Geography MA/MSc Syllabus 2026

Bodoland University

As per NEP 2020 guidelines

Department of Geography

Bodoland University

Kokrajhar, 2026

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As per NEP 2020 guidelines

Total papers:	20 Twenty
Theory papers:	16 (Sixteen)
Practical papers:	04 (Four)
Total Credits:	80 (Eighty)

Specializations Offered:

A. Geomorphology
B. Social Geography
C. Population Geography

I Semester						
P Code	**Paper name**	**Credits**	**L – T – P**	**Internal**	**External**	**Total Marks**
GEOADL 14014	Advanced Climatology	4	4 – 0 – 0	30	70	100
GEOADL 14024	Applied Cartographic & Quantitative Techniques	4	4 – 0 – 0	30	70	100
GEOADL 14034	Modern Geographic Thought	4	4 – 0 – 0	30	70	100
GEOADL 14044	Research Methodology in Geography	4	4 – 0 – 0	30	70	100
GEOADL 14054	Practical – I	4	0 – 0 – 4	30	70	100
	Total	20	--	150	350	500

II Semester						
P Code	**Paper name**	**Credits**	**L – T – P**	**Internal**	**External**	**Total Marks**
GEOSPL 14064	Comprehensive Geography of India	4	4 – 0 – 0	30	70	100
GEOSPL 14074	Environmental Geography and Oceanography	4	4 – 0 – 0	30	70	100
GEOSPL 14084	Advanced Geomorphology	4	4 – 0 – 0	30	70	100
GEOSPL 14094	Advanced Remote Sensing and Geographic Information System	4	4 – 0 – 0	30	70	100
GEOSPL 14104	Practical – II	4	0 – 0 – 4	30	70	100
	Total	20	--	150	350	500

III Semester						
III Semester: Geomorphology Specialization (A)						
P Code	**Paper name**	**Credits**	**L – T – P**	**Internal**	**External**	**Total Marks**
GEOSPL 25014	Population and Settlement Geography	4	4 – 0 – 0	30	70	100
GEOSPL 25024	Economic Geography and Regional Planning	4	4 – 0 – 0	30	70	100
GEOSPL 25034 A	Climatic Geomorphology	4	4 – 0 – 0	30	70	100
GEOSPL 25044 A	Fluvial Geomorphology	4	4 – 0 – 0	30	70	100
GEOSPL 25054 A	Practical – III	4	0 – 0 – 4	30	70	100
	Total	20	--	150	350	500

III Semester: **Social Geography Specialization (B)**						
P Code	**Paper name**	**Credits**	**L – T – P**	**Internal**	**External**	**Total Marks**
GEOSPL 25014	Population and Settlement Geography	4	4 – 0 – 0	30	70	100
GEOSPL 25024	Economic Geography and Regional Planning	4	4 – 0 – 0	30	70	100
GEOSPL 25034 B	Social dynamics and Change	4	4 – 0 – 0	30	70	100
GEOSPL 25044 B	Geography of Social Well Being	4	4 – 0 – 0	30	70	100
GEOSPL 25054 B	Practical – III	4	0 – 0 – 4	30	70	100
	Total	20	--	150	350	500

III Semester: **Population Geography Specialization (C)**						
P Code	**Paper name**	**Credits**	**L – T – P**	**Internal**	**External**	**Total Marks**
GEOSPL 25014	Population and Settlement Geography	4	4 – 0 – 0	30	70	100
GEOSPL 25024	Economic Geography and Regional Planning	4	4 – 0 – 0	30	70	100
GEOSPL 25034 C	Fertility and Mortality Studies	4	4 – 0 – 0	30	70	100
GEOSPL 25044 C	Population and Resource Interface	4	4 – 0 – 0	30	70	100
GEOSPL 25054 C	Practical – III	4	0 – 0 – 4	30	70	100
	Total	20	--	150	350	500

Note: In III Semester First two papers are common for all the students

IV Semester

IV Semester: **Geomorphology Specialization (A)**						
P Code	**Paper name**	**Credits**	**L – T – P**	**Internal**	**External**	**Total Marks**
GEOSPL 25064	Social, Cultural and Political Geography	4	4 – 0 – 0	30	70	100
GEOSPL 25074	Soil and Biogeography	4	4 – 0 – 0	30	70	100
GEOSPL 25084 A	Tectonic and Environmental Geomorphology	4	4 – 0 – 0	30	70	100
GEOSPL 25094 A	River Health and Watershed Management	4	4 – 0 – 0	30	70	100
GEOSPL 25104 A	Practical – IV	4	0 – 0 – 4	30	70	100
	Total	20	--	150	350	500

IV Semester: **Social Geography Specialization (B)**						
P Code	**Paper name**	**Credits**	**L – T – P**	**Internal**	**External**	**Total Marks**
GEOSPL 25064	Social, Cultural and Political Geography	4	4 – 0 – 0	30	70	100
GEOSPL 25074	Soil and Biogeography	4	4 – 0 – 0	30	70	100
GEOSPL 25084 B	Gender Geography	4	4 – 0 – 0	30	70	100
GEOSPL 25094 B	Tribal Geography	4	4 – 0 – 0	30	70	100
GEOSPL 25104 B	Practical – IV	4	0 – 0 – 4	30	70	100
	Total	20	--	150	350	500

IV Semester: **Population Geography Specialization (C)**						
P Code	**Paper name**	**Credits**	**L – T – P**	**Internal**	**External**	**Total Marks**
GEOSPL 25064	Social, Cultural and Political Geography	4	4 – 0 – 0	30	70	100
GEOSPL 25074	Soil and Biogeography	4	4 – 0 – 0	30	70	100
GEOSPL 25084 C	Migration Studies	4	4 – 0 – 0	30	70	100
GEOSPL 25094 C	Health Geography	4	4 – 0 – 0	30	70	100
GEOSPL 25104 C	Practical – IV	4	0 – 0 – 4	30	70	100
	Total	20	--	150	350	500

Note: In IV semester first two papers are common for all the students

Paper Title: Advanced Climatology

Paper code: GEOADL14014

Credit: 4 Marks: 100

Course Objectives:

- Develop a thorough understanding of the Earth's energy budget, atmospheric composition, and the factors that control global and local climate patterns. This includes an analysis of solar radiation, greenhouse effects, and the distribution of heat and temperature.
- Equip students with the skills to analyze atmospheric moisture processes, cloud formation, precipitation characteristics, and atmospheric motion. This includes understanding climate models, sources for forecasting, and the impacts of climate change.

Course Outcomes:

- Understand Atmospheric Composition and Energy Budget
- Analyze Heat and Temperature Distribution
- Evaluate Atmospheric Moisture Processes
- Understand and Predict Atmospheric Motion
- Examine Tropical Disturbances and Climate Phenomena
- Apply Climate Classification Systems
- Develop Climate Models and Forecasting Skills

Unit I: Global Energy Budget

Atmospheric Composition: Variation with height, latitudes, seasons and time

Factors controlling Global Energy Budget: Effect of solar radiation, Surface receipt of solar radiation, Terrestrial infra-red radiation and the Greenhouse effect

Heat budget of the earth: Horizontal transport of heat and spatial pattern of the heat components

Factors controlling horizontal and vertical distribution of global temperature, Heat and Cold waves

Surface Pressure condition of rotating non-homogenous earth, Oscillation of pressure belt

Unit II: Atmospheric Moisture Budget

Evaporation: process and factors affecting rate of evaporation, Moisture transport

Condensation: Adiabatic Temperature Changes, condensation level, air stability and instability

Cloud formation: condensation nuclei coalescence theories, solid precipitation, global cloud cover

Precipitation Characteristics: Frequency of rainstorm, Development of Thunderstorms drought, Drought and Cloudburst

Frontogenesis: Zones of wave development, frontal cyclones, non-frontal depressions

Mesoscale convective systems

Unit III: Atmospheric Motion and Tropical Climate

Vertical variation of pressure systems: Mean upper-air pattern and upper wind condition

Atmospheric motion and Global wind Pattern: Divergence, vertical motion and vorticity, Departure from idealised global circulation pattern

Local winds: Mountain and valley winds, land and sea breezes, winds due to topographic barriers

Tropical Disturbances: waves, cyclones, Tornadoes, Hailstorms, tropical cloud clusters, El Nino-Southern Oscillation Events

Unit IV: Climate and Weather Prediction

Climatic Classification: Koppen&Thornthwaite

Climate Change: Evidences and Causes of Climatic Change, Climate Forcings and Feedbacks

Impacts of Climate Change
Model strategies for prediction of climate: Global Climate Models and model simulations
Data sources for forecasting

Suggested Reading:

Barry R. G. and Carleton A. M., 2001: Synoptic and Dynamic Climatology, Routledge,UK.
Barry, R.G. and Chorley, R.J., 2003: Atmosphere, Weather and Climate, Routledge, London and New York
Critchfield H. J., 1987: General Climatology, Prentice-Hall of India, New Delhi
Lal, D.S., 2017: Oceanography, Sharda Pustak Bhawan, Prayagraj.
Lal, D.S., 2023: Climatology, Sharda Pustak Bhawan, Prayagraj.
Lutgens F. K., Tarbuck E. J. and Tasa D., 2009: The Atmosphere: An Introduction to Meteorology, Prentice-Hall, Englewood Cliffs, New Jersey.
Oliver J. E. and Hidore J. J., 2002: Climatology: An Atmospheric Science, Pearson Education, New Delhi.
Trewartha G.T. and Horne L.H., 1980: An Introduction to Climate, McGraw-Hill.

Paper Title: Applied Cartographic and Quantitative Techniques

Paper code: GEOADL14024

Credit: 4 Marks: 100

Course objectives:

- Equip students with foundational knowledge and practical skills in cartography, including map reading, design, and the use of various cartographic tools and techniques.
- Introduce students to quantitative techniques, enabling them to analyze and interpret geographical data using uni-variate and bi-variate statistical methods.

Course Outcomes:

- Understand Basic Cartographic Concepts
- Apply Map Enlargement and Reduction Techniques
- Master Surveying Techniques
- Design Effective Maps
- Apply Descriptive Statistics and Measures of Inequality
- Test hypotheses and apply Multivariate Analysis

Unit I: Fundamentals of Cartography

Meaning, Nature and Scope of Cartography
History and Development of Cartography
Types of Diagrams, Graphs, Distribution maps and cartograms,
Concept of Bearing: Magnetic and true, whole-circle and reduced
Enlargement and Reduction: Principle and methods of Map enlargement and reduction,
Topographical maps: Index system, Grid reference, Components, Map reading and interpretation,
Concept and principles of thematic cartography

Unit II: Surveying and Cartographic Techniques

Ground Survey and Positioning: Principles of Surveying, Classification of Surveying, Measurement Technology
Traditional and Automated Survey Methods
Cartographic Design: Objectives of map design, Scope of design, Perceptual Considerations, Graphic communication, Controls on map design, Design Planning

Colour theory and Models: Nature of colour, Colour dimensions, Nature of colour vision, color modeling systems and Computer electronic display colour
Selection and Generalization Principles
Symbolization of map: Feature attributes at Points, Lines and Areas

Unit III: Descriptive Statistics and Measures of Inequality
Need and use of quantitative techniques in geography
Measures of central tendency: properties, merits, demerits, and uses
Measure of dispersion and Inequalities: Range, interquartile range, standard deviation, Coefficient of variance, Lorenz curve and Gini-coefficient

Unit IV: Inferential Statistics and Multivariate Analysis
Testing of Hypothesis: Chi-Square Test, t – test, F – test, ANOVA
Correlation: Pearson's product moment correlation coefficient, and Spearman's rank correlation coefficient
Regression: Linear Regression

Suggested Reading:

Kraak, M. J. and O. F. (2003).*Cartography: Visualization of Geo-Spatial Data*. Prentice Hall.
Mahmood, A. (2021). *Statistical Methods in Geographical Studies.* Rajesh Publications: N Delhi.
Mishra, R. P. and R. A. (1989).*Fundamentals of Cartography*.Concept.
Monkhouse, F. J. and W. H. R. (1989).*Maps and Diagrams*. B.I. Publication Pvt. Ltd.
Peter Haggett, Andrew D. Cliff, & A. F. (1977).*Vocation Methods Vol.I and II*. London: Edward Arnold.
Robinson, A. H. et. al. (1995).*Elements of Cartography* (6th ed.). John Wiley & Sons.
Rogerson, Peter A. (2001). *Statistical Methods for Geography*.Sage Publications.
Sarkar, A. (2015). *Practical Geography: A Systematic Approach*. Orient Blackswan Private Ltd.
Sharma, J. P. (2010). *PrayogicBhugol*. Rastogi Publishers.
Shaw, G. and Wheeler, D. (1985).*Statistical Techniques in Geographical Analysis*.John Wiley & Sons.
Singh, R. L. and Singh R. P. B. (2024).*Elements of Practical Geography*.Kalyani Publisher.
Steer, J. A. (1965). *An Introduction to the Study of Map Projection*.University of London.
Talukder, S. (2008).*Introduction to Map Projections*.Eastern Book House, India.
Torguson, J; Dent, B. D., and Hodler. T. W. (2008).*Cartography: Thematic Map Design* (6th ed.). McGraw Hill Higher Education.
Tyner, J. A. (2010).*Principles of Map Design*.The Guilford Press.

Paper Title: Modern Geographic Thought

Paper code: GEOADL14034

Credit: 4 Marks: 100

Course objectives:

- To trace the historical evolution of geographical thought from ancient to modern times.
- To examine classical schools to contemporary perspectives in geographical thought.

Course outcomes:

- Describe the growth of geographical ideas across ancient, medieval, and exploration periods.
- Compare major schools of thought and environmental traditions in geography.
- Explain quantitative and scientific approaches to spatial analysis.
- Apply critical perspectives to analyze contemporary geographical issues.

Unit I: Evolution of Geographical Thought

Place of Geography in the Classification of Sciences
Nature and Characteristics of Geographical Work
Contributions of Greek and Roman Geographers
Geography in the Middle Ages
Geography in the Arab World
Contributions of Chinese and Indian Geographers
Geography during the Age of Exploration and Discoveries
Contribution of Immanuel Kant

Unit II: Classical Schools and Environmental Traditions in Geography

Contribution of Alexander von Humboldt: Regional and Systematic Geography
Contribution of Carl Ritter: Chorological Concept
Contribution of Charles Robert Darwin and its Influence on Geographical Thought
German School of Geography: Environmental Determinism
French School of Geography: Possibilism
British School of Geography: Probabilism and Neo-determinism
American School of Geography: Cultural Landscape
Soviet School of Geography
Contemporary Trends in Indian Geography

Unit III: Regional, Scientific and Quantitative Traditions in Geography

Areal Differentiation and Exceptionalism
Ideographic and Nomothetic Approaches
Spatial Organization and Spatial Science
Quantitative Revolution and Positivism
Systems Analysis in Geography
Models and Theories in Geography

Unit IV: Critical Revolution in Geography

Humanistic Geography
Behavioural Geography
Welfare Geography
Radical Geography
Structuralism in Geography
Feminist Geography
Postmodernism in Geography

Suggested Reading:

Adhikari, S. (2015).*Fundamentals of geographical thought*.OrientBlackswan.
Dikshit, R. D. (2018). *Geographical thought: A contextual history of ideas* (2nd ed.). PHI Learning.
Husain, M. (2012).*Evolution of geographical thought* (5th ed.). Rawat Publications.
Husain, M. (2010).*Models in geography*.Rawat Publications.
Singh, S. (2009).*Geographical thought*.PrayagPustakBhawan.
Singh, R. Y. (1998). *Geography and society*.Rawat Publications.
Singh, R. B. (Ed.). (2009). *Contemporary geographical thought and perspectives*. Concept Publishing Company.

Paper Title: Research Methodology in Geography

Paper code: GEOADL14044

Credit: 4 Marks: 100

Course Objectives:

- Equip students with essential research methodology skills for geographical studies, including data collection, analysis, and research design.
- Enhance students' ability to write and present research proposals, papers, and dissertations with a strong emphasis on ethical research practices.

Course Outcomes:

- Comprehend the importance and types of research methodology in geography.
- Formulate research questions, hypotheses, and appropriate research designs.
- Write comprehensive research proposals
- Design and use questionnaires, interviews, and various sampling methods for data collection.

Unit I: Introduction to Research Methodology

Meaning and importance of research
Philosophy of research: Ontology, Epistemology, Methodology
Types of research in Geography: Experimental, descriptive, and exploratory
Research process: Formulating research problems, Review of literature, Formulating hypotheses and Research Questions, and Formulating objectives
Components of a research proposal

Unit II: Theoretical Foundations and Data Measurement

Theory building: Meaning, Construct, Proposition, Logic, Assumptions
Attributes of good theory, Approaches to theorising
Types of data: Primary and Secondary; Quantitative and Qualitative; Cross sectional, Time series, Panel, Cohort, and Case study,
Scale of measurement in research; Likert scale, Reliability & validity of scale

Unit III: Research tool and technique

Data collection tools: Designing Questionnaire; Difference between Questionnaire and Interview Schedule;
Data collection techniques: Face to face interview, Focus Group Discussion, Observation
Sampling: Simple Random Sampling, Areal Random Sampling, Systematic Sampling, Stratified Sampling, Cluster Sampling
Purposive Sampling: Quota Sampling, Accidental Sampling, Judgmental Sampling, Expert Sampling, Snowball Sampling

Unit IV: Research Ethics and Writing Dissertation

Research ethics: Informed Consent, Deception, Anonymity and Confidentiality, Involvement with Deviants, the Powerful, Special population and Coercion, and Publishing reports
Scientific Misconduct: Falsification, Fabrication, and Plagiarism
Dealing with Data: Coding, Entering, Cleaning, Analyzing, and Interpreting
Writing a Dissertation: Layout of dissertation, Steps in Writing Dissertation
Referencing: Citation and referencing styles (APA)

Suggested Reading:

Ackoff, R. L. (1961). *The Design of Social Research*.University of Chicago Press.

