<table>
<thead>
<tr>
<th>Semester and Course No.</th>
<th>Nomenclature</th>
<th>Max. Marks</th>
<th>Hours of Teaching per week</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SEMESTER I</strong></td>
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<tr>
<td>COURSE-I</td>
<td>Geomorphology</td>
<td>100</td>
<td>6 Hours</td>
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<tr>
<td>COURSE-II</td>
<td>Climatology</td>
<td>100</td>
<td>6 Hours</td>
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<tr>
<td>COURSE-III</td>
<td>Human Geography</td>
<td>100</td>
<td>6 Hours</td>
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<tr>
<td>COURSE-IV</td>
<td>Cartography</td>
<td>100</td>
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<td><strong>SEMESTER-II</strong></td>
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<tr>
<td>COURSE-V</td>
<td>Spatial Patterns of Economic Activities</td>
<td>100</td>
<td>6 Hours</td>
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<td>COURSE-VI</td>
<td>Population Geography</td>
<td>100</td>
<td>6 Hours</td>
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<tr>
<td>COURSE-VII</td>
<td>Bio-geography</td>
<td>100</td>
<td>6 Hours</td>
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<tr>
<td>COURSE-VIII</td>
<td>Map Projection &amp; GIS</td>
<td>100</td>
<td>6 Hours</td>
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<td><strong>SEMESTER-III</strong></td>
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<tr>
<td>COURSE-IX</td>
<td>Regional Planning</td>
<td>100</td>
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<tr>
<td>COURSE-X</td>
<td>Quantitative Techniques in Geography</td>
<td>100</td>
<td>6 Hours</td>
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<tr>
<td>COURSE-XI</td>
<td>History of Geographical Thought</td>
<td>100</td>
<td>6 Hours</td>
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<tr>
<td>COURSE-XII</td>
<td>Physico-Socio-Economic</td>
<td>100</td>
<td>6 Hours</td>
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<td><strong>SEMESTER-IV</strong></td>
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<tr>
<td>COURSE-XIII</td>
<td>Geography of Himachal Pradesh</td>
<td>100</td>
<td>6 Hours</td>
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<tr>
<td>COURSE-XIV</td>
<td>Cultural Geography</td>
<td>100</td>
<td>6 Hours</td>
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<td>COURSE-XV</td>
<td>Political Geography</td>
<td>100</td>
<td>6 Hours</td>
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<tr>
<td>COURSE-XVI</td>
<td>Remote Sensing</td>
<td>100</td>
<td>6 Hours</td>
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<td><strong>Total</strong></td>
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<td><strong>1600</strong></td>
<td><strong>96 Hours</strong></td>
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</tbody>
</table>
GEOMORPHOLOGY

Maximum Marks: 100
(Theory 80 + I.A. 20 marks)

Unit-I
Definition, nature and scope of geomorphology. Fundamental concepts: geological structures and landforms, Uniformitarianism, assemblages of landforms, sequential changes in landforms, climatic geomorphology.

Unit-II
Earth movements: Epeirogenic and Orogenic, Topographic expressions of fault and fold structures, Orogenic forces with reference to the evolution of the Himalayas. Forces of crustal instability: Isostasy, Plate tectonics and Volcanoes.

Unit-III
Exogenic processes: Definition, causes and types of weathering and mass movements, landforms produced. Hill slope: Definition and forms of slopes, Geomorphic processes and slope forms, Slope evolution: downwearing, parallel retreat and slope replacement models.

Unit-IV
Geomorphic processes: Fluvial, Glacial, Aeolian, Marine and Karst processes and resulting landforms.

Unit-V
Drainage Systems and patterns: Meaning, major drainage systems and patterns, Concept of river capture, Applied geomorphology: Meaning and concept, Hydro geomorphology, urban geomorphology, environmental geomorphology, geomorphic hazards.

Notes:
1. The paper would be set from the syllabus covering the full content. Ten questions, two from each unit, are to be framed. Candidates will have to attempt five questions, one from each unit.
2. All questions will carry equal marks.

