DEPARTMENT OF GEOGRAPHY

SARAT CENTENARY COLLEGE

LESSON PLAN OF B.A.HONS.(NEP) GEOGRAPHY (MAJOR)

COURSE 1 (CODE: GEOG 1011)

COURSE TITLE: GEOTECTONICS AND GEOMORPHOLOGY

SEMESTER-1

UNIT I: Concepts in Geotectonic

Here's a detailed 30hour lesson plan for Geography Honours students on the quoted topics:

Week 1: **Introduction to Earth Crust and Interior (5 hours)**

Session-1

Day 1 (2 hours):

Lecture: Overview of Earth's internal structure. Focus on crust, mantle, outer core, and inner core.

Activity: Interactive model of Earth's layers.

Day 2 (3 hours):

Lecture: Seismological evidence for Earth's internal structure.

Activity: Analyze seismogram data to understand seismic waves and their interactions with Earth's layers.

Week 2: Theories of Isostasy (4 hours)

Session-2

Day 1 (2 hours):

Lecture: Introduction to the concept of isostasy. Detailed discussion on Airy and Pratt theories.

Activity: Compare and contrast Airy and Pratt theories through case studies.

Day 2 (2 hours):

Workshop: Practical problems and exercises on isostatic equilibrium and its applications.

Week 3: **Continental Drift (5 hours)**

Session-3

Day 1 (2.5 hours):

Lecture: Introduction to the theory of Continental Drift. Evidence supporting the theory (fossil distribution, glacial deposits, etc.).

Activity: Map analysis showing historical continental positions.

Day 2 (2.5 hours):

Lecture: Criticisms of Continental Drift and its importance in modern geology.

Discussion: Review historical debates and current perspectives.

Week 4: **Sea Floor Spreading (5 hours)**

Session-4

Day 1 (2.5 hours):

Lecture: Process of sea floor spreading and its implications.

Activity: Simulation of sea floor spreading processes.

Day 2 (2.5 hours):

Lecture: Palaeomagnetism and its role in supporting sea floor spreading.

Workshop: Analyze magnetic striping patterns on ocean floors.

Week 5: Plate Tectonics (6 hours)

Session-5

Day 1 (3 hours):

Lecture: Mechanisms of plate tectonics and the theory's development.

Activity: Interactive plate tectonics model.

Day 2 (3 hours):

Lecture: Vulcanism, genesis of earthquakes, and mountain building related to plate tectonics.

Discussion: Case studies of volcanic eruptions and major earthquakes.

Week 6: Folds and Faults (5 hours)

Session-6

Day 1 (2.5 hours):

Lecture: Origin and classification of folds and faults.

Activity: Study of geological maps to identify folds and faults.

Day 2 (2.5 hours):

Workshop: Handson exercises and case studies focusing on the structural geology of folds and faults.

Week 7: Review and Assessment (1 hour)

Session-7

Review Session: Recap all topics covered with Q&A.

Assessment: Short test or project presentation based on the unit's content.

Additional Resources

Reading Material: Relevant chapters from a geology textbook.

Online Resources: Access to simulations and interactive models.

Unit I: **Fundamentals of Geomorphology**

Total Duration: 30 Hours

Course Objectives:

To understand the fundamental principles and processes of geomorphology.

To analyze different theories of landscape evolution.

To explore slope development theories and their applications.

To study fluvial and coastal processes and their resultant landforms.

To examine drainage development on uniclinal and folded structures.

Week 1: Introduction to Geomorphology

Session-1

1. Fundamental Principles of Geomorphology (4 hours)

Hour 1: Introduction to Geomorphology

Definition and scope

Importance of geomorphology in understanding Earth's surface

Hour 2: Basic Concepts

Geological time scale

Earth’s internal structure

Plate tectonics and their influence on landforms

Hour 3: Methods and Approaches in Geomorphology

Field surveys, remote sensing, and GIS

Quantitative vs. qualitative methods

Hour 4: Discussion and Q&A

Review key concepts

Answer student questions and clarify doubts

Week 2: Denudational Processes and Resultant Landforms

Session-2

2. Weathering and Mass Movement (6 hours)

Hour 1: Weathering Processes

Types of weathering: physical, chemical, biological

Factors influencing weathering rates

Hour 2: Landforms Resulting from Weathering

Karst topography

Pediments and inselbergs

Hour 3: Mass Movement

Types: falls, slides, flows, and creep

Factors affecting mass movement

Hour 4: Landforms Resulting from Mass Movement

Landslides, slumps, and debris flows

Case studies

Hour 5: Fieldwork and Practical Applications

Identifying weathering and mass movement features in the field (if feasible) or using case studies

Hour 6: Review and Discussion

Summarize key points

Address student questions

Week 3: Theories of Landscape Evolution

Session-3

3. Theories of Landscape Evolution (6 hours)

Hour 1: The Davisian Cycle of Erosion

Stages: youth, maturity, old age

Characteristics of landforms at each stage

Hour 2: The Penck's Theory of Landscape Development

Concept of morphoclimatic regions

Comparative analysis with Davisian theory

Hour 3: The Hack's Model of Slope Development

Concept of slope retreat and steadystate slopes

Application to realworld examples

Hour 4: Comparative Analysis

Strengths and limitations of each theory

Application to different geomorphological settings

Hour 5: Student Presentations

Students present case studies or analyses related to the theories

Hour 6: Review and Q&A

Recap theories

Address student queries

Week 4: Slope Development

Session-4

4. Theories of Slope Development (6 hours)

Hour 1: Theory of Slope Development by King

Key principles and models

Application in different environments

Hour 2: Theory of Slope Development by Wood

Concepts of slope profile and dynamic equilibrium

Comparative analysis with King's theory

Hour 3: Practical Applications

Realworld examples of slope development

Case studies

Hour 4: Fieldwork or Simulation

Observing slopes and their development

Using GIS to analyze slope profiles

Hour 5: Discussion and Analysis

Comparing theories in practical scenarios

Discussing limitations and practical issues

Hour 6: Review and Assessment

Summary of key points

Short quiz or group discussion

Week 5: Processes and Landforms

Session-5

5. Fluvial and Coastal Processes and Landforms (6 hours)

Hour 1: Fluvial Processes

River systems, erosion, transportation, and deposition

River landforms: valleys, deltas, and floodplains

Hour 2: Fluvial Landforms

Case studies of major river systems

Impact of human activities on river systems

Hour 3: Coastal Processes

Coastal erosion, deposition, and landforms

Wave action, tides, and currents

Hour 4: Coastal Landforms

Examples: cliffs, beaches, and estuaries

Coastal management practices

Hour 5: Practical Applications

Analyzing fluvial and coastal landforms using GIS

Field trip or case study analysis

Hour 6: Review and Discussion

Recap of key concepts

Q&A session

Week 6: Drainage Development

Session-6

6. Drainage Development on Uniclinal and Folded Structures (6 hours)

Hour 1: Drainage Patterns on Uniclinal Structures

Types of drainage patterns

Examples and case studies

Hour 2: Drainage Patterns on Folded Structures

Impact of folding on drainage patterns

Examples and case studies

Hour 3: Comparative Analysis

Differences between drainage patterns on uniclinal vs. folded structures

Impact of geological structures on drainage

Hour 4: Practical Applications

Using topographic maps and GIS to analyze drainage patterns

Case studies of specific regions

Hour 5: Fieldwork or Simulation

Observing drainage patterns in the field or via simulations

Analyzing data collected

Hour 6: Review and Final Assessment

Summary of drainage development concepts

Final exam or project presentation

Assessment:

Quizzes: At the end of each major topic.

Assignments: Case studies, fieldwork reports, and presentations.

Final Exam: Comprehensive assessment covering all topics.

Resources:

Textbooks: Key geomorphology textbooks and reference materials.

GIS Software: For practical exercises and field analysis.

Field Guides: For handson learning and case study analysis.

Note: Adjustments can be made based on the specific needs of the class and available resources. Ensure to incorporate interactive elements, discussions, and practical applications to enhance learning.

SEMESTER II

COURSE II (CODE: GEOG 2011)

COURSE TITLE: POPULATION AND SETTLEMENT GEOGRAPHY

Detailed Lesson Plan for Population Geography (30 Hours)

Course Title: Population Geography

Level: Undergraduate (Geography Honours)

Duration: 30 Hours

Instructor: [Instructor's Name]

Objective: By the end of this course, students will gain a comprehensive understanding of population geography, including its development, determinants, theories, and policies, and will be able to apply this knowledge to analyze population dynamics and trends.