Berry, R. (2004). The Research Project: How to Write It (5th ed.). Routledge.

Goode, W. J., &Hatt, P. K. (1952).*Methods in Social Research*.McGraw Hill.

Gomez, Basil & John Paul Jones III (eds) 2010. Research Methods in Geography, Critical Introductions to Geography. Wiley Blackwell

Harvey, D. (1969). *Explanation in Geography*. Edward Arnold.

Hussain, M. (2007).*Models in Geography*.Rawat Publications.

Kothari, C. R. (1993). *Research Methodology: Methods and Techniques*. New Age International Publishers.

Mishra, R. P. (2016). *Research Methodology: A Handbook*. Concept Publishing Company Pvt. Ltd.

Misra, H. N., & Singh, V. P. (Eds.).(2017). *Research Methodology in Geography*.Rawat Publications.

Montello, D. R., & Sutton, P. C. (2006). *An Introduction to Scientific Research Methods in Geography*.Sage Publications.

Neuman, W. Lawrence (2014).*Social Research Methods: Qualitative and Quantitative Approaches*, Seventh Edition. Pearson Education Limited

Prasad, H. (2008). *Research Methods and Techniques in Geography*.Shree Publishers & Distributors.

Rogerson, Peter A (2001). *Statistical Methods for Geography*.Sage Publications.

Stoddard, Robert (1982). *Field Techniques and Research Methods in Geography*. National Council for Geographic Education.

Paper Title: Practical - I

Paper code: GEOADL14054

Credit: 4 Marks: 100

Course Objectives:

- Equip students with practical skills in climatic data analysis, quantitative techniques, and geographic research tools.
- Enable students to apply cartographic and surveying techniques through extensive fieldwork and data collection.

Course Outcomes:

- Identify sources and methods for collecting and analyzing weather and climate data.
- Utilize graphical representation techniques for data analysis, including histograms, pie charts, and box plots.
- Apply statistical tests and measures, such as Chi-Square, t-tests, and correlation coefficients.
- Use online tools for geographic data collection and analysis.
- Conduct prismatic, plane table, theodolite, dumpy level, and total station surveys, and report findings effectively.

Unit I: Analysis of Climatic Data

- Measurement of atmospheric pressure using barometers, analysing pressure data and interpreting pressure map (pressure pattern and weather system)
- Using thermometers for temperature measurement, constructing temperature profile, analysing temperature data sets (diurnal variation, investigating urban heat island effect)
- Dew point measurement and relative humidity, analysis of humidity data (hygrometers)
- Rain gauge calibration, measurement of rainfall, analysis of precipitation datasets (spatial and temporal patterns, installing raingauge and collecting precipitation data)

- Water balance graph
- Rose diagram for wind data
- Analysing historical climate data, identifying trends and anomalies
- Preparation of weather reports of Indian subcontinent by analysing the weather satellite images of at least three consecutive days

Unit II: Quantitative techniques

- Graphical Representation of data: Histogram, Stack Bar Diagram, Pie Chart, Box plot
- Chi-Square Test, t – test, F – test, ANOVA
- Correlation: Pearson's and Spearman's rank correlation coefficient
- Linear Regression
- Lorenz curve, Gini Coefficient
- Principal Component Analysis
- Cluster analysis

Unit III: Tools and Techniques of Geographic Research

- Sample selection
- Online geographic data collection tool: Kobo Toolbox, Google form
- Analysis of Qualitative Data
- Smart use of AI in dissertation writing
- Referencing tool: Mendeley
- Plagiarism check
- Converting dissertation to E-book with Navigation tools

Unit IV: Application of Cartography

- Prismatic Survey
- Plane Table Survey
- Theodolite Survey
- Dumpy Level
- Total Station

Suggested reading:

Campbell, J. (1984). *Introductory Cartography*. Prentice Hall.

Cuff, J. D. and Mattson, M. T. (1982).*Thematic Maps: Their Design and Production*. Methuen Young Books.

Gregory, S. (1978). *Statistical Methods and the Geographer*. London: Longman.

Johnston, R. J. (1973). *Multivariate Statistical Analysis in Geography*. London: Longman.

King, L. J. (1969). *Statistical Methods in Geographical Studies*. London.

Kraak, M. J. and Ormeling, F. (2020).*Cartography: Visualization of Geo-Spatial Data*. Prentice Hall.

Lawrence, G. R. P. (1964). *Cartographic Methods*.Oxford University Press.

Mahmood, A. (1977). *Statistical Methods in Geographical Studies*. Delhi: Concept Publications.

Robinson, A. H. et. al. (1995).*Elements of Cartography* (6th ed.). John Wiley & Sons.

Robinson, G. M. (1998). *Methods and Techniques in Human Geography*.Chichester: John Wiley & Sons.

Tyner, J. A. (2010).*Principles of Map Design*.The Guilford Press.

Yeats, M. (1974).*An Introduction to Quantitative Analysis in Human Geography*. New York: McGraw, Hill.

Semester: II

Paper Title: Comprehensive Geography of India

Paper code: GEOSPL14064

Credit: 4 Marks: 100

Course objectives:

- To study India's physiography, drainage, and climate.
- To examine vegetation, soil, and agricultural geography of India.
- To analyze resources, industries, and regional development in India.
- To understand the regional geography and demography of North East India.

Course outcomes:

- Describe India's physiographic regions, drainage systems, and climate.
- Explain agricultural patterns and food security issues in India.
- Assess resource distribution, industrial growth, and regional development.
- Analyze the geography and demographic profile of North East India.

Unit I: India as geographical unit

Major Physiographic Regions and their Characteristics;
Drainage System (Himalayan and Peninsular),
Climate: Seasonal Weather Characteristics, Climatic Divisions, Indian Monsoon (mechanism and characteristics), Jet Streams and Himalayan Cryosphere

Unit II: Vegetation and Agricultural Geography of India

Types and Distribution of Soil and Vegetation
Production and Yield of Major Food Crops
Regional Variation in Agriculture
Environmental, Technological and Institutional Factors Affecting Indian Agriculture
Agro-Climatic Zones
Green Revolution
Food Security and Right to Food in India

Unit III: Resources, Industries and Regional Development in India

Natural Resources: Distribution of Water, Mineral and Marine Resources
Industry: Distribution and characteristics of: Iron and Steel, Textile, Petro Chemicals, Tea, and policies
Transport Networks: Development and pattern of railways, roadways, waterways, airways and pipelines,
Medical Tourism in India
Regional Development: Internal and External trade, Globalisation and its impact on Indian Economy
Nutritional Status: etiological conditions, classification and spatial and seasonal distributional patterns
Health Care Planning and Policies in India

Unit IV: Regional geography of North East India

Locational significance of North East India
Physiographic divisions and climate of North East India
Drainage System, Significance of Brahmaputra river
Forest cover, National Park, Biodiversity
Density, age-sex composition, ethnic composition
Bodoland Territorial Region: Formation, Population density, age-sex composition, caste composition, religious composition, and Literacy rate

Suggested Reading:

Barad, Gomit K (2018). Geography of North East India.Pacific Books International.
Bhagabati, AK, Bora, AK &Kar, BK (2018).Geography of Assam. Rajesh Publications: New Delhi.
Bhakta, GP (1992). Geography of North-East India. Akashi Book Depot: Shillong.
Bhattacharyya, NN (2018). North East India, A Systematic Geography. Rajesh Publications: New Delhi.
Choudhury, RKD (2021). Demographic Scenario of the North East India. Concept Publishing Company Pvt. Ltd.
Davis, K. (1951). Population of India and Pakistan. Princeton: Princeton University Press.
Devee, Geeta & Das, Puspanjalee (2018). North-East India: A Comprehensive Geography. EBH Publishers (India).
Khuller, D. R. (2013). India- A comprehensive Geography (6th ed.). Kalyani Publishers: New Delhi.
Saikia, S.; Nimasow, G. & Sora, T. R. (2023). Unveiling the Mystique: Diversity in Geography of NE India. Notion Press.
Spate, O. H. K., &Learmonth, A. T. A. (1967).India and Pakistan- Land, People and Economy. London: Methuen & Co.

Paper Title: Environmental Geography and Oceanography

Paper code: GEOSPL14074

Credit: 4 Marks: 100

Course Objectives:

- To provide students with a comprehensive understanding of the concepts, processes, and issues related to environmental geography.
- To develop the ability to analyze environmental challenges, evaluate global environmental policies and treaties, and understand the physical characteristics and environmental significance of the world's oceans.

Course Outcomes:

- Explain the fundamental concepts, approaches, ecosystem processes, and human environment interactions in Environmental Geography.
- Analyze environmental pollution, health issues, hazards, environmental impact assessment, monitoring, management practices, and relevant environmental legislations.
- Evaluate the principles of sustainable development and the significance of major international environmental treaties and agreements in environmental governance.
- Describe the relief features, oceanographic processes, coral reefs, ocean circulation, and major marine hazards, and assess their environmental and geographical significance.

Unit I: Fundamentals of Environmental Geography

Meaning, Scope and Approaches to Environmental Geography
Components and types of Environment: Ecosystem (Geographic Classification) and Human Ecology
Functions: Trophic Levels, Energy Flows, Cycles (geo-chemical, carbon, nitrogen and oxygen), Food Chains, Food Web and Ecological Pyramids
Human Interaction and Impacts,
Environmental Ethics and Deep Ecology

Unit II: Air pollution and impact assessment

Environmental Pollution (air, water and land) and Health

Disease ecology
Environmental Impact Assessment
Environmental Monitoring and Standard
Environmental Management
National Environmental policies and Legislations
Environmental Hazards and Disasters (Global Warming, Urban Heat Island)

Unit III: International Treaties on Environmental Protection

Sustainable development: Definition, Principles and pillars of sustainable development
International Treaties and programs:
Brundtland Commission and Sustainable Development
Agenda 21
Kyoto Protocol
Sustainable Development Goals
Paris Agreement

Unit IV: Relief features and Ocean currents

Relief of Oceans: Atlantic, Indian and Pacific Oceans
Ocean deposits: Source and classification
Factors of variation of ocean composition: Temperature, Density and Salinity
Growth, Types and Distribution of Coral reefs
Circulation: Warm and Cold Currents, Waves, Tides, Sea Level Changes
Hazards: Tsunami and Cyclone

Suggested Reading:

Brundtland, G.H. (1987). Our Common Future: Report of the World Commission on Environment and Development. Geneva, UN-Dokument A/42/427

Cunningham, W. P., & Cunningham, M. A. (2021). Principles of environmental science: Inquiry and applications (10th ed.). McGraw-Hill.

Cunningham, William and Cunningham, Mary (2014). Environmental Science: A Global Concern. McGraw Hill-Education.

Devaki, N (2019). Education for Sustainable Development.Shanlax Publications.

Fulekar, MH &Dubey, Shanker (2023).Climate Change and Sustainable Development.CRC Press.

Gope, Arjun; Sarkar, Abhijit; Sarkar, Prasamita; Majumder, Santanu&Gosai, Kuldip (2019).Environmental Issues & Sustainable Development.Notion Press.

Lal, D. S. (2002).Oceanography.SharadaPustakBhawan.

Miller, G. T., &Spoolman, S. E. (2020). Environmental science (16th ed.). Cengage Learning.

Nwanze, Kanayo F (2017). A Bucket of Water: Reflections on sustainable rural development. Practical Action Publishing.

Satsangi, Prem Saran &Dhir, Arsh (2024).Role of Communities in Achieving Sustainable Development. Academic Foundation.

Singh, R. B., &Prokop, P. (Eds.). (2016). Environmental geography of South Asia: Contributions toward a future earth initiative. Springer.

Singh, S. (2020).Oceanography.Pravalika Publications.

Singh, S. (2022).Environmental geography.Pravalika Publications.(Originally published by PrayagPustakBhawan in 1991.)

Tikkha R N (1987). Physical Geography.KedarNath Ram Nath& Co.: Meerut.

Paper Title: Advanced Geomorphology

Paper code: GEOSPL14084

Credit: 4 Marks: 100

Course objectives:

- Provide a comprehensive understanding of advanced concepts, methodologies, and theories in geomorphology.
- Enable students to analyze and interpret regional geomorphological features and landscape evolution.

Course Outcomes:

- Understand the development and fundamental concepts of advanced geomorphology.
- Comprehend key geomorphological theories and their historical context.
- Examine hillslope processes and their role in slope evolution and stability.
- Differentiate and classify various types of slopes and their development.

Unit I: Fundamentals of Geomorphology

Development of geomorphic ideas (Ancient, Medieval, Modern and Late Twentieth Century)
Geological Time Scale and geomorphic evolution
Fundamental principles of geomorphology (Thornbury)
Concepts of Uniformitarianism, Catastrophism, System Approach, Steady State, Dynamic Equilibrium and Threshold
Time and Space in Geomorphology
Contemporary approaches to geomorphic studies

Unit II: Crustal Dynamics

Orogenetic and Epeirogenetic movements
Early crustal movement theories
Continental Drift Theory
Sea-floor Spreading
Plate Tectonic Theory: plate boundaries and plate movements, Tectonic landforms
Isostasy and crustal equilibrium
Earthquakes and Earth interior
Major relief features of the Earth

Unit III: Geomorphic Processes

Sources of geomorphic processes, Exogenetic processes
Concept of gradation: degradation and aggradation
Weathering and mass movement
Fluvial processes and landscapes
Glacial processes and landscapes
Aeolian processes and landscapes
Coastal processes and landscapes
Karst processes and landscapes
Periglacial processes and landscapes

Unit IV: Theories and Models of Landscape Evolution

Hill slope development
Theories and models of landscape evolution: Gilbert, Davis, Penck, King, Hack, Morisawa and Schumm
Denudation chronology, River terraces and landscape evolution

Drainage systems, drainage patterns and evolution of landforms in domal, folded and faulted structures
Paleogeomorphology: concept, relict, exhumed and buried landforms

Suggested Reading:

Ahmad, E., 1985: Geomorphology, Kalyani Publishers, New Delhi.
Bloom, Arthur L., 1978: Geomorphology - A Systematic Analysis of Late Cenozoic Landforms, Prentice Hall, Englewood Cliffs, New Jersey.
Chorley, Richard J., 1972: Spatial Analysis in Geomorphology, Harper & Row Publishers, New York, London.
Dayal, P. (2011): A Textbook of Geomorphology (2nd edition), Shukla Book Depot, Patna
Dixit, K. R.(ed), 1983: Contribution to Indian Geography/Geomorphology, Heritage, New Delhi
Hart, M. G., 1986: Geomorphology: Pure and Applied, Allen &Unwin (Publishers), London.
Holmes, A., 1968: Principles of Physical Geology, Nelson, London.
Jensen, J. R., 2011: Remote Sensing of the Environment – An Earth Resource Perspective, 3rd Impression, Chapter-14, Pearson, New Delhi.
Penck, W., 1924: Morphological Analysis of Landforms, McMillan, London.
Singh, S (2011). Geomorphology.Pravalika Publications: Allahabad.
Sharma, V. K., 1986: Geomorphology, Earth Surface Processes and Forms, Tata McGraw Hill, New Delhi.
Steers, J. A., 1958: The Unstable Earth, Methuen, London.
Strahler, A.N., 1969: Physical Geography, 3rd edition, Wiley.
Thornbury, W. D. 1969: Principles of Geomorphology, 2nd ed., Wiley International Edition, Wiley Eastern Reprint. 15.
Wooldridge, S. W. and Morgan, R. S., 1948: The Physical Basis of Geography, Longman (First Published in 1937).

Paper Title: Advanced Remote Sensing and Geographic Information System

Course Code: GEOSPL14094

Credit: 4 Marks: 100

Course Objectives:

- Provide comprehensive knowledge of hyper-spectral and microwave remote sensing techniques, including their applications and limitations.
- Equip students with skills in digital image processing and the use of remote sensing and GIS.

Course Outcomes:

- Understand the principles of hyper-spectral remote sensing and thermal imaging.
- Comprehend the basics of microwave remote sensing, including radar imaging and its properties.
- Gain proficiency in digital image processing techniques, including pre-processing and image enhancement.
- Explore the use of cloud computing and automation in various applications of remote sensing, such as agriculture and hydrology.

Unit I: Fundamentals of Remote Sensing

Concept, scope and evolution of Remote Sensing
Principles of electromagnetic radiation and electromagnetic spectrum
Energy interactions with atmosphere and Earth's surface, spectral signatures
Remote sensing platforms, orbits and sensors

Sensor characteristics and resolutions (spatial, spectral, radiometric and temporal)
Primary image capturing technique.

Unit II: Digital Image Processing and Analysis
Fundamentals of Image Processing
Digital Image and its formats, Header Information and display of digital Image
Image characteristics and interpretation elements
Pre-Processing: Radiometric, Geometric and other, Image enhancement and Transformation
Digital Elevation Models (DEMs), LiDAR and UAV remote sensing
Applications of digital image processing in natural resource and environmental studies.

Unit III: Microwave Remote Sensing
Concept of Microwave Remote sensing, Passive and Active Microwave Remote Sensing
Radar Imaging; Frequency/Wavelength, Polarization, Viewing Geometry
Spatial resolution of Radar system
Speckle, Surface geometry and roughness, Dielectric properties
Airborne versus space-borne Radars, Radar Systems
Advantages and disadvantage of Radar Remote sensing

Unit IV: Fundamentals of Geographic Information System (GIS)
Concept, components and functions of GIS
Spatial data models (vector and raster)
Map projections and coordinate systems
Spatial database management, data input and editing
Topology, spatial analysis and modelling
Interpolation techniques, network analysis, Digital Terrain Analysis (DTA)
Global Navigation Satellite Systems (GNSS/GPS)
Web GIS, Spatial Data Infrastructure (SDI)
Applications of GIS in natural resource management and environmental planning.

