

ESTABLISHED 1948

DEPARTMENT OF GEOGRAPHY

GAUHATI UNIVERSITY

Jalukbari, Guwahati – 781014, Assam, India

NAAC Accredited · Grade A+



SYLLABUS

Four-Year Under-Graduate. Programme In Geography

Semester I - VIII

**DURATION: 4 YEARS
(8 SEMESTERS)**

AS PER NEP 2020



ACADEMIC SESSION

2026 – 2027

EFFECTIVE FROM July 2026

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Version 1

Recommended by the meeting of the CCS in Geography held on 10.04.2026, the Joint faculty meeting held on 20.05.2026 and the Academic Council held on 26.05.2026

Programme Outcomes (POs)

M.Sc. Geography — Gauhati University

PO1 – Disciplinary Knowledge Demonstrate advanced and integrated knowledge of physical, human, and regional geography, connecting classical theoretical frameworks with contemporary developments to understand complex spatial and environmental phenomena.

PO2 – Critical Thinking and Research Aptitude Apply analytical reasoning to evaluate geographic problems, design appropriate research methodologies, and conduct independent scholarly inquiry with rigour and academic integrity.

PO3 – Geospatial and Technical Competence Demonstrate proficiency in GIS, Remote Sensing, GPS, and cartographic tools, applying them effectively in spatial data collection, analysis, and evidence-based decision-making.

PO4 – Environmental Awareness and Social Responsibility Integrate principles of sustainable development, environmental ethics, and climate-resilient thinking into geographic practice, and apply disciplinary knowledge responsibly to address issues of regional inequity, vulnerability, and environmental degradation.

PO5 – Communication, Collaboration, and Lifelong Learning Communicate geographic knowledge effectively through written, oral, and visual modes; work productively in interdisciplinary teams; and pursue continuous learning to adapt to evolving academic, technological, and policy environments.

Programme Specific Outcomes (PSOs)

M.Sc. Geography — Gauhati University

PSO1 – Physical and Environmental Geography of Northeast India Analyse geomorphological, climatological, hydrological, and biogeographical processes with particular reference to the Eastern Himalayas and Brahmaputra valley, including flood dynamics, erosion, and disaster vulnerability in Assam.

PSO2 – Human, Social, and Regional Geography Critically examine population dynamics, settlement patterns, cultural landscapes, socio-economic inequalities, and border-space issues, situating Northeast India's development challenges within national and global geographic frameworks.

PSO3 – Geospatial Technology and Field Methods Independently apply GIS, remote sensing, and cartographic tools alongside systematic fieldwork methods — including primary surveys, PRA, and instrument-based measurement — to produce research-quality spatial analyses and thematic outputs.

PSO4 – Climate Change, Hazards, and Sustainability Interpret climate change impacts on physical and human systems in the Northeast Indian region, assess environmental and disaster risks, and contribute to adaptation, mitigation, and sustainable land-use planning at local and regional scales.

PSO5 – Professional Readiness and Multidisciplinary Engagement Demonstrate preparedness for careers in academic research, civil services, urban/regional planning, environmental assessment, GIS industry, and policy sectors, while engaging constructively with cognate disciplines in the spirit of NEP 2020's multidisciplinary vision.

Four-year Undergraduate Programme in geography
Department of Geography
Gauhati University

Course Code	Course name	Major/Minor	COURSE_CATEGORY	TYPE	Credit
GGY4100104MJ	Introduction to Physical Geography	Major	Compulsory	Theory	4
GGY4100104MN	Introduction to Physical Geography	Minor	Elective	Theory	4
GGY4200104MJ	Introduction Human Geography	Major	Compulsory	Theory	4
GGY4200104MN	Introduction Human Geography	Minor	Elective	Theory	4
GGY4300104MJ	Geography as a Spatial Science	Major	Compulsory	Theory	4
GGY4300104MN	Geography as a Spatial Science	Minor	Elective	Theory	4
GGY4300204MJ	Geography of Disaster	Major	Compulsory	Theory	4
GGY4300204MN	Geography of Disaster	Minor	Elective	Theory	4
GGY4400104MJ	Geomorphology	Major	Compulsory	Theory & Practical	3+1
GGY4400204MJ	Geography of India	Major	Compulsory	Theory & Practical	3+1
GGY4400204MN	Geography of India	Minor	Elective	Theory & Practical	3+1
GGY4400304MJ	Cartographic Techniques	Major	Compulsory	Theory & Practical	3+1
GGY4400404MJ	Population and Settlement Geography	Major	Compulsory	Theory & Practical	3+1
GGY4400404MN	Population and Settlement Geography	Minor	Elective	Theory & Practical	3+1
GGY4500104MJ	Climatology, Biogeography and Oceanography	MAJOR	COMPULSORY	THEORY & PRACTICAL	3+1
GGY4500104MN	Climatology, Biogeography and Oceanography	MINOR	ELECTIVE	THEORY & PRACTICAL	3+1
GGY4500204MJ	Quantitative Methods in Geography	MAJOR	COMPULSORY	THEORY & PRACTICAL	3+1
GGY4500304MJ	Economic and Resource Geography	MAJOR	ELECTIVE	THEORY & PRACTICAL	3+1
GGY4500304MN	Economic and Resource Geography	MINOR	ELECTIVE	THEORY & PRACTICAL	3+1
GGY4500404MJ	Social, Cultural and Political Geography	MAJOR	ELECTIVE	THEORY & PRACTICAL	3+1
GGY4500404MN	Social, Cultural and Political Geography	MINOR	ELECTIVE	THEORY & PRACTICAL	3+1
GGY0500504MJ	Internship	MAJOR	COMPULSORY	Internship	4
GGY4600104MJ	Geography of Environment and Development	MAJOR	COMPULSORY	THEORY & PRACTICAL	3+1
GGY4600104MN	Geography of Environment and Development	MINOR	ELECTIVE	THEORY & PRACTICAL	3+1
GGY4600204MJ	Introduction to Remote Sensing and GIS	MAJOR	COMPULSORY	THEORY & PRACTICAL	3+1
GGY4600304MJ	Urban Geography	MINOR	COMPULSORY	THEORY & PRACTICAL	3+1
GGY4600304MN	Urban Geography	MINOR	ELECTIVE	THEORY & PRACTICAL	3+1
GGY4600404MJ	Surveying Techniques	MAJOR	ELECTIVE	THEORY & PRACTICAL	3+1

Four-year Undergraduate Programme in geography
Department of Geography
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GGY4600404MN	Surveying Techniques	MINOR	ELECTIVE	THEORY & PRACTICAL	3+1
GGY4600504MJ	Geography of North East India	MAJOR	ELECTIVE	THEORY & PRACTICAL	3+1
GGY4600504MN	Geography of North East India	MINOR	ELECTIVE	THEORY & PRACTICAL	3+1
GGY4700104MJ	Geographical Thought	MAJOR	COMPULSORY	THEORY & PRACTICAL	3+1
GGY4700204MJ	Field Techniques in Geography	MAJOR	COMPULSORY	THEORY & PRACTICAL	3+1
GGY4700304MJ	Climate Change and Sustainability Science	MAJOR	Compulsory	THEORY & PRACTICAL	3+1
GGY4700404MJ	Micro Area Studies and Regional Analysis	MAJOR	ELECTIVE	THEORY & PRACTICAL	3+1
GGY4700504MJ	Research Methodology in Geography	MAJOR	COMPULSORY	THEORY & PRACTICAL	3+1
GGY4700604MJ	Geography of India's Neighbours	MAJOR	ELECTIVE	THEORY & PRACTICAL	3+1
GGY4700704MN	Introduction to Climate Change	MINOR	ELECTIVE	THEORY	4
GGY4800104MJ	Geography of Rural Landscape and Livelihood (Graduation with Honours)	MAJOR	COMPULSORY	THEORY & PRACTICAL	3+1
GGY4800204MJ	Advanced Geomorphology (Graduation with Honours)	MAJOR	COMPULSORY	THEORY & PRACTICAL	3+1
GGY4800304MJ	Geography of Health (Graduation with Honours)	MAJOR	COMPULSORY	THEORY & PRACTICAL	3+1
GGY4800404MJ	Gender Geography (Graduation with Honours)	MAJOR	COMPULSORY	THEORY & PRACTICAL	3+1
GGY4800704MN	Geography of Himalayas (Graduation with Honours for other subjects)	MINOR	ELECTIVE	THEORY	4
GGY0800504MJ	Project Formulation and Execution (Graduation with Research)	MAJOR	COMPULSORY	THEORY & PRACTICAL	4
GGY0800612MJ	Dissertation / Research Project (Graduation with Research)	Major	COMPULSORY	Dissertation	12

Four Year Under-Graduate Programme

Subject: Geography

Semester: I

Course Name: **Introduction to Physical Geography**

Course Code: **GGY4100104MJ / GGY4100104MN**

Course Level: Foundation & Introductory

Theory: 4 Credits (60 classes, one-hour duration)

Marks: 100 (Theory = 60, Internal = 40)

Course Objectives

1. Explain the basic concepts and principles of physical geography.
2. Identify the major processes that shape the Earth's physical environment.
3. Analyze how physical geography processes impact human activities and development.
4. Apply critical thinking skills to analyze and solve problems related to physical geography.

Course Outcomes

1. Understand the evolution, concept, scope, and branches of Physical Geography.
2. Appreciate the scope and significance of Geomorphology.
3. Grasp key elements of Climatology.
4. Understand fundamentals of Oceanography.
5. Comprehend Biogeography concepts.

Course Content

Unit I: Evolution and Growth of Physical Geography

Growth of nature-centric geography; evolution and trend of Physical Geography; meaning, scope and nature; branches; interdisciplinary nature.

Unit II: Geomorphology

Scope and significance; fundamental concepts: catastrophism, uniformitarianism, Davisian landform development.

Unit III: Climatology

Scope and significance; insolation, heat budget, temperature-pressure-precipitation relationships; wind systems.

Unit IV: Oceanography

Scope and significance; origin of ocean basins and currents; temperature-salinity relationship.

Unit V: Biogeography

Scope and significance; biosphere, ecology, ecosystems, biodiversity.

Reading List

1. Strahler, A. & Strahler, A. (2007). *Physical Geography*. John Wiley & Sons.
2. Bloom, A. L. (1998). *Geomorphology: A Systematic Analysis*. Prentice Hall.
3. Waugh, D. (2000). *Geography: An Integrated Approach*. Nelson Thornes.
4. Kale, V.S. & Gupta, A. (2001). *Introduction to Geomorphology*. Orient Longman.
5. Selby, M.J. (2005). *Earth's Changing Surface*. Clarendon Press.
6. Thornbury, W. (1968). *Principles of Geomorphology*. John Wiley & Sons.
7. Siddhartha, K. (2018). *Oceanography: A Brief Introduction*. Kitab Mahal.
8. Critchfield, H.J. (2008). *General Climatology*. Pearson.
9. Lal, D.S. (2022). *Climatology*. Sarda Pustak Bhaban.
10. Cox, C.B. & Moore, P.D. (2000). *Biogeography*. John Wiley & Sons.

Course Details

Theory Credit: 4

Practical Credit: 0

Required Classes: 60

Contact Classes: 40

Non-Contact Classes: 20

Course Designer

Department of Geography, Gauhati University

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Four Year Under-Graduate Programme

Subject: Geography

Semester: II

Course Name: **Introduction to Human Geography**

Course Code: **GGY4200104MJ/ GGY4200104MN**

Course Level: Foundation & Introductory

Theory: 4 Credits (60 classes, one-hour duration)

Marks: 100 (Theory = 60, Internal = 40)

Course Objectives

1. Students will be able to identify and describe the fundamental concepts, theories, and approaches of human geography.
2. Students will be able to apply the skills of analysis and interpretation to a range of geographical phenomena.
3. Students will be able to recognize the significance of human geography in addressing contemporary world issues and challenges.

Course Outcomes

1. Understand human geography's scope, its relationship with other sciences and development trend.
2. Explain the concept of man-environment relationship, and interpret different schools of thought.
3. Evaluate and contrast different schools of human geography, focusing on Human Ecology, Landscape and Locational Analysis.
4. Assess the impact of environment on man and his activities on environment in various global contexts, with emphasis on Urbanization.
5. Analyze the concept of ethnicity and race and identify global patterns of racial composition, investigating urban and rural socio-economic practices.

Course Content

Unit I: Defining the field of human geography and its development

Meaning and scope; Place of man in the study of geography; Nature of human geography and its relation with other social sciences; Changing definitions and trend of development of human geography.

Unit II: Concept of man-environment relationship in human geography

Determinism, Possibilism, Neo-determinism and Cultural Determinism.

Unit III: Schools of human geography

Human Ecology, Landscape and Locational Analysis.

Unit IV: Man and environment relationship

Changing man-environment relationship through ages; Impact of environment on man in different geographical conditions; Impact of man and its activities on environment in different parts of the world; Urbanization and environment in different global contexts.

Unit V: Man and culture

Concept of ethnicity and race; Global patterns of the racial composition of the population and associated characteristics of major racial groups; Rural and urban environment and associated socio-economic practices.

Reading List

1. Johnston, R. et al. (2008). *The Dictionary of Human Geography*. Blackwell Publication.
2. Jordan-Bychkov et al. (2006). *The Human Mosaic: A Thematic Introduction to Cultural Geography*. W. H. Freeman and Company, New York.
3. Hussain, Majid (2012). *Human Geography*. Rawat Publications, Jaipur.
4. Gregory, D. (1978). *Ideology, Science and Human Geography*. Hutchinson, London.
5. James, M.R. and Bacon, R.S. (1990). *The Cultural Landscape: An Introduction to Human Geography*. Prentice Hall.
6. Leong, G.C. and Morgan, G.C. (1992). *Human and Economic Geography*. Oxford University Press.

7. Fellmann, J.D., Getis, A. and Getis, J. (1999). *Human Geography: Landscapes of Human Activities*. WCB McGraw-Hill.
8. Jones, E. (1972). *Human Geography*. Chatto and Windus, London.
9. Broek, J.O.M. and Webb, J.W. (1969). *A Geography of Mankind*. Taylor and Francis.

Course Details

Theory Credit: 4

Practical Credit: 0

Required Classes: 60

Contact Classes: 40

Non-Contact Classes: 20

Course Designer

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Four Year Under-Graduate Programme

Subject: Geography

Semester: III

Course Name: **Geography as a Spatial Science**

Course Code: **GGY4300104MJN / GGY4300104MN**

Course Level: Intermediate

Theory: 4 Credits (60 classes of one-hour duration)

Marks: 100 Marks (Theory = 60 Marks, Internal Assessment = 40 Marks)

Course Objective

1. To introduce students to the fundamental concepts of geography as a spatial science.
2. To provide students with a strong foundation in spatial data analysis and visualization.
3. To enable students to understand and critically analyze the spatial dimensions of a range of geographic processes.
4. To equip students with the skills to develop and apply spatial models and technologies to solve geographic problems.

Course Outcome

1. Understand and explain the multidisciplinary nature of geography and its evolution.
2. Grasp the concept of space, place, region and learn about spatial processes and patterns.
3. Analyze different geographical approaches including systematic, regional, ideographic, and nomothetic approaches.
4. Apprehend spatial analysis in Geography through concepts of location and area patterns.
5. Recognize various scientific approaches in Geography, including inductive, deductive methods and different modes of explanations.

1 Unit I

Defining the field of Geography: Study of the earth as the home of man; Place of geography in relation to natural and social sciences; The changing definitions of geography and its multidisciplinary nature.

2 Unit II

Geography as a spatial science and spatial concepts in geography: Concept of space, place, territory, and region; Geographic space (Absolute Space and Relative Space); Spatial Processes and Patterns (basic concepts only) – Spatial distribution, spatial concentration, spatial organization, spatial relationship.

3 Unit III

Basic Approaches in Geography: Systematic and Regional; Ideographic and Nomothetic; Pure and Applied.

4 Unit IV

Spatial Analysis in Geography: Concept of location; Concept of point, line, and area patterns.

5 Unit V

Scientific Approaches in Geography: Inductive and Deductive methods; Harvey's modes of explanations in Geography (basic concepts only): Cognitive, Morphometric, Cause and effect, Temporal, Functional and System analysis.

Reading List

1. Abler, R., Adams, J. & Gould, P.P. (1971). *Spatial Organization: The Geographers' View of the World*. Prentice-Hall.
2. Ackerman, E.A. et al. (1965). *The Science of Geography*. National Academy of Science, Washington D.C.
3. Adhikari, Sudepta (2015). *Fundamentals of Geographical Thought*. Orient Blackswan Pvt. Ltd., New Delhi.
4. Chorley, R.J. & Haggett, P. (eds.) (1967). *Models in Geography*. Methuen, London.
5. Chorley, R.J. (1973). *Directions in Geography*. Methuen, London.
6. Dikshit, R.D. (1994). *The Art and Science of Geography*. Prentice Hall of India, New Delhi.
7. Haggett, P. (2001). *Geography: A Global Synthesis*. Pearson Education, Essex.
8. Hartshorne, R. (1939). *The Nature of Geography*. Association of American Geographers.

9. Hartshorne, R. (1959). *Perspective on the Nature of Geography*. Rand McNally, Chicago.
10. Harvey, D. (1969). *Explanation in Geography*. St. Martin's Press, New York.
11. Johnston, R.J. et al. (eds.) (1986). *The Dictionary of Human Geography*. Basil Blackwell.

Additional Information

- **Theory Credit:** 4
- **Practical Credit:** 0
- **Required Classes:** 60
- **Contact Classes:** 40
- **Non-Contact Classes:** 20
- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: III

Course Name: **Geography of Disaster**

Course Code: **GGY4300204MJ / GGY4300204MN**

Course Level: Intermediate

Theory: 4 Credits (60 classes of one-hour duration)

Marks: 100 Marks (Theory = 60 Marks, Internal Assessment = 40 Marks)

Course Objectives

1. To understand the concepts of disasters and their management.
2. To identify the different types of disasters.
3. To evaluate the impact of disasters on society and the environment.
4. To learn the various mitigation measures and techniques of disaster management.

Course Outcome

1. Comprehend various definitions and classifications related to Disaster Management, along with understanding the factors affecting vulnerability.
2. Understand and apply the phases of the Disaster Management Cycle, apprehending roles within Community-Based Disaster Management.
3. Identify and assess the hazard and vulnerability profile of India, emphasizing diverse disaster-prone areas.
4. Analyze the impact of development projects on disaster genesis and understand indigenous knowledge for disaster management.
5. Evaluate the components of disaster management policies, specifically the National Disaster Management policy and plan of India.