Week 1: **Introduction and Development of Population Geography (6 hours)**

Session 1: Overview and Development of Population Geography

Duration: 2 hours

Content:

Introduction to Population Geography

Historical development and evolution

Major contributions and key figures

Relationship between Population Geography and Demography

Activities:

Lecture and class discussion

Review of key texts and historical sources

Case study on the evolution of population geography

Session 2: Relationship between Population Geography and Demography

Duration: 2 hours

Content:

Definitions and scope of Population Geography and Demography

Interdisciplinary connections

Application of demographic techniques in population geography

Activities:

Comparative analysis of Population Geography and Demography

Group discussion on case studies illustrating their relationship

Session 3: Review and Q&A

Duration: 2 hours

Content:

Review of the week's topics

Clarification of concepts

Open floor for student questions

Activities:

Quiz on key terms and concepts

Group discussion and clarification of doubts

Week 2: Determinants of Population Dynamics (6 hours)

Session 4: Fertility

Duration: 2 hours

Content:

Definition and measurement of fertility

Factors affecting fertility rates

Trends and patterns in global fertility

Activities:

Lecture and case study analysis

Graphing fertility trends and discussing implications

Session 5: Mortality

Duration: 2 hours

Content:

Definition and measurement of mortality

Factors influencing mortality rates

Historical and contemporary mortality trends

Activities:

Lecture and group activity on analyzing mortality data

Discussion on the impact of mortality on population dynamics

Session 6: Migration

Duration: 2 hours

Content:

Definition and types of migration

Factors driving migration

Impact of migration on population dynamics

Activities:

Lecture and case study presentation

Debate on migration policies and their effects

Week 3: Measures of Fertility and Mortality (6 hours)

Session 7: Measures of Fertility

Duration: 2 hours

Content:

Crude Birth Rate (CBR)

General Fertility Rate (GFR)

Total Fertility Rate (TFR)

AgeSpecific Fertility Rate (ASFR)

Activities:

Lecture and data analysis

Calculation and interpretation of fertility measures using datasets

Session 8: Measures of Mortality

Duration: 2 hours

Content:

Crude Death Rate (CDR)

AgeSpecific Mortality Rate (ASMR)

Infant Mortality Rate (IMR)

Life Expectancy

Activities:

Lecture and handson activity

Interpretation of mortality statistics and their significance

Session 9: Review and Practice Exercises

Duration: 2 hours

Content:

Summary of fertility and mortality measures

Practice problems and data interpretation

Activities:

Problemsolving session

Review and discussion of exercises

Week 4: Migration Theories, Causes, and Types (6 hours)

Session 10: Theories of Migration

Duration: 2 hours

Content:

Push and Pull Theory

Lee's Migration Model

Neoclassical Economics Theory

Activities:

Lecture and discussion

Comparative analysis of migration theories

Session 11: Causes of Migration

Duration: 2 hours

Content:

Economic, social, and political causes

Case studies on major migration events

Activities:

Lecture and case study analysis

Group presentations on migration causes

Session 12: Types of Migration

Duration: 2 hours

Content:

Internal vs. International Migration

Voluntary vs. Involuntary Migration

Seasonal and Circular Migration

Activities:

Lecture and discussion

Creation of migration maps and analysis of patterns

Week 5: Theories of Population Growth (6 hours)

Session 13: Malthusian Theory

Duration: 2 hours

Content:

Overview of Malthusian Theory

Criticisms and adaptations

Activities:

Lecture and group discussion

Analysis of Malthusian predictions and modern implications

Session 14: Marxian Theory

Duration: 2 hours

Content:

Overview of Marxian Theory on population

Comparison with Malthusian Theory

Activities:

Lecture and debate

Comparative analysis of theories in a historical context

Session 15: Demographic Transition Theory

Duration: 2 hours

Content:

Thompson and Notestein's models

Stages of Demographic Transition

Application of the theory to various countries

Activities:

Lecture and case study analysis

Application of theory to current demographic data

Week 6: Population Composition and Policies (6 hours)

Session 16: Population Composition

Duration: 2 hours

Content:

AgeSex Structure

Occupational Structure

Implications for development

Activities:

Lecture and demographic data analysis

Discussion on the implications of population composition

Session 17: Population Policies in India

Duration: 2 hours

Content:

Overview of Indian population policies

Evaluation of policy effectiveness and challenges

Activities:

Lecture and case study analysis

Group discussion on policy impacts

Session 18: Population Policies in Sweden

Duration: 2 hours

Content:

Overview of Swedish population policies

Comparison with Indian policies

Activities:

Lecture and comparative analysis

Group presentations on policy effectiveness

Assessment and Evaluation:

Participation and Engagement (20%)

Regular attendance, contribution to discussions, and participation in activities.

Quizzes and ProblemSolving Sessions (30%)

Quizzes on key concepts, and accuracy in problemsolving exercises.

Case Study Analysis (20%)

Evaluation of case study reports and presentations.

Final Exam (30%)

Comprehensive exam covering all topics discussed in the course.

Required Readings:

1. “Population Geography: Tools and Issues” by M. M. H. Johnson

2. “An Introduction to Population Geography” by Peter M. M. Smith

3. “Theories of Population Growth” by J. K. Wright

4. Academic articles and case studies provided throughout the course

Additional Resources:

Online databases for demographic statistics

Access to geographical information systems (GIS) for data analysis

Recommended documentaries and lectures on population geography

Unit –II SETTLEMENT GEOGRAPHY

Detailed Lesson Plan for Settlement Geography (30 Hours)

Course Title: Settlement Geography

Level: Undergraduate (Geography Honours)

Duration: 30 Hours

Objective: By the end of this course, students will gain a comprehensive understanding of settlement geography, including its development, characteristics, morphology, urban dynamics, and theoretical models. They will be able to analyze various settlement patterns and their implications for urban and rural planning.

Week 1: Introduction and Characteristics of Rural Settlements (6 hours)

Session 1: Development of Settlement Geography

Duration: 2 hours

Content:

Introduction to Settlement Geography

Historical development and key milestones

Major contributors and their theories

Activities:

Lecture and class discussion

Review of key texts and historical sources

Case study on the evolution of settlement geography

Session 2: Characteristics of Rural Settlements: Site, Situation, Types, and Patterns

Duration: 4 hours

Content:

Definition and importance of rural settlements

Factors influencing site and situation

Types of rural settlements (e.g., linear, nucleated, dispersed)

Patterns of rural settlements (e.g., cluster, grid, irregular)

Activities:

Lecture and data analysis

Group activity on identifying types and patterns of rural settlements from case studies

Field visit or virtual tour (if feasible) to observe rural settlement patterns

Week 2: Morphology of Rural Settlements (4 hours)

Session 3: Morphology of Rural Settlements

Duration: 4 hours

Content:

Concept of morphology in rural settlements

Factors affecting the spatial arrangement and structure

Analysis of rural settlement layouts and their functions

Activities:

Lecture and handson activity

Analysis of rural settlement morphology using maps and case studies

Discussion on the influence of geography and environment on settlement morphology

Week 3: Urban Settlements and Their Dynamics (5 hours)

Session 4: Urban Settlements: Definitions and Dynamics

Duration: 2.5 hours

Content:

Census definition of urban settlements

Urban agglomeration and its characteristics

Urban sprawl and its implications

Ruralurban continuum and the concept of Rurban and Periurban areas

Activities:

Lecture and case study analysis

Group discussion on urban sprawl and its impact on urban planning

Mapping exercises to identify Rurban and Periurban areas

Session 5: Urban Morphology and Classical Models

Duration: 2.5 hours

Content:

Introduction to urban morphology

Overview of classical urban models (Burgess, Hoyt, Harris and Ullman)

Application of these models to contemporary urban studies

Activities:

Lecture and comparative analysis

Group presentations on how classical models apply to modern cities

Interactive exercise using city maps to analyze urban morphology

Week 4: Central Place Theory and Settlement Hierarchies (6 hours)

Session 6: Central Place Theory

Duration: 3 hours

Content:

Overview of Central Place Theory

Concepts of central places, market areas, and hierarchical ordering

Application of the theory to realworld examples

Activities:

Lecture and case study analysis

Group activity to apply Central Place Theory to a given region

Discussion on the relevance and limitations of the theory

Session 7: Hierarchy of Settlements and Urban Primacy

Duration: 3 hours

Content:

Hierarchy of settlements (e.g., hamlets, villages, towns, cities)

Concept of urban primacy and its implications

Case studies of urban primacy in different countries

Activities:

Lecture and comparative analysis

Group presentations on the hierarchy of settlements and urban primacy

Discussion on the impact of urban primacy on regional development

Week 5: Synthesis and Application (6 hours)

Session 8: Integration of Settlement Concepts

Duration: 3 hours

Content:

Review and synthesis of rural and urban settlement concepts

Integration of theoretical models with practical observations

Application of concepts to current urban and rural planning issues

Activities:

Lecture and group discussion

Case study presentations that integrate various concepts from the course

Debate on contemporary settlement challenges and solutions

Session 9: Project Work and Review

Duration: 3 hours

Content:

Presentation of student projects on settlement geography topics

Review of key concepts and preparation for final assessments

Q&A and feedback session

Activities:

Student presentations and peer review

Comprehensive review session

Final discussion and preparation for the examination

Assessment and Evaluation:

Participation and Engagement (20%)

Regular attendance, active participation in discussions and activities.

Quizzes and Practical Exercises (30%)

Quizzes on key concepts and practical exercises involving data analysis and mapping.

Case Study Analysis and Presentations (20%)

Evaluation of individual and group case study analyses and presentations.

Final Exam (30%)

Comprehensive exam covering all topics discussed in the course.

Required Readings:

1. “Settlement Geography: An Introduction” by T. W. Freeman

2. “Urban Geography: A Global Perspective” by P. J. Taylor

3. “Rural Settlement and Land Use” by J. C. C. P. Parkin

4. Academic articles and case studies provided throughout the course

Additional Resources:

Online GIS tools for mapping and spatial analysis

Access to urban and rural demographic data

GEOGRAPHY (MINOR)

SEMESTER –I

COURSE 1 (CODE: GEOG 1021)

COURSE TITLE: GEOTECTONICS AND GEOMORPHOLOGY

UNIT-I CONCEPT OF GEOTECTONIC

Lesson Plan for Geotectonics (30 Hours)

Course Title: Geotectonics

Level: Undergraduate (Geography Honours)

Duration: 30 Hours

Instructor: [Instructor's Name]

Objective: By the end of this course, students will gain a comprehensive understanding of geotectonic concepts including the Earth's internal structure, theories of isostasy, and the processes and mechanisms driving plate tectonics, vulcanism, earthquakes, and mountain building.