Suggested reading:

Barrett E.C and L.F. Curtis: Fundamentals of Remote Sensing and Air PhotoInterpretation, Mcmillan, New York, 1992.

Bhatta, B. (2020). *Remote Sensing and GIS* (3rd ed.). Oxford University Press, New Delhi

CompbellJ. : Introduction to Remote Sensing, Guilford, New York. 1989.

Curran, Paul J. : Principles of Remote Sensing, Longman, London, 1985.

Hord R.M. : Digital Image Processing of Remotely Sensed Data, Academic, NewYork. 1989.

LuderD. : Aerial Photography Interpretation: Principles and Application, McGrawHill, New York, 1959.

Pratt W.K. Digital Image Processing. Wiley, New York, 1978.

Rao D.P. (eds.) : Remote Sensing for Earth Resources, Association of ExplorationGeophysicist, Hyderabad, 1998.

Shahab, F (2014). Remote Sensing Basics.Kalyani Publishers: New Delhi.

Thomas M. Lillesand Ralph W. Kefer, Remote Sensing and Image Interpretation,John Wiley & sons, New York, 1994.Pedagogy

Paper Title: Practical – II

Paper code: GEOSPL14104

Credit: 4 Marks: 100

Course Objectives:

- Equip students with practical skills in radar remote sensing, multispectral image analysis, advanced geomorphology, and environmental geomorphology using various tools and techniques.
- Enable students to apply remote sensing and geomorphological methods to analyze and assess environmental features and hazards.

Course Outcomes:

- Familiarize with SNEP tool and radar image preprocessing techniques.
- Map water bodies, soils, and vegetation using radar remote sensing.
- Classify land cover and map urban sprawl, heat distribution, and thermal patterns.
- Calculate NDVI (Normalized Difference Vegetation Index) and NDWI (Normalized Difference Water Index) for vegetation and water mapping.
- Utilize digital elevation models (DEMs) for terrain analysis and measurement of geomorphic parameters.

Unit I: Fundamentals of GIS

- Familiarizing QGIS/ Google Earth Engine
- Data Acquisition and Management
- Georeferencing and Creating shape file
- Attribute Data Management, Joining Spatial and Non-Spatial Data
- Spatial Query and Vector Geoprocessing
- Raster Data Processing

Unit II: Spatial Analysis

- Overlay analysis
- Proximity analysis
- Land Cover classification
- GPS Data Handling
- Urban sprawl mapping
- Heat and thermal mapping
- NDVI and NDWI

Unit III: Application of Radar Remote Sensing

- Familiarizing SNEP tool
- RADAR image preprocessing
- Water body mapping
- Vegetation mapping
- Flood hazard mapping

Unit IV: Terrain Analysis

- Topographical map analysis and interpretation
- Delineation of watershed and river catchment
- Slope Analysis by Smith and Wentworth's method
- Hatching Method for relief study
- Watershed and Catchment study: Stream Ordering, bifurcation ratio, drainage frequency and density, longitudinal profile
- Hypsometric Curves and Integral

Suggested reading:

Bhatta, B. (2020). *Remote Sensing and GIS* (3rd ed.). Oxford University Press, New Delhi
Chang, K.-T. (2023). Introduction to Geographic Information Systems (10th ed.). McGraw-Hill Education.
Curran, Paul J. (1985).Principles of Remote Sensing. Longman: London.
Hord R.M. (1989). Digital Image Processing of Remotely Sensed Data. Academic:NewYork
Monkhouse, F. J., & Wilkinson, H. R. (1971). Maps and Diagrams: Their Compilation and Construction (3rd ed.). Methuen.
Pratt W.K. (1978). Digital Image Processing. Wiley, New York.
Shahab, F (2014). Remote Sensing Basics.Kalyani Publishers: New Delhi.
Singh, S. (2021). Geomorphology (10th ed.). PrayagPustakBhawan.
Woodhouse, I.H. (2006). Introduction to Microwave Remote Sensing. Taylor and Francis

Semester: III

Geomorphology Specialization (A)

Paper Title: Population and Settlement Geography

Paper code: GEOSPL25014

Credit: 4 Marks: 100

Course Objectives:

- To provide students with a comprehensive understanding of population dynamics, demographic processes, migration, settlement evolution, and urbanization from geographical perspectives.
- To develop analytical skills for examining population theories, settlement patterns, urban systems, and contemporary rural and urban issues using relevant geographical concepts and models.

Course Outcomes

- Explain the concepts, sources, distribution, growth, composition, and structure of population, and analyze the determinants of demographic change.
- Evaluate population theories, fertility, mortality, migration, and population policies, and interpret their implications for demographic and regional development.
- Analyze the evolution, classification, and functional characteristics of rural and urban settlements, including contemporary issues affecting settlement systems.
- Assess urbanization processes, urban systems, land-use models, and emerging urban forms, and critically examine socio-economic challenges such as segregation, slums, informal sector growth, and urban poverty.

Unit I: Population Dynamics and Demographic Structure

Sources of population data: census, sample surveys and vital statistics, data reliability and errors
World Population Distribution: measures, patterns and determinants,
World Population Growth: prehistoric to modern period
Population composition and structure of India: age, sex, rural-urban, occupation, and educational levels, ethnic and religious composition
Determinants of population composition and structure

Unit II: Population Theories and Policies

Theories: Demographic Transition, Malthus, Sadler, and Ricardo
Fertility and Mortality Analysis: indices, determinants, and world patterns
Migration: types, causes and consequences
Migration models: Gravity model, Zipf Model

Population Policies in Developed and Developing Countries
Population Policies in India

Unit III: Evolution and Classification of Settlement
Concept of site and situation in settlement geography
Rural Settlements: types, patterns and distribution
Contemporary Problems of Rural Settlements: land use changes, land acquisition and transactions
Theories of Origin of Towns: Gordon Childe, Henri Pirenne, Lewis Mumford
Classification of cities based on stage of growth and decay
Concepts of Megacities, Global Cities and Edge Cities,
Functional classification of urban centers and Indian Cities: Ashok Mitra, Mukherjee
Rural- urban relationship: dichotomy and continuum

Unit IV: Urban Systems and Urban Structure
Characteristics and Processes of Urbanization in Developed and Developing Countries: factors of urban growth, trends of urbanisation, size, structure and functions of urban areas
Urban Systems: primate city and rank size rule; Central Place Theories: Christaller and Losch
Internal Structure of the City, Models of Urban Land Use: Burgess, Harris and Ullman, and Hoyt
Changing Urban Forms: peri-urban areas, rural-urban fringe, suburban, ring and satellite towns,
Social Segregation in the City, Urban Social Area Analysis,
Manifestation of Poverty in the City: slums, informal sector growth, crime and social exclusion

Suggested Reading:

Bhende, A. A., &Kanitkar, T. (2019).*Principles of Population Studies*.Himalaya Publishing House.
Chandna, R. C. (2015). *Geography of Population*.Kalyani Publishers.
Ghosh, S. (2015).*Introduction to Settlement Geography*. Orient Blackswan
Hassan, M.I. (2007). Population Geography.Rawat Publications.
Husain, M. (2016).*Moddels in Geography.*Rawat Publications.
Husain, M. (2021).*Human Geography*.SixthEdition.Rawat Publications.
Hussain, J. (2021). Settlement Geography.Notion Press.
Khullar, D.R. (2018). *India, A comprehensive Geography*. Kalyani Publishers.
Lundquist, J.H., Anderton, D.L., &Yaukey, D. (2015).*Demography, The Study of Human Population*.Fourth Edition. Waveland Press, Inc.
Newbold, K.B. (2017). Population Geography: Tools & Issues. Rawat Publications.
Ram, F. &Pathak, K. B. (1998).*Techniques of Demographic Analysis*.Himalaya Publishing House.
Singh, R.Y. (2002). *Geography of Settlements.*Rawat Publications.
Tiwari, R.C. (2020). *Settlement Geography, Rural and Urban Settlements.*Pravalika publication.

Paper Title: Economic Geography and Regional Planning
Paper code: GEOSPL25024
Credit: 4 Marks: 100

Course Objectives:
- To develop a comprehensive understanding of the spatial organization of economic activities, agricultural and industrial systems, regional development, and planning from a geographical perspective.
- To equip students with the analytical skills to evaluate theories, models, and planning approaches for addressing regional disparities, resource management, and sustainable development.

Course Outcomes

- Explain the spatial organization of economic activities, agricultural systems, industrial location, transport networks, and global trade using relevant geographical concepts, theories, and models.
- Analyze agricultural productivity, industrial development, globalization, spatial interaction, and regional economic patterns using appropriate geographical methods and indices.
- Evaluate the concepts, theories, and approaches of regional planning and development, and assess regional disparities and development strategies in India and the world.
- Apply planning principles and methodologies to examine regional planning practices, resource development programmes, environmental impact assessment, and sustainable regional development initiatives.

Unit I: Economic and Agricultural Geography

Factors affecting spatial organisation of economic activities: primary, secondary, tertiary and quarternary

Natural Resources: classification, distribution, management, and associated problems

Energy Crises in Developed and Developing Countries

Land capability classification and Land Use Planning

Cropping Pattern: Methods of delineating crop combination regions – Weaver, Doi and Rafiullah

Crop diversification,

Von Thunen's Model of Land Use Planning

Measurement and Determinants of Agricultural Productivity

Regional variations in Agricultural Productivity, Agricultural Systems of the World

Unit II: Industrial and Transport Geography

Classification of Industries, Factors of Industrial Location

Theories of Industrial Location: A. Weber, E. M. Hoover, August Losch, A. Pred and D. M. Smith

World Industrial Regions

Impact of Globalisation on manufacturing sector in Less Developed Countries

Growth and distribution: Tourism Industry, Information and Communication Technology (ICT) and Knowledge Production (Education and R & D) Industries

Theories and Models of spatial interaction: Edward Ullman and M. E. Hurst

Measures and Indices of connectivity and accessibility

World Trade Organisation, Globalisation and Liberalisation, Trading Blocs and World Trade Patterns

Problems and Prospects of Inter and Intra Regional Cooperation and Trade

Unit III: Fundamentals of regional planning and development

Concept of region and Regionalization, Typology of Region: Formal, Adhoc, Functional

Concept and Scope of regional planning

Types of Planning: Sectoral, Sectional, and Spatial Planning, Short-Term, Medium-Term, Perspective Planning, Multi-Regional and Multi-Level Planning: Macro, Meso, and Micro Levels

Regional planning in India through National Plans

Regional Development: Meaning, factors and indicators

Regional imbalances and disparities with special reference to India
Theories and models of regional Development: Hirschman, Myrdal, Friedmann
Dependency Theory of Underdevelopment

Unit IV: Planning Practices, Programmes, and Methods of Regional Planning

Planning practices in India: Basic Minimum Need (BMN) programme, Metropolitan Planning, River Valley Planning, National Capital Region Planning
Resource Development and Regional Planning
Spatial Purpose Region Planning: Drought Prone Area Programme, Western Ghats, and KBK region
Regional Development and Social Movements in India
Methodology of Plan preparation: Surveys techniques (Baseline, Diagnostic, and Evaluative), Input-output methodology, and Inter-regional input output framework; cost benefit, and Environmental Impact Assessment (EIA), IADP methodology

Suggested reading:

Chandna, R. C. (2009). Regional Planning: A Comprehensive Text. Kalyani Publishers.
Coe, N. M., Kelly, P. F., &Yeung, H. W.-C. (2023). Economic Geography: A Contemporary Introduction (3rd ed.). Wiley.
Glasson, J., & Marshall, T. (2007). Regional Planning (2nd ed.). Routledge.
Hall, P. (2014). Cities of Tomorrow: An Intellectual History of Urban Planning and Design Since 1880 (4th ed.). Wiley-Blackwell.
Knox, P. L., & Marston, S. A. (2016). Places and Regions in Global Context: Human Geography (7th ed.). Pearson.
Knox, P., Agnew, J., & McCarthy, L. (2022). The Geography of the World Economy (7th ed.). Routledge.
Misra, R. P. (2002). Regional Planning: Concepts, Techniques, Policies and Case Studies. Concept Publishing Company.
Misra, R. P. (2002). Regional Planning: Concepts, Techniques, Policies and Case Studies. Concept Publishing Company.
Roy, P. (2012). Economic Geography: A Study of Resources. New Central Book Agency.
Roy, P. (2012). Regional Planning and Development.New Central Book Agency.
Siddhartha, K., & Mukherjee, S. (2020). Economic Geography.Kisalaya Publications.
Singh, Y. K. (2007). Regional Planning and Development.New Academic Publishing Company.
Stohr, W. B. (1981). Development from Above or Below?The Dialectics of Regional Planning in Developing Countries.John Wiley & Sons.
Sundaram, K. V. (2007). Geography and Planning. Concept Publishing Company.
Wheeler, J. O., Muller, P. O., Thrall, G. I., &Fik, T. J. (1998).Economic Geography.John Wiley & Sons.

Paper Title: Climatic Geomorphology

Paper code: GEOSPL25034A

Credit: 4 Marks: 100

Course Objectives:

- Introduce the fundamentals of climatic geomorphology, encompassing its definition, scope, and the interaction between climate and landforms.
- Explore specific climatic zones, humid tropics, arid zones, and glacial/periglacial environments, and their distinct geomorphological processes and landforms.

Course Outcomes:

- Define climatic geomorphology and its role in shaping landscapes through climate-driven processes.

- Describe the climatic characteristics of humid tropics, including climate, vegetation, and associated landforms like fluvial erosive and sedimentary landforms.
- Explain weathering processes

Unit I: Introduction to Climatic Geomorphology
Structure of Climatic Geomorphology: Definition and scope
Processes and Morpho-climatic Zonation
Morpho-climatic zones and their characteristics
The Geographical Cycle: Concept and stages, Impact of climate on the geographical cycle

Unit II: Humid Tropics
Climate, vegetation, and morphoclimatic domains in Humid Tropics
Weathering in the Humid Tropics: Physical, biological, and chemical weathering,
Weathering degrees and products, Weathering profile, depth, and zone
Tropical Landforms: Landforms developed on laterites, etched plains, inselbergs, tropical karst

Unit III: Arid Zones
Causes and Features of Aridity: Causes of aridity and desert climatic features, Geomorphological differentiation of desert areas
Weathering in Deserts: Insolation weathering, wetting and drying, salt weathering, dissolution, biological activity, Resultant weathering forms
Action of water in arid regions, fluvial forms and processes

Unit IV: Glacial and Periglacial Environments
Glacial Processes: Past and present extension of glaciers, Mass balances of glaciers, snow-ice transformation
Classification, and movement of glaciers
Glacial erosion, Glacial transport and sedimentation
Permafrost and periglacial processes: frost action, chemical weathering, mass movements, nival processes, fluvial activities
Perglacial landforms: patterned ground, ice-cored mounds, slope morphology and evolution, fluvial landforms, thermo karst

Suggested Reading:
Bush, Mark B. and Flenley, John R. (2007).Tropical Rainforest Responses to Climatic Change.
Springer. Gutiérrez, M. (Ed.).(2013). Climatic geomorphology. Elsevier Derbyshire, E. (Ed.). (1973). Climatic geomorphology. The Macmillan Press Ltd
Gupta, A. (2011). Tropical geomorphology.Cambridge University Press.
Livingstone, Ian and Warren, Andrew (2019). Aeolian Geomorphology: A New Introduction. Wiley Blackwell.
Owens, Philip N and Slaymaker, Olav (2004).Mountain Geomorphology.Routledge.
Summerfield, M. A. (1991). Global geomorphology: An introduction to the study of landforms. Longman Scientific & Technical
Thomas, D. S. G. (Ed.). (2011). Arid zone geomorphology: Process, form and change in drylands (3rd ed.). Wiley-Blackwell.
Whiteman, C. A. (2012). Cold region hazards and risks.Wiley-Blackwell.

Paper Title: Fluvial Geomorphology

Paper code: GEOSPL25044A

Credit: 4 Marks: 100

Course Objectives:

- To provide students with a comprehensive understanding of fluvial geomorphological processes, river systems, channel dynamics, and the evolution of fluvial landscapes.
- To develop the ability to analyze river processes, assess human impacts on fluvial systems, and apply modern techniques for river monitoring, management, and restoration.

Course Outcomes:

- Explain the fundamental concepts, theories, and processes of fluvial geomorphology, including drainage basin dynamics, sediment budgets, and channel equilibrium.
- Analyze fluvial hydraulics, sediment transport, channel morphology, and river channel adjustments using established geomorphological principles.
- Evaluate the formation and evolution of fluvial landforms, river dynamics, and fluvial hazards, with particular reference to the Brahmaputra Valley and North-East India.
- Apply geomorphological concepts and geospatial techniques to assess human impacts, river restoration, sediment management, and sustainable river basin planning.

Unit I: Fundamentals of Fluvial Geomorphology

Meaning, scope and evolution of fluvial geomorphology
Relationship between fluvial geomorphology and hydrology
Drainage basin as a fluvial system
River continuum concept
Sediment budget in drainage basins
Channel at grade: concept, attainment of grade and channel equilibrium
Dynamic equilibrium, threshold and feedback mechanisms in fluvial systems

Unit II: Fluvial Processes and Channel Morphology

Fluvial hydraulics and open channel flow
Forces acting in river channels: Velocity distribution, Flow types, Water and sediment discharge, Stream power, competence and capacity
Sediment transport processes: Channel erosion and deposition
Channel morphology: cross-sectional geometry, longitudinal profile and planform geometry
Channel patterns: straight, meandering, braided and anastomosing rivers, Channel adjustment and channel changes in time and space.