Suggested Readings:
COURSE: CLIMATOLOGY

Maximum Marks: 100
(Theory 80 + I.A. 20 marks)

Unit-I
Compositional and thermal structure of the atmosphere, Insolation: Solar source, heat balance of the earth, green house effect and global warming, vertical and horizontal distribution of temperature.

Unit-II
Atmospheric motion: Forces controlling motion of air, vertical motion and vorticity, local winds, jet stream, general circulation in the atmosphere; Atmospheric moisture: humidity, evaporation, condensation, precipitation: formation, types, acid rain, world pattern of precipitation.

Unit-III
Tropical, temperate and high latitude weather systems- concept of air masses and atmospheric disturbances, ocean atmospheric interaction- El Nino, southern oscillation (ENSO) and La Nina, monsoon winds, norwesters and cyclones, Tropical and Temperate phenomena, climate of India and its controls: Western disturbances.

Unit – IV
Climatic classification of Köppen and Thornthwaite, Major climates of the world-tropical, temperate, desert and mountain climate.

Unit-V
Climatic Changes: Ozone Depletion; Global Warming: Strengthening of Greenhouse effect; Evidences and Possible causes of global warming; Environmental impacts of global warming and society’s response.

Notes:
1. The paper would be set from the syllabus covering the full content. Ten questions, two from each unit, are to be framed. Candidates will have to attempt five questions, one from each unit.
2. All questions will carry equal marks.

Suggested Readings
5. India Met, Deptt.: Climatological Tables of Observatories in India, govt. of India, 1968.
Objectives:

The objective of this course is to acquaint the students with the emerging issues in Human Geography in the 21st century.

UNIT-I
THE WORLD BEFORE GLOBALIZATION: CHANGING SCALES OF EXPERIENCE

- Pre capitalist worlds: A classification Human Societies, cities and civilization, Pre-capitalist societies.
- The rise and spread of capitalism: Defining capitalism, Transition from feudalism to capitalism, Urbanization
- The making of the twentieth-century world: Organized capitalism, Communism and Command Economy, The Disorganization of Capitalism

UNIT-II
SOCIETY, SETTLEMENT AND CULTURE

- Cities: Defining cities in social context, Urban heterogeneity
- Rural alternatives: Defining rural, a typology of the rural
- Geography, culture and global change: Cultural globalization, Impact of globalization on culture, Multi and hybrid cultures

UNIT-III
POPULATION, RESOURCES AND DEVELOPMENT

- Resources and development: Natural resources, Fuelling the Planet, Energy and Development.
- Changing geographies of global food production: Population Growth and Food Supply, globalization and Food Regimes, Reorientation of developing world Agriculture
- Alternative geographies of global development and inequality

UNIT-IV
PRODUCTION, EXCHANGE AND CONSUMPTION

- The geography of the economy: The rise of Global Economy, Importance of INCS
- The global production system: from Fordism to post-Fordism: Defining Fordism, Geography of Fordism, A new Global Production system
- The global financial system: worlds of monies
- Worlds of consumption: global and Local geographies of consumption

UNIT-V
GEOPOLITICS, STATES AND CITIZENSHIP

- Geopolitical traditions: Organic Theory of State, Heartland, German Geopolitics, Policy of Containment
- The place of the nation-state: Diversity of nations and states, Relationship between nations, states and territory.
- States, citizenship and collective action: Development of modern citizenship, collective action and policy, Linking formal and Internal politics

Notes:

1. The paper would be set from the syllabus covering the full content. Ten questions, two from each unit, are to be framed. Candidates will have to attempt five questions, one from each unit.
2. All questions will carry equal marks.

Books Recommended:

Paper IV: Cartography

100 Marks

(i) A written paper of 3 hours duration 50 Marks
   In the departmental lab

(ii) Practical record book 20 Marks

(iii) Viva-voce 10 Marks

(iv) Internal Assessment 20 Marks

UNIT-I

Nature and history of cartography
Types of data and symbols
Cartographic design & generalization

UNIT-II

Mapping physical phenomena:
   (i) Depiction of relief: contour method, spot heights and layer shading
   (ii) Profiles: Serial, longitudinal, transverse, superimposed, composite and projected.
   (iii) Methods of slope analysis: Wentworth, Smith, and Robinson.
   (iv) Representation of climatic data: Hythergraphs, Climograph, Windrose Diagram.