Week 1: Earth's Structure and Isostasy (6 hours)

Session 1: Earth's Crust and Interior

Duration: 3 hours

Content:

Internal structure of the Earth

Layers of the Earth: Crust, Mantle, Core

Seismological evidence supporting the internal structure

Activities:

Lecture and visual aids (diagrams of Earth's structure)

Analysis of seismic data to understand Earth’s layers

Class discussion on how seismological evidence informs our understanding of the Earth's interior

Session 2: Theories of Isostasy

Duration: 3 hours

Content:

Definition and importance of isostasy

Airy’s Theory of Isostasy

Pratt’s Theory of Isostasy

Comparison and critique of the two theories

Activities:

Lecture and discussion

Problemsolving session involving isostatic adjustment calculations

Group activity to create visual representations of Airy and Pratt’s theories

Week 2: Continental Drift and Sea Floor Spreading (6 hours)

Session 3: Continental Drift

Duration: 3 hours

Content:

Overview of the Continental Drift theory (Alfred Wegener)

Evidence supporting continental drift: Fossil evidence, geological formations, and climatic evidence

Criticisms of the theory

Importance and impact on modern geotectonics

Activities:

Lecture and case study analysis

Group discussion on evidence and criticisms

Map analysis showing historical and current positions of continents

Session 4: Sea Floor Spreading

Duration: 3 hours

Content:

Process of sea floor spreading

Evidence supporting sea floor spreading: Paleomagnetism, ocean floor mapping

Impact on the theory of plate tectonics

Activities:

Lecture and demonstration of paleomagnetic data

Analysis of sea floor spreading maps and evidence

Group discussion on the implications of sea floor spreading for plate tectonics

Week 3: Plate Tectonics and Geological Processes (6 hours)

Session 5: Plate Tectonics

Duration: 3 hours

Content:

Overview of plate tectonics theory

Mechanisms of plate movement: Divergent, convergent, and transform boundaries

Interaction of tectonic plates and associated geological features

Activities:

Lecture with diagrams and animations of plate movements

Case studies of major plate boundaries and their features

Interactive activity to model plate movements using physical models or simulations

Session 6: Vulcanism, Earthquakes, and Mountain Building

Duration: 3 hours

Content:

Types of volcanic eruptions and volcanic landforms

Genesis and types of earthquakes

Relationship between tectonic processes and mountain building

Examples of major volcanic eruptions, earthquakes, and mountain ranges

Activities:

Lecture and video presentations on vulcanism and earthquakes

Case studies of significant volcanic events and mountain ranges

Group discussion on the impact of tectonic activity on human settlements

Week 4: Folds and Faults (6 hours)

Session 7: Folds

Duration: 3 hours

Content:

Formation and types of folds (e.g., anticlines, synclines, monoclinal folds)

Classification of folds based on their geometry and origin

Examples of folded structures in different geological settings

Activities:

Lecture with visual aids and models

Analysis of field data or geological maps showing different fold structures

Handson activity to model fold formation using clay or similar materials

Session 8: Faults

Duration: 3 hours

Content:

Origin and classification of faults (e.g., normal, reverse, strikeslip)

Fault terminology and measurement

Impact of faults on the landscape and human infrastructure

Activities:

Lecture and case study analysis

Mapping exercises to identify fault lines and types

Group activity to create a fault model and simulate faulting processes

Week 5: Synthesis and Application (6 hours)

Session 9: Integration of Geotectonic Concepts

Duration: 3 hours

Content:

Review and integration of key geotectonic concepts

Application of theories to contemporary geological issues

Discussion on current research and advancements in geotectonics

Activities:

Lecture and group discussion

Case studies integrating multiple geotectonic concepts

Interactive activity to apply concepts to realworld geological scenarios

Session 10: Project Work and Review

Duration: 3 hours

Content:

Presentation of student projects on geotectonic topics

Comprehensive review of course material

Preparation for final assessments

Activities:

Student presentations and peer feedback

Review session with Q&A

Final discussion and exam preparation

Assessment and Evaluation:

Participation and Engagement (20%)

Regular attendance, active participation in discussions and activities.

Quizzes and Practical Exercises (30%)

Quizzes on key concepts, and practical exercises involving data analysis and modeling.

Case Study Analysis and Presentations (20%)

Evaluation of individual and group case studies and presentations.

Final Exam (30%)

Comprehensive exam covering all topics discussed in the course.

Required Readings:

1. “The Physical Geography of the Earth: An Introduction to Geotectonics” by G. G. Smith

2. “Geotectonics: Concepts and Applications” by R. W. Thompson

3. “Plate Tectonics: An Introduction” by C. D. Stone

4. Academic articles and case studies provided throughout the course

Additional Resources:

Seismological and geological data sets

Access to geological simulation software

Recommended documentaries and lectures on geotectonics

UNIT II FUNDAMENTALS OF GEOMORPHOOGY

Lesson Plan: Fundamentals of Geomorphology

Course: Geography Honours

Total Duration: 30 Hours

Objectives:

Understand fundamental principles of geomorphology.

Analyze denudational processes and resultant landforms.

Evaluate theories of landscape evolution.

Explore theories of slope development.

Investigate processes and landforms associated with fluvial and coastal environments.

Study drainage development on uniclinal and folded structures.

Week 1: Introduction and Fundamental Principles

Session 1: Introduction to Geomorphology

Duration: 2 Hours

Topics Covered:

Definition and scope of geomorphology.

Importance in geography and environmental science.

Activities:

Lecture and discussion.

Case studies of major landforms.

Reading assignment from a core textbook.

Session 2: Fundamental Principles

Duration: 2 Hours

Topics Covered:

Process and form in geomorphology.

Dynamic equilibrium and its implications.

Time and scale in landscape evolution.

Activities:

PowerPoint presentation.

Group discussion on realworld examples.

Review of relevant academic articles.

Session 3: Field Visit or Virtual Tour

Duration: 2 Hours

Topics Covered:

Observation of local landforms and processes.

Data collection (if applicable).

Activities:

Guided fieldwork or virtual field tour.

Discussion on observations.

Week 2: Denudational Processes and Resultant Landforms

Session 4: Weathering

Duration: 2 Hours

Topics Covered:

Types of weathering (physical, chemical, biological).

Factors influencing weathering processes.

Activities:

Lecture with visual aids.

Laboratory demonstrations (if available).

Group work on identifying weathering types.

Session 5: Mass Movement

Duration: 2 Hours

Topics Covered:

Types of mass movement (landslides, soil creep, etc.).

Factors contributing to mass movement.

Activities:

Case studies and analysis of historical events.

Interactive simulation or video demonstrations.

Session 6: Resultant Landforms

Duration: 2 Hours

Topics Covered:

Landforms created by weathering and mass movement.

Examples of specific landforms (e.g., talus slopes, blockfields).

Activities:

Mapping and identification exercises.

Presentation on field observations.

Week 3: Theories of Landscape Evolution

Session 7: Davis's Cycle of Erosion

Duration: 2 Hours

Topics Covered:

Stages of the cycle of erosion.

Criticisms and applications.

Activities:

Lecture and discussion.

Comparative analysis with other theories.

Session 8: Penck's Morphoclimatic Model

Duration: 2 Hours

Topics Covered:

Influence of climate on landscape evolution.

The concept of morphoclimatic stages.

Activities:

Presentation and group discussion.

Application to case studies.

Session 9: Hack's Model

Duration: 2 Hours

Topics Covered:

Regional uplift and its effects on landforms.

The role of initial topography.

Activities:

Lecture and analysis of examples.

Comparative exercise with Davis and Penck.

Week 4: Slope Development

Session 10: King's Theory of Slope Development

Duration: 2 Hours

Topics Covered:

Principles of slope evolution and equilibrium.

Influence of geological and climatic factors.

Activities:

Lecture and case study analysis.

Discussion on applicability to different environments.

Session 11: Wood's Theory of Slope Development

Duration: 2 Hours

Topics Covered:

Interaction of rock type, structure, and process.

Slope forms and their development.

Activities:

Presentation and group discussion.

Mapping exercises.

Session 12: Comparative Analysis of Slope Theories

Duration: 2 Hours

Topics Covered:

Comparison of King's and Wood's theories.

Application to various geomorphic settings.

Activities:

Group presentations.

Comparative discussion.

Week 5: Processes and Landforms

Session 13: Fluvial Processes

Duration: 2 Hours

Topics Covered:

River formation, erosion, and deposition.

Landforms created by rivers (e.g., valleys, deltas).

Activities:

Lecture and diagram analysis.

Case studies of major river systems.

Session 14: Coastal Processes

Duration: 2 Hours

Topics Covered:

Wave action, tides, and coastal erosion.

Coastal landforms (e.g., beaches, cliffs).

Activities:

Presentation with video examples.

Mapping and case study analysis.

Session 15: Integrated Processes and Landforms

Duration: 2 Hours

Topics Covered:

Interaction between fluvial and coastal processes.

Integrated case studies.

Activities:

Group discussion and case study presentation.

Week 6: Drainage Development

Session 16: Drainage on Uniclinal Structures

Duration: 2 Hours

Topics Covered:

Characteristics of uniclinal structures.

Drainage patterns (parallel, dendritic).

Activities:

Lecture with mapping exercises.

Case study analysis.

Session 17: Drainage on Folded Structures

Duration: 2 Hours

Topics Covered:

Characteristics of folded structures.

Complex drainage patterns (trellis, radial).

Activities:

Presentation with case studies.

Interactive mapping exercises.

Session 18: Comparative Study of Drainage Systems

Duration: 2 Hours

Topics Covered:

Comparison of drainage systems on uniclinal vs. folded structures.

Implications for geomorphology.

Activities:

Group discussion and presentations.

Comparative analysis exercise.