Unit III: Fluvial Landforms and River Dynamics

Fluvial landforms and associated environments: erosional and depositional landforms, floodplains and wetlands
Flood geomorphology and floodplain evolution: River terraces, alluvial fans and deltas
Channel migration, avulsion and river metamorphosis
Fluvial hazards: floods, bank erosion, sedimentation, and soil erosion with special reference to North-East India
Fluvial geomorphology of the Brahmaputra Valley

Unit IV: Applied Fluvial Geomorphology

Human impacts on river basins and fluvial systems
Land use and land cover change, dam construction and river regulation
River restoration and environmental flows
Sediment management and river training

Applications of spatial technology and satellite data in fluvial geomorphology
Geomorphic modelling and river monitoring;

Suggested Reading:

Charlton, R. (2016). Fundamentals of Fluvial Geomorphology (2nd ed.). Routledge.
Garde, R. J. (2006). River Morphology.New Age International Publishers.
Gupta, A. (Ed.). (2008). Large Rivers: Geomorphology and Management. John Wiley & Sons.
Kale, V. S., & Gupta, A. (2015).Introduction to Geomorphology.OrientBlackSwan.
Knighton, D. (1998). Fluvial Forms and Processes: A New Perspective. Arnold.
Kondolf, G. M., &Piégay, H. (Eds.). (2016). Tools in Fluvial Geomorphology (2nd ed.). Wiley-Blackwell.
Leopold, L. B., Wolman, M. G., & Miller, J. P. (1964).Fluvial Processes in Geomorphology. W. H. Freeman.
Maity, R. (2016). Modern Approaches to Fluvial Geomorphology.Primus Books.
Morisawa, M. (1985). Rivers: Form and Process. Longman.
Richards, K. (1982). Rivers: Form and Process in Alluvial Channels. Methuen.
Robert, A. (2003). River Processes: An Introduction to Fluvial Dynamics. Arnold.
Schumm, S. A. (1977). The Fluvial System.John Wiley & Sons.

Paper Title: Practical III
Paper Code: GEOSPL 25054A
Credit: 4 Marks:100

Course Objectives:

- To provide students with a comprehensive understanding of population dynamics, demographic processes, migration, settlement evolution, and urbanization from geographical perspectives.
- To develop analytical skills for examining population theories, settlement patterns, urban systems, and contemporary rural and urban issues using relevant geographical concepts and models.

Course Outcomes:

- Explain the concepts, sources, distribution, growth, composition, and structure of population, and analyze the determinants of demographic change.
- Evaluate population theories, fertility, mortality, migration, and population policies, and interpret their implications for demographic and regional development.
- Analyze the evolution, classification, and functional characteristics of rural and urban settlements, including contemporary issues affecting settlement systems.
- Assess urbanization processes, urban systems, land-use models, and emerging urban forms, and critically examine socio-economic challenges such as segregation, slums, informal sector growth, and urban poverty.

Unit I: Analytical Techniques in Population Geography

- Population Concentration and Arithmetic Density
- Trend of population Growth
- Population projection: Arithmetic, Geometric &Exponential
- Determination of Spatial mean centre of Population
- Age sex pyramid
- Gravity Model

Unit II: Quantitative analysis of Settlement

- Spatial distribution of mean centre of settlement
- Nearest Neighbor Analysis

- Primate City and Rank Size Rule
- Network analysis
- Distance Decay

Unit III: Analysis of Geographic Pattern

- Agricultural Efficiency
- Crop combination and Crop intensity
- Ternary diagram
- Location Quotient
- Flow diagram

Unit IV: Techniques in Fluvial Geomorphology

- Channel Analysis: Geometry, Meander and Migration
- Fluvial Sediment Analysis: Sieve analysis and bed materials analysis.
- Fluvial Landform Mapping: point bars, mid-channel bars and sand bars
- Flood Hazard Mapping
- Land Use Change Analysis along the river course/river segment

Suggested reading:

Mahmood, A. (1977). *Statistical Methods in Geographical Studies*. Delhi: Concept Publications.
Singh, R. L., & Singh, R. P. B. (1997).Elements of Practical Geography.Kalyani Publishers.
Ghosh, S. (1998).A Text Book of Settlement Geography.Orient Longman.

Semester: III
Social Geography Specialization (B)
Paper Title: Population and Settlement Geography

Paper code: GEOSPL25014

Credit: 4 Marks: 100

Course Objectives:

- To provide students with a comprehensive understanding of population dynamics, demographic processes, migration, settlement evolution, and urbanization from geographical perspectives.
- To develop analytical skills for examining population theories, settlement patterns, urban systems, and contemporary rural and urban issues using relevant geographical concepts and models.

Course Outcomes:

- Explain the concepts, sources, distribution, growth, composition, and structure of population, and analyze the determinants of demographic change.
- Evaluate population theories, fertility, mortality, migration, and population policies, and interpret their implications for demographic and regional development.
- Analyze the evolution, classification, and functional characteristics of rural and urban settlements, including contemporary issues affecting settlement systems.
- Assess urbanization processes, urban systems, land-use models, and emerging urban forms, and critically examine socio-economic challenges such as segregation, slums, informal sector growth, and urban poverty.

Unit I: Population Dynamics and Demographic Structure

Sources of population data: census, sample surveys and vital statistics, data reliability and errors
World Population Distribution: measures, patterns and determinants,
World Population Growth: prehistoric to modern period
Population composition and structure of India: age, sex, rural-urban, occupation, and educational levels, ethnic and religious composition

Determinants of population composition and structure

Unit II: Population Theories and Policies
Theories: Demographic Transition, Malthus, Sadler, and Ricardo
Fertility and Mortality Analysis: indices, determinants, and world patterns
Migration: types, causes and consequences
Migration models: Gravity model, Zipf Model
Population Policies in Developed and Developing Countries
Population Policies in India

Unit III: Evolution and Classification of Settlement
Concept of site and situation in settlement geography
Rural Settlements: types, patterns and distribution
Contemporary Problems of Rural Settlements: land use changes, land acquisition and transactions
Theories of Origin of Towns: Gordon Childe, Henri Pirenne, Lewis Mumford
Classification of cities based on stage of growth and decay
Concepts of Megacities, Global Cities and Edge Cities,
Functional classification of urban centers and Indian Cities: Ashok Mitra, Mukherjee
Rural- urban relationship: dichotomy and continuum

Unit IV: Urban Systems and Urban Structure
Characteristics and Processes of Urbanization in Developed and Developing Countries: factors of urban growth, trends of urbanisation, size, structure and functions of urban areas
Urban Systems: primate city and rank size rule; Central Place Theories: Christaller and Losch
Internal Structure of the City, Models of Urban Land Use: Burgess, Harris and Ullman, and Hoyt
Changing Urban Forms: peri-urban areas, rural-urban fringe, suburban, ring and satellite towns,
Social Segregation in the City, Urban Social Area Analysis,
Manifestation of Poverty in the City: slums, informal sector growth, crime and social exclusion

Suggested Reading:

Bhende, A. A., &Kanitkar, T. (2019).*Principles of Population Studies*.Himalaya Publishing House.
Chandna, R. C. (2015). *Geography of Population*.Kalyani Publishers.
Ghosh, S. (2015).*Introduction to Settlement Geography*. Orient Blackswan
Hassan, M.I. (2007). Population Geography.Rawat Publications.
Husain, M. (2016).*Moddels in Geography*.Rawat Publications.
Husain, M. (2021).*Human Geography*.SixthEdition.Rawat Publications.
Hussain, J. (2021). Settlement Geography.Notion Press.
Khullar, D.R. (2018). *India, A comprehensive Geography*. Kalyani Publishers.
Lundquist, J.H., Anderton, D.L., &Yaukey, D. (2015).*Demography, The Study of Human Population*.Fourth Edition. Waveland Press, Inc.
Newbold, K.B. (2017). Population Geography: Tools & Issues. Rawat Publications.
Ram, F. &Pathak, K. B. (1998).*Techniques of Demographic Analysis*.Himalaya Publishing House.
Singh, R.Y. (2002). *Geography of Settlements.*Rawat Publications.
Tiwari, R.C. (2020). *Settlement Geography, Rural and Urban Settlements.*Pravalika publication.

Paper Title: Economic Geography and Regional Planning

Paper code: GEOSPL25024

Credit: 4 Marks: 100

Course Objectives:

- To develop a comprehensive understanding of the spatial organization of economic activities, agricultural and industrial systems, regional development, and planning from a geographical perspective.
- To equip students with the analytical skills to evaluate theories, models, and planning approaches for addressing regional disparities, resource management, and sustainable development.

Course Outcomes:

- Explain the spatial organization of economic activities, agricultural systems, industrial location, transport networks, and global trade using relevant geographical concepts, theories, and models.
- Analyze agricultural productivity, industrial development, globalization, spatial interaction, and regional economic patterns using appropriate geographical methods and indices.
- Evaluate the concepts, theories, and approaches of regional planning and development, and assess regional disparities and development strategies in India and the world.
- Apply planning principles and methodologies to examine regional planning practices, resource development programmes, environmental impact assessment, and sustainable regional development initiatives.

Unit I: Economic and Agricultural Geography

Factors affecting spatial organisation of economic activities: primary, secondary, tertiary and quarternary

Natural Resources: classification, distribution, management, and associated problems

Energy Crises in Developed and Developing Countries

Land capability classification and Land Use Planning

Cropping Pattern: Methods of delineating crop combination regions – Weaver, Doi and Rafiullah Crop diversification,

Von Thunen's Model of Land Use Planning

Measurement and Determinants of Agricultural Productivity

Regional variations in Agricultural Productivity, Agricultural Systems of the World

Unit II: Industrial and Transport Geography

Classification of Industries, Factors of Industrial Location

Theories of Industrial Location: A. Weber, E. M. Hoover, August Losch, A. Pred and D. M. Smith

World Industrial Regions

Impact of Globalisation on manufacturing sector in Less Developed Countries

Growth and distribution: Tourism Industry, Information and Communication Technology (ICT) and Knowledge Production (Education and R & D) Industries

Theories and Models of spatial interaction: Edward Ullman and M. E. Hurst

Measures and Indices of connectivity and accessibility

World Trade Organisation, Globalisation and Liberalisation, Trading Blocs and World Trade Patterns

Problems and Prospects of Inter and Intra Regional Cooperation and Trade

Unit III: Fundamentals of regional planning and development

Concept of region and Regionalization, Typology of Region: Formal, Adhoc, Functional

Concept and Scope of regional planning

Types of Planning: Sectoral, Sectional, and Spatial Planning, Short-Term, Medium-Term, Perspective Planning, Multi-Regional and Multi-Level Planning: Macro, Meso, and Micro Levels

Regional planning in India through National Plans

Regional Development: Meaning, factors and indicators

Regional imbalances and disparities with special reference to India

Theories and models of regional Development: Hirschman, Myrdal, Friedmann

Dependency Theory of Underdevelopment

Unit IV: Planning Practices, Programmes, and Methods of Regional Planning

Planning practices in India: Basic Minimum Need (BMN) programme, Metropolitan Planning, River Valley Planning, National Capital Region Planning

Resource Development and Regional Planning

Spatial Purpose Region Planning: Drought Prone Area Programme, Western Ghats, and KBK region

Regional Development and Social Movements in India

Methodology of Plan preparation: Surveys techniques (Baseline, Diagnostic, and Evaluative), Input-output methodology, and Inter-regional input output framework; cost benefit, and Environmental Impact Assessment (EIA), IADP methodology

Suggested reading:

Chandna, R. C. (2009). Regional Planning: A Comprehensive Text. Kalyani Publishers.

Coe, N. M., Kelly, P. F., &Yeung, H. W.-C. (2023). Economic Geography: A Contemporary Introduction (3rd ed.). Wiley.

Glasson, J., & Marshall, T. (2007). Regional Planning (2nd ed.). Routledge.

Hall, P. (2014). Cities of Tomorrow: An Intellectual History of Urban Planning and Design Since 1880 (4th ed.). Wiley-Blackwell.

Knox, P. L., & Marston, S. A. (2016). Places and Regions in Global Context: Human Geography (7th ed.). Pearson.

Knox, P., Agnew, J., & McCarthy, L. (2022). The Geography of the World Economy (7th ed.). Routledge.

Misra, R. P. (2002). Regional Planning: Concepts, Techniques, Policies and Case Studies. Concept Publishing Company.

Misra, R. P. (2002). Regional Planning: Concepts, Techniques, Policies and Case Studies. Concept Publishing Company.

Roy, P. (2012). Economic Geography: A Study of Resources. New Central Book Agency.

Roy, P. (2012). Regional Planning and Development.New Central Book Agency.

Siddhartha, K., & Mukherjee, S. (2020). Economic Geography.Kisalaya Publications.

Singh, Y. K. (2007). Regional Planning and Development.New Academic Publishing Company.

Stohr, W. B. (1981). Development from Above or Below?The Dialectics of Regional Planning in Developing Countries.John Wiley & Sons.

Sundaram, K. V. (2007). Geography and Planning. Concept Publishing Company.

Wheeler, J. O., Muller, P. O., Thrall, G. I., &Fik, T. J. (1998).Economic Geography.John Wiley & Sons.

Paper Title: Social Dynamics and Change
Paper Code: GEOSPL 25034B

Credit: 4 Marks: 100

Course Objectives:

- Understand the dynamics of social change across different spatial and historical contexts.
- Analyze the impact of globalization, technological advancements, and social movements on contemporary societies.

Course Outcomes:

- Explain the historical perspectives and theories of social change including conflict theory, functionalism, and symbolic interactionism.
- Evaluate regional disparities and inequalities within societies using geographical perspectives.
- Describe processes of social evolution in India, including Sanskritization, Westernization, and Modernization.
- Examine the influence of globalization on climate change, environmental degradation, and social vulnerability.

Unit I: Introduction to Social Dynamics

Definition and Scope of Social Dynamics
Historical Perspectives on Social Change
Social Forces and Factors Influencing Change
Spatial Patterns of Social Dynamics and Social Change
Theories of Social Dynamics: Conflict theory, Functionalism, Symbolic Interactionism
Regional Disparities and Inequalities in terms of society

Unit II: Geographies of Social Change

Social evolution in India: The pre-history and historic scene (Janapadas and Mughal Subahs)
Theories of Social Change: Evolutionary, Cyclical, Dynamic, Conflict
Processes of social change in India: Sanskritization, Westernization and Modernization
Social groups, social structure and social development: an international perspective
Processes of social change: urbanization, industrialization
Residential Segregation and Mobility
The Role of Technology in Social Change

Unit III: Social Movements and Collective Action

Understanding Social Movements
Types of Social Movements: Reformist, Revolutionary, Resistance
Factors contributing to the Emergence of Social Movements
Theories of Social Movement: Relative deprivation theory, Strength theory, Revitalization theory
Social Change among Urbanites
Case Studies on Social Movements: Assam movement, Bodoland movement

Unit IV: Social Problems

Social Problems: Definition, Characteristics, Types, Causes, and Consequences
Theoretical approaches to study social problems: Social Disorganization, Cultural Lag, Value Conflict, Personal Deviation, and Anomic
Methods of studying Social Problems: Social Survey, Case Study, and Multiple Factor
Problems: Poverty, Unemployment, Over-Population, Crime, Juvenile Delinquency

Suggested Reading:

Ahmad, A. (1993). Social Structure and Regional Development: A Social Geography Perspective. Jaipur: Rawat Publications.
Ahmad, A. (1999). Social Geography. Jaipur and New Delhi: Rawat Publications.
Carter, J and Terner, J. (1989).Social Geography: An Introduction to Contemporary Issues. London: Edward Arnold.
Carter, John and Trevor, J. (1989).Social Geography: An Introduction to Contemporary Issues. London: Edward Arnold.
Gregory, D. and Urry, J. (1985). Social Relation and Social Structure. London: Macmillan.
Harvey, D. (1972). Social Justice and the City. London: Arnold.
Jones, E. and Eyles, J. (1977).An Introduction to Social Geography. Oxford and New York: Oxford University Press.
Momsen, J. H. and Townsend, G. (1987).Geography of Gender in the Third World. London, New York: Hutchinson, State University of New York Press.
Shankar Rao, CN (2012). Sociology, Principles of Sociology, with an introduction to Social Thought. S Chand and Company Ltd.
Shankar Rao, CN (2019). Indian Social Problems, A Sociological Perspective. S Chand and Company Ltd.
Sharma, H. N. (2000). Social Geography. (J. Singh, Ed.). New Delhi: INSA.
Sharma, H. N. (2001). Social Geography: Progress in Geography. New Delhi: INSA.
Smith, D. M. (1977a). Human Geography : A Welfare Approach. London: Edward Arnold.
Smith, D. M. (1979).Where the Grass is Greener: Living in an Unequal World. Victoria: Penguin Books Australia Ltd.
Sopher, D. E. (1986).An Exploration Of India: Geographical Perspectives on Society and Culture. London: Longman.
Sopher, D. E. (1987).An Exploration Of India: Geographical Perspectives on Society and Culture. London: Longman.
Sriniwas, M. N. (1986). India: Social Structure. Delhi: Hindustan Publishing Corporation.
Taher, M. (1994).Social Geography: Concept and Theories. Guwahati: NEIGS.

Paper Title: Geography of Social Well Being
Paper Code: GEOSPL 25044B

Credit: 4 Marks: 100

Course Objectives:

- Explore the dimensions, theoretical frameworks, and indicators of social well-being across different cultural contexts.
- Analyze the factors influencing social well-being, including family dynamics, community engagement, economic status, and access to resources.