1 Unit I

Disaster Management – Meaning and definition; Definitions of Disaster and Hazards – Risks, Vulnerability, Resilience and their inter-relationship; Classification of Disasters – Natural and Human-induced; Geophysical, hydro-meteorological and man-made hazards and disasters; Causes

and impacts of disasters; Factors affecting vulnerability – Economic, Political, Environmental and Social contexts.

2 Unit II

Disaster Management Cycle; Disaster Management Phases – Prevention and Preparedness, Mitigation, Response and Recovery; Community-Based Disaster Management – Roles and responsibilities of communities.

3 Unit III

Hazard and Vulnerability Profile of India; Disaster-prone and vulnerable areas in India with emphasis on Cyclones, Earthquakes and Floods; Structural and Non-structural measures for Disaster Risk Reduction in earthquake- and flood-prone areas.

4 Unit IV

Disasters and Development – Impact of Development Projects such as dams, embankments, land-use changes on disaster genesis; Understanding differential impacts of disasters on people of various tribes, classes, gender, age, location and disability; Indigenous Knowledge and Disaster Management with reference to flood problems in the Brahmaputra Valley.

5 Unit V

Disaster management policies: Disaster management plans – components; National Disaster Management Policy and Plan of India.

Reading List

1. Coppola, Damon (2011). *Introduction to International Disaster Management*. Elsevier.
2. Abbott, Patrick Leon (2008). *Natural Disasters*. McGraw-Hill.
3. Carresi A. L. et al. (2013). *Disaster Management: International Lessons in Risk Reduction, Response and Recovery*. Routledge, U.K.
4. Kurowa, Julio. *Disaster Reduction: Living in Harmony with Nature*. Quebec or World, Peru.
5. Emdad Hague C. (2005). *Mitigation of Natural Hazards and Disasters: International Perspectives*. Springer.

6. Shaw, Rajib and Krishnamurthy, R.R. (2009). *Disaster Management: Global Challenges and Local Solutions*. Universities Press.
7. Kapoor, Mukesh (2009). *Disaster Management*. Universities Press.
8. Diwan, Parang (2010). *A Manual on Disaster Management*. Pentagon Press.

Additional Information

- **Theory Credit:** 4
- **Practical Credit:** 0
- **Required Classes:** 60
- **Contact Classes:** 40
- **Non-Contact Classes:** 20
- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: IV

Course Name: **Geomorphology**

Course Code: **GGY4400104MJ**

Course Level: Intermediate

Theory: Part I: Theory (3 Credits, 45 classes)

Part II: Practical (1 Credit, 15 classes of two-hour duration)

Marks: 100 Marks (Theory = 45 Marks, Practical = 25 Marks, Internal Assessment = 30 Marks)

Course Objectives

1. To provide a general idea about the topographic and surficial characteristics of the earth's surface to the students.
2. To make students aware of the forms and patterns of diverse landforms in different physical settings of the earth.
3. To make students skilled for applying geomorphic knowledge and techniques for investigating geomorphic processes and the resultant landforms.

Course Outcome

1. Understand the history, development and recent trends in Geomorphology.
2. Identify the major branches of Geomorphology and understand their significance.
3. Gain knowledge about the structure and composition of the Earth, including its crust and interior, and rocks and minerals.
4. Evaluate fundamental theories and concepts of Geomorphology.
5. Assess Geomorphic Processes and Resultant Landforms; understand Endogenetic and Exogenetic processes, ideas of Penck and L.C. King, Fluvial, Glacial and Aeolian processes and resultant landforms.

Part I: Theory

1 Unit I

History and Development of Geomorphic Ideas; Recent Trends in Geomorphology; Post-modern Geomorphology.

2 Unit II

Branches of Geomorphology and their significance: Theoretical and Applied Geomorphology; Major branches—Structural, Fluvial, Glacial, Arid, Environmental and Paleogeomorphology.

3 Unit III

Structure and Composition of the Earth: Earth's crust and interior; Rocks and Minerals.

4 Unit IV

Fundamental Concepts and Theories of Geomorphology: System Concept—Steady State, Dynamic Equilibrium; Mountain Building Theories of Kober and Holmes; Continental Drift; Plate Tectonics; Isostasy.

5 Unit V

Geomorphic Processes and Resultant Landforms: Endogenetic and Exogenetic Processes; Ideas of Penck and L.C. King; Fluvial, Glacial and Aeolian Processes and Resultant Landforms; Slope Forming Processes.

Part II: Practical

6 Unit I: Practical Works (16 Marks)

Two questions of 8 marks each.

1. **Study of Topographical Maps:** Topographical map content, numbering system; General interpretation of toposheets regarding physical characteristics. (3 Assignments)
2. **Profile Drawing:** Serial, superimposed, projected and composite profiles. (3 Assignments)
3. **Preparation of Slope Map / Relative Relief Map:** Wentworth's method and Smith's method. (3 Assignments)

4. **Drainage Basin Analysis:** Delineation of drainage basin and network; Construction of cross and long profiles; Stream ordering by Horton and Strahler methods. (6 Assignments)
5. **Geological Map Interpretation:** Interpretation and construction of cross-sections (two maps, including one with interruptions) showing different sedimentary beds. (2 Assignments)

7 Unit II: Practical Note-Book and Viva-voce (9 Marks)

1. Evaluation of Practical Note-Book (5 marks)
2. Viva-voce (4 marks)

Reading List

1. Bloom, A.L. (1978). *Geomorphology: A Systematic Analysis of Late Cenozoic Landforms*. Prentice Hall.
2. Charlton, R. (2008). *Fundamentals of Fluvial Geomorphology*. Routledge.
3. Chorley, R.J. (1972). *Spatial Analysis in Geomorphology*. Harper & Row.
4. Chorley, R.J. (ed.) (1969). *Water, Earth and Man*. Methuen.
5. Cooke, R.U. & Warren, A. (1973). *Geomorphology in Deserts*. Batsford.
6. Crickmay, C.H. (1974). *The Work of the River*. Macmillan.
7. Davidson-Arnott, R., Bauer, B. & Houser, C. (2019). *Introduction to Coastal Processes and Geomorphology*. Cambridge University Press.
8. Derbyshire, E. (ed.) (1976). *Geomorphology and Climate*. Wiley.
9. Dury, G.H. (1959). *The Face of the Earth*. Penguin.
10. Embelton, C. & Thorns, J. (1979). *Processes in Geomorphology*. Arnold Heinemann.
11. Gabler, R.E., Petersen, J.F. & Trapasso, L.M. (2007). *Essentials of Physical Geography*. Thomson Brooks.
12. Gregory, K.J. (1985). *The Nature of Physical Geography*. Edward Arnold.
13. Gutierrez, M. (2018). *Geomorphology*. CRC Press.
14. Heckmann, T. & Morche, D. (eds.) (2019). *Geomorphology of Proglacial Systems*. Springer.

15. Huggett, R.J. (2018). *Fundamentals of Geomorphology*. 4th Edition. Routledge.
16. Hails, J.R. (ed.) (1978). *Applied Geomorphology*. Elsevier.
17. Kale, V.S. (2023). *Processes, Products and Cycles of Tectonic Geomorphology*. Elsevier.
18. Leopold, L.B., Wolman, M.G. & Miller, J.P. (1964). *Fluvial Processes in Geomorphology*. Freeman.
19. Morisawa, M.M. (ed.) (1981). *Fluvial Geomorphology*. Allen & Unwin.
20. Morisawa, M.M. (1985). *River Forms and Processes*. Longman.
21. Pitty, A.F. (1971). *Introduction to Geomorphology*. Barnes & Noble.
22. Richards, K. (1982). *Rivers: Form and Process in Alluvial Channels*. Blackburn Press.
23. Sharma, H.S. (1982). *Perspectives in Geomorphology* (Vols. I–IV). Concept Publishing.
24. Strahler, A.N. (2013). *Introducing Physical Geography*. Wiley India.
25. Thornbury, W.D. (1969). *Principles of Geomorphology*. Wiley.
26. Thomas, D.S.G. & Goudie, A. (2000). *The Dictionary of Physical Geography*. Blackwell.
27. Wohl, E. (2020). *Rivers in the Landscape*. Wiley Blackwell.

Additional Information

- **Theory Credit:** 3
- **Practical Credit:** 1
- **Required Classes:** 60
- **Contact Classes:** 40
- **Non-Contact Classes:** 20
- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: IV

Course Name: **Geography of India**

Course Code: **GGY0400204MJ / GGY0400204MN**

Course Level: Intermediate

Theory: Part I: Theory (3 Credits, 45 classes)

Part II: Practical (1 Credit, 15 classes of two-hour duration)

Marks: 100 Marks (Theory = 45 Marks, Practical = 25 Marks, Internal Assessment = 30 Marks)

Course Objectives

This is a core paper that intends to introduce students to India as a geographical entity. It seeks to develop new insights among students on the geographical dimensions of the country. A field study is incorporated to make the students understand the regional diversity of India with respect to its land, people, and economy.

Course Outcome

1. Understand and evaluate the significance of India's geographical location and administrative divisions.
2. Analyze and interpret the physical features of India, including climate, vegetation, soil types and distribution.
3. Investigate and evaluate India's population trends, linguistic and religious composition, and spatial variations.
4. Evaluate and predict trends in India's agricultural and industrial sectors with a focus on resource distribution and production.
5. Evaluate India's socio-economic development trends, health status, education status, and trade relations.

Part I: Theory

1 Unit I

India's location, areal extent and their significance; geopolitical and strategic importance; administrative divisions.

2 Unit II

Physical setting: Physiographic divisions and their characteristics; rivers and water bodies; climate and its seasonal and regional characteristics; soil types and their distribution; vegetation and its distribution.

3 Unit III

Population: Trend of growth, spatial variation in growth and distribution; age and sex composition; linguistic and religious composition.

4 Unit IV

Trend of socio-economic development: Literacy and education; health status and health care facilities; transport and communication systems; trade relations (export and import); development policies.

5 Unit V

Agricultural and Industrial sector: Regional distribution and production patterns of rice, wheat, and millet; distribution and production patterns of iron and steel, cotton textiles and fertilizers; overall industrial development scenario in the country; distribution and production scenario of coal, petroleum, gas and hydro-power; potentiality of solar, wind, and nuclear power generation.

Part II: Practical

6 Unit I: Practical Works (12 Marks)

Two questions of 6 marks each.

1. Trend of population growth and growth rates in India since 1901 using Census data (Source: censusindia.gov.in). (2 assignments)
2. Choropleth mapping to show spatial variation in decennial population growth rate and literacy rate in India. (2 assignments)

3. Spatial variation in the patterns of religious composition and social composition (SC, ST, General) using pie-graphs. (2 assignments)
4. Trend of food grains production (Rice, Wheat, Maize, Barley, Jowar, Bajra) in India since 1950–51 using band-graph. (1 assignment)
5. Mapping of population distribution of India and analysis of its relationship with relief. (1 assignment)
6. Flow pattern of selected commodities in India using standard carto-statistical techniques. (1 assignment)

7 Unit II: Field Report (5 Marks)

Preparation of a field report based on observational knowledge about the geographical perspective of any part of India or any part of NE India under the guidance of teacher(s).

8 Unit III: Practical Note-Book and Viva-voce (8 Marks)

1. Evaluation of Practical Note-Book (5 marks)
2. Viva-voce (3 marks)

Reading List

1. Deshpande, C.D. (1992). *India: A Regional Interpretation*. ICSSR.
2. Johnson, B.L.C. (2001). *Geographical Dictionary of India*. Vision Books.
3. Mandal, R.B. (ed.) (1990). *Patterns of Regional Geography – Vol. 3: Indian Perspective*.
4. Sdyasuk Galina & Sengupta, P. (1967). *Economic Regionalisation of India*. Census of India.
5. Sharma, T.C. (2003). *India: Economic and Commercial Geography*. Vikas Publishing.
6. Singh, R.L. (1971). *India: A Regional Geography*. National Geographical Society of India.
7. Singh, Jagdish (2003). *India: A Comprehensive & Systematic Geography*. Gyanodaya Prakashan.
8. Spate, O.H.K. & Learmonth, A.T.A. (1967). *India and Pakistan: A General and Regional Geography*. Methuen.
9. Tirtha, Ranjit (2002). *Geography of India*. Rawat Publications.

10. Pathak, C.R. (2003). *Spatial Structure and Processes of Development in India*. Regional Science Association.
11. Tiwari, R.C. (2007). *Geography of India*. Prayag Pustak Bhawan.
12. Sharma, T.C. (2013). *Economic Geography of India*. Rawat Publications.

Additional Information

- **Theory Credit:** 3
- **Practical Credit:** 1
- **Required Classes:** 60
- **Contact Classes:** 40
- **Non-Contact Classes:** 20
- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: IV

Course Name: **Cartographic Techniques**

Course Code: **GGY4400304MJ**

Course Level: Intermediate

Theory: Part I: Theory (3 Credits, 45 classes)

Part II: Practical (1 Credit, 15 classes of two-hour duration)

Marks: 100 Marks (Theory = 45 Marks, Practical = 25 Marks, Internal Assessment = 30 Marks)

Course Objective

This course on Cartographic Techniques provides a general understanding of the field of cartography including its modern developments and importance in geographic study. It focuses on various types of map scales and their construction, principles of map projection and construction of selected projections, and preparation of thematic maps representing various geographical data using different cartographic techniques.

Course Outcome

1. Understand and trace the evolution of Cartography, focusing on its significance in geography.
2. Devise point, line, and area data representations in different map types while discerning map characteristics and scale.
3. Formulate zenithal, conical, and cylindrical projections effectively, dictating their choice, use, and limitations.
4. Distinguish between different types of thematic maps, and apply the concepts of Isopleth and Choropleth mapping.
5. Comprehend the shape and size of the Earth and the coordinate systems.

Part I: Theory

1 Unit I

Cartography – Meaning, development (traditional and modern) and importance of cartography in geography.

2 Unit II

Shape and size of the Earth; coordinate system—latitude (parallels) and longitude (meridians).

3 Unit III

Map: Characteristics, types, scale and content; representation of point, line and area data in maps.

4 Unit IV

Map Projections: Concept and classification; principles of constructing zenithal, conical and cylindrical projections (basic ideas); choice of map projection with reference to whole world or a specific area; uses and limitations.

5 Unit V

Thematic mapping: Concept and types; Isopleth and Choropleth mapping.

Part II: Practical

6 Unit I: Practical Works (16 Marks)

Two questions of 8 marks each.

1. Construction of graphical scale (linear, diagonal and comparative); conversion of map scale. (6 assignments)
2. Construction of graticules of Zenithal Polar Gnomonic and Stereographic, Simple Conical with one standard parallel, Bonne's Conical, and Gall's Stereographic Cylindrical projection with their properties, uses and limitations. (5 assignments)
3. Preparation of thematic maps (choropleth, isopleths, band graph, pie diagram) for representing various physical and human geographic data. (4 assignments)

7 Unit II: Practical Note-Book and Viva-voce (9 Marks)

1. Evaluation of Practical Note-Book (5 marks)
2. Viva-voce (4 marks)

Reading List

1. Anson, R. & Ormelling, F.J. (1994). *International Cartographic Association: Basic Cartographic*. Pergamon Press.
2. Gupta, K.K. & Tyagi, V.C. (1992). *Working with Map*. Survey of India, DST, New Delhi.
3. Misra, R.P. & Ramesh, A. (1989). *Fundamentals of Cartography*. Concept Publishing.
4. Monkhouse, F.J. & Wilkinson, H.R. (1973). *Maps and Diagrams*. Methuen.
5. Rhind, D.W. & Taylor, D.R.F. (eds.) (1989). *Cartography: Past, Present and Future*. Elsevier.
6. Robinson, A.H. (2009). *Elements of Cartography*. John Wiley & Sons.
7. Singh, R.L. & Singh, R.P.B. (1999). *Elements of Practical Geography*. Kalyani Publishers.
8. Sarkar, A. (2015). *Practical Geography: A Systematic Approach*. Orient Blackswan.
9. Singh, L.R. (2013). *Fundamentals of Practical Geography*. Sharda Pustak Bhawan.
10. Talukder, S. (2008). *Introduction to Map Projections*. EBH Publishers, Guwahati.

Additional Information

- **Theory Credit:** 3
- **Practical Credit:** 1
- **Required Classes:** 60
- **Contact Classes:** 40
- **Non-Contact Classes:** 20
- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: IV

Course Name: **Population and Settlement Geography**

Course Code: **GGY4400404MJ / GGY4400404MN**

Course Level: Intermediate

Theory: Part I: Theory (3 Credits, 45 classes)

Part II: Practical (1 Credit, 15 classes of two-hour duration)

Marks: 100 Marks (Theory = 45 Marks, Practical = 25 Marks, Internal Assessment = 30 Marks)

Course Objective

1. This paper intends to introduce students to the basic concepts of population and settlement geography and how the differential characteristics of population and settlement influence the development process of an area.
2. It seeks to develop an understanding among students about the significance of population geography and settlement geography and their inter-relationship.

Course Outcome

1. Understand and explain the field of population geography, its correlation with demography, and the components of population growth.
2. Recognize global patterns of population distribution, density, and the factors influencing them.
3. Analyze various theories of population growth, and assess their relevance in current global contexts.
4. Interpret and explain the field of settlement geography, understand settlement hierarchy, and apply it to rural and urban settlements.
5. Demonstrate practical knowledge of population trends and spatial patterns through graphical representation and map reading skills.

Part I: Theory

1 Unit I: Population Geography

1. Defining the field of population geography and population data: Meaning, emergence as a systematic branch of geography and significance; its relation with demography; sources of population data and perspectives on Census of India publications.
2. Distribution and density of population: Factors influencing population distribution and density; global patterns of population distribution.
3. Population Growth: Trend of global population growth; components of population growth—fertility, mortality and migration; push and pull factors of migration; spatial variations in population growth across the world.
4. Theories of population growth: Malthusian Theory and Demographic Transition Theory.
5. Population composition and associated characteristic patterns in global contexts: Age-sex structure; rural-urban composition; population ageing.

2 Unit II: Settlement Geography

1. Defining the field of settlement geography: Meaning and scope.
2. Rural and urban settlements: Factors influencing distribution patterns; types of rural settlements; morphology and characteristics of rural and urban settlements.
3. Concept of settlement hierarchy and urban fringe; Christaller's Central Place Theory.

Part II: Practical

3 Unit I: Practical Works (16 Marks)

Two questions of 8 marks each.