UNIT-III


UNIT-IV

Mapping Economic data: Land use, Cropping pattern and irrigation, employment, traffic flow and accessibility

Note: (i) The question paper in this course will consists of EIGHT questions covering the entire syllabus. Candidates will be asked to attempt any FOUR questions. All questions will be of equal marks.

(ii) The examination of this paper will be conducted in the department by an external examiner who will be assisted by an internal examiner who would generally be the course teacher. The external examiner will be appointed by the Vice Chancellor out of a panel of five experts submitted to him in this regard by the Chairman of the Department.

(iii) The external examiner who will set the question paper in assistance with internal examiner shall have the freedom to decide the nature of questions (whether MCQ type or otherwise) to be put in the question paper covering the entire syllabus

BOOKS RECOMMENDED

COURSE - V: SPATIAL PATTERN OF ECONOMIC ACTIVITY

Max. Marks: 100
(Theory 80 + I.A. 20 marks)

UNIT-I
NATURE OF ECONOMIC ACTIVITY
- Types of Economic Activity
- International Trade: Historical Perspective, Contemporary World trade
- Geographical Configuration of World trade
- Open World Trading System: Merits & Demerits.

UNIT-II
LOCATION AND LAND USE
- Central Place Theory: Christaller's Model
- Agricultural Land Use: Von thunen's Model
- Industrial location: Weber's Model
- Modifications to Central Place Theory and the rank size rule
- The internal structure of the City

UNIT-III
TRANSPORT AND MOVEMENT
- Transport routes and networks
- Transport costs and modes
- Movement in space: the gravity model
- Movement in Space overtime: Diffusion (Hagerstand Model)

UNIT-IV
ECONOMIC GROWTH
- The Sector Model
- Rostow's Stage Model
- Polarized Development: Models of Myrdal, Hirshman and Friedmann

UNIT-V
ECONOMIC DEVELOPMENT IN INDIA
- Regional Disparities in the levels of Development
- Impact of Green Revolution on Indian economy and Environment
- Need for New Green Revolution

Notes:
1. The paper would be set from the syllabus covering the full content. Ten questions, two from each unit, are to be framed. Candidates will have to attempt five questions, one from each unit.
2. All questions will carry equal marks.

Suggested Readings
UNIT-I
(i) Nature and Scope of population geography.
(ii) Sources of population data; their quality and reliability.
(iii) Major theories of population: Malthusian perspective and Marxist perspective. Demographic transition theory.

UNIT-II
Concept, determinants & world pattern of the following attributes of population:

(i) Density and distribution
(ii) Growth
(iii) Literacy

UNIT-III
Concepts, determinants and patterns in India of the following attributes of population:

(i) Age & Sex Composition
(ii) Occupational composition
(iii) Urbanisation

UNIT-IV
(i) Migration, types, determinants and consequences
(ii) Laws of migration: Revenstein’s and Lee’s laws of migration.
(iii) International migration pattern.

UNIT-V
(i) Population and resources: Concepts of optimum population over population and under population.
(ii) Population policy: Concept, population policy of India.
(iii) A comparative study of population problems and policies of following countries:
   (i) USA  
   (ii) Japan  
   (iii) China  
   (iv) India

Note: There will be ten questions in all at least TWO questions from each unit. The candidates will have to answer FIVE questions selecting ONE question from each unit. All questions carry equal marks.
BOOKS RECOMMENDED


BIO-GEOGRAPHY

Maximum Marks: 100
(Theory 80 + I.A. 20 marks)

Unit-I
Meaning and filed of biogeography, Environment, Habitats, Microhabitats and Niches. Concept, Components, types and functioning of ecosystem.