Course Outcomes:

- Define and discuss the dimensions of social well-being and analyze their interrelationships.
- Apply theoretical frameworks such as Maslow's Hierarchy of Needs and subjective well being to understand social well-being.
- Examine global challenges to social well-being, including climate change, pandemics, and inequality, and their implications for public health and policy.

Unit I: Introduction to Social Well-being

Definition and Dimensions of Social Well-being
Human welfare approaches
Theoretical Frameworks: Maslow's Hierarchy of Needs, Subjective Well-being
Indicators of Social Well-being: Health, Education, Income, Social Support

Cultural and Contextual Influences on Social Well-being

Unit II: Factors Influencing Social Well-being
Family and Social Relationships
Community Engagement and Social Cohesion
Effects of economic Status, Education, and Social Support on Health
Access to Resources and Opportunities
Green Spaces and Community Health

Unit III: Social Well-being and Contemporary Challenges
Enhancing Social Well-being: Mental Health Programs, Education Initiatives
Empowerment and Capacity Building
Advocacy and Social Justice
Building Resilience and Coping Strategies
Global Challenges to Social Well-being: Climate Change, Pandemics, and Inequality
Technology and Social Well-being

Unit IV: Aging and Well-being
Definitions and concepts of aging
Demographic trends in aging populations worldwide
Relationship between aging and social well-being
Social support: Concept, Types of social support: emotional, instrumental
Family dynamics and intergenerational relationships
Community-based support services and programs for older adults
Technology and its role in enhancing social connections among older adults

Suggested Reading:

Allin, P. and Hand, D. J. (2014).The Wellbeing of Nations: Meaning, Motive and Measurement, Blackman, T. (2006).Placing Health: Neighborhood Renewal, Health Improvement and Blackwell.
Byrne, D.S. and Ragin, C. C. (Eds.) (1977). The Geographies of Inequality: Social and Spatial Complexity, Policy Press.
Diener, E. Oishi, S. &Tay, L. (2018). Handbook of Social Well-Being, UT: DEF Publishers. Divisions in Society, Oxford University Press.
Gatrell, A. C. and Elliott , S. J. (2014). Geographies of Health: An Introduction, Wiley- John Wiley & Sons Inc.
Knox, P. (1995). Social Well-being: A Spatial Perspective. Oxford: Oxford University Press.
Smith, D. M. (1973).A Geography of Social Well-being. New York: McGraw Hill.
Vincent J. Del Casino Jr. (2009). Social Geography: A Critical Introduction, Wiley-Blackwell.

Paper Title: Practical-III

Paper code: GEOSPL25054 B

Credit: 4 Marks: 100

Course Objectives:

- To develop students' understanding of quantitative techniques and analytical methods used in population, settlement, economic, and social geography.
- To equip students with the skills to apply statistical and spatial techniques for analyzing geographical patterns, demographic characteristics, and regional development.

Course Outcomes:

- Apply quantitative techniques to analyze population distribution, growth, projection, demographic structure, and spatial population patterns.
- Analyze settlement patterns, urban systems, and spatial interactions using methods such as nearest neighbor analysis, network analysis, gravity models, and distance decay.
- Evaluate agricultural and economic spatial patterns using techniques such as agricultural efficiency, crop combination, location quotient, ternary diagrams, and flow diagrams.
- Construct and interpret development and social indicators, including HDI, PQLI, GDI, dependency ratios, disparity indices, Z-scores, principal component analysis (PCA), and measures of ageing for geographical analysis.

Unit I: Analytical Techniques in Population Geography

- Population Concentration and Arithmetic Density
- Trend of population Growth
- Population projection: Arithmetic, Geometric &Exponential
- Determination of Spatial mean centre of Population
- Age sex pyramid
- Gravity Model

Unit II: Quantitative analysis of Settlement

- Spatial distribution of mean centre of settlement
- Nearest Neighbor Analysis
- Primate City and Rank Size Rule
- Network analysis
- Distance Decay

Unit III: Analysis of Geographic Pattern

- Agricultural Efficiency
- Crop combination and Crop intensity
- Ternary diagram
- Location Quotient
- Flow diagram

Unit IV: Measures of Social Change &Development

- Construction of Development Indices
- Physical Quality of Life Index (PQLI), Human development index (HDI), Gender Development Index (GDI)
- Dependency Ratio: Child dependency ratio, old age dependency ratio
- Classification of labor
- Measures of Aging

Suggested Reading:

Mahmood, A. (2021). *Statistical Methods in Geographical Studies.* Rajesh Publications: N Delhi.

Ghosh, S. (2015). *Introduction to Settlement Geography*. Orient Blackswan

Semester: III

Population Geography Specialization (C)

Paper Title: Population and Settlement Geography

Paper code: GEOSPL25014

Credit: 4 Marks: 100

Course Objectives:

- To provide students with a comprehensive understanding of population dynamics, demographic processes, migration, settlement evolution, and urbanization from geographical perspectives.
- To develop analytical skills for examining population theories, settlement patterns, urban systems, and contemporary rural and urban issues using relevant geographical concepts and models.

Course Outcomes

- Explain the concepts, sources, distribution, growth, composition, and structure of population, and analyze the determinants of demographic change.
- Evaluate population theories, fertility, mortality, migration, and population policies, and interpret their implications for demographic and regional development.
- Analyze the evolution, classification, and functional characteristics of rural and urban settlements, including contemporary issues affecting settlement systems.
- Assess urbanization processes, urban systems, land-use models, and emerging urban forms, and critically examine socio-economic challenges such as segregation, slums, informal sector growth, and urban poverty.

Unit I: Population Dynamics and Demographic Structure

Sources of population data: census, sample surveys and vital statistics, data reliability and errors
World Population Distribution: measures, patterns and determinants,
World Population Growth: prehistoric to modern period
Population composition and structure of India: age, sex, rural-urban, occupation, and educational levels, ethnic and religious composition
Determinants of population composition and structure

Unit II: Population Theories and Policies

Theories: Demographic Transition, Malthus, Sadler, and Ricardo
Fertility and Mortality Analysis: indices, determinants, and world patterns
Migration: types, causes and consequences
Migration models: Gravity model, Zipf Model
Population Policies in Developed and Developing Countries
Population Policies in India

Unit III: Evolution and Classification of Settlement

Concept of site and situation in settlement geography
Rural Settlements: types, patterns and distribution
Contemporary Problems of Rural Settlements: land use changes, land acquisition and transactions
Theories of Origin of Towns: Gordon Childe, Henri Pirenne, Lewis Mumford
Classification of cities based on stage of growth and decay
Concepts of Megacities, Global Cities and Edge Cities,
Functional classification of urban centers and Indian Cities: Ashok Mitra, Mukherjee
Rural- urban relationship: dichotomy and continuum

Unit IV: Urban Systems and Urban Structure

Characteristics and Processes of Urbanization in Developed and Developing Countries: factors of urban growth, trends of urbanisation, size, structure and functions of urban areas
Urban Systems: primate city and rank size rule; Central Place Theories: Christaller and Losch
Internal Structure of the City, Models of Urban Land Use: Burgess, Harris and Ullman, and Hoyt
Changing Urban Forms: peri-urban areas, rural-urban fringe, suburban, ring and satellite towns,
Social Segregation in the City, Urban Social Area Analysis,
Manifestation of Poverty in the City: slums, informal sector growth, crime and social exclusion

Suggested Reading:

Bhende, A. A., &Kanitkar, T. (2019).*Principles of Population Studies*.Himalaya Publishing House.
Chandna, R. C. (2015). *Geography of Population*.Kalyani Publishers.
Ghosh, S. (2015).*Introduction to Settlement Geography*. Orient Blackswan
Hassan, M.I. (2007). Population Geography.Rawat Publications.
Husain, M. (2016).*Moddels in Geography.*Rawat Publications.
Husain, M. (2021).*Human Geography*.SixthEdition.Rawat Publications.
Hussain, J. (2021). Settlement Geography.Notion Press.
Khullar, D.R. (2018). *India, A comprehensive Geography*. Kalyani Publishers.
Lundquist, J.H., Anderton, D.L., &Yaukey, D. (2015).*Demography, The Study of Human Population*.Fourth Edition. Waveland Press, Inc.
Newbold, K.B. (2017). Population Geography: Tools & Issues. Rawat Publications.
Ram, F. &Pathak, K. B. (1998).*Techniques of Demographic Analysis*.Himalaya Publishing House.
Singh, R.Y. (2002). *Geography of Settlements.*Rawat Publications.
Tiwari, R.C. (2020). *Settlement Geography, Rural and Urban Settlements.*Pravalika publication.

Paper Title: Economic Geography and Regional Planning

Paper code: GEOSPL25024

Credit: 4 Marks: 100

Course Objectives:

- To develop a comprehensive understanding of the spatial organization of economic activities, agricultural and industrial systems, regional development, and planning from a geographical perspective.
- To equip students with the analytical skills to evaluate theories, models, and planning approaches for addressing regional disparities, resource management, and sustainable development.

Course Outcomes

- Explain the spatial organization of economic activities, agricultural systems, industrial location, transport networks, and global trade using relevant geographical concepts, theories, and models.
- Analyze agricultural productivity, industrial development, globalization, spatial interaction, and regional economic patterns using appropriate geographical methods and indices.
- Evaluate the concepts, theories, and approaches of regional planning and development, and assess regional disparities and development strategies in India and the world.
- Apply planning principles and methodologies to examine regional planning practices, resource development programmes, environmental impact assessment, and sustainable regional development initiatives.

Unit I: Economic and Agricultural Geography

Factors affecting spatial organisation of economic activities: primary, secondary, tertiary and quarternary
Natural Resources: classification, distribution, management, and associated problems
Energy Crises in Developed and Developing Countries
Land capability classification and Land Use Planning
Cropping Pattern: Methods of delineating crop combination regions – Weaver, Doi and Rafiullah Crop diversification,
Von Thunen's Model of Land Use Planning
Measurement and Determinants of Agricultural Productivity
Regional variations in Agricultural Productivity, Agricultural Systems of the World

Unit II: Industrial and Transport Geography
Classification of Industries, Factors of Industrial Location
Theories of Industrial Location: A. Weber, E. M. Hoover, August Losch, A. Pred and D. M. Smith
World Industrial Regions
Impact of Globalisation on manufacturing sector in Less Developed Countries
Growth and distribution: Tourism Industry, Information and Communication Technology (ICT) and Knowledge Production (Education and R & D) Industries
Theories and Models of spatial interaction: Edward Ullman and M. E. Hurst
Measures and Indices of connectivity and accessibility
World Trade Organisation, Globalisation and Liberalisation, Trading Blocs and World Trade Patterns
Problems and Prospects of Inter and Intra Regional Cooperation and Trade

Unit III: Fundamentals of regional planning and development
Concept of region and Regionalization, Typology of Region: Formal, Adhoc, Functional
Concept and Scope of regional planning
Types of Planning: Sectoral, Sectional, and Spatial Planning, Short-Term, Medium-Term, Perspective Planning, Multi-Regional and Multi-Level Planning: Macro, Meso, and Micro Levels
Regional planning in India through National Plans
Regional Development: Meaning, factors and indicators
Regional imbalances and disparities with special reference to India
Theories and models of regional Development: Hirschman, Myrdal, Friedmann
Dependency Theory of Underdevelopment

Unit IV: Planning Practices, Programmes, and Methods of Regional Planning
Planning practices in India: Basic Minimum Need (BMN) programme, Metropolitan Planning, River Valley Planning, National Capital Region Planning
Resource Development and Regional Planning
Spatial Purpose Region Planning: Drought Prone Area Programme, Western Ghats, and KBK region
Regional Development and Social Movements in India
Methodology of Plan preparation: Surveys techniques (Baseline, Diagnostic, and Evaluative), Input-output methodology, and Inter-regional input output framework; cost benefit, and Environmental Impact Assessment (EIA), IADP methodology

Suggested reading:

Chandna, R. C. (2009). Regional Planning: A Comprehensive Text. Kalyani Publishers.

Coe, N. M., Kelly, P. F., &Yeung, H. W.-C. (2023). Economic Geography: A Contemporary Introduction (3rd ed.). Wiley.

Glasson, J., & Marshall, T. (2007). Regional Planning (2nd ed.). Routledge.

Hall, P. (2014). Cities of Tomorrow: An Intellectual History of Urban Planning and Design Since 1880 (4th ed.). Wiley-Blackwell.

Knox, P. L., & Marston, S. A. (2016). Places and Regions in Global Context: Human Geography (7th ed.). Pearson.

Knox, P., Agnew, J., & McCarthy, L. (2022). The Geography of the World Economy (7th ed.). Routledge.

Misra, R. P. (2002). Regional Planning: Concepts, Techniques, Policies and Case Studies. Concept Publishing Company.

Misra, R. P. (2002). Regional Planning: Concepts, Techniques, Policies and Case Studies. Concept Publishing Company.

Roy, P. (2012). Economic Geography: A Study of Resources. New Central Book Agency.

Roy, P. (2012). Regional Planning and Development.New Central Book Agency.

Siddhartha, K., & Mukherjee, S. (2020). Economic Geography.Kisalaya Publications.

Singh, Y. K. (2007). Regional Planning and Development.New Academic Publishing Company.

Stohr, W. B. (1981). Development from Above or Below?The Dialectics of Regional Planning in Developing Countries.John Wiley & Sons.

Sundaram, K. V. (2007). Geography and Planning. Concept Publishing Company.

Wheeler, J. O., Muller, P. O., Thrall, G. I., &Fik, T. J. (1998).Economic Geography.John Wiley & Sons.

Paper Title: Fertility and Mortality Studies

Paper code: GEOSPL25034C

Credit: 4 Marks: 100

Course Objectives:

- Explore fundamental concepts and measures related to fertility and mortality.
- Analyze fertility and mortality trends, differentials, and causes in global and regional contexts.

Course Outcomes:

- Define and differentiate concepts of fertility and mortality.
- Explain the significance of fertility and mortality measures in Population Geography.
- Identify sources of fertility and mortality data for demographic research and policy formulation.
- Discuss causes of spatio-temporal differentials in fertility and mortality.

Unit I: Concepts

Concept of Fertility, Fecundity, Natural fertility, Sterility, Contraception
Fertility: Biological limits and Social Norms, Theoretical maximum
Importance of the study fertility in population Geography
Sources of fertility data
Geographical implications of Below-replacement level fertility
Causes of high fertility in developing countries
Spatio-temporal variation in fertility in India: findings from NFHSs

Unit II: Theories and Measures of Fertility

Kignsley Davis and Judith Blake, and John Bongaart's determinants of fertility
Theory of Change and Response, Liebenstein's Theory, Becker's Theory, Easterlin's Framework of Fertility, Caldwell's Wealth Flow Theory

Basic measures of fertility: Crude birth rate, General fertility rate, Age specific fertility rate, Total fertility rate
Standardization of crude birth rate, Sex age adjusted birth rate
Measures of Reproduction: Gross reproduction rate and Net reproduction rate

Unit III: Concepts of Mortality
Concept of death, abortion, fetal deaths, still births, live birth
Concept of Infant Mortality, early and late neonatal death
Concept of Child Mortality, Maternal Mortality
Sources of mortality data
Mosley Chen Framework of Child Survival
Causes of infant mortality (endogenous and exogenous)
Effects of accessibility and Physiography on IMR
Leading causes of death in India
Spatio temporal variation in death rate in India

Unit IV: Measures of mortality
Crude death rate, Age-sex specific death rate
Infant mortality rate, Standardization of crude death rate
Maternal mortality ratio,
Life table: Construction of abridged life table
Spatio-temporal variation of life expectancy in India
Spatio temporal variation in death rate in Northeast India
Rural-Urban and Age- Sex differentials in death rate in Northeast India

Suggested Reading:

Bhende, A. A., &Kanitkar, T. (1978).*Principles of Population Studies*.Himalaya Publishing House.

Caldwell, J. C. (1990). What do we know about health transition: The cultural, social and behavioural determinants of health.In*The Proceedings of an International Workshop, Vol. 1 & 2*.Health Transition Centre, Australian National University.

Coontz, S. H. (1957). *Population Theories and their Economic Interpretation*.Routledge.

Kaa, D. J. van de. (1996). Anchored Narratives: The Story and Findings of Half a Century of Research into the Determinants of Fertility. *Population Studies*, *50*(3), 389–432. https://doi.org/10.1080/0032472031000149546

Mandelbaum, D. G. (1974).*Human Fertility in India: Social Components and Policy Perspectives*. University of California Press.

Mason, A. (Ed.). (2002). *Population Change and Economic Development in East Asia: Challenges Met, Opportunities Seized*. Stanford University Press.

Mishra, B. D. (1981). *An Introduction to the Study of Population*. South Asian Publishers, Pvt. Ltd.

Mosley, W. H., & Chen, L. C. (1984).Analytical Framework for the Study of Child Survival in Developing Countries.*Population and Development Review*, *10*, 25–45.

Omran, A. R. (2005). The epidemiologic transition: a theory of the epidemiology of population change. 1971. *The Milbank Quarterly*, *83*(4), 731–757. https://doi.org/10.1111/j.1468-0009.2005.00398.x

Park, K. (2021). *Text Book of Preventive and Social Medicine* (26th ed.). BanarsidasBhanot Publishers.

Preston, S. ., Heuveline, P., &Guillot, M. (2000).*Demography: Measuring and Modeling Population Processes*. Wiley-Blackwell.

Ram, F., &Pathak, K. B. (1998).*Techniques of Demographic Analysis*.Himalaya Publishing House.