1. Trend of population growth in Assam/N.E. India through line graph; calculation and graphical representation of decadal growth rates of population in Assam/N.E. India/India. (2 exercises)
2. Choropleth map showing spatial variation in decadal population growth in Assam/N.E. India/India. (1 exercise)
3. Choropleth map showing spatial pattern of population density in Assam/India. (1 exercise)

4. Pie-graph showing spatial variation in social/religious/rural–urban composition of population in Assam/N.E. India. (1 exercise)
5. Choropleth map showing spatial pattern of level of urbanization in Assam/N.E. India. (1 exercise)
6. Flow cartogram showing direction and volume of migration into Assam/N.E. India from different parts of India. (1 exercise)
7. Map showing distribution of towns and their population size with spheres in Assam/N.E. India. (1 exercise)

4 Unit II: Practical Note-Book and Viva-Voce (9 Marks)

1. Evaluation of Practical Note-Book (5 marks)
2. Viva-voce (4 marks)

Reading List

1. Barrett, H.R. (1995). *Population Geography*. Oliver and Boyd.
2. Bhende, A. & Kanitkar, T. (2000). *Principles of Population Studies*. Himalaya Publishing House.
3. Chandna, R.C. & Sidhu, M.S. (1980). *An Introduction to Population Geography*. Kalyani Publishers.
4. Chandna, R.C. (2014). *Geography of Population: Concepts, Determinants and Patterns*. Kalyani Publishers.
5. Clarke, J.I. (1965). *Population Geography*. Pergamon Press.
6. Jones, H.R. (2000). *Population Geography*. Paul Chapman.
7. Lutz, W., Warren, C.S. & Scherbov, S. (2004). *The End of World Population Growth in the 21st Century*. Earthscan.
8. Newbold, K.B. (2009). *Population Geography: Tools and Issues*. Rowman & Littlefield.
9. Pacione, M. (1986). *Population Geography: Progress and Prospect*. Taylor and Francis.
10. Wilson, M.G.A. (1968). *Population Geography*. Nelson.
11. Panda, B.P. (1988). *Janasankya Bhugol*. M.P. Hindi Granth Academy.
12. Maurya, S.D. (2009). *Jansankya Bhugol*. Sharda Pustak Bhawan.

13. Chandna, R.C. (2006). *Jansankhya Bhugol*. Kalyani Publishers.
14. Roy, D. (2015). *Population Geography*. Books and Allied.
15. Ahmad, A., Noin, D. & Sharma, H.N. (eds.) (1997). *Demographic Transition: The Third World Scenario*. Rawat Publications.
16. Money, D.C. (1972). *Patterns of Settlement*. Evan Brothers.
17. Peters, G.L. & Larkin, R.P. (1979). *Population Geography*. Kendall/Hunt.
18. Singh, R.L. & Singh, K.N. (eds.) (1975). *Readings in Rural Settlement Geography*. BHU.
19. Singh, R.Y. (1994). *Geography of Settlements*. Rawat Publications.
20. Maurya, S.D. (2014). *Settlement Geography*. Sharda Pustak Bhawan.

Additional Information

- **Theory Credit:** 3
- **Practical Credit:** 1
- **Required Classes:** 60
- **Contact Classes:** 40
- **Non-Contact Classes:** 20
- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: V

Course Name: **Climatology, Biogeography and Oceanography**

Course Code: GGY4500104MJ / GGY4500104MN

Course Level: Higher

Theory: Part I: Theory (3 Credits, 45 classes)

Part II: Practical (1 Credit, 15 classes of two-hour duration)

Marks: 100 Marks (Theory = 45 Marks, Practical = 25 Marks, Internal Assessment = 30 Marks)

Course Objective

The main objective of the course is to sensitise the students towards global climatological, biogeographical and marine issues.

Course Outcome

1. Comprehend the structure and variations in atmospheric composition, characteristics, climatic classifications and weather forecasting techniques.
2. Understand and apply knowledge of approaches to study biogeography, bio-energy cycles, significance of forest and wildlife conservation, soil formation processes and soil types in India.
3. Recognize the significance of physical and biological factors in biogeography, including concepts of biodiversity, ecology and ecosystems.
4. Analyse the submarine topography of oceans and major oceanic currents.
5. Apply practical knowledge of climatology, biogeography and oceanography through graphs, maps and diagrams.

Part I: Theory

1 Unit I: Climatology

1. Atmospheric composition and structure; their variation with altitude, latitude and season.
2. Atmospheric temperature: horizontal and vertical distribution.

3. General circulation; jet streams.
4. Atmospheric moisture – evaporation, humidity, condensation, fog, precipitation.
5. Climatic classification of Köppen and Trewartha; Monsoon – mechanism, distribution, trajectories and irregularities; El-Niño and Walker circulation.
6. Cyclones and anticyclones: Tropical cyclones, anticyclones and extra-tropical cyclones.
7. Air masses and fronts: characteristics, types, origin and modification of air masses.
8. Techniques of weather forecasting: conventional and modern methods.

2 Unit II: Biogeography

1. Role of physical and biological factors; distribution of plants and animals; biomes and biodiversity hotspots of the world.
2. Bio-energy cycles and food chain.
3. Concept of biodiversity; conservation of forest and wildlife.
4. Ecology and ecosystem: structure and functioning.
5. Soil as an environmental component; soil formation processes and factors; soil composition and horizons; soil types and distribution in India.

3 Unit III: Oceanography

1. Submarine topography of Pacific, Atlantic and Indian Oceans.
2. Ocean temperature and salinity.
3. Ocean currents, tides, tsunamis.
4. Ocean deposits; coral reefs.

Part II: Practical

4 Unit I: Practical Works (16 Marks)

Two questions of 8 marks each.

1. Interpretation of Indian weather maps for monsoon and non-monsoon seasons based on various symbols. (2 assignments)

2. Preparation of weather reports for the Indian subcontinent using weather satellite images (INSAT 3D, NOAA) for at least three consecutive days. (3 assignments)
3. Preparation of rainfall–temperature graphs: hythergraph, climograph and ergograph (India/N.E. India/Assam). (3 assignments)
4. Calculation of average annual rainfall and variability; preparation of rainfall distribution and variability maps using isopleths. (2 assignments)
5. Mapping of protected areas (national parks, biosphere reserves, wildlife sanctuaries) of Assam/N.E. India/India. (3 assignments)
6. Mapping of phytogeographic and zoogeographic regions of the world. (2 assignments)
7. Mapping of biodiversity hotspots of the world. (1 assignment)
8. Mapping soil types of Assam/N.E. India and soil horizons. (2 assignments)

5 Unit II: Practical Note-Book and Viva-Voce (9 Marks)

1. Evaluation of Practical Note-Book (5 marks)
2. Viva-voce (4 marks)

Reading List

1. Barry, R.G. & Carleton, A.M. (2001). *Synoptic and Dynamic Climatology*. Routledge.
2. Barry, R.G. & Chorley, R.J. (1998). *Atmosphere, Weather and Climate*. Routledge.
3. Critchfield, H.J. (1987). *General Climatology*. Prentice-Hall.
4. Lutgens, F.K., Tarbuck, E.J. & Tasa, D. (2009). *The Atmosphere: An Introduction to Meteorology*. Prentice-Hall.
5. Oliver, J.E. & Hidore, J.J. (2002). *Climatology: An Atmospheric Science*. Pearson.
6. Trewartha, G.T. & Horne, L.H. (1980). *An Introduction to Climate*. McGraw-Hill.
7. Gupta, L.S. (2000). *Jalvayu Vigyan*. Delhi University.
8. Lal, D.S. (2006). *Jalvayu Vigyan*. Prayag Pustak Bhawan.
9. Vatal, M. (1986). *Bhautik Bhugol*. Central Book Depot.
10. Singh, S. (2009). *Jalvayu Vigyan*. Prayag Pustak Bhawan.
11. Raj, Manideep. *Soil and Biogeography*. Kalyani Publishers.
12. Cox, C.B., Moore, P.D. & Ladle, R. (2016). *Biogeography*. Wiley.

Additional Information

- **Theory Credit:** 3
- **Practical Credit:** 1
- **Required Classes:** 60
- **Contact Classes:** 40
- **Non-Contact Classes:** 20
- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: V

Course Name: **Quantitative Methods in Geography**

Course Code: **GGY4500204MJ**

Course Level: Higher

Theory: Part I: Theory (3 Credits, 45 classes)

Part II: Practical (1 Credit, 15 classes of two-hour duration)

Marks: 100 Marks (Theory = 45 Marks, Practical = 25 Marks, Internal Assessment = 30 Marks)

Course Objective

The paper *Quantitative Methods in Geography* highlights the importance of data in geographical studies. It deals with various techniques of data collection, tabulation, interpretation and analysis using basic statistical measures. The paper provides an understanding of both the pure and applied nature of geography along with key methodological elements in the discipline.

Course Outcome

1. Understand quantification and its role in geographical studies, along with the merits and limitations of quantitative methods.
2. Apply measures of central tendency and dispersion to analyze geographical data.
3. Comprehend the need for sampling and understand sampling types relevant to geography.
4. Classify geographical data by scale of measurement and understand sources and nature of such data.
5. Perform time-series analysis, correlation and regression analysis for geographical datasets.

Part I: Theory

1 Unit I

Quantification and its significance in geographical study; advantages and limitations of quantitative methods in geography.

2 Unit II

Geographical Data: Nature, types and sources; scale of measurement—nominal, ordinal, interval and ratio.

3 Unit III

Measures of central tendency (mean, median, mode) and dispersion (range, quartile deviation, mean deviation, standard deviation, coefficient of variation) and their applications in geographical data analysis.

4 Unit IV

Sampling techniques: meaning of sampling and its need; types of sampling—simple random and stratified random.

5 Unit V

Time-series analysis and its applications in geographical studies; basic techniques of time-series analysis—semi-average, moving average and least squares.

6 Unit VI

Correlation and regression analysis: Meaning of correlation; bi-variate coefficient of correlation (Spearman's rank correlation and Pearson's product-moment correlation); linear regression analysis and their applications in geographical data analysis.

Part II: Practical

7 Unit I: Practical Works (16 Marks)

Two questions of 8 marks each.

1. Tabulation/grouping of geographical data for frequency distribution; preparation of histogram, frequency polygon and frequency curve. (2 assignments)
2. Computation of mean, median and mode for ungrouped and grouped data; determination of median and mode using graphical methods; determination of spatial mean centre of settlements using centrophoric measures. (4 assignments)
3. Computation of standard deviation and coefficient of variation for ungrouped and grouped geographical data (e.g., rainfall, income, production). (2 assignments)

4. Analysis of time-series geographical data (rainfall, production, export/import values) using moving average and least squares. (2 assignments)
5. Computation of correlation between two geographical variables using Spearman's rank correlation and Pearson's product-moment correlation; preparation of scatter diagram and fitting linear regression lines. (1 assignment)

8 Unit II: Practical Note-Book and Viva-Voce (9 Marks)

1. Evaluation of Practical Note-Book (5 marks)
2. Viva-voce (4 marks)

Reading List

1. Hammond, P. & McCullagh, P.S. (1978). *Quantitative Techniques in Geography: An Introduction*. Oxford University Press.
2. Sarkar, A. (2013). *Quantitative Geography: Techniques and Presentations*. Orient Blackswan.
3. Yeates, M. (1974). *An Introduction to Quantitative Analysis in Human Geography*. McGraw-Hill.
4. Mathews, J.A. (1987). *Quantitative and Statistical Approaches to Geography*. Pergamon.
5. Mahmood, A. (1999). *Statistical Methods in Geographical Studies*. Rajesh Publications.
6. Elhance, D.N. (1972). *Fundamentals of Statistics*. Kitab Mahal.
7. Monkhouse, F.J. & Wilkinson, H.R. (1989). *Maps and Diagrams*. B.I. Publications.
8. Gregory, S. (1963). *Statistical Methods and Geographers*. Longman.

Additional Information

- **Theory Credit:** 3
- **Practical Credit:** 1
- **Required Classes:** 60
- **Contact Classes:** 40
- **Non-Contact Classes:** 20

- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: V

Course Name: **Economic and Resource Geography (Optional)**

Course Code: **GGY4500304MJ / GGY4500304MN**

Course Level: Higher

Theory: Part I: Theory (3 Credits, 45 classes)

Part II: Practical (1 Credit, 15 classes of two-hour duration)

Marks: 100 Marks (Theory = 45 Marks, Practical = 25 Marks, Internal Assessment = 30 Marks)

Course Objective

This paper intends to introduce students to the principles of economic geography and associated patterns and processes of major economic activities in the world. It seeks to develop new insights among students on the relevance of economic geography and associated economic issues in contemporary times.

Course Outcome

1. Understand the scope and approaches of economic geography and resources.
2. Recognize and classify various economic activities and analyze the role of production systems.
3. Examine and compare the agricultural sector and models of agricultural location world-wide.
4. Appraise industrial location factors using Weber's theory and understand the distribution and production of major industries globally.
5. Evaluate modes of transport, their influence on development, and their role in resource mobilization and economic development.

Part I: Theory

1 Unit I

Meaning, scope and approaches of Economic Geography; concept and classification of resources.

2 Unit II

Economic activity: meaning and classification; production system—role of land, labour and capital.

3 Unit III

Agriculture sector: Factors influencing agriculture; types of agriculture; Von Thünen's Model of Agricultural Location; factors influencing cultivation of wheat, rice, coffee and tea, and their global distribution and production.

4 Unit IV

Manufacturing sector: Factors influencing industrial location; Weber's theory of industrial location; classification of industries; factors, distribution and production of iron and steel, cotton textile and IT industries worldwide; Special Economic Zones (SEZs) and technology parks.

5 Unit V

Transport system: Modes of transport; factors influencing transport development; role of transport in resource mobilization and economic development.

6 Unit VI

Trade: Factors influencing trade in different countries; trade relations of India with USA, Russia and Japan.

Part II: Practical

7 Unit I: Practical Works (16 Marks)

Two questions of 8 marks each.

1. Trend of rice, wheat and iron & steel production in the world/USA/India using moving average and least squares methods. (4 assignments)
2. Trend of production of wheat, rice, maize and barley in the world/USA using band graphs. (2 assignments)
3. Trend of balance of trade (export and import value) of India with USA, China and Japan using bar graphs. (2 assignments)

4. Regional variation in fertilizer consumption and agricultural productivity in rice, wheat and barley in selected countries using bar graphs. (1 assignment)
5. Inter-state/inter-national flow of selected commodities and inter-city movement of traffic/buses in N.E. India using flow cartograms. (2 assignments)

8 Unit II: Practical Note-Book and Viva-Voce (9 Marks)

1. Evaluation of Practical Note-Book (5 marks)
2. Viva-voce (4 marks)

Reading List

1. Hartshorn, T.A. & Alexander, J.W. (2004). *Economic Geography*. Prentice-Hall.
2. Coe, N.M., Kelly, P.F. & Yeung, H.W. (2007). *Economic Geography: A Contemporary Introduction*. Wiley-Blackwell.
3. Hodder, B.W. & Lee, R. (1974). *Economic Geography*. Taylor and Francis.
4. Combes, P., Mayer, T. & Thisse, J.F. (2008). *Economic Geography: The Integration of Regions and Nations*. Princeton University Press.
5. Wheeler, J.O. (1998). *Economic Geography*. Wiley.
6. Bagchi-Sen, S. & Smith, H.L. (2006). *Economic Geography: Past, Present and Future*. Taylor and Francis.
7. Willington, D.E. (2008). *Economic Geography*. Husband Press.
8. Saxena, H.M. (2013). *Economic Geography*. Rawat Publications.

Additional Information

- **Theory Credit:** 3
- **Practical Credit:** 1
- **Required Classes:** 60
- **Contact Classes:** 40
- **Non-Contact Classes:** 20
- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: V

Course Name: **Social, Cultural and Political Geography (Optional)**

Course Code: **GGY0500404MJ / GGY0500404MN**

Course Level: Higher

Theory: Part I: Theory (3 Credits, 45 classes)

Part II: Practical (1 Credit, 15 classes of two-hour duration)

Marks: 100 Marks (Theory = 45 Marks, Practical = 25 Marks, Internal Assessment = 30 Marks)

Course Objective

To appreciate the social and political dimensions of geographic phenomena and understand how geography influences political issues and their spatial dimensions.

Course Outcome

1. Identify, understand and analyze the concepts in Social Geography and its significance to human development.
2. Comprehend and analyze types of cultures, the role of cultural diffusion and attributes of cultural landscapes.
3. Evaluate levels of social well-being and construct ternary diagrams to represent social composition.
4. Generate, analyze and interpret maps of major conflict zones and interstate boundary disputes.
5. Understand the nature and scope of Political Geography, conceptualize geopolitics and comprehend geographic conflicts.

Part I: Theory

1 Unit I: Social Geography

1. Social Geography: Meaning, scope, approaches and contemporary trends.
2. Concept and types of social space and social groups.

3. Social Well-being: Concept and components—housing, health and education; concept of human development and its measurement.
4. Contribution of race, religion, language and ethnicity in promoting diversity in India.
5. Social geographies of inclusion and exclusion: caste, class, gender and ethnicity.

2 Unit II: Cultural Geography

1. Meaning and scope of Cultural Geography; contemporary trends.
2. Types of culture: material and non-material.
3. Concepts: Cultural diffusion, cultural lag, cultural landscape, cultural region.
4. Cultural ecology and folk geography; folk culture and rituals with special reference to Assam.

3 Unit III: Political Geography

1. Political Geography: Nature, scope and recent trends; approaches to its study.
2. Concept of state, nation, nation-state; attributes of the state; frontiers, boundaries and buffer zones.
3. Concept of geopolitics; Heartland and Rimland; Mackinder's Heartland Theory.
4. Concepts of colonialism, neo-colonialism and lebensraum.
5. Geography and conflict: India–Pakistan, India–China, Russia–Ukraine.

Part II: Practical

4 Unit I: Practical Works (16 Marks)

Two questions of 8 marks each.

1. Level of Social Well-being using composite Z-score in India/N.E. India. (1 exercise)
2. Construction of ternary diagram representing social composition in India/N.E. India. (1 exercise)
3. Sex disparity in literacy using Sopher's Disparity Index in India/N.E. India. (1 exercise)
4. Mapping conflict zones of India (2 exercises); mapping North-East India pre- and post-Independence (3 exercises); mapping boundary disputes with China and within N.E. India.

5. Sketch of traditional house types of selected tribes of North-East India.
6. Preparation of a short video documentary on a folk ritual of a selected Assamese community.

5 Unit II: Practical Note-Book and Viva-Voce (9 Marks)

1. Evaluation of Practical Note-Book (5 marks)
2. Viva-voce (4 marks)

Reading List

Social Geography

1. Ahmad, A. (1999). *Social Geography*. Rawat Publications.
2. Ahmad, A. (ed.) (1993). *Social Structure and Regional Development*. Rawat Publications.
3. Carter, J. & Jones, T. (1989). *Social Geography*. Edward Arnold.
4. Eyles, J. in Johnston et al. *Dictionary of Human Geography*. Blackwell.
5. Jones, E. & Eyles, J. (1977). *An Introduction to Social Geography*. OUP.
6. Jones, E. (ed.) (1975). *Readings in Social Geography*. OUP.
7. Sharma, H.N. (2000). "Social Geography" in Singh (ed.) INSA.
8. Smith, D.M. (1977). *Human Geography: A Welfare Approach*. Edward Arnold.
9. Sopher, D. (ed.) (1980). *Exploration of India*. Longman.
10. Srinivas, M.N. (1986). *India: Social Structure*. Hindustan Publishing.
11. Taher, M. (1994). *Introduction to Social Geography*. NEIGS.

Cultural Geography

1. Crang, M. (1998). *Cultural Geography*. Routledge.
2. Duncan, J. & Ley, D. (eds.) (1992). *Place/Culture/Representation*. Routledge.
3. Gritzner, C.F. (1984). "Scope of Cultural Geography". *Journal of Geography*.
4. Jackson, R. & Hudman, L. (1990). *Cultural Geography*. West Publishing.

5. Johnston, R.J. et al. (eds.) (1994). *Dictionary of Human Geography*. Blackwell.
6. Jordan, T.G. & Rowntree, L. *The Human Mosaic*. McGraw-Hill.
7. Noble, A. & Dutt, A. (eds.) (1982). *India: Cultural Patterns*. Westview Press.

Political Geography

1. Agnew, J. et al. (2015). *Wiley Blackwell Companion to Political Geography*.
2. Smith, S. (2020). *Political Geography: A Critical Introduction*. Wiley.
3. Dikshit, R.D. (2020). *Political Geography*. Macmillan.
4. Dwivedi, R.L. & Misra, H.N. (2019). *Fundamentals of Political Geography*. Surjeet Publications.

Additional Information

- **Theory Credit:** 3
- **Practical Credit:** 1
- **Required Classes:** 60
- **Contact Classes:** 40
- **Non-Contact Classes:** 20
- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: V

Course Name: **Internship**

Course Code: **GGY0500504MJ**

Course Level: Higher

Theory: 4 Credits (120 Hours)

Marks: Assessment based on Internship Completion Requirements

Internship at a Glance

- **Credits:** 4
- **Total Hours:** 120 hours (offline or online)
- Internship to be undertaken after the 4th Semester examination (Summer break) and may continue during the next semester.
- Marks will appear in the Grade Sheet of Semester V (even if internship extends into Semester VI). The marksheet is available for download only after grade entry.
- Two categories of Internship:
 - Skill Internship
 - Research Internship
- Internship may be intra-institutional.
- A formal letter must be issued by HoD/Principal to the Internship Providing Organisation (IPO) to initiate the internship.

Documents to be Submitted Upon Completion

1. Certificate of Successful Completion (Format provided below)
2. Activity Logbook (Daily Activity Record)
3. Evaluation Report (Supervisor + Department Mentor)
4. Internship Report submitted by the student

Internship Completion Certificate (Format)

This is to certify that **[Student Name]** has successfully completed her/his internship at **[Host Institute/Organisation]** under the supervision of **[Supervisor Name]** from **[Start Date]** to **[End Date]** and completed **120 working hours**.

Skill-Based Internship

During this period, the intern was attached to **[Branch/Division/Lab]** and worked on **[Name of Work]**. She/He demonstrated qualities such as punctuality, regularity, commitment, teamwork, discipline, and dedication, along with the skills learned.

Research Internship

During this period, the intern worked on **[Research Aspect/Project]** including tasks such as literature review, experiment design, data analysis, etc. She/He demonstrated analytical capability, research aptitude, discipline, and relevant research skills.

Overall Performance: Outstanding / Excellent / Very Good / Good / Average / Satisfactory / Poor

Signature of Supervisor at IPO

Designation:

Division / Branch / Department:

Host Organisation Seal:

Activity Logbook (Format)**IPO Name:****Department/Division:****Name of Student:****Enrollment No.:****Academic Year:****Semester:**

Date	Reporting Time	Departure Time	Total Hours En-gaged	Nature of Work	Theory	Hands-on Activity	Field Work

Signature of Student:**Signature of IPO Supervisor:**

Evaluation Report (Format)**Student Name:****Enrollment No.:****Program and Semester:****Internship Type (Skill/Research):****Internship Providing Organisation:****Internship Supervisor:****Internship Period:****Assessment by IPO Supervisor**

- Punctuality / Regularity: 4 marks
- Conduct: 6 marks
- Technical / Research Skills: 15 marks
- Analytical & Problem-Solving Skills: 15 marks
- Communication Skills: 5 marks
- Teamwork: 5 marks

Signature of IPO Supervisor:**Assessment by Department Mentor**

- Activity Logbook: 10 marks
- Internship Report: 15 marks
- Seminar Presentation: 15 marks
- Overall Performance: 10 marks

Total Score (out of 100):**Signature of Departmental Mentor:**

Report of the Student (Format)

Cover Page

- Student Name
- Enrollment No.
- Program and Semester
- Department and Mentor Name
- Internship Type
- Internship Providing Organisation / Lab
- Internship Supervisor (Name & Designation)
- Internship Period (dates)

Sections of the Report

1. Acknowledgement
2. Table of Contents
3. List of Tables / Figures / Illustrations
4. Introduction (summary + details of IPO)
5. Nature of the Work Assigned
6. Details of Internship Activities
7. Skills Learned
8. Conclusion and Future Value of the Internship
9. References (manuals, sources, other materials used)

Signature of the Student

Additional Information

- **Total Credits:** 4
- **Hours Required:** 120
- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: VI

Course Name: **Geography of Environment and Development**

Course Code: **GGY4600104MJ / GGY4600104MN**

Course Level: Higher

Theory: Part I: Theory (3 Credits, 45 classes)

Part II: Practical (1 Credit, 15 classes of two-hour duration)

Marks: 100 Marks (Theory = 45 Marks, Practical = 25 Marks, Internal Assessment = 30 Marks)

Course Objective

This paper introduces students to the interface between geography and the environment. It develops insights on the relevance of environmental studies, environmental issues, pollution, disaster, and the management of environmental problems.

Course Outcome

1. Understand the nature, scope, and significance of environmental geography, with emphasis on man–environment relationships and biome-based adaptations.
2. Identify major environmental problems, understand their consequences, and comprehend the concepts of hazard, disaster, risk and vulnerability.
3. Evaluate the relationship between environment and development and understand sustainable development.
4. Comprehend and explain the concept, types and functioning of ecosystems; analyze energy flow and biogeochemical cycles.
5. Evaluate key themes in Environmental Geography, including biodiversity, conservation, water resource management and corporate ecological responsibility.

Part I: Theory

1 Unit I

Environmental Geography: Nature, scope and significance; man–environment relationship; historical progression; adaptation in different biomes.

2 Unit II

Major environmental problems: Pollution, deforestation, desertification, global warming, bio-depletion; hazard, disaster, risk and vulnerability; types of hazards/disasters—natural and man-made.

3 Unit III

Ecosystem: concept and types; ecosystem functioning; energy flow; biogeochemical cycles; biosphere as an ecosystem.

4 Unit IV

Environment and Development: ecology and equity; concept of environment and development; development processes, nature and trends; sustainable development.

5 Unit V

Thematic Issues in Environmental Geography: Population–consumption–technology nexus; biodiversity, conservation and protected areas; water resources and fishing livelihoods; corporate ecological responsibility.

Part II: Practical

6 Unit I: Practical Works (16 Marks)

Two questions of 8 marks each.

1. Studying satellite images and topographic sheets to observe bank-line changes of the Brahmaputra River across three time periods and mapping the changes. (1 exercise)
2. Mapping major wetlands in a district and computing size- and shape-based distribution. (1 exercise)
3. Preparing a map of a nearby wetland; assessing changes in dimensions, water level and encroachment over the past decade (field-based). (1 exercise)
4. Preparing long-term rainfall time series (minimum 30 years) for a selected station in N.E. India using the moving average method. (1 exercise)

7 Unit II: Practical Note-Book and Viva-Voce (9 Marks)

1. Evaluation of Practical Note-Book (5 marks)
2. Viva-voce (4 marks)

Reading List

1. Chandna, R.C. (2002). *Environmental Geography*. Kalyani.
2. Cunningham, W.P. & Cunningham, M.A. (2004). *Principles of Environmental Science*. McGraw-Hill.
3. Goudie, A. (2001). *The Nature of the Environment*. Blackwell.
4. Singh, R.B. (Ed.) (2009). *Biogeography and Biodiversity*. Rawat.
5. Miller, G.T. (2004). *Environmental Science: Working with the Earth*. Thomson.
6. MoEF (2006). *National Environmental Policy*. Govt. of India.
7. Singh, R.B. & Hietala, R. (Eds.) (2014). *Livelihood Security in Northwestern Himalaya*. Springer.
8. Odum, E.P. (2005). *Fundamentals of Ecology*. Cengage.
9. Singh, S. (1997). *Environmental Geography*. Prayag Pustak Bhawan.
10. UNEP (2007). *Global Environment Outlook—GEO4*.
11. Singh, M., Singh, R.B. & Hassan, M.I. (Eds.) (2014). *Climate Change and Biodiversity*. Springer.
12. Singh, R.B. (1998). *Ecological Techniques and Approaches*. Oxford & IBH.
13. Alcántara-Ayala, I. (2002). “Geomorphology, hazards, vulnerability”. *Geomorphology*.
14. Goudie, A. & Ayala, I. (2010). *Geomorphological Hazards*. Cambridge University Press.
15. <https://www.undrr.org/publications>
16. <https://sdmassam.nic.in/dmp.html>
17. <https://ndma.gov.in/>

Additional Information

- **Theory Credit:** 3
- **Practical Credit:** 1
- **Required Classes:** 60
- **Contact Classes:** 40
- **Non-Contact Classes:** 20
- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: VI

Course Name: **Introduction to Remote Sensing and GIS**

Course Code: **GGY4600204MJ**

Course Level: Higher

Theory: Part I: Theory (3 Credits, 45 classes)

Part II: Practical (1 Credit, 15 classes of two-hour duration)

Marks: 100 Marks (Theory = 45 Marks, Practical = 25 Marks, Internal Assessment = 30 Marks)

Course Objective

1. To introduce students to the interface of Remote Sensing and GIS.
2. To develop insights into the relevance of geospatial studies within the field of Geography.

Course Outcome

1. Interpret and analyze remote sensing data for applications such as land, vegetation and water.
2. Apply the basics of GIS—its components, data types and structures—in geographical studies.
3. Perform spatial analyses in GIS including buffer, proximity, viewshed and overlay analysis.
4. Understand the fundamentals of remote sensing theory and its historical developments.
5. Demonstrate practical skills in aerial photo interpretation, digital classification and GIS layer creation and analysis.

Part I: Theory

1 Unit I: Introduction to Remote Sensing

1. Remote Sensing: Definition and history of development.

2. Principles of Remote Sensing: Energy sources; EMR interaction with atmosphere and earth features; platforms, sensors and resolutions; aerial and satellite remote sensing; fundamentals of photogrammetry.
3. Remote Sensing data products, sources and characteristics; elements of image interpretation (visual and digital); digital image processing—enhancement and classification (supervised and unsupervised).
4. Applications of Remote Sensing: Land, vegetation and water.

2 Unit II: Introduction to GIS

1. Geographical Information System (GIS): Definition, development, components, functions; open-source GIS.
2. GIS data types and structures: Spatial and non-spatial data; raster and vector structures; database management systems (DBMS).
3. Spatial Analysis: Layer extraction; buffer, proximity and viewshed analysis; overlay analysis.
4. Applications of GIS: Site/habitat suitability, network analysis, flood damage estimation.

Part II: Practical

3 Unit I: Practical Works (16 Marks)

Two questions of 8 marks each.

1. Aerial photo interpretation and visual interpretation of satellite imagery; preparation of thematic maps. (2 assignments)
2. Analysis of aerial photographs and satellite images: Determining photo scale and object height using a mirror stereoscope; supervised and unsupervised digital classification. (3 assignments)
3. Geo-referencing and data layer creation: Geometric correction; digitization of point, line and polygon features; attribute data input; thematic representation; buffer and overlay analysis. (3 assignments)

4 Unit II: Practical Note-Book and Viva-Voce (9 Marks)

1. Evaluation of Practical Note-Book (5 marks)
2. Viva-voce (4 marks)

Reading List

1. Campbell, J.B. (2007). *Introduction to Remote Sensing*. Guildford Press.
2. Jensen, J.R. (2004). *Introductory Digital Image Processing*. Prentice Hall.
3. Joseph, G. (2005). *Fundamentals of Remote Sensing*. United Press.
4. Lillesand, T.M., Kiefer, R.W. & Chipman, J.W. (2004). *Remote Sensing and Image Interpretation*. Wiley.
5. Nag, P. & Kudra, M. (1998). *Digital Remote Sensing*. Concept Publishing.
6. Rees, W.G. (2001). *Physical Principles of Remote Sensing*. Cambridge University Press.
7. Singh, R.B. & Murai, S. (1998). *Space-Informatics for Sustainable Development*. Oxford IBH.
8. Wolf, P.R. & Dewitt, B.A. (2000). *Elements of Photogrammetry*. McGraw-Hill.
9. Sarkar, A. (2015). *Practical Geography: A Systematic Approach*. Orient Blackswan.
10. Chauniyal, D.D. (2010). *Sudur Samvedan Evam Bhogolik Suchana Pranali*. Sharda Pustak Bhawan.
11. Burrough, P.A. & McDonnell, R.A. (1998). *Principles of GIS*. Oxford University Press.

Additional Information

- **Theory Credit:** 3
- **Practical Credit:** 1
- **Required Classes:** 60
- **Contact Classes:** 40
- **Non-Contact Classes:** 20
- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: VI

Course Name: **Urban Geography**

Course Code: **GGY4600304MJ / GGY4600304MN**

Course Level: Higher

Theory: Part I: Theory (3 Credits, 45 classes)

Part II: Practical (1 Credit, 15 classes of two-hour duration)

Marks: 100 Marks (Theory = 45 Marks, Practical = 25 Marks, Internal Assessment = 30 Marks)

Course Objectives

1. To introduce students to the field of urban geography and its major aspects.
2. To develop insights on the relevance of urban geography and its associated issues in a rapidly urbanizing world.

Course Outcome

1. Comprehend the nature, scope, and trends of urban geography; understand classification, origin and growth of towns.
2. Understand patterns of urbanization in different countries; identify components of urban growth; explain urban morphology and theories.
3. Grasp concepts such as city-region, urban agglomeration, rural–urban continuum, urban fringe, satellite town, new town and smart cities.
4. Identify and analyze urban issues including housing, slums, traffic congestion, pollution and waste disposal.
5. Evaluate urbanization trends in India; understand national urban development programmes and emerging urban issues in major regions.

Part I: Theory

1 Unit I

Urban Geography: Nature and scope; approaches and trends in urban geography; origin and growth of towns in global and national contexts; types and characteristics of towns; functional

classification of towns; city classification schemes by J.M. Houston, G. Taylor and L. Mumford.

2 Unit II

Patterns of urbanization in developed and developing countries; components of urbanization and urban population growth; organization of urban space; urban morphology and land-use structure; theories of internal structure of towns—Sector Theory (Homer Hoyt) and Multiple Nuclei Theory (Harris and Ullman).

3 Unit III

Concepts: city-region, urban agglomeration, urban sprawl, umland and periphery, rural–urban dichotomy and continuum, urban fringe, satellite town, new town, smart cities.

4 Unit IV

Urban issues and problems: housing, slums, civic amenities (transport and drinking water), traffic congestion, pollution (air, water, land, noise), urban waste disposal and crime.

5 Unit V

Urbanization and development planning in India: trends and regional patterns of urbanization; national urban development policies and programmes; emerging issues in Delhi NCR, Mumbai and Guwahati.

Part II: Practical

6 Unit I: Practical Works (16 Marks)

Two questions of 8 marks each.

1. Plotting of million-plus cities of India using proportionate sphere method. (1 exercise)
2. Mapping distribution of Class I II urban centres in Assam/N.E. India using proportionate sphere method. (1 exercise)
3. Determining spatial mean centres of urban settlements using weighted centrophagic technique (population as weight) in Assam and N.E. India. (2 exercises)
4. Calculation of distribution pattern of urban settlements in a district/state using Nearest Neighbour Analysis. (1 exercise)

5. Choropleth mapping of spatial patterns of urbanization in Assam and N.E. India. (2 exercises)
6. Determination of rank–size relationship of urban centres in Assam/N.E. India/India. (1 exercise)
7. Urban population potential mapping for selected urban centres in Assam/N.E. India. (1 exercise)
8. Delineation of urban influence zones using Reilly’s breaking point formula. (1 exercise)

7 Unit II: Practical Note-Book and Viva-Voce (9 Marks)

1. Evaluation of Practical Note-Book (5 marks)
2. Viva-voce (4 marks)

Reading List

1. Bala, R. (1986). *Urbanisation in India*. Rawat Publications.
2. Bansal, S.C. (2010). *Urban Geography*. Meenakshi Prakashan.
3. Fyfe, N.R. & Kenny, J.T. (2005). *The Urban Geography Reader*. Routledge.
4. Graham, S. & Marvin, S. (2001). *Splintering Urbanism*. Routledge.
5. Hall, T. (2006). *Urban Geography*. Taylor and Francis.
6. Kaplan, D.H., Wheeler, J.O. & Holloway, S.R. (2008). *Urban Geography*. Wiley.
7. Knox, P.L. & McCarthy, L. (2005). *Urbanization: An Introduction*. Pearson.
8. Knox, P.L. & Pinch, S. (2006). *Urban Social Geography*. Prentice-Hall.
9. Kundu, A. (1992). *Urban Development and Urban Research in India*. Khanna Publishers.
10. Nangia, S. (1976). *Delhi Metropolitan Region*. Rajesh Publications.
11. Pacione, M. (2009). *Urban Geography: A Global Perspective*. Routledge.
12. Ramachandran, R. (1989). *Urbanisation and Urban Systems of India*. Oxford University Press.
13. Sassen, S. (2001). *The Global City*. Princeton University Press.