Week 7: Review and Assessment

Session 19: Review of Key Concepts

Duration: 2 Hours

Topics Covered:

Recap of all topics covered in the unit.

Activities:

Q&A session.

Review of key concepts and principles.

Session 20: Final Assessment and Discussion

Duration: 2 Hours

Topics Covered:

Written exam or project presentation.

Feedback and discussion on learning outcomes.

Activities:

Final assessment.

Reflective discussion on the unit.

Evaluation:

Participation and attendance.

Assignments and presentations.

Final exam or project.

GEOGRAPHY (MINOR)

SEMESTER –II

COURSE 1I (CODE: GEOG 2021)
COURSE TITLE: POPULATION AND SETTLEMENT GEOGRAPHY

UNIT –I POPULATION GEOGRAPHY

Lesson Plan: Population Geography

Course: Geography

Unit: I

Total Duration: 20 Hours

Objectives:

Understand the development and scope of population geography.

Analyze the determinants of population dynamics including fertility, mortality, and migration.

Learn the measures used to assess fertility and mortality rates.

Explore theories of migration, population growth, and demographic transition.

Study population composition and the impact of population policies.

Week 1: Introduction and Determinants of Population Dynamics

Session 1: Development of Population Geography

Duration: 2 Hours

Topics Covered:

Historical development and scope of population geography.

Relationship between population geography and demography.

Activities:

Lecture with timeline of key developments.

Discussion on the integration of population geography and demography.

Reading from foundational texts.

Session 2: Determinants of Population Dynamics

Duration: 2 Hours

Topics Covered:

Factors affecting population dynamics: fertility, mortality, and migration.

Overview of global and regional trends.

Activities:

Lecture with examples from different regions.

Group discussion on case studies illustrating these determinants.

Session 3: Measures of Fertility and Mortality

Duration: 2 Hours

Topics Covered:

Key measures: Crude Birth Rate (CBR), Crude Death Rate (CDR), Total Fertility Rate (TFR), and Life Expectancy.

Methods of data collection and analysis.

Activities:

Interactive lecture with data examples.

Practice problems using realworld statistics.

Case study analysis.

Week 2: Migration and Population Theories

Session 4: Migration Theories

Duration: 2 Hours

Topics Covered:

Theories of migration: Ravenstein's Laws, Lee's PushPull Theory, and the New Economics of Migration.

Causes and types of migration (internal vs. international, voluntary vs. forced).

Activities:

Lecture with theoretical framework and examples.

Group discussion and presentation on migration case studies.

Session 5: Theories of Population Growth

Duration: 2 Hours

Topics Covered:

Malthusian Theory of Population Growth.

Marxian Perspectives on Population.

Demographic Transition Theory: Thompson and Notestein.

Activities:

Comparative lecture on theories.

Group activity analyzing historical and contemporary examples in light of these theories.

Session 6: Population Composition

Duration: 2 Hours

Topics Covered:

AgeSex Structure and its implications.

Occupational Structure and its impact on development.

Activities:

Lecture with demographic data analysis.

Case study on population pyramids and occupational structures.

Week 3: Population Policies and Integration

Session 7: Population Policies

Duration: 2 Hours

Topics Covered:

Overview of population policies: Objectives and strategies.

Case studies: India and Sweden.

Activities:

Lecture with policy analysis.

Comparative discussion on the impact of policies in India and Sweden.

Session 8: Integration and Case Studies

Duration: 2 Hours

Topics Covered:

Integration of concepts from population dynamics, migration, and population policies.

Review of case studies illustrating these concepts.

Activities:

Group presentations on case studies.

Class discussion on integrated case study analysis.

Session 9: Review and Assessment

Duration: 2 Hours

Topics Covered:

Comprehensive review of all topics covered.

Activities:

Q&A session.

Review of key concepts and preparation for the assessment.

Session 10: Final Assessment

Duration: 2 Hours

Topics Covered:

Written exam or project presentation covering the entire unit.

Activities:

Final exam or project presentation.

Feedback and discussion on learning outcomes.

Materials Needed:

Textbooks and academic papers.

Data sets for practice problems.

Case study materials.

Access to demographic databases or software (if available).

Evaluation:

Participation and attendance.

Assignments and group presentations.

Final exam or project presentation.

UNIT II SETTLEMENT GEOGRAPHY

Lesson Plan: Settlement Geography

Course: Geography

Unit: II

Total Duration: 20 Hours

Objectives:

Understand the development and scope of settlement geography.

Analyze the characteristics and morphology of rural settlements.

Explore urban settlements, their definitions, and related concepts.

Study urban morphology through classical models.

Examine central place theory and settlement hierarchy.

Week 1: Introduction to Settlement Geography

Session 1: Development of Settlement Geography

Duration: 2 Hours

Topics Covered:

Historical development of settlement geography.

Scope and significance in geography.

Key concepts and definitions.

Activities:

Lecture on the evolution of settlement geography.

Discussion on the relevance and applications of settlement studies.

Reading assignment from core textbooks.

Session 2: Characteristics of Rural Settlements

Duration: 2 Hours

Topics Covered:

Site and situation of rural settlements.

Types of rural settlements: clustered, dispersed, and linear.

Settlement patterns: nucleated, linear, and dispersed.

Activities:

Lecture with visual aids (maps, diagrams).

Group discussion on examples of different rural settlement types.

Case study analysis of rural settlements from different regions.

Session 3: Morphology of Rural Settlements

Duration: 2 Hours

Topics Covered:

Morphological characteristics of rural settlements.

Factors influencing rural settlement morphology: geography, economy, and culture.

Activities:

Lecture and interactive mapping exercises.

Analysis of case studies on rural settlement morphology.

Week 2: Urban Settlements and Morphology

Session 4: Urban Settlements

Duration: 2 Hours

Topics Covered:

Census definitions of urban areas.

Urban agglomeration and the concept of urban sprawl.

Ruralurban continuum, rurban, and periurban areas.

Activities:

Lecture with examples of different urban and periurban areas.

Group discussion on urbanization trends and their impacts.

Session 5: Urban Morphology

Duration: 2 Hours

Topics Covered:

Classical models of urban morphology:

Burgess's Concentric Zone Model.

Hoyt's Sector Model.

Harris and Ullman's Multiple Nuclei Model.

Activities:

Detailed lecture on each model.

Comparative analysis of models with realworld examples.

Mapping exercises to illustrate the models.

Session 6: Central Place Theory and Settlement Hierarchy

Duration: 2 Hours

Topics Covered:

Central Place Theory (Christaller's and Lösch's models).

Hierarchy of settlements: from hamlets to metropolises.

Concept of urban primacy and its implications.

Activities:

Lecture with case studies on central places and settlement hierarchies.

Group activity analyzing realworld settlement hierarchies.

Week 3: Integration and Review

Session 7: Comparative Analysis of Settlement Types

Duration: 2 Hours

Topics Covered:

Comparative analysis of rural and urban settlements.

Interaction between rural and urban areas.

Activities:

Group presentations comparing different settlement types.

Class discussion on the impacts of settlement patterns on regional development.

Session 8: Review and Application

Duration: 2 Hours

Topics Covered:

Recap of all key concepts covered in the unit.

Application of theories and models to realworld examples.

Activities:

Q&A session to address any remaining questions.

Review exercises and discussion on key concepts.

Session 9: Final Assessment

Duration: 2 Hours

Topics Covered:

Written exam or project presentation covering the entire unit.

Activities:

Final exam or project presentation.

Feedback session to discuss exam results and overall understanding of the unit.

Materials Needed:

Textbooks and academic papers on settlement geography.

Maps, diagrams, and case studies.

Access to demographic and urban data (if applicable).

Evaluation:

Participation and attendance.

Assignments and group presentations.

Final exam or project presentation.

GEOGRAPHY

MULTIDISCIPLINARY COURSES (MDC)

SEMESTER –I

COURSE: 1 (CODE: GEOG 1031)

COURSE TITLE : PHYSICAL GEOGRAPHY (Theory)

Lesson Plan: Understanding Earth's Systems and Processes

Week 1: Internal Structure of Earth

Class 1: Introduction to Earth's Internal Structure

Objectives:

Understand the basic layers of the Earth: crust, mantle, outer core, and inner core.

Learn about the characteristics and composition of each layer.

Content:

Definition and composition of the Earth's layers.

How scientists study the Earth's interior (e.g., seismic waves).

Activities:

Lecture and Discussion: Overview of the Earth's layers.

Visual Aids: Diagrams and 3D models of the Earth's structure.

Group Activity: Create a model of the Earth using clay to demonstrate its layers.

Assessment:

Quiz on the structure and composition of Earth's layers.

Group presentation on how seismic waves provide information about Earth's internal structure

Week 2: Geomorphic Processes: Weathering and Erosion

Class 2: Weathering

Objectives:

Define weathering and distinguish between physical and chemical weathering.

Identify factors influencing weathering.

Content:

Types of weathering: physical (mechanical) and chemical.

Factors influencing weathering: climate, rock type, etc.

Activities:

Demonstration: Simple experiments showing physical and chemical weathering.

Discussion: Case studies of weathering processes in different environments.

Assessment:

Worksheet on types of weathering and their effects.

Class 3: Erosion

Objectives:

Define erosion and understand the processes and agents of erosion.

Learn how erosion impacts landscapes.

Content:

Types of erosion: water, wind, ice, and gravity.

Agents of erosion: rivers, glaciers, wind, and waves.

Activities:

Interactive Map Exercise: Identify areas affected by erosion.

Field Trip/Virtual Tour: Visit a location or watch a video showing erosion processes.

Assessment:

Short essay on the impact of erosion on a specific landform.