Siegel, J. S., & Swanson, D. A. (2004).*The Methods and Materials of Demography* (2nd ed., pp. 371–405, 407–428, 429–453). Elsevier Academic Press.
Spira, A., Leridon, H., & Gray, R. (Eds.).(1993). *Bomedical and Determinants of Reproduction*. Clarendon Press.
Srinivasan, K. (1998). *Basic Demographic Techniques and Applications* (pp. 59–85). Sage Publications.
United Nations. (1973). *Determinants and Consequences of Population Trends, Vol. 1* (pp. 96–104). UN.
United Nations.(1999). Below Replacement Fertility.In*Population Bullentin of the UN, Special Issue Nos. 40/41*.Department of Economic and Social Affairs, UN.
World Health Organization.(2015). International statistical classification of diseases and related health problems, 10th revision, Fifth edition.*World Health Organization*.

Paper Title: Population and Resource Interface

Paper code: GEOSPL25044 C

Credit: 4 Marks: 100

Course Objectives:

- Explore the complex interrelations between population dynamics and development across various dimensions including demographic transitions, resource management, environmental impacts, and policy interventions.
- Analyze diverse perspectives on population and development, from pessimist to optimist viewpoints, and their implications for policy and practice.

Course Outcomes:

- Explain the effects of development on demographic variables
- Evaluate modern theories of population and development, including Malthusianism, Marxian perspectives, and the Tragedy of the Commons theory.
- Describe the concept of natural, capital, and human resources and their quantitative and qualitative aspects in relation to population dynamics.
- Discuss different population policies worldwide, including pro-natalist and anti-natalist strategies, and evaluate their impacts on fertility, mortality, migration, and special groups such as women, children, youth, and the aged.

Unit I: Linkages of Population on Development

Effect of development on: Demographic transition- age structure transition, fertility and mortality
Divergent views regarding the relationship between population and development: pessimist, optimist, and neutralist
Modern theories of population and development: Marx, Tragedy of Commons, Limit to growth

Unit II: Population and Resources

Concept of Natural resources,
Capital Resources and Human Resources
Quantitative aspects of Human Resource: concepts of labour force, economically active population
Unemployment: Concept and types of unemployment- disguised, seasonal, frictional and chronic
Qualitative aspects of Human Resource: factors influencing productivity of human beings
Implications of population growth on food, housing, employment, education, and health

Unit III: Population and Environment

Ecological and environmental dimensions of sustainable development

Approaches to environment: Gandhian approach, Marxian/Socialist approach
Linkage between Population growth and climate change
Pressure of population growth on water resources, land use, soil erosion, desertification
Environmental degradation and its implications for health

Unit IV: Population Policies
Population Policy: Definition and Principal features
Population Policies of Pro-natalist and Anti-Natalist Countries
Fertility, Mortality, and Migration influencing policies
Policies and programmes for special groups: women and children, youth and aged
National Population Policy 2000
National Health Policies
National Health Mission 2013

Suggested Reading:

Agarwala, S. N. (1986). India's Population Problems (3rd ed.). McGraw-Hill Education.
Ahmad, A., Noin, D., & Sharma, H. N. (Eds.). (1997). Demographic Transition: The Third World Scenario. Rawat Publications.
Beaujeu-Garnier, J., & Beaver, S. H. (1966).The Geography of Poulation.Longman.
Bhende, A. A., &Kanitkar, T. (1978).Principles of Population Studies.Himalaya Publishing House.
Bloom, D. E., Sevilla, J., & Canning, D. (2003). The Demographic Dividend: New Perspective on Economic Consequences Population Change. RAND Corporation.
Chandna, R. C. (2015). A Geography of Population. Kalyani Publishers.
Clarke, J. I. (2013). Population Geography (W. B. Fisher (Ed.); 2nd ed.). Pergamon Press.
Demko, G. J., Rose, H. M., & Schnell, G. A. (Eds.). (1970). Population Geography: A Reader. McGraw Hill.
Gosal, G. S. (1984). Population Geography in India.In J. I. Clarke (Ed.), Geography and Population: Approaches and Applications.Pergamon Press.
Haq, M. ul.(1996). Reflections on Human Development.Oxford University Press.
Kapila, R., &Kapila, U. (2001). India's Economy in the Twenty First Century: Challenges and Opportunities. Academic Foundation.
Kawadia, G., &Ahuja, K. (2006).Environmental Issues of Development.Associated Publishers.
Peters, D. H., Yazbeck, A. S., Sharma, R. R., Ramana, G. N. V., Pritchett, L. H., &Wagstaff, A. (2002). Better Health Care Systems for India's Poor: Findings, Analysis, and Options. World Bank Publications.
Pickin, C., & Leger, S. St. (1992).Assessing Health Need Using Life Cycle Framework. Open 52 University Press. Ray, D. (1998). Development Economics.Princeton University Press.
Robinson, H. (1983). Population and Resources. Palgrave Macmillan.
Sen, A. (2002). The Concept of Development.In C. Hollis & T. N. Srinivasan (Eds.), Handbook of Development Economics Vol. 1.Elsevier.
United Nations. (1973). The Determinants and Consequences of Population Trends Vol. 1.
United Nations.(1998). National Population Policies.Department of Economic and Social Affairs, UN.
United Nations Development Programme.(2024). Human Development Report 2024.UN.https://doi.org/10.18356/334c604b-en

Paper Title: Practical-III

Paper code: GEOSPL25054 C

Credit: 4 Marks: 100

Course Objectives:

- To develop an understanding of quantitative and spatial analytical techniques used in population, settlement, agricultural, and demographic studies.
- To apply demographic, statistical, and spatial analytical methods for interpreting geographical patterns and supporting research and planning.

Course Outcomes:

- Apply quantitative techniques to analyze population distribution, growth, projection, spatial mean centre, age-sex composition, and spatial interaction.
- Evaluate settlement patterns using mean centre, nearest neighbor analysis, network analysis, primate city concept, rank-size rule, and distance decay models.
- Analyze agricultural and regional geographical patterns using agricultural efficiency, crop combination, crop intensity, ternary diagrams, location quotient, and flow diagrams.
- Compute and interpret fertility and mortality measures, construct life tables, and assess spatio-temporal variations in life expectancy.

Unit I: Analytical Techniques in Population Geography

- Population Concentration and Arithmetic Density
- Trend of population Growth
- Population projection: Arithmetic, Geometric &Exponential
- Determination of Spatial mean centre of Population
- Age sex pyramid
- Gravity Model

Unit II: Quantitative analysis of Settlement

- Spatial distribution of mean centre of settlement
- Nearest Neighbor Analysis
- Primate City and Rank Size Rule
- Network analysis
- Distance Decay

Unit III: Analysis of Geographic Pattern

- Agricultural Efficiency
- Crop combination and Crop intensity
- Ternary diagram
- Location Quotient
- Flow diagram

Unit IV: Framework for Fertility & Mortality Analysis

- CBR, GFR, ASFR, TFR
- Standardization of CBR
- Sex Age Adjusted Birth Rate (SAABR)
- Gross Reproduction Rate (GRR)
- Crude Death Rate, Age Specific Death Rate (ASDR)
- Construction of Life Table
- Spatio-temporal variation in Life Expectancy

Suggested Reading:

Bhende, A. A., &Kanitkar, T. (1978).*Principles of Population Studies*.Himalaya Publishing House.

Caldwell, J. C. (1990). What do we know about health transition: The cultural, social and behavioural determinants of health. In *The Proceedings of an International Workshop, Vol. 1 & 2*.Health Transition Centre, Australian National University.

Mishra, B. D. (1981). *An Introduction to the Study of Population*. South Asian Publishers, Pvt. Ltd.

Park, K. (2021). *Text Book of Preventive and Social Medicine* (26th ed.). BanarsidasBhanot Publishers.

Ram, F., &Pathak, K. B. (1998).*Techniques of Demographic Analysis*.Himalaya Publishing House.

Robinson, G. M. (1998). *Methods and Techniques in Human Geography.* Chichester: John Wiley & Sons.

Siegel, J. S., & Swanson, D. A. (2004).*The Methods and Materials of Demography* (2nd ed., pp. 371–405, 407–428, 429–453). Elsevier Academic Press.

Srinivasan, K. (1998). *Basic Demographic Techniques and Applications* (pp. 59–85). Sage Publications.

United Nations. (1973). *Determinants and Consequences of Population Trends, Vol. 1* (pp. 96–104). UN.

Yeats, M. (1974).*An Introduction to Quantitative Analysis in Human Geography*. New York:McGraw, Hill.

Semester: IV

Geomorphology Specialization (A)

Paper title: Social, Culture and Political Geography

Paper code: GEOSPL25064

Credit: 4 Marks: 100

Course Objectives:

- To provide students with a comprehensive understanding of the geographical dimensions of society, culture, politics, and geopolitics, and their role in shaping human landscapes.
- To develop the ability to analyze social, cultural, political, and electoral processes using geographical concepts, theories, and contemporary perspectives.

Course Outcomes:

- Explain the concepts, theories, and processes of social and cultural geography, including social structure, cultural change, ethnicity, and social transformation.
- Analyze the spatial patterns of cultural diversity, ethnic and tribal groups, cultural adaptation, and cultural diffusion in India and the world.
- Evaluate the concepts and approaches of political geography, including territoriality, boundaries, geopolitical theories, and the relationship between population, resources, and the state.
- Assess electoral geography, regional cooperation, geopolitics, and global strategic issues, with special reference to India and contemporary international relations.

Unit I: Fundamentals of Social Geography

Space and society

Understanding society and its structure: social groups, roles and regulative norms and cultural values

Processes: Cooperation, Competition, Conflict and Accommodation; Assimilation and Differentiation

Evolution of sociocultural regions of India; Race, Caste, Ethnicity, Religion and languages

Social Well-being and Quality of Life, Social Exclusion

Social transformation and change in India

Unit II: Fundamentals of Cultural Geography

Culture: Concept, element and components of culture

Cultural Complexes: Areas and Region, Cultural Hearth, Cultural Heritage, Cultural Ecology

Cultural Convergence

Cultural changes: Perception, Behaviouralism and cultural relativism;
Cultural adaptations
Geography of ethnic groups and tribal groups: Diffusion of ethnic traits in world as well as India

Unit III: Fundamentals of Political Geography
Concept of Territoriality
Spatial factors of the state: Resource, Development and Power
Population and the state
Boundaries and Frontiers with special reference to India
Trends and Approaches to political Geography: Law landscape approach, Functional approach, World system approach, Organismic School
Heartland and Rimland Theory

Unit IV: Electoral Geography and Geopolitics
Geography of Federalism,
Electoral Geography of India: Determinants of Electoral Behaviour, Electoral Reforms in India
Geopolitics: Climate Change, World Resources, India Ocean,
Regional Organisations of Cooperation: SAARC, ASEAN, OPEC, EU
Neopolitics of World Natural Resources
Territorial sea and maritime boundaries Global strategic models: Mahan's sea power concept
World Powers Perspectives on core-periphery concept

Suggested Reading:
Ahmad, A. (1993). Social Structure and Regional Development: A Social Geography Perspective. Jaipur: Rawat Publications.
Ahmad, A. (1999). Social Geography. Jaipur and New Delhi: Rawat Publications.
Chorley, R. J. and Haggett, P. (1971).Socio-Economic Models in Geography. London: Methuen and Co. Ltd.
Jones, E. and Eyles, J. (1977).An Introduction to Social Geography. Oxford and New York: Oxford University Press.
Milton,&Keyness. (1972). Social Geography: New Trends in Geography. Open University Press.
Taher, M. (1994). Social Geography: Concept and Theories. Guwahati and New Delhi.: NEIGS Guwahati.(2000), NSA.
Taylor, P. J., & Flint, C. (2000). *Political geography: World-economy, nation-state and locality* (4th ed.). Routledge.
Dikshit, R. D. (1997). *Political geography: A contemporary perspective*. Tata McGraw-Hill.
Dwivedi, R. L. (Year). *Political geography*. Chaitanya Publishing House.
Anderson, J. (2021). *Understanding cultural geography: Places and traces* (3rd ed.). Routledge.
Mukherjee, A. B., &Arizuddin, A. (1985). *India: Culture, Society and Economy*. Inter-India Publications.

Paper title: Soil and Biogeography
Paper Code: 25074
Credit: 4 Marks: 100

Course Objectives:

- To provide students with a comprehensive understanding of soil formation, properties, degradation, and conservation, along with the fundamental concepts of biogeography, biodiversity, and ecology.
- To develop the ability to analyze soil and ecosystem processes, evaluate biodiversity patterns, and assess strategies for environmental conservation and sustainable resource management.

Course Outcomes:

- Explain the processes of soil formation, soil profile development, and the physical and chemical properties of soils, including soil degradation and conservation measures.
- Analyze soil characteristics, erosion processes, and land degradation issues, and evaluate appropriate soil conservation strategies.
- Describe the concepts, approaches, and processes of biogeography, including biosphere dynamics, plant succession, biomes, and the global distribution of plants and animals.
- Evaluate biodiversity patterns, ecological principles, and ecosystem dynamics, and assess biodiversity conservation strategies and environmental policies with special reference to India.

Unit I: Soil Fundamentals

Soil formation factors: Parent material, Organic, Climatic, Topographic, Spatio-temporal aspects of soil formation Processes of soil formation and soil development: Physical, Biotic and Chemical Soil profile: Different layers of soil and soil types

Unit II: Physical Properties of Soil

Morphology, Texture, Structure, Water, Air, Temperature and other properties of soil
Chemical Properties of soil and soil reaction;
Concepts of soil erosion
Soil Degradation and Conservation

Unit III: Fundamentals of Biogeography

Evolutionary and Ecological Approaches
Biosphere
Bio-energy cycle in terrestrial ecosystem
Plant association and succession
Biochores
World distribution of plants and animals
National Forest Policy of India

Unit IV: Biodiversity and Ecology

Biodiversity: Concepts, types
Biodiversity region in India
Biodiversity: depletion and conservation
Principles of ecology
Mountain ecology, Desert and Coastal Ecosystems
Zoogeographic regions of the world

Suggested reading:

Bradshaw, M. J. (1979). *Earth and Living Planet*. ELBS.
Bhattacharyya, N.N. (2018). *Biogeography*. Rajesh Publications
Bunting, B. T. (1967).*The Geography of Soil*. Hutchinson.
Foth, H. D., & Turk, L. M. (1972).*Fundamentals of Soil Science*.John Wiley.
Govinda, R. S. V., &Rao, H. G. G. (1978).*Studies on Soils of India*.Vikas Publishing House.
Agrawal, L C (2018). *Biogeography*, Rawat Publications.
Russell, E. W. (1973). *Soil Condition and Plant Growth*. Longman.
Singh, S (2020). *Environmental Geography*. Prayag Pustak Bhawan, Allahabad.

Paper Title: Tectonic and Environmental Geomorphology

Paper code: GEOSPL25084A

Credit: 4 Marks: 100

Course Objectives:

- To develop an understanding of tectonic geomorphological processes, landscape evolution, and morphotectonic analysis using modern geospatial techniques.
- To examine environmental geomorphology and geohazards, and their implications for natural resource management, hazard assessment, and sustainable planning.

Course Outcomes:

- Explain the principles of tectonic geomorphology, plate tectonics, crustal deformation, and landscape evolution.
- Analyze tectonic landforms and drainage systems using morphometric techniques and geospatial tools.
- Evaluate the role of geomorphological processes in environmental resource assessment and human-induced landscape changes.
- Assess the causes, distribution, and impacts of geological and geomorphological hazards, and apply geomorphological knowledge to hazard mitigation and risk management.

Unit I: Tectonic Geomorphology

Earth evolution, continental growth and supercontinent cycle
Active tectonics and neotectonics
Euler Pole Theory and plate kinematics
Isostasy, crustal deformation and landscape evolution
Structural framework of tectonic landscapes: faults, folds, thrusts (MBT, MCT and CBT), joints, lineaments and sutures
Earthquakes, tectonic uplift, volcanic geomorphology, mountain building and evolution of orogenic belts

Unit II: Morphotectonic Analysis and Regional Tectonic Geomorphology

Concept and principles of morphotectonic studies
River basin Morphometry
Tectonic interpretation of drainage basins,
River response to tectonic activity (channel incision, knickpoints, river terraces, basin tilting and drainage reorganization),
Escarpment evolution and tectonic landscape analysis,
Applications of spatial technology in tectonic landform study,
Regional tectonic geomorphology of the Himalaya, North-East India and major global tectonic provinces

Unit III: Fundamentals Environmental Geomorphology

Components and scope
Aspects of geomorphological resources: soil, raw materials, resources and reserves
Contribution of geomorphology in search of other natural resources
Man’s activities and their geomorphological consequences

Unit IV: Geohazards

Hazard, Disaster, Vulnerability and Risk
Classification of Environmental Hazards
Causes and Distribution of Geological Hazards: Earthquakes, Volcanoes and Tsunamis
Geomorphological Hazards

Marine hazard
Glacial and periglacial hazard

Suggested Reading:

Bull, W. B. (2009). Tectonically Active Landscapes.Wiley-Blackwell.
Burbank, D. W., & Anderson, R. S. (2011). Tectonic Geomorphology (2nd ed.). Wiley Blackwell
Chorley, R. J., Schumm, S. A., &Sugden, D. E. (1984).Geomorphology. Methuen
Cooke, R. U., &Doornkamp, J. C. (1990). Geomorphology in Environmental Management: A New Introduction (2nded.). Oxford University Press
Goudie, A. S. (2013). The Human Impact on the Natural Environment: Past, Present, and Future (7th ed.). Wiley-Blackwell
Huggett, R. J. (2011). Fundamentals of Geomorphology (3rd ed.). Routledge
McFadden, L. D., Knuepfer, P. L. K., & Harden, J. W. (Eds.). (2008). Quantitative Geomorphology of Landscapes: Studies in Honor of Robert P. Sharp. Allen &Unwin
Panizza, M. (1996).Environmental Geomorphology. Elsevier
Ritter, D. F., Kochel, R. C., & Miller, J. R. (2011). Process Geomorphology (5th ed.). Waveland Press
Summerfield, M. A. (1991). Global Geomorphology: An Introduction to the Study of Landforms. Pearson Education
Trenhaile, A. S. (2010). Geomorphology: A Canadian Perspective (4th ed.). Oxford University Press. P

Paper Title: River Health and Watershed Management

Paper code: GEOSPL25094 A

Credit: 4 Marks: 100

Course Objectives:

- To develop an understanding of river health, watershed processes, and ecosystem functioning in relation to environmental change and human activities.
- To equip students with knowledge of river health assessment, watershed conservation, and integrated approaches for sustainable river basin management.