14. Siddhartha, K. & Mukherjee, S. (1996). *Cities, Urbanisation and Urban Systems*. Transworld Media.
15. Singh, R.B. (Ed.) (2001). *Urban Sustainability in the Context of Global Change*. Science Publishers.
16. Singh, R.B. (Ed.) (2015). *Urban Development, Challenges, Risks and Resilience*. Springer.

Additional Information

- **Theory Credit:** 3
- **Practical Credit:** 1
- **Required Classes:** 60
- **Contact Classes:** 40
- **Non-Contact Classes:** 20
- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: VI

Course Name: **Surveying Techniques (Optional)**

Course Code: **GGY4600404MJ / GGY4600404MN**

Course Level: Higher

Theory: Part I: Theory (3 Credits, 45 classes)

Part II: Practical (1 Credit, 15 classes of two-hour duration)

Marks: 100 Marks (Theory = 45 Marks, Practical = 25 Marks, Internal Assessment = 30 Marks)

Course Objective

This course provides a general understanding of surveying, including the use of modern survey tools to enhance field-based geographical knowledge. It emphasizes various survey instruments, principles of ground surveying, and methods required for preparing maps and plans for different spatial contexts.

Course Outcome

1. Understand the meaning, types, and significance of field surveying.
2. Learn the principles of plane and geodetic surveying and triangulation.
3. Master principles and techniques of Plane Table, Prismatic Compass, Theodolite, Dumpy Level and Total Station.
4. Gain proficiency in radiation, intersection, traversing, contouring and leveling.
5. Understand GPS fundamentals, principles and applications.

Part I: Theory

1 Unit I

Field surveying: Meaning, types and significance in geography.

2 Unit II

Principles of surveying: Plane and geodetic surveying; principles of triangulation.

3 Unit III

Principles and techniques of surveying by Plane Table, Prismatic Compass, Theodolite, Dumpy Level and Total Station.

4 Unit IV

Methods of radiation, intersection, traversing, contouring and leveling.

5 Unit V

GPS: Basic concept, principles and utilities.

Part II: Practical

6 Unit I: Practical Works (16 Marks)

Two questions of 8 marks each.

1. Preparation of a plan/map of an area within the college campus (or suitable area) using Plane Table (radiation and intersection methods). (2 assignments)
2. Open and Closed Traverse Survey using Prismatic Compass; preparation of plan with adjustment of closing errors. (2 assignments)
3. Closed Traverse Survey using Theodolite: plotting a plan through computation of reduced bearing, consecutive and independent coordinates; measurement of object height with Theodolite. (2 assignments)
4. Profile leveling and contouring in a selected area using Dumpy Level. (2 assignments)
5. Mapping a trail and prominent features using hand-held GPS and associated software/freeware. (2 assignments)

7 Unit II: Practical Note-Book and Viva-Voce (9 Marks)

1. Evaluation of Practical Note-Book (5 marks)
2. Viva-voce (4 marks)

Reading List

1. Campbell, J. (1984). *Introductory Cartography*. Prentice Hall.
2. Misra, R.P. & Ramesh, A. (1995). *Fundamentals of Cartography*. Concept Publishing.
3. Robinson, A.H. et al. *Elements of Cartography*. John Wiley & Sons.
4. Raisz, E. *Principles of Cartography*. McGraw Hill.
5. Kenetkar, T.P. & Kulkarni, S.U. *Surveying and Levelling* (Vol. I–II). Vidyarthi Griha Prakashan.
6. Das, A.K. (2021). *Pocket Size Handbook on Handling GPS for Field Studies*. GTAD and Aranyak (PDF).

Additional Information

- **Theory Credit:** 3
- **Practical Credit:** 1
- **Required Classes:** 60
- **Contact Classes:** 40
- **Non-Contact Classes:** 20
- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: VI

Course Name: **Geography of North East India (Optional)**

Course Code: **GGY4600504MJ / GGY4600504MN**

Course Level: Higher

Theory: Part I: Theory (3 Credits, 45 classes)

Part II: Practical (1 Credit, 15 classes of two-hour duration)

Marks: 100 Marks (Theory = 45 Marks, Practical = 25 Marks, Internal Assessment = 30 Marks)

Course Objectives

1. To introduce students to the northeastern region of India, which has a distinct identity within the Indian Union.
2. To develop an understanding of the significance of the geographical dimensions of the region.
3. To incorporate field study for understanding meso-regional diversity in land, people and economy.

Course Outcome

1. Understand the geographical, climatic and physiographic features of North-East India and their implications.
2. Analyze demographic trends, social structure, ethnic composition, linguistic and religious diversity.
3. Evaluate agricultural production patterns, shifting cultivation and contemporary agricultural transformations.
4. Assess industrial development patterns, regional industries, and associated challenges.
5. Examine transport, communication and trade patterns; understand Act East Policy and its potential.

Part I: Theory

1 Unit I

North-East India: locational and strategic significance; administrative divisions; physical setting—physiographic divisions and characteristics; rivers and water bodies; climate characteristics; forest cover; protected areas; soil types and distribution.

2 Unit II

Population: trends of growth; variation in growth and distribution at state levels; ethnic composition; age–sex composition; linguistic and religious composition; literacy; educational and healthcare infrastructure.

3 Unit III

Agriculture: Production patterns and characteristics of rice, jute and tea; nature of shifting cultivation in hill regions; contemporary agricultural transformations including horticulture and pisciculture.

4 Unit IV

Agriculture and industry: Regional industrial development; distribution and production of coal, petroleum and cement; potential of agro-based, handloom and handicraft industries; challenges to industrial growth.

5 Unit V

Transport and communication: state-level transport and communication patterns; nature of trade; issues and prospects of Act East Policy for enhancing trade relations.

Part II: Practical

6 Unit I: Practical Works (16 Marks)

Two questions of 8 marks each.

1. Trend of population growth and growth rates in N.E. India since 1901 using Census data. (2 assignments)
2. Choropleth mapping of spatial variation in urbanization levels in N.E. India. (1 assignment)

3. Using carto-statistical tools to depict spatial variations in religious and social composition (SC/ST/General) in N.E. India. (2 assignments)
4. Trend of food grains production (Rabi and Kharif) using band graphs. (1 assignment)
5. Mapping distribution of major tribal groups in N.E. India. (1 assignment)

7 Unit II: Practical Note-Book and Viva-Voce (9 Marks)

1. Evaluation of Practical Note-Book (5 marks)
2. Viva-voce (4 marks)

Reading List

1. Bhagabati, A.K., Bora, A.K. & Kar, B.K. *Geography of Assam*. Rajesh Publications.
2. Taher, M. & Ahmed, P. *Geography of North East India*. Mani Manik Prakash.
3. Das, M.M. *Peasant Agriculture in Assam*. Inter-India Publications.
4. Gopal Krishnan, R. *Geography of North East India*.
5. Bhattacharya, P. (2006). *Trend in Tourism Potentiality*. Bani Mandir.
6. Bhagabati, A.K. (Ed.). *Biodiversity of Assam*. Eastern Book House.
7. Bhattacharyya, N.N. *North East India*. Rajesh Publications.
8. Srivastava, S.C. *Demographic Profile of N.E. India*. Mittal Publications.
9. *Basic Statistics of NE India*. NEC, Shillong (PDF).
10. *India Tourist Statistics*. Ministry of Tourism (PDF).

Additional Information

- **Theory Credit:** 3
- **Practical Credit:** 1
- **Required Classes:** 60
- **Contact Classes:** 40
- **Non-Contact Classes:** 20
- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: VII

Course Name: **Geographical Thought**

Course Code: **GGY4700104MJ**

Course Level: Higher

Theory: Part I: Theory (3 Credits, 45 classes)

Part II: Practical (1 Credit, 15 classes of two-hour duration)

Marks: 100 Marks (Theory = 45 Marks, Practical = 25 Marks, Internal Assessment = 30 Marks)

Course Objectives

This course explores the evolution of geographical thought from ancient times to the present, focusing on major theories, methodologies and debates. Students will critically examine different paradigms and reflect on the future of geographical inquiry.

Course Outcome

1. Comprehend the historical evolution of geographical thought and identify key contributing figures and cultures.
2. Discuss socio-political contexts shaping geographical ideas and understand the role of technology in research.
3. Understand interdisciplinary approaches to geography and the changing concepts of space and place.
4. Evaluate shifting approaches and methodologies within the discipline.
5. Analyze implications of climate change and future urban developments on geographical thought.

Part I: Theory

1 Unit I: Geography Through the Ages

1. Ancient, Dark Age, Medieval philosophies; Age of Exploration; Renaissance contributions to modern geography.

2. Foundations of modern geography: Contributions of German (Humboldt, Ritter, Ratzel), French (Vidal de la Blache), British and American geographers.
3. Major debates: Systematic vs. Regional; Ideographic vs. Nomothetic; Paradigms and paradigm shifts.

2 Unit II: Evolution of Geographic Thought

1. Environmental Determinism, Possibilism, Human Ecology, Landscape Morphology, Areal Differentiation.
2. Regional geography and its methodologies.
3. Quantitative revolution and critiques.
4. Behavioral and Humanistic approaches; Radicalism; Welfare approach; Modernism.

3 Unit III: Towards Post-Modern Geography

1. Socio-spatial dialectic.
2. Gender perspectives in geography.
3. New environmentalism and applied geography.
4. Geopolitics and geo-strategy in the contemporary world.

4 Unit IV: Methodological Innovations in Geography

1. Qualitative methodologies and ethnographic approaches.
2. Quantitative methods in geographic enquiry.
3. Statistical analysis: descriptive and inferential statistics.
4. Mathematical modelling: gravity model, spatial interaction model, spatial diffusion model, density gradient model and applications.
5. GIS and spatial data analysis.
6. Remote sensing and GPS-based data collection.

Part II: Practical

5 Unit I: Practical Works (16 Marks)

Two questions of 8 marks each.

1. Mapping of routes of Exploration and discoveries (Marco Polo, Christopher Columbus, Vasco-da-gama and James Cook)
2. Trend of development of Paradigm in geography (from Environmental determinism to post-modernism) through time scale graph indicating the exemplar, image of the subject matter, theories and Laws, Methods and area of discontent.
3. Preparation of a world map highlighting the major developments of geography (Greek, Arab, France, Germany, Russia, UK and USA) indicating the contribution, name of the contributor and the year of contribution.
4. Prepare a chronological timeline of major geographical thinkers from ancient to contemporary periods highlighting their key contributions.
5. Intensity of spatial interaction of Guwahati city with the neighboring urban centres.
6. Mapping of Population potential surfaces using gravity model.
7. Population density gradient analysis of Guwahati or any other city.

6 Unit II: Practical Note-Book and Viva-Voce (9 Marks)

1. Evaluation of Practical Note-Book (5 marks)
2. Viva-voce (4 marks)

Reading List

1. Arentsen, M., Stam, R. & Thuijjs, R. (2000). *Post-modern Approaches to Space*.
2. Bhat, L.S. (2009). *Geography in India*. Pearson.
3. Bonnett, A. (2008). *What is Geography?*. Sage.
4. Dikshit, R.D. (1997). *Geographical Thought*. Prentice–Hall.
5. Hartshorne, R. (1959). *Perspectives on the Nature of Geography*. Rand McNally.
6. Holt-Jensen, A. (2011). *Geography: History and Its Concepts*. Sage.
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11. Martin, G.J. (2005). *All Possible Worlds: A History of Geographical Ideas*. Oxford.
12. Soja, E. (1989). *Post-modern Geographies*. Verso.

Additional Information

- **Theory Credit:** 4
- **Required Classes:** 60
- **Contact Classes:** 40
- **Non-Contact Classes:** 20
- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: VII

Course Name: **Field Techniques in Geography**

Course Code: **GGY4700204MJ**

Course Level: Higher

Theory: Part I: Theory (3 Credits, 45 classes)

Part II: Practical (1 Credit, 15 classes of two-hour duration)

Marks: 100 Marks (Theory = 45 Marks, Practical = 25 Marks, Internal Assessment = 30 Marks)

Course Objectives

This course provides practical and analytical skills necessary for fieldwork in geography. It emphasises methodologies for collecting, analyzing and interpreting geographic data. The course guides students from basic field observation to advanced spatial data analysis, fostering skills in independent and collaborative research.

Course Outcome

1. Interpretation of field data critically by applying analytical tools and preparation of detailed field reports.
2. Carrying out geographic measurements and analysis by using GIS/GPS for land, water, soil and biogeographical studies.
3. Application of field techniques in advanced scenarios such as urban planning and environmental management through mini-research projects.
4. Understanding of the importance of fieldwork, and to plan effectively and to perform accurate field observations and sketching.
5. Implementation of qualitative and quantitative data collection methods using traditional and digital tools.

Part I: Theory

1 Unit 1: Introduction to Field Studies in Geography

1. Overview of geographic fieldwork: purpose and importance.

2. Planning and preparation for field research.
3. Field safety and ethical considerations.
4. Basic techniques: observation, note-taking and sketching.

2 Unit 2: Data Collection Techniques

1. Quantitative data collection: surveys, sampling strategies.
2. Qualitative data collection: interviews, focus groups, participatory observations.
3. Use of analogue tools: Prismatic Compass, Theodolite, Dumpy Level.
4. Use of digital tools: GPS, GIS, Remote Sensing for collecting and mapping geographic data.

3 Unit 3: Geographic Measurement and Analysis

1. Land use assessment; soil analysis techniques.
2. Water quality measurement; hydrological assessments.
3. Biogeographic surveys and biodiversity assessment.
4. Applications of GIS/GPS/RS in atmospheric, land use, water, soil and biogeographical studies.

4 Unit 4: Data Interpretation and Reporting

1. Statistical and thematic data analysis.
2. Use of software tools such as GIS, SPSS for data visualization.
3. Critical interpretation of field data.
4. Preparing field reports and presentations.

5 Unit 5: Advanced Field Applications and Case Studies

1. Case studies in urban planning, rural development and environmental management.
2. Advanced GIS applications in field contexts.
3. Field project: design and execute a mini-research project.
4. Presentation of field projects and peer review.

Part II: Practical

6 Unit I: Practical Works (16 Marks)

Two questions of 8 marks each.

1. Field observation and preparation of a brief report including physical and human aspects, supported by sketches, profiles, photographs and notes.
2. Close traverse survey using Prismatic Compass and Theodolite; preparation of plan with error correction.
3. Profile levelling and contouring using Dumpy Level and preparation of a large-scale map.
4. Collection of point, line and area data using GPS and preparation of maps in a digital environment.
5. Use of aerial/satellite imagery for thematic mapping using GIS or visual interpretation.

7 Unit II: Practical Note-Book and Viva-Voce (9 Marks)

1. Evaluation of Practical Note-Book (5 marks)
2. Viva-voce (4 marks)

Reading List

1. Creswell, J. (1994). *Research Design: Qualitative and Quantitative Approaches*. Sage.
2. Dikshit, R.D. (2003). *The Art and Science of Geography*. Prentice Hall.
3. Evans, M. (1988). "Participant Observation" in *Qualitative Methods in Human Geography*. Polity.
4. Mukherjee, N. (1993). *Participatory Rural Appraisal*. Concept.
5. Mukherjee, N. (2002). *Participatory Learning and Action*. Concept.
6. Robinson, A. (1998). "Thinking Straight and Writing That Way". Pryczak Publishing.
7. *Special Issue: Doing Fieldwork*. Geographical Review, 91(1–2), 2001.
8. Stoddard, R.H. (1982). *Field Techniques and Research Methods in Geography*. Kendall/Hunt.
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11. Singh, R.L. & Singh, R.P.B. (1999). *Elements of Practical Geography*. Kalyani.
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13. Sarkar, A. (2015). *Practical Geography: A Systematic Approach*. Orient Blackswan.
14. Misra, R.P. & Ramesh, A. (1989). *Fundamentals of Cartography*. Concept Publishing.

Additional Information

- **Theory Credit:** 3
- **Practical Credit:** 1
- **Required Classes:** 60
- **Contact Classes:** 40
- **Non-Contact Classes:** 20
- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: VII

Course Name: **Climate Change and Sustainability Science**

Course Code: **GGY4700304MJ**

Course Level: Higher

Theory: Part I: Theory (3 Credits, 45 classes)

Part II: Practical (1 Credit, 15 classes of two-hour duration)

Marks: 100 Marks (Theory = 45 Marks, Practical = 25 Marks, Internal Assessment = 30 Marks)

Course Objectives

This course explores the scientific foundations, societal impacts and potential solutions related to climate change and sustainability. It emphasizes interdisciplinary approaches to understanding climate science, policy measures and sustainable practices.

Learning Outcomes

1. Understand and explain the fundamental scientific principles of climate change.
2. Analyze the impacts of climate change on natural and human systems.
3. Evaluate sustainability practices and policies aimed at mitigating climate change.
4. Develop and propose innovative sustainability solutions.
5. Apply interdisciplinary knowledge to address challenges in climate change and sustainability.

Part I: Theory

1 Unit 1: Introduction to Climate Science

1. Overview of the Earth's climate system.
2. Historical and recent trends in climate data.
3. Greenhouse gases and their role in climate change.
4. Impacts of human activities on the climate.

5. Basic climate modelling and predictions.

2 Unit 2: Impacts of Climate Change

1. Physical impacts: sea-level rise, changing weather patterns, extreme weather.
2. Biological impacts: species extinction and shifts in biodiversity.
3. Socio-economic impacts: agriculture, infrastructure and human health.
4. Regional case studies on vulnerabilities and impacts.

3 Unit 3: Mitigation Strategies

1. Renewable energy technologies and energy efficiency.
2. Carbon capture and sequestration.
3. Urban planning and green architecture.
4. Agricultural practices and forest management.
5. Policy frameworks and international agreements.

4 Unit 4: Sustainability and Adaptation

1. Concepts of sustainability: ecological, social and economic dimensions.
2. Adaptive strategies for communities and ecosystems.
3. Sustainable water and land-use management.
4. Building resilience in urban and rural contexts.
5. Innovative technologies in adaptation.

5 Unit 5: Case Studies and Project Work

1. Analysis of global and local sustainability projects.
2. Role of NGOs and community participation.
3. Designing small-scale sustainability projects.
4. Group presentations on proposed projects.
5. Integrating local knowledge with scientific approaches.

Part II: Practical

6 Unit I: Practical Works (16 Marks)

Two questions of 8 marks each.

1. Climate data analysis and visualization: temperature, rainfall, CO₂ trends using real datasets (IMD, NASA, NOAA).
2. Carbon footprint assessment of household or institution using online tools or primary surveys.
3. Monitoring Urban Heat Island effect using field temperature records or satellite thermal data.
4. Preparation of a Local Climate Profile (LCP) using climatic trends and vulnerability data.
5. Green Audit of campus: energy, water and waste management assessment.
6. Rainwater harvesting feasibility study: rooftop mapping and runoff estimation.
7. Climate Action Plan for a local area based on mitigation/adaptation strategies.

7 Unit II: Practical Note-Book and Viva-Voce (9 Marks)

1. Evaluation of Practical Note-Book (5 marks)
2. Viva-voce (4 marks)

Reading List

1. Kump, L.R., Kasting, J.F. & Crane, R.G. (2013). *The Earth System*. Pearson.
2. IPCC Reports (2021–2022). *Climate Change: Physical Science Basis; Impacts; Mitigation*.
3. Steffen, W. et al. (2004). *Global Change and the Earth System*. Springer.
4. Houghton, J.T. (2015). *Global Warming: The Complete Briefing*. Cambridge University Press.
5. Parry, M.L. et al. (2007). *Climate Change 2007: Impacts, Adaptation, Vulnerability*. Cambridge University Press.
6. Oreskes, N. & Conway, E.M. (2011). *Merchants of Doubt*. Bloomsbury Press.
7. Meadows, D.H. et al. (1972). *The Limits to Growth*. Club of Rome.

8. Raworth, K. (2017). *Doughnut Economics*. Random House.
9. Jackson, T. (2011). *Prosperity Without Growth*. Routledge.
10. UNFCCC (2015). *Paris Agreement*.
11. United Nations (2015). *Sustainable Development Goals*.
12. MoEFCC. *National Action Plan on Climate Change (NAPCC)*.
13. World Bank (2012). *Turn Down the Heat*.
14. Ravindranath, N.H. & Sathaye, J. (2002). *Climate Change and Developing Countries*. Springer.
15. TERI Reports on India's climate action and sustainability initiatives.

Additional Information

- **Theory Credit:** 3
- **Practical Credit:** 1
- **Required Classes:** 60
- **Contact Classes:** 40
- **Non-Contact Classes:** 20
- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: VII

Course Name: **Micro Area Studies and Regional Analysis (Optional)**

Course Code: **GGY4700404MJ**

Course Level: Higher

Theory: Part I: Theory (3 Credits, 45 classes)

Part II: Practical (1 Credit, 15 classes of two-hour duration)

Marks: 100 Marks (Theory = 45 Marks, Practical = 25 Marks, Internal Assessment = 30 Marks)

Course Objectives

This course focuses on micro-spatial studies of specific geographical, political and cultural areas, considering micro areas as field laboratories of geography. It develops deep understanding of the dynamism, problems and potentials of micro areas and builds students' capacities to conduct independent research and regional analysis.

Course Outcome

1. To understand and distinguish core concepts, theories and methodologies in Micro Area Studies.
2. To comprehend and implement diverse research methods ethically in area studies.
3. To apply learned concepts to conduct detailed analyses of selected micro areas, identifying problems and proposing solutions.
4. To understand linkages between regional dynamics and global issues using case studies.
5. To conduct independent research on a micro area, analyze regional data and present findings effectively.

Part I: Theory

1 Unit 1: Introduction to Micro Area Studies

Definition, nature and scope of micro area studies; emergence and significance of micro area studies in geography; micro area as a field laboratory; distinction between micro and macro area studies. Historical development of micro area studies in India and abroad; conceptual

and methodological foundations. Micro landscapes: physical and cultural components; human response to micro landscapes; influence of social and physical processes.

2 Unit 2: Research Methodologies in Area Studies

Participatory appraisal methods and techniques; interdisciplinary approaches. Qualitative and quantitative research methods. Selection of micro areas for case study; primary field survey methodologies. Data collection techniques (Qualitative and Quantitative) for regional analysis. Ethics in micro area and regional studies.

3 Unit 3: Micro Area Studies – Focused Analyses

Assessment of problems and potentials of specific regions (e.g., village, municipal ward, urban fringe, micro ecological setting). Physical, ecological, cultural and political characterization of micro areas. Comparative studies across micro areas; micro area planning and development.

4 Unit 4: Regional Dynamics and Global Impact

Influence of regional characteristics on national and global issues. Case studies on regional conflict, economic development, cultural exchange. Role of geographical boundaries and political entities in shaping regional dynamics. Regional development plans and policies.

5 Unit 5: Independent Project Work

Selection of a micro area for detailed study. Application of research methodologies for data collection and analysis. Preparation of written project report. Peer review and academic critique to refine analytical skills.

Part II: Practical

6 Unit I: Practical Works (16 Marks)

Two questions of 8 marks each.

1. Micro-spatial risk assessment using GIS-based MCDA and AHP. (2 exercises)
2. Mapping physical and cultural features of micro areas in Assam/N.E. India using toposheets and satellite imagery. (2 exercises)
3. Participatory mapping of land use and land cover for selected micro areas (village/urban ward). (2 exercises)

4. Identification and mapping of micro landscapes, resource base, problems and potentials through field survey. (2 exercises)
5. Dag survey and mapping using cadastral maps. (2 exercises)
6. Toposequence preparation through transect walk in rural/urban areas. (2 exercises)
7. Survey Schedule-cum-Questionnaire design for micro area study. (1 exercise)

7 Unit II: Practical Note-Book and Viva-Voce (9 Marks)

1. Evaluation of Practical Note-Book (5 marks)
2. Viva voce (4 marks)

Reading List

1. Hall, R.B. (1947). *Area Studies and Their Implications for Research in Social Sciences*. SSRC.
2. Ludden, D. (1998). *Area Studies in the Age of Globalization*. University of Pennsylvania.
3. Mukherjee, N. (1993). *Participatory Rural Appraisal*. Concept Publishing.
4. Cahnman, W.J. (1948). "Outline of a Theory of Area Research," *Annals AAG*.
5. Labh, K. (1986). *Area Studies in India*. NBU Seminar Paper.
6. Mukherjee, N. (1995). *PRA and Questionnaire Survey*. Concept.
7. Ullman, E.L. (1953). "Human Geography and Area Research," *Annals of AAG*.
8. Chambers, R. (1981). "Rapid Rural Appraisal." *Public Administration and Development*.
9. McCracken, J.A. et al. (1988). *Rapid Rural Appraisal for Agricultural Development*.
10. Krosnick, J.A. (2018). "Questionnaire Design." *Palgrave Handbook of Survey Research*.
11. Lietz, P. (2010). "Research into Questionnaire Design." *International Journal of Market Research*.
12. Codó, E. (2008). "Interviews and Questionnaires." *Blackwell Guide to Research Methods*.
13. Hennink, M.M. (2013). *Focus Group Discussions*. Oxford.
14. Neuman, W.L. (2014). *Social Research Methods*. Pearson.

15. Acharya, A. (2006). *International Relations and Area Studies*. NTU Singapore.
16. Appadurai, A. (1996). *Modernity at Large*. Minnesota.
17. Bates, R.H. (1997). “Area Studies and the Discipline,” *PS: Political Science and Politics*.
18. Droselle, J.B. (1952). “Area Studies: Problems of Method,” *International Social Science Bulletin*.
19. Grieb, K.J. (1974). “Area Studies and the Traditional Disciplines,” *The History Teacher*.
20. Morgenthau, H. (1952). “Area Studies and IR,” *International Social Science Bulletin*.
21. Murdoch, G.P. (1950). “Conceptual Basis of Area Research,” *World Politics*.
22. Julian H. (1950). *Area Research: Theory and Practice*. SSRC.
23. Whitaker, U. (1959). “Application of Area Studies in Education,” *IR*.

Additional Information

- **Theory Credit:** 3
- **Practical Credit:** 1
- **Required Classes:** 60
- **Contact Classes:** 40
- **Non-Contact Classes:** 20
- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: VII

Course Name: **Research Methodology in Geography**

Course Code: **GGY4700504MJ**

Course Level: Higher

Theory: Part I: Theory (3 Credits, 45 classes)

Part II: Practical (1 Credit, 15 classes of two-hour duration)

Marks: 100 Marks (Theory = 45 Marks, Practical = 25 Marks, Internal Assessment = 30 Marks)

Course Objectives

This course equips students with essential research skills in geography. Through theoretical insights and practical exercises, students learn to identify research problems, design methodologies, collect and analyze data, and present research findings. The course integrates UGC Graduate Attributes and Bloom's Taxonomy for holistic learning.

Course Outcome

1. Understand the role and significance of geographic research; evolve research problems and conduct literature review.
2. Design effective research proposals, understand data types and sources, and learn primary data processing techniques.
3. Analyze quantitative and qualitative data using software tools; understand geospatial data analysis and GIS applications.
4. Write research papers, prepare reports and present geographic research effectively while adhering to research ethics.
5. Update knowledge on recent advances, innovative data collection methods and the role of big data in geographic research.

Part I: Theory

1 Unit 1: Introduction to Research in Geography

Definition and characteristics of geographic research; relationship with allied fields; significance of geographic research. Types of research: Basic, Applied, Qualitative, Quantitative, Longitudinal, Cross-sectional, Exploratory, Evaluative, Comparative. Developing research problems, identifying research gaps, formulating objectives and research questions. Review of literature: significance and sources (journals, books, online databases).

2 Unit 2: Research Design and Methodology

Designing a geographic research proposal: Statement of problem, review, objectives, questions, hypotheses, database, methodology, significance, structure and references. Types of research designs: experimental, quasi-experimental, and non-experimental. Nature of geographical data: physical and human; spatial and non-spatial. Data sources:

- Primary – pilot surveys, field surveys, household surveys, interviews, observation, FGDs.
- Secondary – Census, NFHS, NSO, NSS, RS data, maps, govt. agencies.
- Tertiary – research articles, books, reports.

Sampling techniques: probability and non-probability; sample size. Primary data processing: manual and software-based (MS Excel, SPSS, R).

3 Unit 3: Data Analysis in Geography

Quantitative analysis: meaning, significance; application of central tendency, dispersion, correlation, regression; time series; spatial statistics. Use of MS Excel, SPSS, R. Qualitative analysis: content analysis, thematic analysis, perception analysis. Use of NVivo for qualitative analysis. Geospatial data analysis and GIS significance.

4 Unit 4: Writing and Presenting Geographic Research

Research paper structure: abstract, introduction, objectives, methodology, analysis, findings, conclusion, references. Academic writing styles; referencing systems. Presentation skills: preparation of slides, posters and oral presentations. Ethical considerations: research integrity, sensitive data, ethical clearance. Structure of research report: preliminaries, texts, tables, figures, appendices; citations and bibliography; executive summary.

5 Unit 5: Conducting Advanced Geographic Research

Recent advances in geographic research. New methodologies in spatial analysis. Innovative data collection (e.g., drones). Spatial modelling and predictive analysis. Role of big data in geographical research. Funding opportunities and grant proposal writing.

Part II: Practical

6 Unit I: Practical Works (16 Marks)

Two questions of 8 marks each.

1. Preparation of household survey schedules/questionnaires for socio-economic or demographic studies.
2. Preparation of village/area survey schedule for environment and infrastructure studies.
3. Preparation of survey schedule for rural market studies.
4. Designing survey tools for perception-based urban environmental studies.
5. Preparation of sketch-maps of rural/urban landscapes.
6. Construction of cross-section profile of land use/land cover in selected areas.
7. Application of statistical techniques for hypothesis testing using sample data.

7 Unit II: Practical Note-Book and Viva-Voce (9 Marks)

1. Evaluation of Practical Note-Book (5 marks)
2. Viva-voce (4 marks)

Reading List

1. Creswell, J.W. & Creswell, J.D. (2017). *Research Design*. Sage.
2. Engel, R.J. & Schutt, R.K. (2016). *The Practice of Research in Social Work*. Sage.
3. Steinberg, S.L. & Steinberg, S.J. (2015). *GIS Research Methods*. Wiley.
4. Gomez, B. & Jones III, J.P. (2010). *Research Methods in Geography*. Wiley.
5. Nayak, A. & Jeffrey, A. (2013). *Geographical Thought*. Routledge.
6. Rogerson, P.A. *Statistical Methods for Geography*. Sage.

Additional Information

- **Theory Credit:** 3
- **Practical Credit:** 1
- **Required Classes:** 60
- **Contact Classes:** 40
- **Non-Contact Classes:** 20
- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: VII

Course Name: **Geography of India's Neighbours (Optional)**

Course Code: **GGY4700604MJ**

Course Level: Higher

Theory: Part I: Theory (3 Credits, 45 classes)

Part II: Practical (1 Credit, 15 classes of two-hour duration)

Marks: 100 Marks (Theory = 45 Marks, Practical = 25 Marks, Internal Assessment = 30 Marks)

Course Objectives

This course aims to provide a comprehensive understanding of the geographical, socio-cultural, economic, and geopolitical characteristics of India's neighbours with respect to Bangladesh, Bhutan, China, Myanmar, Nepal, Pakistan and Sri Lanka. It focuses on their physical environments, population patterns, agricultural and industrial economies, development trajectories and India's geo-political relations with these countries including trade relations, while highlighting their regional significance and interrelationships with India, in a comparative geographical perspective.

Course Outcomes

1. Describe the locational and situational contexts of India's neighbouring countries—Bangladesh, Bhutan, China, Myanmar, Nepal, Pakistan, and Sri Lanka—and explain their locational significance in relation to India.
2. Analyze the geo-political history and strategic importance of India's neighbouring countries in the context of regional and international relations.
3. Examine the physical geographic characteristics of neighbouring countries, including terrain conditions, climatic features, and major geo-environmental issues.
4. Evaluate the socio-economic conditions of India's neighbouring countries with reference to population characteristics, literacy, urbanization, economic development, and human development indicators.
5. Assess India's relations with neighbouring countries in terms of geo-political interactions, trade relations, and transport connectivity for regional cooperation and development.

Unit I

Locational and situational contexts of the India's neighbouring countries (Bangladesh, Bhutan, China, Myanmar, Nepal, Pakistan and Sri Lanka); Locational significance of each country in relation to India; Geo-political history.

Unit II

Physical geographic perspectives: General terrain condition; climatic characteristics; geo- environmental issues.

Unit III

Socio-economic background: Population size, growth and age composition; population distribution and density; ethno-religious composition; literacy and education; urbanization level; economic scenario: agriculture, industry and economic development perspectives; human development.

Unit IV

India's relations with its neighbours: Geo-political relations; trade relations (exports and imports); transport connectivity with India.

Part II: Practical

1 Unit I: Practical Works (16 Marks)

Two questions of 8 marks each.

1. Drawing of a political map of India and its neighbouring countries (Bangladesh, Bhutan, China, Myanmar, Nepal, Pakistan and Sri Lanka) showing the location of their capitals and highlighting the neighbouring countries with different colours (1 assignment)
2. Preparation of Rainfall-Temperature graphs for selected places of India and its neighbouring countries (one for each country) (3 assignments)
3. Construction of a topological map of India and its neighbouring countries by showing area under agriculture/population size, applying grid method. (2 assignments)
4. Preparation of thematic maps to show variation in population density/urbanization level/population growth rate in India and its neighbouring countries (3 assignments)

5. Construction of a Band graph to show trend of population growth in India and its neighbouring countries during post 1950s (1 Assignment).
6. Preparation of thematic maps to show spatial disparity in levels of human development/socio-economic development/infrastructure development using composite Z-score (2 assignments)

2 Unit II: Practical Note-Book and Viva-Voce (9 Marks)

1. Evaluation of Practical Note-Book (5 marks)
2. Viva-voce (4 marks)

Reading List

1. Hugh Brammer, Bangladesh: Landscapes, Soil Fertility and Climate Change, The University Press Limited (UPL), 2016.
2. Ahmed Choudhury, Giasuddin and Anwar Ali , Storm Surges in Bangladesh : An Introduction to CEGIS Storm Surge Model, The University Press Limited (UPL), 2014.
3. Ahmed Choudhury, Giasuddin , Ken'ichi Nakagami, Jianhua Li, Kensuke Fukushi , Strategic Adaptation Towards Water Crisis, The University Press Limited (UPL), 2014.
4. Philip Gain, The Chittagong Hill Tracts Man-Nature Nexus Torn, Society for Environment and Human Development (SHED), 2013.
5. Hugh Brammer, The Physical Geography of Bangladesh, The University Press Limited (UPL), 2012.
6. Hugh Brammer, Land Use and Land Use Planning in Bangladesh, The University Press Limited (UPL), 2002.
7. Anonym, Geo-spatial Tools for Analysis of Flood plain Resources, Environment and GIS Support Project for Water Sector Planning (EGIS), The University Press Limited (UPL), 2000.
8. Muhammad Z Mamun and A T M Nurul Amin, Densification: A Strategic Plan to Mitigate River bank Erosion Disaster in Bangladesh, The University Press Limited (UPL), 1999.
9. Hugh Brammer, The Geography of the Soils of Bangladesh, The University Press Limited (UPL), 1996.
10. Atiq Rahman , Saleemul Huq and Gordon R Conway, Environmental Aspects of Surface Water Systems of Bangladesh, The University Press Limited (UPL), 1990.

11. Hugh Brammer, Climate Change: Sea-level Rise and Development in Bangladesh, The University Press Limited (UPL), 2014.
12. Tawhidul Islam and Ananta Neelim, Climate change in Bangladesh: A Closer Look into Temperature and Rainfall Data, The University Press Limited (UPL), 2010.
13. Hugh Brammer, Can Bangladesh be Protected from Floods?, The University Press Limited (UPL), 2004.
14. Pradyumna P. Karan, Bhutan : A Physical and Cultural Geography, University Press of Kentucky. 196
15. Anonym, Manorama Year Book, 2017, Mammen Mathew, Malayala Manorama Press, 2016.
16. Fraser, Bhattacharya and Bhattacharya, Geography of Himalayan Kingdom: Bhutan, Concept Publishing Company, New Delhi, 2011.
17. Henry Francis Blanford, An Elementary Geography of Burma, India and Shillong,
18. Ranjit Tirtha, Geography of Asia, Rawat Publications, Jaipur.

Additional Information

- **Theory Credit:** 4
- **Required Classes:** 60
- **Contact Classes:** 40
- **Non-Contact Classes:** 20
- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: VII

Course Name: **Introduction to Climate Change (Minor)**

Course Code: GGY4700704MN

Course Level: Higher

Theory: Theory (4 Credits, 60 classes)
Part

Marks: 100 Marks (Theory = 60 Marks, Internal Assessment = 40 Marks)

Course Objectives

1. To introduce the basic concepts and science of climate change.
2. To understand the drivers and evidence of climate change.
3. To examine the impacts of climate change on natural and human systems.
4. To explore mitigation and adaptation strategies.
5. To develop awareness of climate policy and global initiatives.

Course Outcome

1. Explain the fundamental concepts related to climate change.
2. Identify causes and scientific evidence of global warming.
3. Analyze the impacts of climate change across sectors and regions.
4. Evaluate mitigation and adaptation strategies.
5. Understand global and national climate policies.
6. Apply interdisciplinary perspectives to climate-related issues.

1 Unit 1: Basics of climate and climate change

Weather vs Climate,
Components of the climate system,
Climate variability vs climate change,
Historical perspective of climate change,

Introduction to the Greenhouse Effect

2 Unit 2: Causes and Evidence of Climate Change

Natural causes: Solar variability, volcanic activity ,

Anthropogenic causes: Fossil fuels, deforestation, industrialization ,

Greenhouse gases (CO₂, CH₄, N₂O) ,

Scientific evidence: Temperature trends, sea-level rise, glacier retreat,

Role of Intergovernmental Panel on Climate Change

3 Unit 3: Impact of Climate Change

Impacts on ecosystems and biodiversity,

Agriculture and food security,

Water resources and the hydrological cycle,

Human health and livelihoods,

Regional focus: India and North-East India

4 Unit 4: Climate Change Mitigation and Adaptation

Mitigation: Renewable energy, carbon sequestration, sustainable practices

Adaptation strategies: Disaster preparedness, resilient agriculture

Climate-resilient development

Role of local knowledge and community-based adaptation

5 Unit 5: Climate Policy, Governance, and Future Pathways

Global agreements: Paris Agreement

UNFCCC framework

Climate justice and equity

Sustainable Development Goals (SDGs)

India's climate policy and initiatives

Reading List

References

- [1] IPCC. (2007). *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on*

Climate Change. Cambridge University Press.

- [2] IPCC. (2014). *Climate Change 2014: Impacts, Adaptation and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press.
- [3] IPCC. (2014). *Climate Change 2014: Impacts, Adaptation and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press.
- [4] Palutikof, J. P., van der Linden, P. J., & Hanson, C. E. (Eds.). (2007). *Climate Change 2007: Impacts, Adaptation and Vulnerability*. Cambridge University Press.
- [5] OECD. (2008). *Climate Change Mitigation: What Do We Do?* Organisation for Economic Co-operation and Development.
- [6] UNEP. (2007). *Global Environment Outlook: GEO4: Environment for Development*. United Nations Environment Programme.
- [7] Singh, M., Singh, R. B., & Hassan, M. I. (Eds.). (2014). *Climate Change and Biodiversity: Proceedings of IGU Rohtak Conference, Volume I. Advances in Geographical and Environmental Studies*. Springer.
- [8] Sen Roy, S., & Singh, R. B. (2002). *Climate Variability, Extreme Events and Agricultural Productivity in Mountain Regions*. Oxford & IBH Publishing, New Delhi.
- [9] Misra, R. P., & Ramesh, A. (1989). *Fundamentals of Cartography*. Concept Publishing Company, New Delhi.
- [10] Monkhouse, F. J., & Wilkinson, H. R. (1973). *Maps and Diagrams*. Methuen, London.
- [11] Sarkar, A. (2015). *Practical Geography*. Orient Black Swan Pvt. Ltd, New Delhi.
- [12] Singh, R. L., & Singh, R. P. B. (2013). *Elements of Practical Geography*. Kalyani Publishers, Ludhiana.

Additional Information

- **Theory Credit:** 4
- **Required Classes:** 60
- **Contact Classes:** 40
- **Non-Contact Classes:** 20
- **Course Designer:** Department of Geography, Gauhati University

- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: VIII

Course Name: **Geography of Rural Landscape and Livelihood**

Course Code: **GGY4800104MJ**

Course Level: Higher

Theory: Part I: Theory (3 Credits, 45 classes)

Part II: Practical (1 Credit, 15 classes of two-hour duration)

Marks: 100 Marks (Theory = 45 Marks, Practical = 25 Marks, Internal Assessment = 30 Marks)

Course Description

This course explores geographical aspects of rural landscapes and the diverse livelihoods dependent on them. It examines interactions between physical geography, human activities and rural economic practices. Emphasis is placed on rural land use, resource management, livelihood strategies and sustainable development in rural environments.

Course Outcome

1. Understand the nature, characteristics and historical development of rural landscapes.
2. Analyse environmental contexts of rural landscapes and identify major challenges.
3. Identify principles of sustainable development and evaluate their applicability to rural settings.
4. Assess socio-economic dynamics of rural areas, including demographic changes, diversification of livelihoods and community responses.
5. Examine rural development strategies, GIS applications in rural planning, and future trends in rural geography.

Part I: Theory

1 Unit 1: Introduction to Rural Landscapes

Meaning and nature of rural landscapes; distinction between rural and urban landscapes; role of landscape studies in geography. Historical development of landscape studies in India and

abroad. Concepts of rural landscapes: natural landscapes, cultural landscapes, waterscapes, sacred landscapes, community landscapes. Interdisciplinary approaches in rural landscape studies.

2 Unit 2: Rural Landscapes and Environmental Context

Physical geography of rural areas: landscape settings, landscape ecology, rural hydrology, agroecosystems, agroforestry, ethnoforestry. Rural land use and land cover patterns; landscape diversity across physical settings. Environmental challenges: soil erosion, deforestation, biodiversity loss, water scarcity, climate change impacts on rural landscapes.

3 Unit 3: Socio-economic Aspects of Rural Landscapes

Demographic characteristics and population dynamics; rural depopulation; rural–urban migration; agricultural and physiological density. Rural livelihoods and their relationship with landscapes; traditional knowledge systems in landscape design and management. Transformation of rural landscapes; rural resource management; community responses. Livelihood diversification and resilience strategies.

4 Unit 4: Sustainable Development in Rural Areas

Principles of sustainable development for rural areas. Sustainable agricultural practices: organic farming, pisciculture, agroforestry, ethnoforestry. Rural infrastructure: transport, communication, housing, civic amenities, water resources. Case studies on sustainable rural development initiatives.

5 Unit 5: Rural Development Planning and Future Perspectives

Government rural development programmes and policies. GIS applications in rural planning. Future trends: smart agriculture, renewable energy and digital rural development. Addressing rural–urban migration, urbanization pressures, ruralisation. Impact of rural development policies on rural landscapes and livelihoods.

Part II: Practical

6 Unit I: Practical Works (16 Marks)

Two questions of 8 marks each.

1. Mapping physical and cultural landscapes of rural areas in Assam/N.E. India using cartographic techniques. (2 exercises)

2. Analysis of rural–urban migration trends in Assam/N.E. India using statistical methods. (2 exercises)
3. Mapping and analysis of agricultural and physiological density at district level. (2 exercises)
4. Mapping land use in agro-climatic regions of Assam. (1 exercise)
5. Designing questionnaire for rural landscape and livelihood study. (1 exercise)

7 Unit II: Practical Note-Book and Viva-Voce (9 Marks)

1. Evaluation of Practical Note-Book (5 marks)
2. Viva-voce (4 marks)

Reading List

1. Cloke, P. (2013). *Rural Landscapes*. Wiley-Blackwell.
2. Claval, P. (2005). “Reading the Rural Landscapes.” *Landscape and Urban Planning*.
3. Gallent, N. et al. (2008). *Introduction to Rural Planning*. Routledge.
4. Hebinck, P. & Van Averbek, W. (2007). *Livelihoods and Landscapes*. Brill.
5. Sick, D. (Ed.) (2014). *Rural Livelihoods and Regional Economies*. Routledge.
6. Saha, S., Deka, N. & Bhagabati, A.K. (2020). “Participatory Water Resource Management in Assam.” *IJRM*, Sage.
7. Maharjan, K.L. & Joshi, N.P. (2013). *Climate Change, Agriculture and Rural Livelihoods*. Springer.
8. Scoones, I. (2015). *Sustainable Livelihoods and Rural Development*. Practical Action.
9. Saha, S. & Deka, N. (2020). “Landscape Characteristics in Brahmaputra Floodplain Villages.” *GRI*.
10. Tambe, S. (2022). *Sustainable Livelihoods Approach*. Springer.
11. Ellis, F. (2000). *Rural Livelihoods and Diversity*. Oxford.
12. Deka, N. et al. (2010). “Rural Land Use in the Brahmaputra Floodplain.” *Contemporary India*.
13. Wu, J. (2013). “Landscape Sustainability Science.” *Landscape Ecology*.

14. Yangang, F. & Jisheng, L. (2008). “Cultural Landscape Evolution in North China.” *Chinese Geographical Science*.

Additional Information

- **Theory Credit:** 3
- **Practical Credit:** 1
- **Required Classes:** 60
- **Contact Classes:** 40
- **Non-Contact Classes:** 20
- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: VIII

Course Name: **Advanced Geomorphology**

Course Code: **GGY4800304MJ**

Course Level: Higher

Theory: Part I: Theory (3 Credits, 45 classes)

Part II: Practical (1 Credit, 15 classes of two-hour duration)

Marks: 100 Marks (Theory = 45 Marks, Practical = 25 Marks, Internal Assessment = 30 Marks)

Course Description

This course aims to develop advanced conceptual and analytical understanding of geomorphic systems by critically examining theoretical frameworks, thresholds, quantitative methods, and process interactions, enabling students to interpret landscape evolution, assess geomorphic hazards, and apply geomorphological knowledge in environmental management, particularly in dynamic regions such as the Himalayan and Brahmaputra systems.

Course Outcome

1. Critically evaluate advanced geomorphic theories, system approaches, and recent trends in geomorphology.
2. Apply quantitative and field-based techniques to analyze geomorphic processes and land-forms.
3. Interpret interactions among climate, vegetation, soil, and geomorphic processes across regions.
4. Assess thresholds, non-linearity, and landscape sensitivity in geomorphic systems.
5. Apply geomorphological knowledge to hazard assessment, river basin management, and environmental planning.

Part I: Theory

1 Unit 1: Advanced Geomorphic Theories and System Dynamics

- Critical review of geomorphic ideas (focus on post-classical and contemporary perspectives)
- Advanced system concepts: non-linearity, feedback, complexity, chaos
- Dynamic equilibrium vs metastability
- Threshold concepts in geomorphology and landscape sensitivity
- Time scales in landscape evolution

2 Unit 2: Quantitative and Process-Based Geomorphology

- Quantitative geomorphology: principles and scope
- Morphometric analysis and scaling laws
- Sediment transport, erosion-deposition modelling
- Hillslope evolution models (diffusion, transport-limited vs weathering-limited systems)
- Techniques of geomorphic process study (field instrumentation, monitoring, modelling)

3 Unit 3: Process Interactions and Morphogenetic Regions

- Advanced understanding of fluvial, glacial, and aeolian systems (process-response frameworks)
- Interrelationship of climate, vegetation, and soil in geomorphic processes
- Morphogenetic regions: process dominance, intensity, and spatial variability
- Impact of climate change on geomorphic regimes

4 Unit 4: Slope Dynamics and Landscape Evolution

- Advanced slope development theories
- Slope processes: mass wasting, creep, landslides (mechanics and modelling)
- Slope form evolution and threshold behaviour
- Coupling of hillslopes and channel systems
- Long-term landscape evolution models

5 Unit 5: Applied and Environmental Geomorphology

- Applied geomorphology: concepts and techniques
- Fluvial geomorphology in river basin planning (Brahmaputra focus)
- Palaeo-geomorphology and environmental reconstruction
- Environmental geomorphology and human impact
- Geomorphic hazards: floods, landslides, riverbank erosion
- Role of geomorphology in sustainable development and policy

Part II: Practical

6 Unit I: Practical Works (16 Marks)

Two questions of 8 marks each.

1. Estimation of runoff from daily discharge data; comparison of seasonal basin runoff for Brahmaputra tributaries (north south bank). (2 exercises)
2. Preparation of discharge hydrographs for Brahmaputra and a major tributary for 3 years; analysis of discharge trends. (2 exercises)
3. Preparation of stage–discharge hydrographs at two gauge sites; comparison of discharge–stage variations. (2 exercises)
4. Construction of stage–discharge rating curves (monthly, seasonal, annual) using long-term data; analysis of seasonal discharge patterns. (2 exercises)
5. Preparation of rainfall variability map for Assam/Brahmaputra Valley; analysis of spatial variability. (1 exercise)
6. Quantitative morphometric analysis using GIS
7. DEM-based terrain and slope analysis
8. River channel change detection (multi-temporal satellite data)
9. Hazard zonation mapping (landslide/flood susceptibility)

7 Unit II: Practical Note-Book and Viva-Voce (10 Marks)

1. Evaluation of Practical Note-Book (5 marks)
2. Viva voce (5 marks)

Reading List

1. Chorley, Schumm Sugden (1984) – Geomorphology
2. Huggett (2018) – Fundamentals of Geomorphology
3. Anderson Anderson (2010) – Geomorphology: Mechanics and Chemistry of Landscapes
4. Phillips, J.D. (2009) – Earth Surface Systems
5. Schumm, S.A. (1977) – The Fluvial System
6. Burbank Anderson (2011) – Tectonic Geomorphology
7. Knighton (1998) – Fluvial Forms and Processes
8. Gregory Walling (1973) – Drainage Basin Form and Process
9. Kale, V.S. (recent works on tectonic geomorphology)
10. Charlton (2008) – Fundamentals of Fluvial Geomorphology
11. Relevant journals: Geomorphology, Earth Surface Processes and Landforms, Catena

Additional Information

- **Theory Credit:** 3
- **Practical Credit:** 1
- **Required Classes:** 60
- **Contact Classes:** 40
- **Non-Contact Classes:** 20
- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: VIII

Course Name: **Geography of Health**

Course Code: GGY4800304MJ

Course Level: Higher

Theory: Part I: Theory (3 Credits, 45 classes)

Part II: Practical (1 Credit, 15 classes of two-hour duration)

Marks: 100 Marks (Theory = 45 Marks, Practical = 25 Marks, Internal Assessment = 30 Marks)

Course Description

This course explores the spatial aspects of health and disease within the context of human geography. It examines how geographic factors influence health outcomes, behaviours and distribution of health services. The course provides analytical tools for understanding health issues spatially, strengthening skills in spatial analysis, critical evaluation and policy assessment.

Course Outcome

1. Understand the scope, significance and approaches of health geography.
2. Analyse environmental influences on health using case studies.
3. Understand disease classification, transmission modes and spatial distribution.
4. Evaluate health policies and their spatial implications, and address emerging health challenges.
5. Interpret disease patterns using geographic methods and GIS for disease surveillance.

Part I: Theory

1 Unit 1: Introduction to Health Geography

Definitions, scope and significance of health geography. Key concepts: health, wellness, illness, disease and their geographic distributions. Approaches: ecological, social and spatial. Historical development; medical geography vs. geography of health.

2 Unit 2: Environmental Health

Environmental influences: physical and built environments and their impacts on health. Case studies on air quality, water sanitation and environmental risks. Tools and techniques for environmental health assessment.

3 Unit 3: Diseases and Their Transmission

Classification of diseases: genetic, zoonotic, communicable, non-communicable, occupational, deficiency diseases and malnutrition. Patterns of disease occurrence: emergence, re-emergence and persistence. Modes of transmission of major diseases (Malaria, Japanese Encephalitis, Tuberculosis, Hepatitis, AIDS, COVID-19); global distribution.

4 Unit 4: Disease Ecology and Its Mapping

Disease distribution: spatial patterns and processes. Factors influencing disease transmission: pathological, physical, environmental, social, cultural and economic. Epidemiological applications: geographic methods for tracking outbreaks. Advanced GIS applications in disease surveillance.

5 Unit 5: Health Policy and Planning

Health systems: meaning and components; universal health coverage; role of WHO and UNICEF; SDG 3 (Good Health and Well-being). Spatial analysis of health policies; family welfare programmes, immunization, National Health Mission. Emerging health issues (e.g., COVID-19) and role of health geography in addressing them.

Part II: Practical

6 Unit I: Practical Works (16 Marks)

Two questions of 8 marks each.

1. Mapping health status indicators (hospital beds, PHCs, doctors, paramedics) in Assam/N.E. India using Z-score method. (1 exercise)
2. Trend analysis of infant and maternal mortality rates in India vs. selected developed developing countries using line graphs. (3 exercises)
3. Choropleth mapping of infant mortality rates (state level). (1 exercise)
4. Correlation analysis between physical factors (rainfall/temperature) and disease incidence (e.g., monthly malaria cases). (1 exercise)

5. Mapping spatial variation of disease incidence in India/N.E. India. (1 exercise)
6. Mapping seasonal variation of COVID-19 cases in Assam using pie graphs. (1 exercise)
7. Designing questionnaire for healthcare and health status surveys. (1 exercise)
8. Nearest neighbour analysis for distribution of hospitals and health centres. (1 exercise)

7 Unit II: Practical Note-Book and Viva-Voce (9 Marks)

1. Evaluation of Practical Note-Book (5 marks)
2. Viva-voce (4 marks)

Reading List

1. Akhtar, R. (Ed.) (1990). *Environment and Health: Themes in Medical Geography*. Ashish Publishing.
2. Anthamatten, P. (2011). *Introduction to the Geography of Health*. Rawat Publications.
3. Avon, J.L. & Patzed, J.A. (2001). *Ecosystem Changes and Public Health*. Johns Hopkins.
4. Banerji, D. (1986). *Social Sciences and Health Services in India*. Lok Prakashan.
5. Bradley, D. (1977). *Water, Wastes and Health in Hot Climates*. Wiley.
6. Brown, T., McLafferty, S., Moon, G. (2010). *Companion to Health and Medical Geography*. Wiley.
7. Christaler, G. & Hristopoles, D. (1998). *Spatio-Temporal Environment Health Modelling*. Kluwer.
8. Cliff, A.D. & Peter, H. (1988). *Atlas of Disease Distributions*. Blackwell.
9. Curtis, S. (2004). *Health and Inequality: Geographical Perspectives*. Sage.
10. Gatrell, A. & Loytonen, M. (1998). *GIS and Health*. Taylor & Francis.
11. Mishra, R.P. (1970). *Medical Geography of India*. NBT.
12. Mishra, R.P. (2002). *Geography of Health*. Concept Publishing.
13. Murray, C. & Lopez, A. (1996). *The Global Burden of Disease*. Harvard University Press.
14. Moeller, D.W. (1993). *Environmental Health*. Harvard.