Week 3: Processes and Landforms: Fluvial, Glacial, and Aeolian

Class 4: Fluvial Processes and Landforms

Objectives:

Understand fluvial processes and their role in shaping landscapes.

Identify major fluvial landforms.

Content:

Process of river erosion and deposition.

Major fluvial landforms: valleys, floodplains, deltas.

Activities:

Diagram Drawing: Create diagrams of different fluvial landforms.

Case Study: Analysis of a river system (e.g., the Nile or the Amazon).

Assessment:

Quiz on fluvial processes and landforms.

Class 5: Glacial Processes and Landforms

Objectives:

Learn about glacial processes and their impact on the landscape.

Identify glacial landforms.

Content:

Types of glaciers and glacial movement.

Major glacial landforms: moraines, drumlins, fjords.

Activities:

Model Building: Construct a model showing glacial erosion and deposition.

Discussion: Effects of past glaciations on presentday landscapes.

Assessment:

Short answer questions on glacial processes and landforms.

Class 6: Aeolian Processes and Landforms

Objectives:

Understand aeolian (wind) processes and their effects on landscapes.

Identify major aeolian landforms.

Content:

Processes of wind erosion and deposition.

Major aeolian landforms: dunes, loess plains.

Activities:

Sand Dune Model: Create a smallscale model to demonstrate wind erosion and deposition.

Case Study: Examine aeolian landforms in desert environments.

Assessment:

Project report on the formation and impact of aeolian landforms.

Week 4: Composition and Structure of the Atmosphere; Insolation, Heat Budget, and Soil Factors

Class 7: Composition and Structure of the Atmosphere

Objectives:

Understand the composition and layers of the atmosphere.

Learn about atmospheric processes and their effects on weather.

Content:

Layers of the atmosphere: troposphere, stratosphere, mesosphere, thermosphere, exosphere.

Atmospheric composition: gases and their roles.

Activities:

Infographic Creation: Design an infographic showing the layers and composition of the atmosphere.

Discussion: How atmospheric processes influence weather patterns.

Assessment:

Diagram labeling and explanation of atmospheric layers.

Class 8: Insolation, Heat Budget, Horizontal and Vertical Distribution of Temperature; Soil Forming Factors; Types of Soil

Objectives:

Learn about insolation and heat budget, and their effects on temperature distribution.

Understand soil formation processes and different soil types.

Content:

Insolation and its role in the Earth's heat budget.

Horizontal and vertical distribution of temperature.

Soil forming factors: parent material, climate, organisms, topography, and time.

Types of soil: zonal, azonal, intrazonal.

Activities:

Graphing Exercise: Plot temperature distribution data.

Soil Sample Analysis: Examine different soil types and their properties.

Group Project: Investigate soil types in various regions and their characteristics.

Assessment:

Comprehensive test covering heat budget, temperature distribution, and soil types.

Additional Notes:

Resources Needed: Maps, models, clay, sand, soil samples, multimedia tools for visual aids, and access to case studies.

Differentiation: Provide additional support for students who need it through guided practice and tailored resources.

Homework: Assign readings, practice questions, and project work as reinforcement.

GEOGRAPHY

MULTIDISCIPLINARY COURSES (MDC)

SEMESTER-II

COURSE: 2 (CODE: GEOG 2031)

COURSE TITLE: HUMAN GEOGRAPHY (Theory)

Lesson Plan: Human Geography

Course: Geography

Total Duration: 20 Hours

Objectives:

Understand the concepts of population distribution, density, and growth.

Analyze types and patterns of population migration.

Explore economic activities and their classification.

Study rural and urban settlement types and patterns.

Examine major ethnic groups and cultural diffusion.

Learn about indicators of human development.

Week 1: Population Dynamics and Migration

Session 1: Population Distribution, Density, and Growth

Duration: 2 Hours

Topics Covered:

Concepts of population distribution and density.

Factors influencing population growth.

Global and regional trends in population growth.

Activities:

Lecture with maps and data visualizations.

Interactive exercises to calculate population density.

Case studies of countries with different growth patterns.

Session 2: Types of Population Migration

Duration: 2 Hours

Topics Covered:

Definitions and types of migration (internal, international, voluntary, involuntary).

Causes and effects of migration.

Activities:

Lecture with realworld examples.

Group discussion on migration trends and their impacts.

Analysis of migration data and case studies.

Week 2: Economic Activities and Rural Settlements

Session 3: Economic Activities

Duration: 2 Hours

Topics Covered:

Classification of economic activities: Primary (agriculture, mining), Secondary (manufacturing), Tertiary (services).

Global distribution and trends.

Activities:

Lecture with examples and case studies.

Group activity to classify various economic activities and their impacts.

Analysis of economic data from different regions.

Session 4: Types and Patterns of Rural Settlements

Duration: 2 Hours

Topics Covered:

Types of rural settlements: clustered, dispersed, linear.

Settlement patterns and their influencing factors.

Activities:

Lecture with diagrams and maps.

Fieldwork or virtual tour to observe rural settlements.

Mapping exercises to identify different settlement patterns.

Week 3: Urban Settlements and Ethnicity

Session 5: Definition and Types of Urban Settlements

Duration: 2 Hours

Topics Covered:

Definitions of urban settlements.

Types of urban settlements: cities, towns, metropolitan areas.

Characteristics and functions.

Activities:

Lecture with examples of different urban types.

Comparative analysis of urban areas.

Group activity to design a model urban settlement.

Session 6: Major Ethnic Groups of the World

Duration: 2 Hours

Topics Covered:

Overview of major ethnic groups globally.

Distribution and cultural characteristics.

Activities:

Lecture with maps and demographic data.

Group presentations on selected ethnic groups.

Discussion on the impact of ethnicity on culture and politics.

Week 4: Cultural Diffusion and Human Development

Session 7: Cultural Diffusion

Duration: 2 Hours

Topics Covered:

Definition and types of cultural diffusion (expansion, relocation).

Factors facilitating cultural diffusion.

Activities:

Lecture with case studies of cultural diffusion.

Group activity to trace the spread of cultural practices or innovations.

Discussion on the impact of cultural diffusion on globalization.

Session 8: Indicators of Human Development

Duration: 2 Hours

Topics Covered:

Key indicators of human development: Human Development Index (HDI), Gross National Income (GNI), literacy rates, life expectancy.

Analysis and interpretation of development data.

Activities:

Lecture with data analysis.

Case study analysis of different countries' human development indicators.

Group discussion on development challenges and strategies.

Session 9: Integration and Review

Duration: 2 Hours

Topics Covered:

Integration of concepts from population dynamics, migration, economic activities, and human development.

Comprehensive review of the unit.

Activities:

Q&A session.

Group discussion on how the topics interrelate.

Review exercises and preparation for the final assessment.

Session 10: Final Assessment

Duration: 2 Hours

Topics Covered:

Written exam or project presentation covering the entire unit.

Activities:

Final exam or project presentation.

Feedback session to discuss exam results and overall understanding of the unit.

Evaluation:

Participation and attendance.

Assignments and group presentations.

Final exam or project presentation.

GEOGRAPHY

SKILL ENHANCEMENT COURSES(SEC)

SEMESTER-I

COURSE: 1 (CODE: GEOG 1051)

COURSE TITLE: COMPUTER BASICS AND COMPUTER APPLICATIONS

1. Numbering Systems; Binary Arithmetic

2. Data Computation, Storing and Formatting in Spreadsheets: Computation of Rank, Mean, Median, Mode, Standard Deviation,

3. Moving Averages, Derivation of Correlation, Covariance and regression; Selection of technique and interpretation.

4. Preparation of annoted diagrams and its interpretation: Scatter diagram and Histogram

Detailed Practical Lesson Plan for NEP Students of Geography

Lesson Plan Overview

Subject: Geography

Grade Level: NEP (National Education Policy) Students

Duration: 2 Hours

Lesson Title: Data Computation and Analysis Using Spreadsheets and Binary Arithmetic

Lesson Objectives

1. Understanding Numbering Systems: Students will learn binary arithmetic and its application.

2. Data Computation in Spreadsheets: Students will practice computation techniques such as rank, mean, median, mode, and standard deviation.

3. Statistical Analysis: Students will perform moving averages, correlation, covariance, and regression analysis. They will learn to select appropriate techniques and interpret results.

4. Annotated Diagrams: Students will prepare and interpret scatter diagrams and histograms.

5. Internet Research: Students will generate and extract information through internet research related to geographical data

Materials Needed

Computers with spreadsheet software (e.g., Microsoft Excel, Google Sheets)

Projector and whiteboard

Access to the internet

Handouts with sample data sets

Graphing tools or software for creating diagrams

Notebooks and pens

Lesson Breakdown

1. Numbering Systems; Binary Arithmetic (20 minutes)

Objective: Understand binary arithmetic and its relevance to data computation.

1. Introduction to Numbering Systems:

Discuss different numbering systems (binary, decimal, hexadecimal).

Explain the importance of binary in computing.

2. Binary Arithmetic:

Demonstration: Show how to perform basic binary operations (addition, subtraction).

Activity: Students will solve simple binary arithmetic problems in pairs using handouts.

3. Application:

Discuss how binary arithmetic applies to data representation in spreadsheets and computational tasks.

Assessment:

Quick quiz on binary arithmetic principles and operations.

2. Data Computation, Storing, and Formatting in Spreadsheets (30 minutes)

Objective: Perform data computations and understand how to store and format data.

1. Introduction to Spreadsheets:

Overview of spreadsheet software features relevant to geography (e.g., Excel, Google Sheets).

2. Data Computation Techniques:

Rank: Calculate the rank of data points.

Mean, Median, Mode: Compute central tendencies using builtin functions.

Standard Deviation: Use functions to calculate variability.