Unit-II
Soils: Definition, Function, Components and characteristics, Soil Profile, Biomes of the World: Meaning and types.

Unit-III
The evolution of life, Characteristics, of living matter, Lamarck and Darwin views, Factors affecting distribution of organisms Life on islands.

Unit-IV

Unit-V
Plant life: What is phytogeography, Classification and characteristics of plants, Taxonomic and Raunkiaer’s classifications, A Study of Floristic regions, Animal life: What is zoogeography, Classification and characteristics of animals. A study of zoogeographical realms.

Notes:
1. The paper would be set from the syllabus covering the full content. Ten questions, two from each unit, are to be framed. Candidates will have to attempt five questions, one from each unit.
2. All questions will carry equal marks.

Suggested Readings:
Division of Marks:

(i) A written paper of 3 hours duration  50 Marks
In the departmental lab
(ii) Practical record book 20 Marks
(iii) Viva-voce 10 Marks
(iv) Internal Assessment 20 Marks

UNIT-I

UNIT-II
Spatial referencing: The geoid and vertical datum, the ellipsoid and horizontal datum, the local and global datum, datum transformations, measuring the locational errors on the maps, The Satellite Based Positioning.

UNIT-III
Data in GIS: Spatial and Non-spatial, Spatial data input: direct spatial data acquisition, digitising paper maps, obtaining spatial data elsewhere, data preparation, data checks and repairs, combining multiple data sources.

UNIT-IV
Spatial data analysis: Classification of analytical GIS capabilities; measurement, retrieval and classification functions, overlay functions, neighbourhood functions, connectivity functions, Data visualization, GIS and maps, visualization process.

Note: (i) The question paper in this course will consist of EIGHT questions covering the entire syllabus. All questions will be of equal marks.
(ii) The examination of this paper will be conducted in the department by an external examiner who will be assisted by an internal examiner who would generally be the course teacher. The external examiner will be appointed by the Vice-Chancellor out of a panel of FIVE experts submitted to him by the Chairman of the Department.
(iii) The external examiner who will set the question paper in assistance with the internal examiner shall have the freedom to decide the nature of questions (whether MCQ type or otherwise) to be put in the question paper. The question paper, however, will cover the entire syllabus.

Books Recommended

UNIT-I
BASIC CONCEPTS AND HISTORICAL DEVELOPMENT
- Regional Planning: Concept, Nature and scope, Aims and objectives, Rationale of Regional Planning, Principles, Relation of Regional Development Planning with other Planning activities.
- Historical Development: Regional Planning in the Developed World, Regional Planning in Less Developed World

UNIT-II
GEOGRAPHY AND REGIONAL PLANNING
- Background and Philosophical Base.
- Role of Geography in Regional Planning
- Methodology: Design Method, Regional Method.
- Techniques of Regional Planning: Analytical technique, Procedural techniques

UNIT-III
REGIONS FOR PLANNING
- Concept of Regions: Delineation and variables.
- Types of Regions
- Planning Region: Concept and Characteristics
- Hierarchy of Planning Region
- Need and Importance of Planning Region
- Principle, Criterion and Method for Planning Region.
- Planning Regions of India

UNIT-IV
SURVEYS AND METHODS FOR PLANNING
- Concept and Functions of Surveys
- Types of surveys: Regional and Diagnostic survey
- Concept of Watershed for Regional Planning
- Remote Sensing and its application in Planning
- Geographic Information System as a tool for Planning
- RS, GIS and Planning Synergy.
- Environment Impact Assessment

UNIT-V
REGIONAL PLANNING IN INDIA
- Regional Planning in India in Retrospect.
- Objectives and performance of India’s Five Year Plans
- Problems and Prospects of Regional Planning.
- Future of Regional Planning.
- Detailed Study of Damodar Valley Corporation (DVC)

Notes:
1. The paper would be set from the syllabus covering the full content. Ten questions, two from each unit, are to be framed. Candidates will have to attempt five questions, one from each unit.
2. All questions will carry equal marks.
Books Recommended:

24. Tarlok Singh India's Development Experience, McMillan new Delhi, India, 1974.
UNIT-I
Measures of Central tendency: Mean, median and mode. Measures of Central locations in spatial situation: Mean centre, median point, point of minimum aggregate travel distance.