15. Phillips, D. & Verhasselt, Y. (1994). *Health and Development*. Routledge.
16. Shaw, M., Dorling, D. & Mitchell, R. (2002). *Health, Place and Society*. Pearson.
17. Tromp, S. (1980). *Biometeorology: Impact of Weather and Climate*. Heydon.
18. NHM India: <https://nhm.gov.in>
19. National Health Portal: <https://www.nhp.gov.in>

Additional Information

- **Theory Credit:** 3
- **Practical Credit:** 1
- **Required Classes:** 60
- **Contact Classes:** 40
- **Non-Contact Classes:** 20
- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: VIII

Course Name: **Gender Geography**

Course Code: GGY4800404MJ

Course Level: Higher

Theory: Part I: Theory (3 Credits, 45 classes)

Part II: Practical (1 Credit, 15 classes of two-hour duration)

Marks: 100 Marks (Theory = 45 Marks, Practical = 25 Marks, Internal Assessment = 30 Marks)

Course Description

This course examines the intersection of gender and geography, exploring how spatial structures and processes influence and are influenced by gender relations. It incorporates theoretical frameworks, empirical studies and methodologies to analyze gendered spaces, inequalities and their socio-spatial implications.

Course Outcome

1. Understand the historical development, theoretical foundations and growth of gender geography in global and Indian contexts.
2. Comprehend key concepts such as gender identity, gender roles, stereotypes, sexuality and feminist geographic theory.
3. Analyze the gendering of private and public spaces and the influence of rural–urban dynamics on gender experiences.
4. Evaluate intersectional influences of gender with race, caste, class and sexuality on spatial experiences.
5. Examine spatial patterns of gender inequalities and their implications on social well-being indicators.

Part I: Theory

1 Unit I: Historical Development, Theories in Gender Studies and Methodological Approaches

Growth and development of gender geography globally and in India. Theoretical approaches: Liberal feminism, Marxist feminism, Radical feminism, Postmodern feminism. Methodological approaches in gender studies.

2 Unit II: Gender and Feminist Geography – Key Concepts and Contexts

Sex and gender; gender roles and gender stereotyping. Femininity, masculinity and sexuality within geography. Gender identity, sexual expression and intersectionality. Patriarchy, gender equality and misconceptions about gender and sexuality.

3 Unit III: Gender and Space

1. Gendering of Private and Public Spaces A. Historical gender roles in private/public spaces B. Gendered acts in public spaces and women's mental health C. Gender diversity and discrimination in public spaces

2. Urban and Rural Gender Dynamics A. Inclusivity and access in urban spaces B. Economic opportunities and gender roles C. Access to services and infrastructure D. Exclusion mechanisms and women's participation

3. Space and Gender-Based Crime A. Spatial concentration of gender-based crime B. Gendered experiences of crime across spaces C. Fear of crime and spatial avoidance

4 Unit IV: Spatial Patterns of Gender Inequalities

Inequality in the family: natality inequality. Gender inequality in education, employment and ownership. Inequality in access to healthcare and social well-being indicators.

5 Unit V: Women and Social Institutions

Kinship systems: matrilineal vs. patrilineal; kinship terminologies. Family systems: nuclear, joint and extended; position of women. Marriage systems in India; dowry vs. bride price; property rights.

Part II: Practical

6 Unit I: Practical Works (16 Marks)

Two questions of 8 marks each.

1. Application of qualitative methods in gender geography: ethnography, life-story interviews, intersectional analysis, participatory research, case studies.
2. Preparation of gender disparity maps using Sopher's Disparity Index (literacy-based).
3. Measuring Gender Development Index and Gender Gap Index.
4. Preparation of questionnaire/schedule for gender geography research.

7 Unit II: Practical Note-Book and Viva-Voce (9 Marks)

1. Evaluation of Practical Note-Book (5 marks)
2. Viva-voce (4 marks)

Reading List

1. Agarwal, B. (1994). *A Field of One's Own: Gender and Land Rights in South Asia*. Cambridge University Press.
2. Ermarth, E. (2000). "What Counts as Feminist Theory?" *Feminist Theory*.
3. Gross, E. (1992). "What is Feminist Theory?" in Crowley & Himmelweil (Eds.), *Knowing Women*. Polity Press.
4. Gregory, D. et al. (2009). *Dictionary of Human Geography*. Wiley.
5. Jaggar, A. (1983). *Feminist Politics and Human Nature*. Rowland & Allenfield.
6. Code, L. (2007). "Feminist Epistemologies" in *Blackwell Guide to Feminist Philosophy*.
7. Massey, D. (1994). *Space, Place and Gender*. University of Minnesota Press.
8. Walby, S. (1990). *Theorizing Patriarchy*. Blackwell.
9. Mazumdar, V. & Krishnaji, N. (2001). *Enduring Conundrum: India's Sex Ratio*. CWDS.
10. Phadke, S., Ranade, S. & Khan, S. (2011). *Why Loiter*. Penguin.
11. Spain, D. (1992). *Gendered Spaces*. UNC Press.
12. McDowell, L. (1999). *Gender, Identity and Place*. Blackwell.

13. McDowell, L. & Sharp, J. (1997). *Space/Gender/Knowledge*. Arnold.
14. Tong, R. (2009). *Feminist Thought*. Westview Press.

Additional Information

- **Theory Credit:** 3
- **Practical Credit:** 1
- **Required Classes:** 60
- **Contact Classes:** 40
- **Non-Contact Classes:** 20
- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: VIII

Course Name: **Project Formulation and Execution**

Course Code: **GGY4800504MJ**

Course Level: Higher

Theory: 4 Credits (60 classes of one-hour duration)

Marks: 100 Marks (Theory = 60 Marks, Internal Assessment = 40 Marks)

Course Objectives

1. To enable students to conceptualize, plan and formulate research or development-based projects.
2. To impart knowledge on project cycle management, logical framework analysis, budgeting and execution strategies.
3. To develop field and institutional skills required for community-based or research-based project implementation.
4. To familiarize students with reporting, monitoring and evaluation (M&E) tools.
5. To prepare students to submit project proposals and conduct basic field investigations or case studies.

Learning Outcomes

1. Able to design and formulate viable project proposals based on research or development problems.
2. Will prepare logical frameworks, timelines and budgets using standard templates.
3. Can apply tools for primary and secondary data collection.
4. Able to understand project implementation strategies, stakeholder analysis and risk management.
5. Able to monitor, evaluate and report project outcomes effectively.

Part I: Theory

1 Unit I: Introduction to Project Formulation

Definition, nature and significance of projects; types of projects: academic, research, social, entrepreneurial. Project life cycle: conceptualisation to closure. Need assessment and problem identification. Participatory planning and stakeholder involvement.

2 Unit II: Project Planning Tools and Techniques

Logical Framework Approach (LFA) and Goal-Oriented Project Planning (GOPP). Objectives, outputs and activities; SMART indicators. Work Breakdown Structure (WBS). Gantt Chart; basics of CPM/PERT. Stakeholder analysis and SWOT analysis.

3 Unit III: Budgeting and Resource Mobilisation

Estimating capital and operational costs; budget preparation and justification. Resource mapping: human, financial and material. Proposal writing for funding: components and formats. Government schemes, CSR initiatives and donor funding.

4 Unit IV: Project Execution, Monitoring and Evaluation

Implementation strategies and scheduling. Fieldwork planning: logistics, permissions and ethics. Monitoring indicators and data collection for M&E. Evaluation: formative vs. summative. Tools: Logical Framework Matrix, Theory of Change (ToC).

5 Unit V: Documentation and Final Reporting

Documentation techniques: field notes, journals, photographs, GIS/maps. Data analysis, interpretation and basic visualization. Report writing: structure, style and referencing. Presentation of findings: oral and visual formats. Ethical considerations in reporting.

Assessment and Evaluation

- Project Proposal – 20%
- Field Component / Execution Report – 30%
- Presentation and Viva Voce – 20%
- End Semester Written Exam – 30%

Field-Based Learning Component

Each student must:

1. Identify a local issue or theme based on their Honours subject.
2. Formulate a project proposal in consultation with faculty.
3. Conduct 5–7 days of fieldwork, surveys or institutional visits.
4. Submit a final project report for evaluation.

Reading List

Essential Readings

1. Chandra, P. (2019). *Projects: Planning, Analysis, Selection, Financing, Implementation and Review*. Tata McGraw Hill.
2. UNDP (2009). *Handbook on Planning, Monitoring and Evaluating for Development Results*.
3. Gopalakrishnan, P. & Ramamoorthy, V.E. (2008). *Project Management*. Macmillan India.
4. Government of India (NITI Aayog). *Project Appraisal Guidelines*.
5. World Bank (2007). *The Logframe Handbook*.

Supplementary Readings

1. OECD (2010). *Evaluation Methods for Development Projects*.
2. Kumar, R. (2022). *Research Methodology*. Sage.
3. Kothari, C.R. (2019). *Research Methodology: Methods and Techniques*. New Age International.
4. Chambers, R. (1997). *Whose Reality Counts?*. Intermediate Technology Publications.

Additional Information

- **Theory Credit:** 4
- **Required Classes:** 60
- **Contact Classes:** 40

- **Non-Contact Classes:** 20
- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: VIII

Course Name: **Dissertation / Research Project (Graduation with Research)**

Course Code: **GGY48006012MJ**

Course Level: Higher

Theory: 12 Credits (Full Semester Research Project)

Marks: 300 Marks (Research Proposal + Fieldwork + Analysis + Dissertation + Viva-Voce)

Course Description

The Dissertation / Research Project is a capstone component of the Four-Year Undergraduate Programme (FYUGP) under NEP 2020. It replaces four theory papers with a full-semester research experience worth 16 credits. This course enables students to conceptualize, design, conduct and present an original research study in Geography. Students carry out supervised fieldwork, data collection, spatial and statistical analysis, and prepare a comprehensive dissertation following academic standards.

Course Objectives

1. To develop research skills through the formulation of research problems, hypotheses and objectives.
2. To train students in designing research frameworks, sampling strategies and appropriate methodologies.
3. To acquire proficiency in modern geographic tools including GIS, GPS, remote sensing and statistical applications.
4. To develop scholarly writing, academic referencing and presentation skills.
5. To enable students to conduct independent research work preparing them for postgraduate studies and research careers.

Learning Outcomes

1. Identify and formulate viable research problems in physical, human, regional or applied geography.

2. Design methodological frameworks, implement field-based data collection and manage research ethics.
3. Apply spatial and statistical analytical tools for processing and interpreting geographic data.
4. Prepare a comprehensive dissertation using appropriate maps, figures, tables and scientific narrative.
5. Present and defend research findings in a viva-voce examination with conceptual clarity.

Course Structure (16 Credits)

- **Part I: Research Proposal & Synopsis** – 1 Credit
- **Part II: Fieldwork & Data Collection** – 4 Credits
- **Part III: Data Processing & Analysis** – 4 Credits
- **Part IV: Dissertation Writing** – 5 Credits
- **Part V: Viva-Voce Examination** – 2 Credits

Part I: Research Design and Proposal (12 Hours)

1. Identification of research problem and rationale.
2. Review of literature from primary and secondary sources.
3. Formulation of research questions, objectives and hypotheses.
4. Selection of study area and justification.
5. Designing research methodology and sampling strategies.
6. Ethical considerations in geographic research.

Part II: Fieldwork and Data Collection (12 Hours)

1. Primary data collection: surveys, interviews, GPS mapping, PRA tools.
2. Secondary data sources: Census, statistical abstracts, satellite data, government reports.
3. Field instruments: compass, GPS, water-testing kits, levels (as applicable).
4. Field notes, documentation, photography, safety protocols.

Part III: Data Processing, Spatial and Statistical Analysis (12 Hours)

1. Coding, classification and tabulation of data.
2. MS Excel/SPSS/R-based statistical analysis.
3. Measures of central tendency, dispersion, correlation, regression, time-series.
4. GIS-based mapping: georeferencing, vector creation, geoprocessing.
5. Optional: Satellite image interpretation (LULC/NDVI).

Part IV: Dissertation Writing (12 Hours)**Structure of Dissertation**

1. Title Page, Certificate, Declaration and Acknowledgement.
2. Abstract (250–300 words).
3. Introduction and Research Problem.
4. Review of Literature.
5. Study Area Description.
6. Research Methodology.
7. Data Analysis, Mapping and Interpretation.
8. Findings and Discussion.
9. Conclusion, Limitations and Future Scope.
10. References (APA/MLA/Chicago/Harvard).
11. Appendices (Questionnaire, raw data, maps, photos).

Part V: Dissertation Presentation & Viva-Voce (12 Hours)

1. Preparation of research presentation slides.
2. Oral defence of research before an expert panel.
3. Evaluation of conceptual clarity, methodology, data use and quality of dissertation.

Evaluation Scheme (Total 300 Marks)

- Research Proposal & Synopsis – **30 Marks**
- Fieldwork & Data Collection – **50 Marks**
- Data Processing, GIS & Statistical Analysis – **50 Marks**
- Dissertation Writing – **100 Marks**
- Viva-Voce Examination – **70 Marks**

Suggested Readings

1. Creswell, J.W. & Creswell, J.D. (2017). *Research Design: Qualitative, Quantitative and Mixed Methods*. Sage.
2. Kothari, C.R. (2019). *Research Methodology: Methods and Techniques*. New Age International.
3. Gomez, B. & Jones III, J.P. (2010). *Research Methods in Geography*. Wiley.
4. Rogerson, P. (2010). *Statistical Methods for Geography*. Sage.
5. Burrough, P.A. & McDonnell, R.A. (1998). *Principles of GIS*. Oxford.
6. Lillesand, T.M., Kiefer, R.W. & Chipman, J. (2004). *Remote Sensing and Image Interpretation*. Wiley.
7. Sarkar, A. (2015). *Practical Geography: A Systematic Approach*. Orient Blackswan.
8. Any standard atlases, Census of India, Govt. reports, UN/World Bank datasets.

Additional Information

- **Theory Equivalent Credit:** 0
- **Research/Practical Credit:** 12
- **Field Requirement:** Minimum 5–7 days of fieldwork.
- **Submission:** Hard copy and PDF version required.
- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in

Four Year Under-Graduate Programme

Subject: Geography

Semester: VIII

Course Name: **Geography of Himalayas(Minor)**

Course Code: **GGY4800704MN**

Course Level: Higher

Theory: Theory (4 Credits, 60 classes)

Marks: 100 Marks (Theory = 60 Marks, Internal Assessment = 40 Marks)

Course Objectives

1. Understanding the importance of the Himalayan Mountains.
2. Various aspects of the physical and human geography of the Himalayan mountain ranges.
3. Understanding of climate change adaptation practices and initiatives by international and national agencies and communities.

Course Outcome

1. To enable understanding of origin and Political-Climatological-Social-Spiritual- Ecological significance of the Himalayan Mountain ranges.
2. To understand the distinct physiography, climatology, hydrology, population dynamics, livelihood options, and developmental activities in the Himalayan Mountain ranges.
3. To appreciate climate change and human activities-led impacts in the Himalayan region and related initiatives to cope up with these impacts.

1 Unit 1: Understanding Himalayan Mountains

Origin, Climatological-Social-Spiritual- Economic-Ecological significance.

2 Unit 2: Geography of the Himalayas

Geology and Physiography; soils and vegetation; Climates and River Systems of the Himalayas

3 Unit 3: Population Dynamics

Demographic indicators, population and its growth trend, livelihood options and, developmental activities in the Himalayan Region

4 Unit 4: Climate Change and Human Induced Impacts

Environmental degradation, Hydro-meteorological and geo-environmental disasters; glacial recession; Land use change, deforestation and biodiversity loss infrastructure development and disasters in selected mountain areas.

5 Unit 5: Policy Initiatives and Disaster Mitigation

Climate Change Adaptation Practices, Disaster Risk Reduction, Role of International and National Institutions, Community-based eco-friendly practices

Reading List

References

- [1] Funnell, D. C., & Price, M. F. (2003). Mountain geography: A review. *The Geographical Journal*, 169(3), 183–190.
- [2] Hund, A. J., & Wren, J. A. (2018). *The Himalayas: An Encyclopedia of Geography, History, and Culture*. ABC-CLIO/Greenwood Press.
- [3] Ives, J. D. (1987). The theory of Himalayan environmental degradation: Its validity and application challenged by recent research. *Mountain Research and Development*, 7, 189.
- [4] Ives, J., & Messerli, B. (2003). *The Himalayan Dilemma: Reconciling Development and Conservation*. The United Nations University / Routledge. <https://doi.org/10.4324/9780203169193>
- [5] Kohler, T., & Maselli, D. (2009). *Mountains and Climate Change: From Understanding to Action*. Geographica Bernensia, with support of the Swiss Agency for Development and Cooperation (SDC). Bern.
- [6] Pandit, M. K. (2017). *Life in the Himalaya: An Ecosystem at Risk*. Harvard University Press.
- [7] Price, M. F., Byers, A. C., Friend, D. A., Kohler, T., & Price, L. W. (Eds.). (2013). *Mountain Geography*. University of California Press. <https://doi.org/10.4324/9780203169193>

- [8] Schickhoff, U., Singh, R. B., & Mal, S. (2022). *Mountain Landscapes in Transition: Effects of Land Use and Climate Change*. Springer Nature. <https://doi.org/10.1007/978-3-030-70238-0>
- [9] Singh, R. B., Schickhoff, U., & Mal, S. (2016). Climate change, glacier response, and vegetation dynamics in the Himalaya: Contributions toward future earth initiatives. In *Climate Change, Glacier Response, and Vegetation Dynamics in the Himalaya: Contributions Toward Future Earth Initiatives*. Springer Cham. <https://doi.org/10.1007/978-3-319-28977-9>
- [10] Valdiya, K. S. (1998). *Dynamic Himalaya*. Gondwana Research, 1–178. Jawaharlal Nehru Centre for Advanced Scientific Research. [https://doi.org/10.1016/s1342-937x\(05\)70174-x](https://doi.org/10.1016/s1342-937x(05)70174-x)
- [11] Valdiya, K. S. (2015). *The Making of India: Geodynamic Evolution*. Springer International Publishing.
- [12] Wester, P., Mishra, A., Mukherji, A., & Shrestha, A. B. (2019). *The Hindu Kush Himalaya Assessment*. Springer Cham. <https://doi.org/10.1007/978-3-319-92288-1>

Additional Information

- **Theory Credit:** 4
- **Required Classes:** 60
- **Contact Classes:** 40
- **Non-Contact Classes:** 20
- **Course Designer:** Department of Geography, Gauhati University
- **Email:** geography@gauhati.ac.in