grid reference system:
   a. Location of place on grid reference system using 8 digit, 12 digit and 16 digit system
3. Map Projections:
   i) Simple Cylindrical Projection:
   ii) Cylindrical Equal Area
   iii) Simple conical projection with one standard parallel
   iv) Bonne's Projection
   v) Polyconic projection
   vi) Gnomic projection
   vii) Orthographic projection
   viii) Stereographic Projection
   ix) Mercator's Projection
2. Practical record and Viva.

SEMESTER II

CC-3 : CLIMATOLOGY
(Credits: Theory - 04, Practical - 02) - MARKS – 70
Theory: 40 Classes (1hr duration)

Unit – I

a) Atmospheric Composition and structure
b) Weather and climate: Definition, elements and factors of weather and climate.
c) Insolation and Temperature**:** Factors affecting Insolation and distribution of Temperature, Inversion of Temperature
d) Global Heat Budget

Unit – II

a) Atmospheric Pressure and Winds - Atmospheric pressures and pressure belts of the world
b) Corriolis forces :concept and effects on wind system
c) Planetary, local and monsoon winds, its characteristics and distribution.
d) Jet Stream – origin and characteristics

Unit – III

a) Atmospheric moisture: Evaporation, Humidity and condensation,
b) Forms of condensation and types of clouds
c) Types of precipitation
d) Koppen's classification of climate,
e) Thornthwaites classification of climate.

Unit – IV

a) Air mass and fronts: Concepts, classification and properties of Air mass distribution and modification.
b) Frontogenesis, types and weather associated with fronts
c) Global warming: causes, its consequences and controlling measures

Unit – V

a) Weather disturbances: Tropical Cyclones, Thunderstorm, Tornado, local disturbances
b) Temperate cyclones – Origin and weather pattern
c) Monsoon – concepts and theories of the origin of monsoon

GEOG LAB - CLIMATOLOGY (C 3)
20 Classes (2hr duration)
MARKS – 30 (2 Credits)

1. Monitoring weather elements
   a. Distribution of temperature/ pressure/ humidity on maps by isopleth techniques

   b. Distribution of rainfall on maps by choropleth techniques
   c. Construction of wind Rose for displaying wind direction and wind velocity of a place
   d. Use of moving average in analyzing climatic trends (Temperature, rainfall, Humidity)
2 Construction of Climographs, Hythergraphs and Ergographs
3. Use of weather Maps
   a. Use of symbols of various weather parameters in Indian weather maps
   b. Interpretation of Weather map for understanding weather conditions
4. Practical record and Viva.

SEMESTER-II

CC-4: THEMATIC CARTOGRAPHY
(Credits: Theory - 04, Practical - 02) - MARKS – 70
Theory: 40 Classes (1hr duration)

Unit – I: Thematic Mapping

a) Concept, Definition and Types of Thematic Maps
b) Factors Associated with Thematic Maps; Choice of Map Projection, Choice of Base Maps, Data and Their Representation, Data Generalisation, Standardisation of Symbols, Compilation of Data, Design of Maps, Map Reproduction,
c) Map Reproduction, Map Cataloguing, Map Storing
d) Cartographic Equipments, Drawing Media, Map Compilation, Scale Lines, Frames and Panels

Unit – II: Map Designing, Layout, Symbolisation and Cartographic Communication

a) Cartographic design: Function and scope, Need for Map Designing, Theory of visual perception, , Limitation and constraints in Map Designing
b) Concept of Map symbolization: Use of Point, Line and Area symbols, Map Formats
c) Map lettering and toponomy: Style of lettering, size of lettering, form of lettering, color and background, positioning, mechanical lettering
d) Color theory and models in maps: Nature of color vision, use of color schemes in maps
e) Conventional Signs, Symbols of physical and cultural themes on maps,

Unit – III : Mapping and Analysis of Terrain and Settlements

a) Mapping the terrain, Relief representation by different methods: Spot height, Bench Marks, Hachuring, Hill Shadings,
a) Use of conventional color schemes for depiction of relief and drawing a Relief Map
b) Use of Contours in Representation of Relief,
c) Gradient and Slope: Significance, Calculation of Gradient, Methods of average slope determination Wentworth's method, Smith's method.