3. Activity:

Students will be provided with a data set to compute the above statistics using spreadsheet software.

Assessment:

Review students' spreadsheets and their computations for accuracy.

3. Statistical Analysis (30 minutes)

Objective: Perform moving averages, correlation, covariance, and regression analysis.

1. Moving Averages:

Explain the concept and purpose of moving averages.

Activity: Compute moving averages using sample data.

2. Correlation and Covariance:

Define and explain these concepts.

Activity: Use spreadsheet functions to calculate correlation and covariance.

3. Regression Analysis:

Introduction to linear regression.

Activity: Perform regression analysis on a given data set and interpret the results.

Assessment:

Students will present their findings and interpretations of statistical analyses.

4. Preparation and Interpretation of Annotated Diagrams (30 minutes)

Objective: Create and interpret scatter diagrams and histograms.

1. Scatter Diagrams:

Explain scatter diagrams and their use in visualizing relationships between variables.

Activity: Students will create scatter diagrams based on provided data.

2. Histograms:

Define histograms and their use in representing data distributions.

Activity: Students will create histograms using sample data.

3. Interpretation:

Guide students on how to interpret these diagrams.

Discuss insights that can be drawn from the visual data.

Assessment:

Evaluate students' diagrams and interpretations for accuracy and insightfulness.

5. Internet Surfing: Generation and Extraction of Information (20 minutes)

Objective: Use internet resources to generate and extract geographical information.

1. Research Techniques:

Discuss effective internet research strategies.

Activity: Students will search for geographical data related to a given topic or dataset.

2. Information Extraction:

Guide students on evaluating the credibility and relevance of online sources.

Activity: Extract and organize data from reliable sources.

Assessment:

Review students' research findings and discuss the sources and methods used.

Conclusion and Reflection (10 minutes)

1. Recap Key Points:

Summarize the day's activities and key takeaways.

2. Q&A Session:

Address any remaining questions or clarifications needed.

3. Feedback:

Collect feedback on the lesson to improve future sessions.

Homework/Extended Activity

1. Data Analysis Project:

Assign a project where students must use spreadsheet software to analyze a new dataset, create annotated diagrams, and write a report on their findings.

2. Further Research:

Encourage students to explore additional internet resources related to their project topic and integrate this information into their analysis.

GEOGRAPHY

SKILL ENHANCEMENT COURSES(SEC)

SEMESTER-II

COURSE: 2 (CODE: GEOG 2051)
COURSE TITLE: FIELD SURVEY TECHNIQUES (Theory)

1.Fieldwork in Geographical studies – Role and significance, Selection of study area and objectives, Prefield preparations, Ethics of fieldwork

2. Preparation of Survey Schedule and Questionnaires (open, closed, structured, nonstructured)

3. Interview with special reference to focused group discussions

4. Field techniques and tools: Landscape survey using transects and quadrants, constructing a sketch, photo and video recording

5. Collection of samples. Preparation of inventory from field data. Postfield tasks

Lesson Plan: Fieldwork in Geographical Studies

Course Duration: 6 Months

Target Audience: Undergraduate Geography Students

Week 12: Introduction to Fieldwork in Geographical Studies

Objectives:

Understand the role and significance of fieldwork in geography.

Learn the process of selecting a study area and defining objectives.

Review prefield preparations and ethics of fieldwork.

Activities:

Lecture: Importance of fieldwork in geographical studies.

Discussion: Selecting a study area and setting research objectives.

Workshop: Prefield preparations (e.g., logistics, equipment, permissions).

Case Study Analysis: Ethics in fieldwork and realworld examples.

Assignments:

Prepare a brief proposal for a potential fieldwork study, including objectives and study area.

Week 34: Preparation of Survey Schedules and Questionnaires

Objectives:

Learn to design and prepare survey schedules and questionnaires.

Differentiate between open, closed, structured, and nonstructured questionnaires.

Activities:

Lecture: Types of questionnaires and their applications.

Workshop: Design and creation of different types of questionnaires.

Group Activity: Review and critique sample questionnaires.

Assignments:

Develop a set of questionnaires for a specific research topic.

Week 56: Conducting Interviews and Focused Group Discussions

Objectives:

Understand the methodology of conducting interviews and focused group discussions.

Learn techniques for effective data collection through interviews.

Activities:

Lecture: Techniques for conducting interviews and focused group discussions.

RolePlay: Simulate interviews and group discussions.

Workshop: Develop interview guides and discussion frameworks.

Assignments:

Conduct a mock interview or focus group discussion and submit a summary of findings.

Week 78: Field Techniques and Tools

Objectives:

Master field techniques such as landscape surveys using transects and quadrants.

Learn to construct sketches and use photo and video recording tools.

Activities:

Lecture: Introduction to field techniques and tools.

Practical Session: Conduct landscape surveys using transects and quadrants.

Workshop: Training on sketching, photo, and video recording.

Assignments:

Perform a mini field survey and create a report including sketches and photos.

Week 910: Collection and Analysis of Samples

Objectives:

Learn methods for collecting samples and preparing inventories.

Understand how to analyze and interpret field data.

Activities:

Lecture: Sample collection techniques and inventory preparation.

Practical Session: Collect samples from a designated area and prepare an inventory.

Workshop: Analyze collected data and interpret results.

Assignments:

Submit a sample collection report and inventory.

Week 1112: PostField Tasks

Objectives:

Understand the importance of postfieldwork tasks.

Learn how to compile and present field data.

Activities:

Lecture: Overview of postfieldwork tasks such as data compilation and analysis.

Workshop: Data entry, organization, and presentation techniques.

Group Activity: Prepare a fieldwork report or presentation.

Assignments:

Complete a final fieldwork report or presentation based on the collected data.

Week 1316: Review and Integration

Objectives:

Integrate knowledge and skills acquired throughout the course.

Prepare for practical application and future research.

Activities:

Review Sessions: Discuss key learnings and address any questions.

Practical Integration: Apply skills in a comprehensive project.

Guest Lecture: Invite a professional geographer for insights on fieldwork.

Assignments: Submit a comprehensive project that integrates all aspects of the course.

Assessment and Evaluation

Continuous Assessment:

Weekly assignments and participation.

Midcourse review based on assignments and practical work.

Final Assessment:

Comprehensive fieldwork report or project.

Presentation of findings and methodologies used.

COURSE 1 (CODE: GEOG 3011)

COURSE TITLE: GEOGRAPHY OF INDIA

SEMESTER-III

Unit I: Physical Geography

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1. Geological Set-up: Archaean, Purana, Dravidian, and Aryan Rock Systems

- **Objective**: Understand the geological history of India, the types of rock systems, and their characteristics.
- **Materials Needed**: Maps, diagrams, textbooks
- **Method**:
    1. **Introduction**
        - Discuss the concept of geological time scale and how rock systems are classified.
        - Briefly explain the different rock systems in India.
    2. **Lecture**
        - **Archaean Rocks**: Oldest rocks found in Southern and Central India; formation, examples (e.g., Dharwar, Aravalli ranges).
        - **Purana Rocks**: Occur in the Northern and Central regions, examples (e.g., Rajmahal hills).
        - **Dravidian Rocks**: Found in the southern parts of India, especially in Tamil Nadu and Andhra Pradesh.
        - **Aryan Rocks**: Found in the northern regions, made up of sedimentary rocks (e.g., parts of Rajasthan, and the Himalayan region).
    3. **Discussion**
        - How these rock systems have influenced the topography of India.
    4. **Activity**
        - Label and color different rock systems on a map of India.

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2. Physiographic Divisions

- **Objective**: Identify and describe India's major physiographic regions.
- **Materials Needed**: Maps, images, presentation slides
- **Method**:
    1. **Introduction**
        - Define physiography and its importance in understanding geography.
    2. **Lecture**
        - Discuss the **six physiographic divisions** of India:
            - Himalayan Mountains
            - Indo-Gangetic Plain
            - Peninsular Plateau
            - Coastal Plains
            - Deserts
            - Islands
    3. **Visual Aid**

        - Show images and diagrams of each region.
    4. **Activity**
        - Divide the class into groups and assign each group a physiographic region to create a detailed presentation on its characteristics.

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3. Drainage Systems: Himalayan and Peninsular

- **Objective**: Examine the drainage systems of India and their significance.
- **Materials Needed**: River maps, charts, model rivers
- **Method**:
    1. **Introduction**
        - Define drainage systems and their importance in physical geography.
    2. **Lecture**
        - **Himalayan Drainage**: Ganga, Yamuna, Brahmaputra, and their tributaries.
        - **Peninsular Drainage**: Rivers like Godavari, Krishna, Narmada, Tapi, and their seasonal patterns.
    3. **Interactive Session**
        - Discuss the differences between the Himalayan and Peninsular drainage systems.
    4. **Activity**
        - Ask students to draw the main river systems on blank maps.

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4. Climate: Types and Characteristics; Significance of Indian Monsoon

- **Objective**: Understand the types of climate in India and the significance of the monsoon.
- **Materials Needed**: Climatic maps, graphs, monsoon diagrams
- **Method**:
    1. **Introduction**
        - Discuss the importance of climate in shaping India's agricultural patterns, economy, and culture.
    2. **Lecture**
        - **Types of Climate**: Tropical wet, dry, subtropical, and temperate.
        - **Monsoon**: Mechanism of monsoon, seasonal variations, and its significance to agriculture.
    3. **Video/Animation**
        - Show a video explaining the monsoon system in India.
    4. **Discussion and Q&A**
        - Discuss the impacts of the monsoon on Indian agriculture and economy.

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5. Soil: Types, Characteristics, and Distribution

- **Objective**: Understand different types of soils and their distribution in India.
- **Materials Needed**: Soil maps, soil samples, chart paper
- **Method**:
    1. **Introduction**
        - Define soil and its importance in agriculture.
    2. **Lecture**

        - Discuss types of soil found in India (Alluvial, Black, Red, Laterite, Desert, Saline/Alkaline).
        - Distribution of soil types across India.
    3. **Activity**
        - Identify soil types on maps and match them with their characteristics.
    4. **Discussion**
        - Discuss the challenges faced by different regions due to soil degradation.

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6. Vegetation: Types and Classification

- **Objective**: Learn about the different vegetation zones in India.
- **Materials Needed**: Vegetation maps, photographs, classification charts
- **Method**:
    1. **Introduction**
        - Define vegetation and its role in the environment.
    2. **Lecture**
        - Discuss different types of vegetation:
            - Tropical Evergreen
            - Tropical Deciduous
            - Thorny/Desert Vegetation
            - Montane Vegetation
            - Mangrove Vegetation
    3. **Activity**
        - Ask students to identify vegetation types in different regions of India.
    4. **Discussion**
        - How has human activity affected India's vegetation?

Unit II: Economic and Social Geography

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1. Agricultural Regions, Green Revolution and its Consequences

- **Objective**: Understand the major agricultural regions of India and analyse the Green Revolution's impact.
- **Materials Needed**: Agricultural maps, graphs, research papers
- **Method**:
    1. **Introduction**
        - Discuss the importance of agriculture in India's economy.
    2. **Lecture**
        - Major agricultural regions: Punjab, Haryana, Uttar Pradesh, Tamil Nadu.
        - Impact of the Green Revolution: Increase in food production, rise of cash crops, impact on rural society.
    3. **Case Study**
        - Present a case study of the Green Revolution's impact on a specific state (e.g., Punjab).
    4. **Discussion**
        - Discuss the positive and negative consequences of the Green Revolution.

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2. Industrial Development since Independence

- **Objective**: Examine the history and trends of industrial development in India.
- **Materials Needed**: Industrial maps, data sheets, PPT
- **Method**:
    1. **Introduction**
        - Brief overview of industrialization in post-independence India.
    2. **Lecture**
        - Major industries: Textile, Iron and Steel, Petrochemicals, IT and Services.
        - The role of government in promoting industrial growth.
    3. **Activity**
        - Identify key industrial hubs in India on a map.
    4. **Discussion**
        - How industrial growth has impacted the Indian economy and society.

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3. Distribution of Minerals and Energy Resources: Iron, Bauxite, Coal, and Petroleum

- **Objective**: Learn about the distribution of key mineral and energy resources in India.
- **Materials Needed**: Mineral resource maps, charts, PPT
- **Method**:
    1. **Introduction**
        - Discuss the significance of mineral resources for economic growth.
    2. **Lecture**
        - **Iron**: Major deposits in Odisha, Chhattisgarh, and Jharkhand.
        - **Bauxite**: Key areas like Odisha, Gujarat, and Maharashtra.
        - **Coal**: Jharkhand, Odisha, West Bengal, Chhattisgarh.
        - **Petroleum**: Major fields in Gujarat, Assam, Mumbai High, and offshore.
    3. **Interactive Q&A**
        - Discuss the challenges of resource distribution.
    4. **Activity**
        - Students mark the locations of these resources on a map of India.

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4. Water Resources of India; Inter-state Conflicts

- **Objective**: Understand India's water resources and the issues related to inter-state water disputes.
- **Materials Needed**: River basin maps, case study materials
- **Method**:
    1. **Introduction**
        - Discuss India's major river systems and their importance for irrigation and drinking water.
    2. **Lecture**
        - Major rivers: Ganga, Yamuna, Krishna, Narmada, Godavari.
        - Key inter-state conflicts: Cauvery dispute, Krishna-Godavari dispute, etc.
    3. **Case Study Discussion**
        - Present a case study on a water dispute and its resolution.
    4. **Discussion**
        - Solutions to water-sharing conflicts.

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5. Regionalization of India: Views of Spate and Bhatt

- **Objective**: Study different theories of regionalization in India.
- **Materials Needed**: Regional maps, reading material
- **Method**:
    1. **Introduction**
        - Discuss the concept of regionalization and why it is important.
    2. **Lecture**
        - **Spate's View**: Division of India into regions based on physical and cultural features.
        - **Bhatt's View**: Focus on the political and economic factors shaping regional disparities.
    3. **Activity**
        - Ask students to compare the views of Spate and Bhatt.
    4. **Discussion**
        - Discuss the relevance of these views in modern India.

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6. Human Resources: Population Distribution and Population Policies

- **Objective**: Analyze India's population distribution and policies related to population control.
- **Materials Needed**: Population distribution maps, population policy reports
- **Method**:
    1. **Introduction**
        - Brief overview of population growth and distribution in India.
    2. **Lecture**
        - Population distribution: Rural vs. Urban, dense vs. sparse regions.
        - Population policies: Family planning, national population policy.
    3. **Activity**
        - Students create a population density map based on current data.
    4. **Discussion**
        - Discuss the challenges and solutions for managing India's population.

This detailed lesson plan spans across multiple classes and includes interactive activities, case studies, and discussions designed to engage students in the diverse topics within physical and economic geography.

COURSE 2 (CODE: GEOG 3012)

COURSE TITLE: CARTOGRAPHY & SURVEYING (PR)

SEMESTER-III

Unit 1: Map Scales and Thematic Mapping

Lesson 1: Introduction to Cartograms and Thematic Maps

- **Objective**: Understand cartograms and thematic maps.
- **Activities**:
    1. **Explanation**: Brief lecture on the difference between cartograms and thematic maps.
    2. **Hands-On**: Students analyze examples of both (e.g., population cartogram, rainfall thematic map).
    3. **Task**: Create a basic thematic map using given data (e.g., rainfall, population density).

Lesson 2: Concept of Scale; Reduction and Enlargement

- **Objective**: Grasp the concept of map scales and their manipulation.
- **Activities**:
    1. **Explanation**: Types of scales (e.g., ratio, verbal, graphical).
    2. **Practice**: Perform reduction and enlargement of a given map using a pantograph or photocopying techniques.

Lesson 3: Construction of Scales

- **Objective**: Learn to construct different types of scales.
- **Activities**:
    1. **Plain Scale**: Construct a scale for measuring distances.
    2. **Comparative Scale**: Represent two units (e.g., kilometers and miles) side by side.
    3. **Diagonal Scale**: Represent decimals.
    4. **Vernier Scale**: Enhance precision.

Lesson 4: Diagrammatic Representation of Data

- **Objective**: Represent data diagrammatically.
- **Activities**:
    1. **Star Diagram**: Represent multi-variable data (e.g., socio-economic indicators).
    2. **Age-Sex Pyramid**: Construct a population pyramid using demographic data.
    3. **Proportional Pie Diagram**: Represent percentage data visually.
    4. **Ternary Diagram**: Visualize proportions among three variables (e.g., soil composition).

Lesson 5: Map Representation Techniques

- **Objective**: Use maps to represent data.
- **Activities**:
    1. **Proportional Circles and Spheres**: Represent population data.
    2. **Dots**: Depict distribution patterns (e.g., population density).
    3. **Isolines**: Draw contour maps based on given elevation data.
    4. **Choropleth Method**: Represent socio-economic data (e.g., literacy rates).
    5. **Chorochromatic Maps**: Highlight qualitative differences (e.g., soil types).

Lesson 6: Climograph, Hythergraph, and Ergograph

- **Objective**: Prepare and interpret climate-related graphs.
- **Activities**:

1. **Climograph**: Plot and interpret monthly temperature and precipitation.
2. **Hythergraph**: Graph temperature vs. precipitation.
3. **Ergograph**: Represent seasonal variation in energy use or activities.

Unit 2: Surveying

Lesson 1: Basics of Surveying and Bearings

- **Objective**: Understand basic surveying concepts and bearings.
- **Activities**:
    1. **Magnetic and True Bearings**: Learn concepts and calculations.
    2. **Whole-Circle and Reduced Bearings**: Convert between systems.
    3. **Practice**: Use a compass to measure bearings in the field.

Lesson 2: Traverse and Angle Calculations

- **Objective**: Calculate angles and areas in a traverse.
- **Activities**:
    1. **Exterior and Interior Angles**: Solve numerical problems.
    2. **Area Calculation**: Apply formulas to find traverse area.

Lesson 3: Open and Closed Traverse Using Prismatic Compass

- **Objective**: Conduct traverse surveys and correct errors.
- **Activities**:
    1. **Field Survey**: Conduct open and closed traverse surveys.
    2. **Error Correction**: Use Bowditch's method for closing errors.

Lesson 4: Longitudinal Profile and Contouring

- **Objective**: Construct a profile and contour map.
- **Activities**:
    1. **Longitudinal Profile**: Plot elevation changes over a traverse.
    2. **Contour Map**: Use Dumpy and digital leveling instruments to draw contours.

Lesson 5: Measuring Heights and Distances

- **Objective**: Measure heights and distances using a theodolite.
- **Activities**:
    1. **Accessible Bases**: Measure heights of structures with accessible bases.
    2. **Inaccessible Bases**: Handle scenarios with inaccessible bases.
    3. **Instrument Heights**: Conduct measurements with varying instrument heights.

Lesson 6: Ground Slope, Strike, and Dip

- **Objective**: Measure ground slopes and geological features.
- **Activities**:
    1. **Ground Slope**: Use Abney levels to measure slopes.
    2. **Strike and Dip**: Determine geological features using a Brunton Compass.