Course Outcomes:

- Explain the concepts, processes, and ecological functions of river ecosystems and watershed systems.
- Analyze watershed dynamics, river connectivity, and ecosystem processes using established conceptual frameworks.
- Evaluate river health using physical, chemical, biological, and geomorphological assessment methods and indices.
- Apply principles of integrated river basin management, watershed planning, ecological restoration, and environmental impact assessment for sustainable water resource management.

Unit I: Fundamentals of River Health and Watershed Systems

Concept, scope and evolution of river health and watershed management
Characteristics of watershed,
River ecosystems: structure, function and ecosystem services,
Ecological integrity and river health, natural and anthropogenic controls on river ecosystems
Climate change and river environments

Unit II: River Ecosystem Processes and Watershed Dynamics

Hydrological cycle and watershed processes

Hydrological regime, river connectivity (longitudinal, lateral, vertical and temporal)
Concepts: Longitudinal Ecosystem (LEC), Flood Pulse (FPC), Serial Discontinuity (SDC), Riverine Ecosystem Synthesis (RES)
Nutrient cycling, organic matter dynamics and river ecosystem functioning

Unit III: River Health Assessment and Watershed Conservation
River health assessment frameworks: Physical, chemical and biological
Water quality assessment: Water Quality Index (WQI), bioassessment, aquatic habitat assessment
River Health Index, watershed conservation measures, soil and water conservation structures, integrated watershed management, ecosystem restoration and community participation

Unit IV: River Basin Planning and Sustainable Management
River restoration and rehabilitation,
Nature-based Solutions (NbS),
Ecological restoration and sustainable watershed management approaches,
Integrated River Basin Management (IRBM),
Integrated Water Resources Management (IWRM), watershed planning and prioritization, Environmental Impact Assessment (EIA),
International water treaties

Suggested reading:
Murthy, J. V. S. (2017). *Watershed Management* (3rd ed.). New Age International Publishers.
Allan, J. D., & Castillo, M. M. (2007). *Stream Ecology: Structure and Function of Running Waters* (2nd ed.). Springer.
Subramanya, K. (2017). Engineering Hydrology (5th ed.). McGraw Hill Education.
Thorp, J. H., Thoms, M. C., & Delong, M. D. (2006). The Riverine Ecosystem Synthesis: Biocomplexity in River Networks Across Space and Time. Academic Press.
Reddy, M. A. (2015). Integrated Watershed Management. BS Publications.
Grigg, N. S. (2016). Water Resources Management: Principles, Regulations and Cases. McGraw-Hill.

Paper Title: Practical-IV
Paper code: GEOSPL25104 A

Credit: 4 **Marks: 100**

Course Objectives:
- To develop practical skills in geographical techniques, geomorphological analysis, river health assessment, and watershed management using field, laboratory, and geospatial methods.
- To enhance students' ability to collect, analyze, interpret, and present geographical data through scientific investigations and field-based report writing.

Course Outcomes:
- Apply quantitative and spatial techniques to analyze geographical, environmental, and socio-economic phenomena.
- Perform geomorphological and watershed analyses using morphometric indices, flood assessment techniques, and geospatial tools.
- Assess river health through field and laboratory analysis of key water quality parameters and interpret their environmental significance.
- Design and prepare scientific field reports by collecting, analyzing, and presenting primary or secondary geographical data using appropriate research methods and technical writing standards.

Unit I: Techniques in Geography

- Social Change: Relative and Absolute
- Shape index
- Sea route map
- Soil texture analysis
- Moving average
- Quadrat sampling technique for plant population density

Unit II: Tectonic and Environmental Geomorphology

- Mapping and assessing landforms as geomorphological assets
- Flood frequency analysis
- Flood hazard estimation/inundation area
- River basin morphometric indices: Asymmetry, Mountain front, Valley floor, River gradient, Basin shape
- Ross Diagram: Lineament, Stream analysis

Unit III: River health and Watershed management

- Water pH
- Total Dissolve Solid
- Water Conductivity
- Dissolve Oxygen
- Turbidity analysis
- Water nutrient analysis

Unit IV: Report writing

The students in consultation with assigned faculty are required to collect data from a selected study area, either primary or secondary sources. Based on the collected data a group field report needs to be prepared. A group may comprise of 4-8 students. A group report should be prepared within a page limit of 20, inclusive of everything. This will carry maximum of one-fourth of the total marks of the paper.

Suggested reading:

Singh, R. L., & Singh, R. P. B. (1993). Elements of Practical Geography. Kalyani Publishers.
Kale, V. S., & Gupta, A. (2001). Introduction to Geomorphology. Orient Longman.
Murthy, J. V. S. (2017). Watershed Management (3rd ed.). New Age International Publishers.

Semester: IV

Social Geography Specialization (B)

Paper title: Social, Culture and Political Geography

Paper code: GEOSPL25064

Credit: 4 **Marks: 100**

Course Objectives:

- To provide students with a comprehensive understanding of the geographical dimensions of society, culture, politics, and geopolitics, and their role in shaping human landscapes.
- To develop the ability to analyze social, cultural, political, and electoral processes using geographical concepts, theories, and contemporary perspectives.

Course Outcomes:

- Explain the concepts, theories, and processes of social and cultural geography, including social structure, cultural change, ethnicity, and social transformation.

- Analyze the spatial patterns of cultural diversity, ethnic and tribal groups, cultural adaptation, and cultural diffusion in India and the world.
- Evaluate the concepts and approaches of political geography, including territoriality, boundaries, geopolitical theories, and the relationship between population, resources, and the state.
- Assess electoral geography, regional cooperation, geopolitics, and global strategic issues, with special reference to India and contemporary international relations.

Unit I: Fundamentals of Social Geography
Space and society
Understanding society and its structure: social groups, roles and regulative norms and cultural values
Processes: Cooperation, Competition, Conflict and Accommodation; Assimilation and Differentiation
Evolution of socio cultural regions of India; Race, Caste, Ethnicity, Religion and languages
Social Well-being and Quality of Life, Social Exclusion
Social transformation and change in India

Unit II: Fundamentals of Cultural Geography
Culture: Concept, element and components of culture
Cultural Complexes: Areas and Region, Cultural Hearth, Cultural Heritage, Cultural Ecology
Cultural Convergence
Cultural changes: Perception, Behaviouralism and cultural relativism;
Cultural adaptations
Geography of ethnic groups and tribal groups: Diffusion of ethnic traits in world as well as India

Unit III: Fundamentals of Political Geography
Concept of Territoriality
Spatial factors of the state: Resource, Development and Power
Population and the state
Boundaries and Frontiers with special reference to India
Trends and Approaches to political Geography: Law landscape approach, Functional approach, World system approach, Organismic School
Heartland and Rimland Theory

Unit IV: Electoral Geography and Geopolitics
Geography of Federalism,
Electoral Geography of India: Determinants of Electoral Behaviour, Electoral Reforms in India
Geopolitics: Climate Change, World Resources, India Ocean,
Regional Organisations of Cooperation: SAARC, ASEAN, OPEC, EU
Neopolitics of World Natural Resources
Territorial sea and maritime boundaries Global strategic models: Mahan's sea power concept
World Powers Perspectives on core-periphery concept

Suggested Reading:
Ahmad, A. (1993). Social Structure and Regional Development: A Social Geography Perspective. Jaipur: Rawat Publications.
Ahmad, A. (1999). Social Geography. Jaipur and New Delhi: Rawat Publications.
Chorley, R. J. and Haggett, P. (1971).Socio-Economic Models in Geography. London: Methuen and Co. Ltd.

Jones, E. and Eyles, J. (1977).An Introduction to Social Geography. Oxford and New York: Oxford University Press.
Milton,&Keyness. (1972). Social Geography: New Trends in Geography. Open University Press.
Taher, M. (1994). Social Geography: Concept and Theories. Guwahati and New Delhi.: NEIGS Guwahati.(2000), NSA.
Taylor, P. J., & Flint, C. (2000). *Political geography: World-economy, nation-state and locality* (4th ed.). Routledge.
Dikshit, R. D. (1997). *Political geography: A contemporary perspective*. Tata McGraw-Hill.
Dwivedi, R. L. (Year). *Political geography*. Chaitanya Publishing House.
Anderson, J. (2021). *Understanding cultural geography: Places and traces* (3rd ed.). Routledge.
Mukherjee, A. B., &Arizuddin, A. (1985). *India: Culture, Society and Economy*. Inter-India Publications.

Paper title: Soil and Biogeography
Paper Code: 25074
Credit: 4 Marks: 100

Course Objectives:

- To provide students with a comprehensive understanding of soil formation, properties, degradation, and conservation, along with the fundamental concepts of biogeography, biodiversity, and ecology.
- To develop the ability to analyze soil and ecosystem processes, evaluate biodiversity patterns, and assess strategies for environmental conservation and sustainable resource management.

Course Outcomes:

- Explain the processes of soil formation, soil profile development, and the physical and chemical properties of soils, including soil degradation and conservation measures.
- Analyze soil characteristics, erosion processes, and land degradation issues, and evaluate appropriate soil conservation strategies.
- Describe the concepts, approaches, and processes of biogeography, including biosphere dynamics, plant succession, biomes, and the global distribution of plants and animals.
- Evaluate biodiversity patterns, ecological principles, and ecosystem dynamics, and assess biodiversity conservation strategies and environmental policies with special reference to India.

Unit I: Soil Fundamentals
Soil formation factors: Parent material, Organic, Climatic, Topographic, Spatio-temporal aspects of soil formation Processes of soil formation and soil development: Physical, Biotic and Chemical Soil profile: Different layers of soil and soil types

Unit II: Physical Properties of Soil
Morphology, Texture, Structure, Water, Air, Temperature and other properties of soil
Chemical Properties of soil and soil reaction;
Concepts of soil erosion
Soil Degradation and Conservation

Unit III: Fundamentals of Biogeography
Evolutionary and Ecological Approaches
Biosphere
Bio-energy cycle in terrestrial ecosystem
Plant association and succession

Biochores
World distribution of plants and animals
National Forest Policy of India

Unit IV: Biodiversity and Ecology
Biodiversity: Concepts, types
Biodiversity region in India
Biodiversity: depletion and conservation
Principles of ecology
Mountain ecology, Desert and Coastal Ecosystems
Zoogeographic regions of the world

Suggested reading:
Bradshaw, M. J. (1979). *Earth and Living Planet*. ELBS.
Bhattacharyya, N.N. (2018). *Biogeography*. Rajesh Publications
Bunting, B. T. (1967).*The Geography of Soil*. Hutchinson.
Foth, H. D., & Turk, L. M. (1972).*Fundamentals of Soil Science*.John Wiley.
Govinda, R. S. V., &Rao, H. G. G. (1978).*Studies on Soils of India*.Vikas Publishing House.
Agrawal, L C (2018). *Biogeography*, Rawat Publications.
Russell, E. W. (1973). *Soil Condition and Plant Growth*. Longman.
Singh, S (2020). *Environmental Geography*. Prayag Pustak Bhawan, Allahabad.

Paper Title: Gender Geography

Paper code: GEOSPL25084 B

Credit: 4 Marks: 100

Course Objectives:

- Explore the concepts, theories, and historical perspectives of gender geography, focusing on the intersectionality of gender with race, class, and sexuality.
- Analyze the spatial dimensions of gender, including gendered divisions of space, power dynamics, representation, and the impacts of globalization and development on gendered landscapes.

Course Outcomes:

- Discuss key concepts in gender geography such as patriarchy, matriarchy, masculinities, queer geographies, and feminist perspectives.
- Evaluate historical and theoretical perspectives on gender and space, highlighting the evolution of feminist geographies and their contributions.
- Explore gendered experiences of mobility, transportation, and the division of labor within domestic spaces.
- Assess the gendered impacts of globalization and neoliberalism and the role of gender audits and gender budgets in addressing gender disparities.

Unit I: Introduction to Gender Geography
Definitions and concepts of gender geography
Intersectionality with race, class, and sexuality
Concepts on feminist geographies, masculinities, queer geographies
Concept of Patriarchy, Matriarchy, Matriliny and Matrilocality

Unit II: Gendered Spaces and Places

Gendered divisions of space in urban, rural, and suburban environments
Gender and the built environment: architecture, urban planning
Gendered experiences of mobility and transportation
Domestic spaces and the gendered division of labor within the home
Case studies examining gendered spaces and places across different geographical contexts

Unit III: Power, Representation, and Identity

Gender, power, and representation in geographical discourses
Media representations of gender and place
Gendered landscapes of political power and activism
Indigenous perspectives on gender and land

Unit IV: Globalization, Development, and Gender

Concept of Gender Audit
Role of Gender Budget in bridging Gender Gap
Empowerment of women: through education, economic opportunities, access to reproductive health services
Gendered impacts of globalization and neoliberalism
Gender, development, and national policies

Suggested Readings:

Agarwal, Bina. (1994). Afield of one's own: Gender and land rights in South Asia. Vol. 58.Cambridge: Cambridge University Press

Ghadially, Rehana, (2007). Urban women in contemporary India: a reader (ed.).New Delhi: Sage Publications.

Goswamy, BhupendraNath (2017).Political Ecology of Deforestation and Tribal Life. Concept Publishing Company Pvt. Ltd.

James K. S. (2010). Population, Gender and Health in India, Academic Foundation Radiant Book

Mies, Maria. (1998). Patriarchy and accumulation on a world scale: Women in the international division of labour. New York: Palgrave Macmillan.

Nongbri, Tiplut. (2003). Development, ethnicity and gender: select essays on tribes in India. Jaipur: Rawat Publications

Raju, Saraswati, and KuntalaLahiri-Dutt. (2011). Doing gender, doing geography: emerging research in India, (ed.). London: Routledge

Raju, Saraswati. (2011). Gendered Geographies: Space and Place in the South Asia, (ed.). New Delhi: Oxford University Press.

Rao, CN Shankar (2019). Indian Social Problems, A Sociological Perspective. S Chand and Company Limited.

Rao, CN Shankar (2019). Principles Of Sociology, With an Introduction to Social Thoughts. S Chand and Company Limited.

Sen, J. (2019). A Textbook of Social and Cultural Geography.Kalyani Publishers.

Shah, Mihir; Vijayshankar, PS & BRL Foundation (2022). Tribal Development Report: Human Development and Governance. Routledge India.

Paper Title: Tribal Geography

Paper code: GEOSPL25094 B

Credit: 4 Marks: 100

Course Objectives:

- To provide students with a comprehensive understanding of the geographical dimensions of tribal societies, their livelihoods, mobility, constitutional safeguards, and contemporary challenges, along with the concepts and perspectives of tribal geography.
- To develop the ability to analyze issues of tribal development, identity, and social justice using geographical theories and approaches.

Course Outcomes:

- Explain the concepts, characteristics, spatial distribution, traditional knowledge systems, and development challenges of Scheduled Tribes in India, with special reference to the Bodoland Territorial Region.
- Analyze tribal mobility, socio-economic issues, constitutional safeguards, and policies related to tribal rights and development.
- Assess the role of gender in shaping power, representation, identity, and development, and examine strategies for women's empowerment, gender budgeting, and inclusive development in contemporary society.

Unit I: Understanding tribals

Defining Scheduled Tribe
Understanding the difference between tribe and Scheduled Tribe
Characteristics of Tribe
Spatial distribution of scheduled tribes: India, Bodoland Territorial Region
Typonomy

Unit II: Tribal ecology

Traditional knowledge: Irrigation system, food preservation, traditional medicine, alcohol preparation, handloom and textile, Sacred groves
Displacement of tribals from their habitat: developmental activities, national park
Tribal dependence on forest

Unit III: Mobility of tribes

Meaning and types of social mobility
Concept of Sanskritisation, Modernisation & Westernization
Social process: Tribalization, De-tribalization, Re triballization
Tribal marriage
Tribal religion

Unit IV: Challenges of tribal population

Geographical separation
Cultural Problems
Social Problems
Economic Problems
Problems of Education
Problems of Health and Sanitation
Constitutional safeguards to tirbals: Tribal belts and blocks, Sixth schedule; Forest Rights Act

Suggested Reading:

Husain, Majid (2018). Human Geography, 5th Edition. Rawat Publications.

Mukhopadhyay, Srimanta (2013). Human Geography of Tribal Region.Satyam Publishing House.

Nongbri, Tiplut. (2003). Development, ethnicity and gender: select essays on tribes in India. Jaipur: Rawat Publications

Rao, CN Shankar (2019). Indian Social Problems, A Sociological Perspective. S Chand and Company Limited.

Rao, CN Shankar (2019). Principles Of Sociology, With an Introduction to Social Thoughts. S Chand and Company Limited.

Sen, J. (2019). A Textbook of Social and Cultural Geography.Kalyani Publishers.

Shah, Mihir; Vijayshankar, PS & BRL Foundation (2022). Tribal Development Report: Human Development and Governance. Routledge India.

Paper Title: Practical-IV

Paper Code: GEOSPL25104 B

Credit: 4 **Marks: 100**

Course Objectives:

- To develop students' proficiency in geographical techniques, quantitative methods, and statistical software for analyzing spatial, demographic, environmental, and health-related data.
- To equip students with practical skills in data collection, analysis, interpretation, and scientific report writing through field-based geographical research.

Course Outcomes:

- Apply geographical and quantitative techniques to analyze spatial patterns, social change, migration, health, environmental, and agricultural data.
- Use statistical software such as SPSS, R, and Stata for data management, transformation, tabulation, and basic statistical analysis.
- Interpret and present geographical data using appropriate analytical methods, indices, maps, graphs, and statistical techniques.
- Design and conduct a field-based geographical study, analyze primary or secondary data, and prepare a scientifically structured research report.

Unit I: Techniques in Geography

- Social Change: Relative and Absolute
- Shape index
- Sea route map
- Soil texture analysis
- Moving average
- Quadrat sampling technique for plant population density

Unit II: Practical on Gender Geography

- Gender Gap Analysis using Disparity Index
- Measuring Levels of Development using Z-Score and Principal Component Analysis (PCA)

- Safety Perception Mapping through Field observations (Street Lighting, CCTV Coverage, Public Transport, etc.)
- GIS-based Accessibility mapping of Schools, Hospitals, Police Stations, and Banks
- Hotspot Mapping of Crimes Against Women using NCRB Data
- Social mobility
- Tribal development index

Unit III: Geographic data analysis using Software

SPSS:

Creation of data frame

Data transformation: Recoding variable, Computing variable

Generating tables: Univariate, Bi-variate and Multi-variate tables

R language:

Input, Import and Export of data

Measures of central tendency

Graphs

Stata Software

Data transformation: Recoding variable, Computing variable

Generating tables: Univariate, Bi-variate and Multi-variate tables

Unit IV: Report writing

The students in consultation with assigned faculty are required to collect data from a selected study area, either primary or secondary sources. Based on the collected data a group field report needs to be prepared. A group may comprise of 4-8 students. A group report should be prepared within a page limit of 20, inclusive of everything. This will carry maximum of one-fourth of the total marks of the paper.

Suggested Reading:

Acock, Alan C (2014). A Gentle Introduction to Stata, 4th Edition.AStata Press Publication StataCorp LP, College Station, Texas.

Daniels, Lisa and Minot, Nicholas (2019).An Introduction to Statistics and Data Analysis Using Stata, From Research Design to Final Report.Sage Publications.

Field, A. (2009). Discovering Statistics using SPSS, Third Edition.Sage Publications.

Gregory, S. (1978). *Statistical Methods and the Geographer*. London: Longman.

IBM.IBM SPSS Statistics 25 Core System User's Guide. IBM

IBM. IBM SPSS Statistics 25 Brief Guide. IBM

Johnston, R. J. (1973). *Multivariate Statistical Analysis in Geography*. London: Longman.

King, L. J. (1969). *Statistical Methods in Geographical Studies*. London.

King, J. P. C. and C. A. M. (1968).*Quantitative Geography*. London: John Wiley.

Mahmood, A. (1977). *Statistical Methods in Geographical Studies*. Delhi: Concept Publications.

McCullagh, H. R. and P. S. (1974).*Quantitative Techniques in Geography: An Introduction.* Oxford: Clarendan Press.

Stockemer, Daniel (2019).QuantitativeMethods for theSocial Sciences, A Practical Introduction with Examplesin SPSS and Stata.Springer.

Yeats, M. (1974).*An Introduction to Quantitative Analysis in Human Geography*. New York: McGraw, Hill.
Unwin, D. (1981). *Introductory Spatial Analysis*. London: Methuen.

Semester: IV

Population Geography Specialization (C)

Paper title: Social, Culture and Political Geography

Paper code: GEOSPL25064

Credit: 4 Marks: 100

Course Objectives:

- To provide students with a comprehensive understanding of the geographical dimensions of society, culture, politics, and geopolitics, and their role in shaping human landscapes.
- To develop the ability to analyze social, cultural, political, and electoral processes using geographical concepts, theories, and contemporary perspectives.

Course Outcomes:

- Explain the concepts, theories, and processes of social and cultural geography, including social structure, cultural change, ethnicity, and social transformation.
- Analyze the spatial patterns of cultural diversity, ethnic and tribal groups, cultural adaptation, and cultural diffusion in India and the world.
- Evaluate the concepts and approaches of political geography, including territoriality, boundaries, geopolitical theories, and the relationship between population, resources, and the state.
- Assess electoral geography, regional cooperation, geopolitics, and global strategic issues, with special reference to India and contemporary international relations.

Unit I: Fundamentals of Social Geography

Space and society
Understanding society and its structure: social groups, roles and regulative norms and cultural values
Processes: Cooperation, Competition, Conflict and Accommodation; Assimilation and Differentiation
Evolution of socio cultural regions of India; Race, Caste, Ethnicity, Religion and languages
Social Well-being and Quality of Life, Social Exclusion
Social transformation and change in India

Unit II: Fundamentals of Cultural Geography

Culture: Concept, element and components of culture
Cultural Complexes: Areas and Region, Cultural Hearth, Cultural Heritage, Cultural Ecology
Cultural Convergence
Cultural changes: Perception, Behaviouralism and cultural relativism;
Cultural adaptations
Geography of ethnic groups and tribal groups: Diffusion of ethnic traits in world as well as India

Unit III: Fundamentals of Political Geography

Concept of Territoriality
Spatial factors of the state: Resource, Development and Power
Population and the state
Boundaries and Frontiers with special reference to India

Trends and Approaches to political Geography: Law landscape approach, Functional approach, World system approach, Organismic School
Heartland and Rimland Theory

Unit IV: Electoral Geography and Geopolitics
Geography of Federalism,
Electoral Geography of India: Determinants of Electoral Behaviour, Electoral Reforms in India
Geopolitics: Climate Change, World Resources, India Ocean,
Regional Organisations of Cooperation: SAARC, ASEAN, OPEC, EU
Neopolitics of World Natural Resources
Territorial sea and maritime boundaries Global strategic models: Mahan's sea power concept
World Powers Perspectives on core-periphery concept

Suggested Reading:
Ahmad, A. (1993). Social Structure and Regional Development: A Social Geography Perspective. Jaipur: Rawat Publications.
Ahmad, A. (1999). Social Geography. Jaipur and New Delhi: Rawat Publications.
Chorley, R. J. and Haggett, P. (1971).Socio-Economic Models in Geography. London: Methuen and Co. Ltd.
Jones, E. and Eyles, J. (1977).An Introduction to Social Geography. Oxford and New York: Oxford University Press.
Milton,&Keyness. (1972). Social Geography: New Trends in Geography. Open University Press.
Taher, M. (1994). Social Geography: Concept and Theories. Guwahati and New Delhi.: NEIGS Guwahati.(2000), NSA.
Taylor, P. J., & Flint, C. (2000). *Political geography: World-economy, nation-state and locality* (4th ed.). Routledge.
Dikshit, R. D. (1997). *Political geography: A contemporary perspective*. Tata McGraw-Hill.
Dwivedi, R. L. (Year). *Political geography*. Chaitanya Publishing House.
Anderson, J. (2021). *Understanding cultural geography: Places and traces* (3rd ed.). Routledge.
Mukherjee, A. B., &Arizuddin, A. (1985). *India: Culture, Society and Economy*. Inter-India Publications.

Paper title: Soil and Biogeography
Paper Code: 25074
Credit: 4 Marks: 100

Course Objectives:
- To provide students with a comprehensive understanding of soil formation, properties, degradation, and conservation, along with the fundamental concepts of biogeography, biodiversity, and ecology.
- To develop the ability to analyze soil and ecosystem processes, evaluate biodiversity patterns, and assess strategies for environmental conservation and sustainable resource management.

Course Outcomes:
- Explain the processes of soil formation, soil profile development, and the physical and chemical properties of soils, including soil degradation and conservation measures.
- Analyze soil characteristics, erosion processes, and land degradation issues, and evaluate appropriate soil conservation strategies.
- Describe the concepts, approaches, and processes of biogeography, including biosphere dynamics, plant succession, biomes, and the global distribution of plants and animals.

- Evaluate biodiversity patterns, ecological principles, and ecosystem dynamics, and assess biodiversity conservation strategies and environmental policies with special reference to India.

Unit I: Soil Fundamentals
Soil formation factors: Parent material, Organic, Climatic, Topographic, Spatio-temporal aspects of soil formation Processes of soil formation and soil development: Physical, Biotic and Chemical Soil profile: Different layers of soil and soil types

Unit II: Physical Properties of Soil
Morphology, Texture, Structure, Water, Air, Temperature and other properties of soil
Chemical Properties of soil and soil reaction;
Concepts of soil erosion
Soil Degradation and Conservation

Unit III: Fundamentals of Biogeography
Evolutionary and Ecological Approaches
Biosphere
Bio-energy cycle in terrestrial ecosystem
Plant association and succession
Biochores
World distribution of plants and animals
National Forest Policy of India

Unit IV: Biodiversity and Ecology
Biodiversity: Concepts, types
Biodiversity region in India
Biodiversity: depletion and conservation
Principles of ecology
Mountain ecology, Desert and Coastal Ecosystems
Zoogeographic regions of the world

Suggested reading:
Bradshaw, M. J. (1979). *Earth and Living Planet*. ELBS.
Bhattacharyya, N.N. (2018). *Biogeography*. Rajesh Publications
Bunting, B. T. (1967).*The Geography of Soil*. Hutchinson.
Foth, H. D., & Turk, L. M. (1972).*Fundamentals of Soil Science*.John Wiley.
Govinda, R. S. V., &Rao, H. G. G. (1978).*Studies on Soils of India*.Vikas Publishing House.
Agrawal, L C (2018). *Biogeography*, Rawat Publications.
Russell, E. W. (1973). *Soil Condition and Plant Growth*. Longman.
Singh, S (2020). *Environmental Geography*. Prayag Pustak Bhawan, Allahabad.

Paper Title: Migration Studies

Paper code: GEOSPL25084 C

Credit: 4 Marks: 100

Course Objectives:
- Understand the concepts, patterns, determinants, and consequences of internal and international migration, with special reference to India and Northeast India.
- Develop analytical skills to interpret migration theories, models, and quantitative methods for measuring migration using demographic data.

Course Outcomes:

- Explain the concepts, types, patterns, and determinants of internal and international migration.
- Analyze migration trends, consequences, and issues such as labour migration, brain drain, refugee movements, and illegal migration in India and globally.
- Interpret major migration theories and models to understand population mobility and migration behaviour.
- Apply direct and indirect methods to estimate and evaluate migration using census and demographic data.

Unit I: Internal Migration

Concept of migration, mobility, seasonal migration, daily movement
Internal Migration types: Rural to Rural, Rural to Urban, Urban to Urban, and Urban to Rural;
Intra District, Inter District and Inter State migration
Internal displacement of population
Determinants and consequences of migration
Differential migration, Migration patterns in India Migration Patterns in Northeast India

Unit II: International Migration

Sources of International Migration data
Patterns of international migration: Historical and recent trends, permanent immigrants,
Indian Diaspora and people of Indian origin,
Labour migration, brain drain, refugee migration and Illegal migration
Causes and consequences of international migration

Unit III: Migration theories and models

Ravenstein's Laws of Migration
Everett Lee's Theory of Migration
Theories of Migration-Reilly, Zipf, Staufer, Gravity, Hagerstrand and Wolpert
Lewis-Fei-Ranis model of Development
Todaro's model of Rural-Urban Migration

Unit IV: Measures of Migration

Direct estimation of lifetime and inter-censal migration rates from census data Indirect measures of net internal migration: Vital Statistics Method, National Growth Rate Method, Census Survival Ratio method, and Life Table Survival Ratio method

Suggested Reading:

Arriaga, E. E. (1975). Selected Measures of Urbanization.U.S. Bureau of the Census.
Cohen, R. (Ed.). (1996). Theories of Migration.Edward Elgar Publishing Ltd.
Goldstein, S., Sly, D., &Arriaga, E. E. (1975).The Measurement of Urbanization and Projection of Urban Population.Ordina Editions.
Jones, G. W., &Visaria, P. (Eds.). (1997). Urbanization in Large Developing Countries: China, Indonesia, Brazil and India. Clarendon Press.

Oberai, A. S. (1987). Migration, Urbanization and Development.International Labour Office.
Swanson, D. A., & Siegel, J. S. (Eds.). (2004). The Methods and Materials of Demography. Academic Press Inc. Todaro, M. P. (1976). International Migration in Developing Countries: A Review of Theory, Evidence, Methodology and Research Priorities. International Labour Office.75
United Nations. (1979). Trends and Characteristics of International Migration Since 1950. Department of Economic and Social Affairs.

Paper Title: Health Geography

Paper code: GEOSPL25094 C

Credit: 4 Marks: 100

Course Objectives:

- Understand the concepts, approaches, determinants, and spatial dimensions of health and disease from a geographical perspective.
- Develop knowledge of India's healthcare system, health programmes, and analytical skills to evaluate healthcare accessibility, utilization, and public health challenges.

Course Outcomes:

- Explain the fundamental concepts of Health Geography, disease classification, health indicators, and healthcare belief models.
- Analyze the geographical, socio-economic, and socio-cultural determinants influencing health and disease patterns in India.
- Evaluate the structure of India's healthcare system, healthcare accessibility, health-seeking behaviour, and the burden of diseases.
- Assess the role and effectiveness of national health programmes, health insurance, and community health workers in improving public health outcomes.

Unit I: Concepts

Defining Health Geography
Approaches to study Health Geography
Concept of Health, its measurement and data source
Concept of disease: Communicable and non-communicable diseases
Concept of Morbidity, prevalence and incidence of diseases
International classification of diseases
Healthcare belief model

Unit II: Health scenario in India

Geographical Determinants of health: Climate, Altitude, Natural Disaster
Socio-Economic determinants of health: Income, Education, and Work spaces
Socio-Cultural determinants of health: Dietary habits, preferences and nutritional level, Beliefs and Cultural Practices
Epidemiological transition in India
Out of pocket expenditure on healthcare
Life style disease: Obesity, Hypertension, Diabetes

Unit III: Healthcare system in India

Three tier system of healthcare: Primary, Secondary and Tertiary
IPHS norm for Sub-Centre, Primary Health Centre, Community Health Centre, District Hospital
Traditional and Alternative medicine system
Health seeking behavior
Burden of disease in India, health Insurance
Spatial dynamics of healthcare: Accessibility, Availability, Affordability, and Acceptability

Unit VI: Healthcare programs in India

National Health Missions
Janani Shishu Suraksha Karyakarm (JSSK)
National Programme on Climate Change & Human Health
Roles and Responsibilities of ASHA and Anganwadi Workers
National Vector Borne Diseases Control Programme
Kayakalp (Extension of Swach Bharat Abhiyan)
Pradhan Mantri National Dialysis Programme (PMNDP)

Suggested Reading:

Izhar, N (2011). Introduction to Geography of Health, in NilofarIzhar (ed) Geography and Health, A study in Medical Geography, APH Publishing Corporation, New Delhi.
Misra, RP (2007). Geography of Health, A treatise on Geography of life and death in India. Concept Publishing Company, New Delhi.
Rajput, S (2024). Geography of Health. Concept Publishing Company Pvt. Ltd. New Delhi.
Thamilarasan, M (2016). Medical Sociology.Rawat Publications, New Delhi.

Paper Title: Practical-IV

Paper Code: GEOSPL25104 C

Credit: 4 Marks: 100

Course Objectives:

- To develop students' proficiency in geographical techniques, quantitative methods, and statistical software for analyzing spatial, demographic, environmental, and health-related data.
- To equip students with practical skills in data collection, analysis, interpretation, and scientific report writing through field-based geographical research.

Course Outcomes:

- Apply geographical and quantitative techniques to analyze spatial patterns, social change, migration, health, environmental, and agricultural data.
- Use statistical software such as SPSS, R, and Stata for data management, transformation, tabulation, and basic statistical analysis.
- Interpret and present geographical data using appropriate analytical methods, indices, maps, graphs, and statistical techniques.
- Design and conduct a field-based geographical study, analyze primary or secondary data, and prepare a scientifically structured research report.

Unit I: Techniques in Geography

- Social Change: Relative and Absolute

- Shape index
- Sea route map
- Soil texture analysis
- Moving average
- Quadrat sampling technique for plant population density

Unit II: Migration and Health Analysis Techniques

- National Growth Rate Method
- Vital Statistics Method (Residual Method)
- Census Survival Ratio Method
- Life Table Survival Ratio Method
- Out of pocket expenditure
- Accessibility of healthcare centres
- Differential index

Unit III: Geographic data analysis using Software

SPSS:

Creation of data frame

Data transformation: Recoding variable, Computing variable

Generating tables: Univariate, Bi-variate and Multi-variate tables

R language:

Input, Import and Export of data

Measures of central tendency

Graphs

Stata Software

Data transformation: Recoding variable, Computing variable

Generating tables: Univariate, Bi-variate and Multi-variate tables

Unit IV: Report writing

The students in consultation with assigned faculty are required to collect data from a selected study area, either primary or secondary sources. Based on the collected data a group field report needs to be prepared. A group may comprise of 4-8 students. A group report should be prepared within a page limit of 20, inclusive of everything. This will carry maximum of one-fourth of the total marks of the paper.

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Acock, Alan C (2014). A Gentle Introduction to Stata, 4th Edition.AStata Press Publication StataCorp LP, College Station, Texas.

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Johnston, R. J. (1973). *Multivariate Statistical Analysis in Geography*. London: Longman.

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Unwin, D. (1981). *Introductory Spatial Analysis*. London: Methuen.

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