Unit –IV : Mapping Socio-economic Data with Cartograms

a) Mapping Qualitative Data: Use of Pictures and Symbols (Simple and Multiple Dots), Pictorial Maps
b) Mapping Spatial Variation using Quantitative Data using Diagrams;
   i) One Dimensional (Simple and Complex Bars)
   ii) Two Dimensional (Circles and Pie Diagrams)
   iii) Three Dimensional (Spheres and Block Diagrams

c) Mapping Spatial Variation Using the Techniques of Choropleth and Isopleth, Mapping Flow Data using Isochrones
d) Preparation and Use of Chorochromatic Maps, Principles of Choosing colors, patterns and themes.

Unit –V : Map Interpretation and Analysis

a) Indexing of Topographic Maps and Map Numbering System
b) Interpretation and analysis of Physical Details
c) Interpretation and Analysis of Cultural Details and Settlement Patterns

GEOG LAB - THEMATIC CARTOGRAPHY (C 4)
20 Classes (2hr duration)
MARKS – 30 (2 Credits)

1. Use of Cartograms in representation of Spatial Data
   a. Construction of **one dimensional cartograms** on Maps: Bars and Compound Bars
   b. Construction **two dimensional cartograms** on Maps: Circles, Proportional circles and pie diagram
   c. Construction **of three dimensional cartograms**: Spheres and Block diagrams
2. Techniques of representation of Spatial Data
   a. Drawing of Isopleths using spot height/ rainfall
   b. Drawing of Choropleths showing rainfall / population density / literacy through dot, multiple dot, circle, sphere
   c. Drawing of Isochrone using travel time data
3. Techniques of representation by colors (chorochromatic Maps)
   a. Drawing a relief map using colors in a hierarchical order (Single)
   b. Drawing of a literacy Map using color in hierarchical order
4. Determination of Slope and Relief variation
   a. Slope of an area using Wentworth's Method
   b. Preparation of Relief Map
5. Practical record and Viva.

SEMESTER – III

CC-5 : ENVIRONMENTAL GEOGRAPHY
(Credits: Theory - 04, Practical - 02) - MARKS – 70
Theory: 40 Classes (1hr duration)

Unit – I

a) Environmental Geography – Concept and Scope
b) Types and characteristics of Environment – Biotic and Abiotic and Cultural
c) Environmental Controls – Concept of Tolerance, Components,
d) Differential aspects of Environmental Control (Light, Temperature, Water, Wind, Topography, Edaphic)

Unit – II

a) Human-Environment Relationships and Historical Progression
b) Concept and meaning of Biomes
c) Environmental Characteristics of Biomes
   i) Equatorial ii) Sub-Tropical iii) Temperate iv) Polar

Unit – III

a) Concept of Ecology and Ecosystem and Structure of Ecosystem
b) Energy Conversion and Photosynthesis,
c) Food chain and Food Web, Flow of energy in Ecosystem.

Unit – IV

a) Concepts and types of environmental degradation
b) Environmental Pollution
   i) Air ii) Water iii) Land and Soil

Unit – V

a) Major Environmental Policies and sustainable development
b) Role of UNO, UNDP, UNEP and IUCN in Environmental management
c) Environmental Policies of India and Policies on Climate change

GEOG LAB - ENVIRONMENTAL GEOGRAPHY (C 5)
20 Classes (2hr duration)
MARKS – 30 (2 Credits)

1. Calculation of PE, TE & Evaporation Rates
2. Calculation of Mean Rainfall, Mean Maximum and Minimum temperature
3. Drawing of maps to show Environmental parameter:
   Temperature, Rainfall, Wind direction, Wind velocity
4. Practical record and Viva.