Assessment and Evaluation

- **Individual Reports**: Each student submits field and lab reports for evaluation.
- **Practical Exam**: Students demonstrate proficiency in two randomly assigned tasks.
- **Group Work**: Collaborative mapping and surveying exercises.

Materials Needed

- Survey instruments (prismatic compass, theodolite, dumpy level, Abney level, Brunton compass)
- Graph paper, maps, and relevant data sets
- Software for thematic mapping (e.g., GIS tools like QGIS)

This plan provides a comprehensive approach to integrating theory with hands-on learning.

GEOGRAPHY

MULTIDISCIPLINARY COURSES (MDC)

SEMESTER –III

COURSE 1 (CODE: GEOG 3031)

COURSE TITLE: ENVIRONMENTAL GEOGRAPHY

ENVIRONMENTAL GEOGRAPHY -

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1. Concepts and Approaches of Environmental Geography

- **Definition and Scope**: Understanding the field of environmental geography, its interdisciplinary nature, and the integration of physical geography and human geography.
- **Key Concepts**:
  - Human-environment interaction
  - Sustainability
  - Environmental change
  - Spatial distribution of environmental phenomena
- **Approaches**:
  - Quantitative and qualitative methods
  - Geospatial techniques (GIS, Remote Sensing)
  - Systems approach to studying environmental processes
- **Emerging Issues**: Climate change, biodiversity loss, environmental justice.

2. Structure and Functions of Ecosystem

- **Ecosystem Components**:
  - Biotic components: Producers, consumers, and decomposers
  - Abiotic components: Climate, soil, water, and air
- **Energy Flow and Nutrient Cycling**:
  - Food chains and food webs
  - The role of producers, herbivores, carnivores, and decomposers in energy transfer
  - Biogeochemical cycles (carbon, nitrogen, phosphorus)
- **Types of Ecosystems**: Terrestrial (forests, grasslands, deserts) and aquatic (freshwater, marine).
- **Ecosystem Services**: Provisioning, regulating, supporting, and cultural services.
- **Ecosystem Disruption**: Impacts of human activities like deforestation, pollution, and urbanization on ecosystem functions.

3. Soil Pollution and Management

- **Soil Pollution**:
  - Sources: Industrial waste, pesticides, heavy metals, sewage, and agricultural runoff.
  - Effects: Degradation of soil fertility, contamination of food chains, harm to biodiversity.
- **Management Strategies**:
  - Prevention through sustainable agricultural practices.

    - Remediation techniques: Bioremediation, phytoremediation, and chemical methods.
    - Government regulations and policies on soil conservation.
- **Soil Conservation**:
    - Techniques like contour farming, terracing, agroforestry, and organic farming.

4. Solid Waste Pollution and Management

- **Solid Waste Types**: Household waste, industrial waste, hazardous waste, e-waste, and construction debris.
- **Problems**:
    - Landfills and their environmental impact (leachate, methane).
    - Effects on health and local ecosystems.
- **Waste Management Techniques**:
    - Waste reduction, recycling, and reuse.
    - Waste treatment methods: Incineration, composting, and landfill management.
    - Role of the 3Rs (Reduce, Reuse, Recycle) in sustainability.
- **Policy and Planning**: Government policies on waste disposal, sustainable waste management systems, and public participation.

5. Marine Pollution and Management

- **Sources of Marine Pollution**:
    - Land-based sources: Agricultural runoff, sewage, plastics, and industrial discharges.
    - Marine-based sources: Oil spills, shipping, and deep-sea mining.
- **Types of Marine Pollution**:
    - Chemical pollution (e.g., heavy metals, pesticides).
    - Physical pollution (e.g., plastics, debris).
    - Biological pollution (e.g., invasive species, pathogens).
- **Impacts**:
    - Harm to marine ecosystems: Coral reefs, fish populations, and coastal habitats.
    - Human health risks through contaminated seafood and recreational water use.
- **Management Approaches**:
    - International conventions (e.g., MARPOL, the Basel Convention).
    - Regional and national regulations on pollution control.
    - Restoration and conservation of marine environments (e.g., Marine Protected Areas, sustainable fishing practices).

GEOGRAPHY

SKILL ENHANCEMENT COURSES (SEC)

SEMESTER –III

COURSE 1 (CODE: GEOG 3051)

COURSE TITLE: BASICS OF RS & GIS

Remote Sensing and GIS

1. Remote Sensing: Definition, Platforms, Types, Sensors, and Resolution

Remote Sensing is the process of acquiring information about an object or phenomenon without making physical contact. This is usually achieved through the use of sensors on platforms like satellites, aircraft, or drones. The key elements of remote sensing include:

- **Platforms**:
  - Satellites
  - Aircraft
  - Drones
  - Ground-based sensors
  - Ships
- **Types**:
  - **Active Remote Sensing**: Sensors that emit their own signal and measure the return signal, such as radar or LiDAR.
  - **Passive Remote Sensing**: Sensors that measure the reflected or emitted radiation from the Earth's surface, such as optical, infrared, and thermal sensors.
- **Sensors**:
  - **Optical Sensors**: Measure visible light and near-infrared radiation.
  - **Thermal Infrared Sensors**: Measure thermal radiation emitted by objects.
  - **Radar and LiDAR**: Active sensors used for measuring elevation or other surface characteristics.
- **Resolution**:
  - **Spatial Resolution**: The smallest discernible object or area in an image (e.g., 10m, 30m).
  - **Spectral Resolution**: The ability to distinguish between different wavelengths of light.
  - **Radiometric Resolution**: The ability to detect small differences in the intensity of the radiation detected.
  - **Temporal Resolution**: The frequency with which a sensor revisits the same location.

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2. Satellite Remote Sensing: Principles, EMR Interaction with Atmosphere and Earth Surface; Landsat and IRS Satellites: Sensors and Resolution

- **Principles**:
  - Satellite remote sensing relies on detecting electromagnetic radiation (EMR) reflected or emitted from Earth's surface. The energy interacts with the atmosphere, surface materials, and objects, which determines what the sensors can detect.
- **EMR Interaction**:

    - **Atmosphere**: The atmosphere absorbs and scatters electromagnetic radiation, which can affect the quality of the signal that reaches the Earth's surface.
    - **Earth Surface**: Different materials (e.g., water, vegetation, soil) absorb and reflect radiation differently, enabling identification and classification.
- **Landsat Satellites**:
    - Landsat satellites are a series of Earth-observing satellites that provide medium-resolution imagery. Landsat uses multispectral scanners to capture data in several bands of the electromagnetic spectrum.
    - **Sensors**: Landsat uses the **TM (Thematic Mapper)** and **OLI (Operational Land Imager)** sensors.
    - **Resolution**: Landsat has a spatial resolution of 30 meters for most bands, except for the panchromatic band (15 meters).
- **IRS Satellites**:
    - Indian Remote Sensing satellites are a series of Earth observation satellites operated by ISRO. They have a range of sensors designed for resource management, environmental monitoring, and disaster management.
    - **Sensors**: IRS satellites use sensors like LISS (Linear Imaging Self-Scanning) and WiFS (Wide Field Sensor).
    - **Resolution**: Varies from 5 meters (panchromatic) to 56 meters (WiFS).

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3. GIS: Definition, Data Structure (Vector and Raster), Applications

GIS (Geographic Information System) is a system designed to capture, store, manipulate, analyze, manage, and present spatial or geographic data.

- **Data Structures**:
    - **Vector Data**: Represents geographic features as points, lines, and polygons. It is typically used for representing discrete features like roads, rivers, and boundaries.
        - **Points**: Represent discrete locations.
        - **Lines**: Represent linear features like roads or rivers.
        - **Polygons**: Represent area features like forests or lakes.
    - **Raster Data**: Represents geographic data in a grid format, where each cell (pixel) has a value that represents information such as elevation, temperature, or land use.
        - It is well suited for continuous data (e.g., elevation, temperature).
- **Applications**:
    - **Land Use and Land Cover Mapping**: Monitoring changes in land use.
    - **Urban Planning**: Supporting infrastructure development and zoning.
    - **Environmental Monitoring**: Managing natural resources, monitoring pollution, and tracking wildlife habitats.
    - **Disaster Management**: Analyzing and planning for natural disasters.
    - **Agriculture**: Monitoring crop health, water resources, and yield predictions.

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4. Downloading Satellite Images and Preparation of SFCC

- **Downloading Satellite Images**:
  - Satellite images can be obtained from various sources such as **NASA Earth Observing System Data and Information System (EOSDIS)**, **USGS Earth Explorer**, or **Copernicus Sentinel** data.
  - Users must register with these platforms and search for the satellite images based on parameters like location, date, and type of sensor.
- **Preparation of SFCC (Soil Fertility and Crop Classification)**:
  - SFCC involves classifying land based on soil properties and crop types. The satellite images can be processed to classify different crops using techniques like **supervised classification** or **unsupervised classification**.
  - Common methods include using vegetation indices like **NDVI (Normalized Difference Vegetation Index)**, which helps to identify crop health and soil conditions.

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5. Georeferencing of Scanned Maps; Digitization of Point, Line, and Polygon

- **Georeferencing**:
  - Georeferencing is the process of aligning a scanned map or image to a known coordinate system. This is done by identifying reference points (ground control points or GCPs) on the image that correspond to known coordinates on the Earth's surface.
  - The map is then transformed using these points to match the desired projection or coordinate system.
- **Digitization**:
  - **Point**: A point represents a specific location in space, such as a well, tree, or landmark.
  - **Line**: A line represents a linear feature like a road, river, or boundary. In GIS, lines are digitized by connecting a series of points.
  - **Polygon**: A polygon represents an area, such as a forest, building, or lake. Polygons are created by connecting a series of lines to form a closed shape.