UNIT-II
Measures of dispersion: Mean deviation, standard deviation, coefficient of variation, index of spatial dispersion, median distance, standard distance, Lorenz curve and nearest neighbour analysis.

UNIT-III

UNIT-IV
Measuring the strength of relationship: Scatter diagram, Spearman’s rank correlation, Karl Pearson’s product movement correlation coefficient, co-efficient of variation and determination.

UNIT-V
Regression analysis: Fitting a regression line by semi-averages and least square methods, coefficient of regression; residual from regression; analysis of variance (ANOVA)

Note: There will be ten questions in all, two questions from each unit. Candidates will have to attempt FIVE questions selecting one question from each unit. All questions carry equal marks. Candidates are allowed to use simple four functions calculator.

BOOKS RECOMMENDED
COURSE XI
HISTORY OF GEOGRAPHICAL THOUGHT
Max. Marks: 100
(Theory 80 + I.A. 20 marks)

Unit-I
The field of Geography, its place in the classification of Sciences. Geography as a social science and natural science. Selected concepts in the philosophy of geography. Geography as the study of distributions, man-nature relationship, spatial interactions and areal differentiations, Geographical concepts in ancient India

Unit-II
Historical Development: Contributions of different scholars during ancient, medieval and modern periods. Development of geographic thought up to 18th century. Contribution of Greeks and Romans. Geography in the middle ages. Geography in the 19th Century; Contribution of Humboldt and Carl Ritter to geographic thought. Geography after Humboldt and Ritter; Contributions of different scholars from Germany, France, Britain and America to geographic thought

Unit-III

Unit-IV
Scientific explanations: routes to scientific explanations (Inductive/ deductive), types of explanations. The historical explanation in geography; The role of time and genesis in geography. Major areas of temporal explanation in geography, Historical geography: Meaning, nature and approaches.

Unit-V
Quantitative revolution, Positivism, Behavioural geography, Models in geography, Postmodernism, Status of modern Indian geography

Notes:
1. The paper would be set from the syllabus covering the full content. Ten questions, two from each unit, are to be framed. Candidates will have to attempt five questions, one from each unit.
2. All questions will carry equal marks.

Suggested Readings:
COURSE XII: FIELD SURVEY

Division of Marks:

(v) A written paper of 3 hours duration 50 Marks
     In the departmental lab
(vi) Practical record book 20 Marks
(vii) Viva-voce 10 Marks
(viii) Internal Assessment 20 Marks

UNIT-I

Geographic Field Methods and Techniques
- Role of Field methods and techniques in modern Geographical research
- Historical development of Field investigation
- The structure of Modern Field Research
- Training in Field Geography
- Geographic Field Instruction

UNIT-II

Maps and Instruments
- Base Map for Field Survey
- Use topographic maps, Aerial photographs and Satellite Imageries for Field Survey
- Use of Brunton Compass and Abney Level
- Global Positioning System (GPS)
- Selection of Mapping Techniques

UNIT-III

Procedures for Geographical Field Survey
- Methods of Data collection: Primary/ Secondary
- Observation Method
- Census and Sampling
- Types of Spatial Sampling
- Questionnaire Design
- Administration of the questionnaire

UNIT-IV

Field Research Design & Report Writing
- Basic phases of Field Research Design
- The Problem Statement
- Hypothesis Formulation
- Project Timing and Management
- Importance of Research Design
- Mechanics of writing a report

Writing of Field Report:

Field trip to the selected station(s) shall be compulsory to all the students. They will make study of physico-cultural milieu of the selected station(s) through personal observations and questionnaire methods. On the basis of data collected from the field the students shall prepare a field report on the allotted subject/topic and will make use of tables, figures and photo-plates.
The written paper in the department laboratory and this course will consist of EIGHT questions covering the entire syllabus. All questions will be of equal marks.