SEMESTER – III

CC- 6 : ECONOMIC GEOGRAPHY
(Credits: Theory - 04, Practical - 02) - MARKS – 70
Theory: 40 Classes (1hr duration)

Unit – I

a) Subject matter and Scope of Economic geography
b) Concept and Classification of Economic activities
c) Resources Concept and classification

Unit – II

a) Factors Affecting location of Economic Activity with special reference to Agriculture
b) Locational theory of Von Thunen
c) Factors affecting the localisation of Industry.
d) Weber's theory of industrial location

Unit – III

a) Types of Economic activities: Primary, Secondary, Tertiary, Quaternary
b) Agriculture: Physical and socio-economic factors influencing agriculture;
c) Types of agriculture; Factors and distribution of Rice, Wheat, Tea, Coffee
d) Agricultural regions of India

Unit – IV

a) Concept of Manufacturing Regions, major Industrial regions of Asia.
b) Distribution and factors of location of major industries in India: Iron and Steel, Cotton Textile.
c) Special Economic Zones and Technology Parks

Unit – V

a) Types of Transport – Roads, Railways, Waterways and Airways
b) Role of Transport in national and International Trade.
c) Trade - types and significance; World Trade Organization (WTO),

GEOG LAB - : ECONOMIC GEOGRAPHY (C 6)
20 Classes (2hr duration)
MARKS – 30 (2 Credits)

1. Preparation of Maps to show distribution and production of Minerals in Odisha : Iron, Coal, Aluminum – Pie diagram on Map, Proportional Circle
2. Cropping Intensity by Bhatia and Weaver's Crop Combination Method
3. Enlargement & Reduction of Map
   a. Enlargement & reduction by Graphical method & calculation of New scale
   b. Enlargement & Reduction by instrumental method (Pentograph/ Optical Pentograph/ Optical Reflecting Projector)
4. Practical record and Viva.

SEMESTER – III

CC - VII : EVOLUTION OF GEOGRAPHICAL THOUGHT (C 7)
(Credits: Theory - 04, Practical - 02) - MARKS – 70
Theory: 40 Classes (1hr duration)

Unit – I Classical Age

a) Geography in classical age: Contributions of Greeks scholars: Herodotus, Eratosthenes
b) Contributions of Indian Scholars

Unit – II Pre-Modern

a) Roman scholars: Strabo and Ptolemy.
b) Medieval geography –Arab Geographers: Al-Masudi, Ibn-Batuta

Unit – III Modern Geographical Thought – contributions of the following:

a) German: Alexander Von Humboldt, Carl Ritter, Ratzel
b) France: Vidal de la Blache
c) British: Mackinder

Unit – IV Dichotomies in geography

a) Determinism vs. Possibilism.
b) Systematic vs. Regional
c) Ideographic vs. Nomeothetic

Unit – V Trends –

a) Quantitative Revolution and its Impact,
b) Behaviouralism, Systems Approach, Radicalism, Feminism;
c) Recent change in methods of Geography – RS & GIS

GEOG LAB - EVOLUTION OF GEOGRAPHICAL THOUGHT (C 7)
20 Classes (2hr duration)
MARKS – 30 (2 Credits)

1. Instrumental Surveys
   a) Plane Table – Radiation, Intersection, Traversing, and Resection
   b) Prismatic Compass – Close Traverse and Open Traverse
2. Practical record and Viva.

SEMESTER-IV

CC-8 : HUMAN GEOGRAPHY (C 8)
(Credits: Theory - 04, Practical - 02) - MARKS – 70
Theory: 40 Classes (1hr duration)

Unit – I

a) Definition, Nature and scope of Human Geography.
b) Major Sub-fields; Man and Nature Relationship;
c) Development of Human Geography: Environmental determinism, and Possibilism

Unit – II Space and Society

a) Cultural Realms of the world;
b) Races of mankind and their distribution and characteristics of Major Racial Groups

Unit – III Population

a) World Population distribution: density
b) World Population Growth: Causes and effects
c) Demographic transition theory

Unit – IV Population Distribution

a) Density wise distribution of population in India
b) Trends of urbanization and related problems in India
c) Population Problems of India

Unit – V Settlements

a) Types and Patterns of Rural Settlements
b) Types of Urban Settlements; definition and characteristics
c) Functional classification of Town

GEOG LAB - HUMAN GEOGRAPHY (C 8)
20 Classes (2hr duration)
MARKS – 30 (2 Credits)

1. Graphical representation of Population: Rural & Urban - Bar, Circle and Sphere
2. Population Growth - Trend: Rural & Urban on Frequency graph with its Interpretation
3. Map showing Density of population: - Dot Method, Multiple dot Method
4. Construction of Age-Sex Pyramid
5. Practical record and Viva.

SEMESTER – IV

CC- 9 : STATISTICAL METHODS IN GEOGRAPHY (C 9)
(Credits: Theory - 04, Practical - 02) - MARKS – 70
Theory: 40 Classes (1hr duration)

Unit – I Use of Data in Geography

a) Geographical Data
b) Significance of Statistical Methods in Geography;
c) Sources of Data - primary and secondary
d) Scales of Measurement (Nominal, Ordinal, Interval, Ratio).

Unit – II Tabulation and Descriptive Statistics

a) Frequencies Distribution (Deciles, Quartiles),
b) Cross Tabulation,
c) Central Tendency (Mean, Median and Mode)
d) Dispersion (Standard Deviation, Variance and Coefficient of Variation).

Unit – III Sampling Techniques for Geographical Analysis:

a) Universe and samples;
b) Types of sampling – Purposive, Random, Systematic and Stratified

Unit – IV Theoretical Distribution

a) Normal Distribution and Binomial Distribution

Unit – V Association and Correlation

a) Rank Correlation
b) Product Moment Correlation
c) Simple Regression

GEOG LAB - STATISTICAL METHODS IN GEOGRAPHY (C 9)
20 Classes (2hr duration)
MARKS – 30 (2 Credits)

1. Graphical representation of data – Histogram, frequency Polygon, Frequency Curve and Cumulative frequency curve or Ogive.
2. Exercise on mean, median, mode and quartile with its Graphical representation
3. Exercise on Correlation and Regression
4. Practical record and Viva.

SEMESTER – IV

CC-10 : FIELD WORK AND RESEARCH METHODOLOGY (C 10)
(Credits: Theory - 04, Practical - 02) - MARKS – 70
Theory: 40 Classes (1hr duration)

Unit – I

a) Meaning and objectives of research; research types; significance of research; research process.
b) Role, Value and Ethics of Field-Work
c) Collection of Primary Data

Unit – II

a) Field techniques in Geography – Concept, Method and significance of the following:
   i) PRA
   ii) Focus Group Discussion
b) Method and Presentation of Bibliography

Unit – III Field Techniques

a) Merits, Demerits and Selection of the Appropriate Technique;
   i) Observation (Participant / Non Participant),
   ii) Questionnaires (Open/ Closed / Structured / Non-Structured);
   iii) Interview with Special Focus on Focused Group Discussions;

Unit – IV Use of Field Tools

a) Collection of Material for Physical Surveys -
b) Collection of Material for and Socio-Economic -

Unit – V Designing the Field Report

a) Aims and Objectives,
b) Methodology, Analysis,
c) Interpretation and Writing the Report.

GEOG LAB - FIELD WORK AND RESEARCH METHODOLOGY (C 10)
20 Classes (2hr duration)
MARKS – 30 (2 Credits)

a) Preparation of:
   i) Observation Schedule (Participant / Non Participant),
   ii) Questionnaires (Open/ Closed / Structured / Non-Structured);
   iii) Guide line for Focused Group Discussions;
b) Preparation of Questionnaires for Socio-Economic survey
c) Report and Viva.

Note:

i) Each student will prepare an individual report based on primary and secondary data collected during field work.
ii) The students / teachers can opt to take students in or outside the NCR, depending upon, problem to be studied.
iii) The duration of the field work should not exceed 10 days.
iv) The word count of the report should be about 8000 to 12,000 excluding figures, tables, photographs, maps, references and appendices.
v) One copy of the report on A 4 size paper should be submitted in soft binding.

SEMESTER – V

CC-11 : REGIONAL PLANNING AND DEVELOPMENT
(Credits: Theory - 04, Practical - 02) - MARKS – 70
Theory: 40 Classes (1hr duration)

Unit – I (Regional Planning)
a. Concept and Definition of Region and its Type: Formal, Functional
b. Evolution and types of Regional Planning in India
c. Need for Regional Planning: Special Reference to India

Unit – II (Choice of a Region for Planning)
a. Planning Region: Types and Characteristics of an Ideal Planning Region
b. Delineation of Planning Region and its different methods
c. Concept of Regionalization: Special Reference to India for Planning (Agro Ecological Zones)

Unit – III (Theories and Models for Regional Planning)
a. Growth Pole Model of Perroux
b. Modified Growth Pole Theory of Friedmann
c. Growth Centre Model in Indian Context :
   i. Trickle-down Theory of Hirschman
   ii. Myrdal - Cumulative Causation Theory of Development and Backwardness

Unit – IV
a. Concept of Development and Under Development
b. Regional Disparity in India: Causes and Consequences
c. Indicator of Regional Disparity: (Economic, Social & Environmental)

Unit – V
a. Special Planning/ Policies for Regional and Human Development:
   i. Hill Area Development Planning,
   ii. River Valley Development Planning,
   iii. IRDP
b. Multi Level Planning: Concept of Ashok Mitra
c. Concept and components of Human development

GEOG LAB - REGIONAL PLANNING AND DEVELOPMENT (C 11)
20 Classes (2hr duration)
MARKS – 30 (2 Credits)

1. Measuring Disparity: Rank-Size Rule, Measurement of Regional Disparities-Bhatia's method (Agriculture).
2. Mapping Regional / spatial variation of developmental parameters (Choropleth Method).
3. Calculation of levels of Regional development by scores/ ranks/ weightages (Composite Index).
4. Calculation of Human Development Index (District or Block)
5. Practical record and Viva.

SEMESTER-V

CC-12 : REMOTE SENSING AND GIS
(Credits: Theory - 04, Practical - 02) - MARKS – 70
Theory: 40 Classes (1hr duration)

Unit – I Remote Sensing:
a) Definition and Components, Types and Platforms of Remote Sensing
b) Historical Development of Remote Sensing in India
c) EMR and EMS, Particle theory and Wave theory of radiation
d) Utility of spectral Band

Unit – II Aerial Photography and Satellite Remote Sensing:
a) Principles, Types and Geometry of Aerial Photograph;
b) Concept and principles of 3D vision, and measurement of height of Arial photograph;
c) EMR Interaction with Atmosphere and Earth Surface features: Water, Soil, Vegetation
d) Types of Sensors, Important Satellites and characteristics: Landsat, Iknos, Worldview, Catasat, Oceansat.

Unit – III GIS Data Structures:
a) Fundamentals of GIS: Hardware and software components of GIS
b) Types of GIS data: spatial and Non-spatial, GIS data structure
c) Raster Data Model and Vector Data Model
d) Digitization and Geo-Referencing; Editing and Output; GIS functions (Buffering, Overlay, dissolving)

Unit – IV Digital Image Processing (Digital and Manual) and Data Analysis:
a) Visual image interpretation keys.
b) Pre-processing (Radiometric and Geometric Correction),
c) Image Enhancement and Filtering;
d) Image Classification (Supervised and Un-supervised),

Unit – V Interpretation and Application of Remote Sensing and GIS:
a) Land use/ Land Cover,
b) Water Resources,
c) Forests Monitoring

GEOG LAB - REMOTE SENSING AND GIS (C 12)
20 Classes (2hr duration)
MARKS – 30 (2 Credits)

1. Preparation of 3D vision using stereo cards/ stereoscope
2. Determination of Scale of Aerial Photography
3. Identification of details and mapping from aerial photography
4. Determination of height of object from aerial photography by using parallax Bar
5. Visual interpretation of a Satellite Image from Land-use and Land-cover
6. Preparation of a base map to show features like road, railways, canals, water bodies, coastline etc. and determination of scale
7. Mapping Forest and water resources from Satellite Imagery
8. Digitization, geo-referencing and preparation of base map using GIS Software
9. Practical record and Viva.

SEMESTER–VI

CC-13 : GEOGRAPHY OF INDIA
(Credits: Theory - 04, Practical - 02) - MARKS – 70
Theory: 40 Classes (1hr duration)

Unit – I Physical:
a) Physiographic Divisions,
b) Drainage,
c) Soil and Natural Vegetation,
d) Origin of Monsoon (Theory), Characteristics of Climate, North-east Monsoon, South-west Monsoon, Retreating Monsoon, Climatic regions

Unit – II Population:
a) Density wise distribution of Population
b) Population growth and Factors
c) Problems of population growth

Unit – III Economic:
a) Characteristics of Indian Agriculture
b) Distribution of crops: Rice, Wheat
c) Mineral resources: Types and distribution of Iron Ore and Coal,
d) Power resources: Distribution of Petroleum, Natural Gas

Unit – IV Social:
a) Distribution of population by race,
b) Distribution of population by caste,
c) Distribution of population by religion,
d) Distribution of population by language,
e) Major Tribal groups

Unit – V Regionalisation of India:
a) Physiographic (Spate and R. L. Singh),
b) Socio – cultural (Sopher and A. Ahmed),
c) Economic (Sengupta).

GEOG LAB - GEOGRAPHY OF INDIA (C 13)
20 Classes (2hr duration)
MARKS – 30 (2 Credits)

1. Instrumental Surveys
   a) Dumpy Level
   b) Theodolite
   c) GPS
2. Practical record and Viva.

SEMESTER-VI

CC-14 : DISASTER MANAGEMENT (C 14)
(Credits: Theory - 04, Practical - 02) - MARKS – 70
Theory: 40 Classes (1hr duration)

Unit – I

a) Definition and concept of Hazards and Disasters.
b) Types and classification of Hazards and Disasters: Natural and Man made
c) Concept and measurement of vulnerability and risk, mitigation and preparedness

Unit – II Climatic Disaster:

a) Flood: Causes, Impact, Distribution and Mapping;
b) Cyclone: Causes, Impact, Distribution and Mapping;
c) Drought: Causes, Impact, Distribution and Mapping

Unit – III Geological Disaster:

a) Earthquake: Causes, Impact, Distribution and Mapping;
b) Tsunami: Causes, Impact, Distribution and Mapping;
c) Landslide: Causes, Impact, Distribution and Mapping;

UNIT-IV: Manmade disaster:

a) Manmade disasters: Causes, Impact, Distribution and Mapping
   i) Fire Hazards: House and Forest Fire
   ii) Industrial Hazards
   iii) Nuclear Hazards

Unit – V Disaster Management in India:

a) Disaster Management: Pre Disaster management, During Disaster Management, Post Disaster Management
b) Disaster Management Policies: Important features
c) Community-Based Management

GEOG LAB - DISASTER MANAGEMENT (C 14)
20 Classes (2hr duration)
MARKS – 30 (2 Credits)

1. Topics to be allotted by the department for a specific Case Study – Report & Viva Voce

SKILL ENHANCEMENT COURSE

SEMESTER-IV

SEC-2 : ADVANCED SPATIAL STATISTICAL TECHNIQUES (SEC 2)
(Credits: Theory – 06) - MARKS – 100
Theory: 40 Classes (1hr duration)

Unit – I (Theory)

a) Statistics and Statistical Data, Types of Data- Spatial and non-spatial; indices and ratio.
b) Probability theory, probability density functions with respect to Normal, Binomial and Poisson distributions and their geographical applications.

Unit – II (Theory)

a) Sampling: Sampling plans for spatial and non-spatial data, Types of sampling: Purposive, Random, Systematic, Stratified, sampling distributions; sampling estimates for large and small samples involving means and proportions.

Unit – III (Theory & Exercise)

a) Central Tendency (Mean, Median and Mode)
b) Dispersion (Standard Deviation, Variance and Coefficient of Variation).

Unit – IV (Exercise)

a) Correlation and Regression Analysis: Rank order correlation, linear regression, residuals and standard error of estimate from regression.

Unit – V (Exercise)

Introduction to multi-variate analysis: Multiple correlations and multiple Regressions

DISCIPLINE SPECIFIC ELECTIVE (DSE)

(4 papers including the Project)
DSE-1 to DSE-4 (6 Credits each)

SEMESTER-V

DSE–I : POPULATION GEOGRAPHY

(Credits: Theory - 04, Practical - 02) - MARKS – 70
Theory: 40 Classes (1hr duration)

Unit – I

a) Population Geography: Meaning, nature, scope
b) Sources of Population Data (special reference to India): Census, Vital Statistics & NSS
c) Factors influencing growth and distribution of Population

Unit – II

a) Age-Sex Composition;
b) Rural and Urban Composition;
c) Literacy

Unit – III

a) Determinants of Population Growth: Fertility, Mortality and Migration
b) Measurements of Fertility, Mortality and Migration

Unit – IV Theories of Population Growth

a) Demographic Theory by Blake,
b) Malthus Theory
c) Neo-Malthus

Unit – V Population growth and related problems

a) Ageing of Population and its consequences;
b) Sex Ratio and related demographic problems;
c) Urbanisation and its consequences

DSE-1 (PRACTICAL) – POPULATION GEOGRAPHY

20 Classes (2hr duration)
MARKS – 30 (2 Credits)

1. Population Distribution Maps by Uniform dots, multiple dots, proportionate circles and spheres.
2. Construction of Population Pyramid for Odisha/ India/ other geographical units.
3. Population Projection by different methods - Arithmetic, geometric, exponential, R.G. India method (calculation and graphical display).
4. Record
5. Viva Voce

SEMESTER-V

DSE-2 : HYDROLOGY AND OCEANOGRAPHY
(Credits: Theory - 04, Practical - 02) - MARKS – 70
Theory: 40 Classes (1hr duration)

Unit – I

a) Hydrological Cycle and global Water Balance
b) Human impact on hydrological cycle
c) Hydrological input and output: Precipitation, interception, evaporation, evapo-transpiration, infiltration, ground-water, run off and over land flow

Unit – II

a) Characteristics of river basins, drainage pattern
b) Basin surface run-off, stage discharge curve and Hydrograph
c) Measurement of river discharge

Unit – III

a) Surface configuration of Ocean Floor: Continental Shelf, Continental Slope, Abysal Plain, Mid Oceanic ridges, Oceanic Trench
b) Relief of Atlantic Ocean
c) Relief of Indian Ocean
d) Relief of Pacific Ocean

Unit – IV

a) Ocean water salinity and temperature distribution & determinants
b) Oceanic movements wave, currents & tides.
c) Circulation of Atlantic, Indian

Unit – V

a) Coral reef & atolls
b) Theories of origin of coral reef & atolls.
c) Marine deposits and its Classification
d) Marine resources

DSE-2 : PRACTICAL : HYDROLOGY AND OCEANOGRAPHY
20 Classes (2hr duration)
MARKS – 30 (2 Credits)

1. Estimation of total rainfall over an watershed/ geographical unit
2. Runoff estimation in an open channel
3. Construction of hydrographs
4. Probability estimation of river discharge of certain value in a particular time/month/period.
5. Measurement of catchment basin area and stream length by graphical method/ planimeter and rotameter
6. Record
7. Viva Voce

SEMESTER-VI

DSE-3 : URBAN GEOGRAPHY
(Credits: Theory - 04, Practical - 02) - MARKS – 70
Theory: 40 Classes (1hr duration)

UNIT-I

a) Nature and scope of Urban Geography
b) Origin and growth and factors of urban settlement.
c) Pattern of Urbanisation (World and India)

UNIT-II

a) Urbanisation pattern in developed countries – United Kingdom, Japan
b) Urbanisation pattern in developing countries – India, Bangladesh
c) Problems and Prospects associated with Urbanisation

UNIT-III

a) Functional classification of cities: Quantitative and Qualitative Methods
b) Concept of the following urban elements.
   i) Rural-urban fringe
   ii) Urban Hierarchy
   iii) Conurbation
   iv) Metropolis
   v) Megalopolis

UNIT-IV

a) Christaller's Central Place Theory
b) Urban issues:
   i) Policies and Problems of housing,
   ii) Problems of slums,
   iii) Civic amenities (water and transport).

UNIT-V

Case studies of Delhi, Mumbai Kolkatta and Chandigarh with reference to urban issues.

DSE-3 (PRACTICAL) -URBAN GEOGRAPHY
20 Classes (2hr duration)
MARKS – 30 (2 Credits)

1. Maps showing Urban growth (Uniform and multiple dot method)
   a) Growth of urban population
   b) Growth of Urban centers
2. Urbanisation as a bivariate relationship with the following indicates:
   a) Population, Occupation, Literacy, etc.
3. Practical record and Viva.

SEMESTER-VI

DSE – 4 : PROJECT REPORT
(Credits: 06) - MARKS – 100

Introducing Research Component in Under-Graduate Courses

Project work/Dissertation is considered as a special course involving application of knowledge in solving / analyzing /exploring a real life situation / difficult problem. A Project/Dissertation work would be of 6 credits. A Project/Dissertation work may be given in lieu of a discipline specific elective paper.

1. Selection of a problem for project work
2. Literature Review
3. Objectives
4. Methodology
5. Data collection
6. Statistical analysis and spatial analysis
7. Finding and suggestions

GENERIC ELECTIVE PAPERS

SEMESTER-I & III

GE-1 : REGIONAL DEVELOPMENT
(Credits: Theory-04, Practicals-02)
Theory: 40 Classes (1hr duration)

Unit – I: Historical development of Regional Planning
a) Meaning, Scope Concept and content of Regional Planning
b) Regional Planning in developed and developing world
c) Regional Planning in India

Unit – II:
a) Definition of Region, Evolution,
b) Types and Need of Regional planning: Formal, Functional, and Planning Regions
c) Regional Development.

Unit – III : Regional Imbalances and Problems
a) Regional Imbalances in India,
b) Regional disparity in India
c) Indicators and methods of study of disparities

Unit –IV : Planning Regions
a) Concepts of Planning Region
b) Methods of delineation of Planning Region
c) Regionalization of India for Planning (Agro Ecological Zones)

Unit –V : Spatial Area Programms
a) Planning for Backward Regions
b) DPAP (The Drought Prone Area Programme)
c) IRDP
d) River Valley development Programms/ National Capital Region.

GE LAB – REGIONAL DEVELOPMENT (GE-I / III)
20 Classes (2hr duration)
MARKS – 30 (2 Credits)

2. Graphical Representation of Regional development (Bar)
3. Identification of Regional disparity: Composite Index Method and Choropleath Map)
4. Nearest Neighbourhood Analysis
5. Practical record and Viva.

SEMESTER-II & IV

GE-2 : INDUSTRIAL GEOGRAPHY
(Credits: Theory-04, Practicals-02) – Marks - 70
Theory: 40 Classes (1hr duration)

Unit - I

a. Meaning, Nature and Scope of Industrial Geography
b. Delimitation and Characteristics of world industrial Region USA, Germany and Japan

Unit – II - Types and Geographical Characteristics of Industry

a. Classification of Industries
b. Factors affecting location of Industry
b. Iron & Steel Industry – Canada & India
c. Cotton Textile Industry – USA & India

Unit – III

a. Delimitation & characteristics of Industrial region of India
b. National Capital Region
c. Mumbai-Pune Industrial Region
d. Bangaluru-Tamilnadu Industrial Region

Unit – IV - Industrial Location Theory

a. Weber
b. Smith
c. August Losch

Unit – IV

a. Industrial Policies of India.
b. Industrial decentralization
c. Impact of Industrialization in India: Social, economic and Environmental

GE LAB – INDUSTRIAL GEOGRAPHY (GE 2/4)
20 Classes (2hr duration)
MARKS – 30 (2 Credits)

1. Wheel Diagram
2. Bar Diagram
3. Traffic Flow
4. Practical record and Viva.