(ii) The examination of this paper will be conducted in the department by an external examiner who will be assisted by an internal examiner who would generally be the course teacher. The external examiner will be appointed by the Vice-Chancellor out of a panel of FIVE experts submitted to him by the Chairman of the Department.

(iii) The external examiner who will set the question paper in assistance with the internal examiner shall have the freedom to decide the nature of questions (whether MCQ type or otherwise) to be put in the question paper. The question paper, however, will cover the entire syllabus.

Suggested Readings:


COURSE XIII: GEOGRAPHY OF HIMACHAL PRADESH

Max. Marks: 100
(Theory 80 + I.A. 20 marks)

UNIT-I

Emergence of Himachal Pradesh
- Pre Independence Period
- Independence to period of Re-organisation (1947-1966)
- Modern Himachal Pradesh
- Regions of Himachal Pradesh: Criteria for Regionalisation

UNIT-II

Physical Setting
- Geology
- Relief
- Drainage
- Climate
- Natural Vegetation
- Mineral Resources

UNIT-III

Cultural Setting
- Population: Distribution, Density, Sex Ratio, Literacy etc.
- Rural Settlement
- Urbanisation
- Agriculture: Crops and Cropping Pattern, Irrigation
- Horticulture: Significance, Horticulture zones, Spatio-Temporal Development
- Transport and Communication

UNIT-IV

Socio-Economic Development
- Industries: Structure, Distribution,
- Health: Spatio-Temporal Development of health Sector
- Education: Distribution and development
- Tourism: Different types of Tourism, Destinations

UNIT-V

Problems, Prospects and Policies
- Problems & Prospects: Physical, Economic, Social, Environmental
- Natural Hazards and Disasters: Earthquake, Floods, Cloudburst, Snow Avalanches
- Policies: Water Policy, Forest Policy, Industrial Policy, tourism Policy

Notes:
1. The paper would be set from the syllabus covering the full content. Ten questions, two from each unit, are to be framed. Candidates will have to attempt five questions, one from each unit.
2. All questions will carry equal marks.

Suggested Readings:
UNIT-I
Meaning and nature of cultural geography, Components of culture, cultural traits, complexes and systems. Basic cultural processes. Fundamental themes in cultural geography: Concepts of cultural region, cultural diffusion, cultural ecology, culture integrations and cultural landscape.

UNIT-II

UNIT-III
Folk and Popular geography. Folk culture regions, Folk culture diffusion, Folk ecology, Folk architecture in the cultural landscape, Folk dwellings: house types, structural and functional elements of a house. Popular culture, popular culture regions, popular culture diffusion, the ecology of popular culture, landscapes in popular culture.

UNIT-IV
Human Settlements, significance of settlement studies, place names versus settlements, Meaning, scope and approaches of settlement geography, Types and patterns of settlements, Causes of diverse types of rural settlements.

UNIT-V

Notes:
1. The paper would be set from the syllabus covering the full content. Ten questions, two from each unit, are to be framed. Candidates will have to attempt five questions, one from each unit.
2. All questions will carry equal marks.

Suggested Readings:
POLITICAL GEOGRAPHY

Max. Marks: 100
(Theory 80 + I.A. 20 marks)

Unit-I

A World-Systems Approach to Political Geography
World Systems Analysis
- Historical Systems
- The basic elements of the world economy

Dimensions of An Historical System
- The dynamics of the world-economy
- A space-time matrix for political geography

Power and Politics in the World-economy
- The nature of power: individuals and institutions
- The subtlety of power: What is a strong state
- A political geography perspective on the world-economy

Unit-II

Geopolitics Revived
The Power-Political Heritage
- Mackinder's hearland theory
- German geopolitics 1924-1941
- Containment and deterrence: the US world model

Geopolitical World-Orders
- Cycles of international politics
- The cold war as a geopolitical world order
- A new geopolitical transition

Geopolitical Codes
- Containment: the geopolitical codes of US hegemony
- Alternative geopolitical codes

Unit-III

Geography of Imperialisms
The Revolutionary Heritage
- The rise and fall of the classical theory
- A world-systems interpretation of imperialism

Formal Imperialism: The creation of empires
- The two cycles of formal imperialism
- The geography of formal imperialism
- The economics of formal imperialism
- Where the sun never set

Informal Imperialism: Dominance without empire
- The international relations of informal imperialism
- Informal imperialism as a structural relation
- Informal imperialism today

Unit-IV

Electoral Studies
- Geography and electoral studies: Geography of voting; Geographical influences on voting; geographical influences on representation

Electoral Systems and Electoral Data:
- The Plurality system, Preferential Systems, List systems, Mixed systems; Voting records and Ecological Analysis

Unit-V

Electoral Abuses:

Electoral Reforms:
- The Problem of Alternative Geographics; the problems of Alternative Electoral Systems.
Notes:

1. The paper would be set from the syllabus covering the full content. Ten questions, two from each unit, are to be framed. Candidates will have to attempt five questions, one from each unit.
2. All questions will carry equal marks.

Suggested Readings:

REMOTE SENSING TECHNIQUES

Maximum Marks: 100

(Practical)

Unit-I
History of remote sensing: Development of aerial photography (pre-1960 period); Development of satellite-based remote sensing (post-1960 period); Remote Sensing in India.

Unit-II
Basic principles of remote sensing; electromagnetic energy; energy source; energy and radiation principles; energy interactions in the atmosphere and with earth surface features; spectral reflectance; spectral signatures; methods of recording spectral reflectances (photographic and digital), Remote Sensing Systems (classification)

Unit-III
Air photos and photogrammetry: Elements of photographic system-types, scales and ground coverage, resolution, radiometric characteristics, films, filters, aerial cameras, photograph geometry (vertical)

Vertical aerial photogrammetry: relief displacement, image parallax, stereoscopic viewing and measurements.

Aerial photographic interpretation: elements of aerial photographic interpretation- shape, size, pattern, tone, texture, shadows and site

Unit-IV
Satellite Remote Sensing: RS Satellites- Polar sun-synchronous, geo-stationary; satellite platforms-LANDSAT, SPOT, IRS, INSAT, Principles and geometry of scanners and CCD arrays; Satellite RS data products: Imageries, computer compatible media (CCTs, CDs, Floppies etc.), MSS, TM, SPOT-PLA, SPOT-MLA, LISS-I, LISS-II, LISS-III

Unit-V
Digital Image Processing: Digital image and gray scale images; Analog-to-Digital (A to D) conversion; image rectification and restoration; image enhancement, contrast manipulation, ratioing; image classification: Supervised classification approach-minimum distance to means classification, parallelepiped classification, maximum likelihood classification; unsupervised classification approach
Notes for paper setter and the students:

(1) Maximum marks for the course would be 100.

(2) 100 marks for the course would be divided as follows:

(a) Written examination 50 marks
(b) Record book 20 marks
(c) Viva Voce 10 marks
(d) Internal assessment 20 marks

(3) Written examination would be of 3 hours duration and would be conducted in the Department.

(4) Paper for the written examination shall be made by the external examiner in assistance with the internal examiner (who generally would be the course teacher).

(5) External examiner would be appointed by the VC/PVC out of a panel of four university teachers supplied by the Department Chairman in consultation with the course teacher.

(6) Record book would be evaluated by the external examiner.

(7) Viva voce would be conducted by the external examiner and would pertain to the complete contents of the syllabus.

(8) Internal assessment would be given by the course teacher on the basis of lecture attendance and classroom performance. Internal Assessment marks would be decided by the course teacher and be added to the marks obtained by the student at the time of practical examination.

(9) Paper for the written examination would be set jointly by the external and internal examiners. Paper would comprise two parts. Part one would have two long answer type questions, each question carrying 10 marks. Part two of the paper would contain 40 objective type questions covering the full content of the syllabus each carrying one mark. Questions in this part would be multiple choice, true/false and short answer type.

(10) Answer books would be evaluated jointly by external and internal examiners on the day of examination.

Suggested Readings: