Gauhati University

Syllabus for Four-Year Undergraduate Programme

Subject: Geography

Syllabus as per NEP 2020

Course effective from academic year 2023-24

Approved as per UGCCS in Geography held on 22-03-2023

GAUHATI UNIVERSITY Guwahati-781014

Programme Specific Outcomes in Geography

- PSO1: Understand and apply geographical concepts and principles to analyse spatial patterns and human-environment interactions, and cultural landscapes.

- PSO2: Conduct geographical research and synthesize geographic information to address societal and environmental issues.

- PSO3: Engage in geographic discourse and collaborate with peers to develop innovative solutions to complex problems.

- PSO4: Demonstrate expertise in a specialized area of geography such as human geography, physical geography, or geospatial technology.

Four Year Under-Graduate Programme

Subject: Geography
Semester: I
Course Name: **Introduction to Physical Geography**
Course Code: GGY0100104
Course Level: Foundation & Introductory
Theory (4 Credits, 60 classes of one-hour duration)
100 Marks (Theory =60 Marks, Internal assessment = 40 Marks)

Course Objective:

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 outcome:

1. Understand the evolution, concept, scope, and branches of Physical Geography and its interdisciplinary nature.
2. Appreciate the scope and significance of Geomorphology, and comprehend fundamental concepts such as catastrophism and uniformitarianism.
3. Grasp the meaning, scope, and critical elements of Climatology such as insolation, heat budget, and the relationship between temperature, pressure, and precipitation.
4. Understand the fundamentals of Oceanography, including the origins of ocean basins and currents, and the relationship between temperature and salinity.
5. Comprehend the essence, scope, and key concepts of Biogeography such as the biosphere, ecology, ecosystems, and biodiversity.

Unit I: Evolution and growth of Physical geography

Growth of nature-centric geography; evolution and trend of Physical Geography as a study of earth process systems; meaning, scope and nature of Physical Geography; branches of Physical Geography; Physical geography and its interdisciplinary nature.

Unit II: Geomorphology

Meaning, scope and significance of geomorphological studies. fundamental concepts in geomorphology: catastrophism, uniformitarianism, and Davisian concept of landform development.

Unit III: Climatology

Meaning, scope and significance of climatological studies. fundamental concepts in Climatology: insolation and heat budget, temperature, pressure and precipitation relationship; pressure and wind systems.

Unit IV: Oceanography

Meaning, scope and significance of oceanographic studies; fundamental concepts in oceanography: origin of ocean basins, the origin of ocean currents, temperature and salinity relationship.

Unit V: Biogeography

Meaning, Scope and Significance of biogeographic studies; fundamental concepts in Biogeography: biosphere, ecology, Ecosystem, biodiversity

Reading List

1. Strahler, A., and Strahler, A. (2007). Physical geography. John Wiley & Sons.
2. Bloom, A. L., and Bloom, A. L. (1998). Geomorphology: a systematic analysis of late Cenozoic landforms (No. 551.41 B5.). Upper Saddle River: Prentice Hall.
3. Waugh, D. (2000). Geography: An integrated approach. Nelson Thornes.
4. Kale, V.S. and Gupta, A. (2001) Introduction to Geomorphology. Orient Longman, New Delhi.
5. Selby, M.J. (2005) Earth's Changing Surface: An Introduction to Geomorphology. Clarendon Press
6. Thornbury, W. (1968). Principles of Geomorphology.- John Wiley and Sons, 394 p. NewYork.
7. Siddhartha, K. (2018): Oceanography, A brief Introduction, Kitab Mahal 8. Howard, J. Critchfield: General Climatology, 2008, Pearson
8. Lal, D.S.(2022) Climatology, Sarda Pustak Bhaban
9. C.Barry Cox, Peter D. Moore, (2000), Biogeography, John Wiley and Sons Ltd

Theory Credit : 4
Practical Credit: 0
No. of Required Classes : 60
No. of Contact Classes: 40
No. of Non-Contact Classes : 20

Particulars of Course Designer (Department of Geography, Gauhati University, geography@gauhati.ac.in)

Four Year Under-Graduate Programme

Subject: Geography
Semester: II
Course Name: **Introduction to Human Geography**
Course Code: GGY0200104
Course Level: Foundation & Introductory
Theory (4 Credits, 60 classes of one-hour duration)
100 Marks (Theory =60 Marks, Internal assessment = 40 Marks)

Course Objective:

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 outcome:

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.

Unit I:

Defining the field of human geography and its development: Meaning and scope; Place of man inthe 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 activitieson 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 environmentsand 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 CulturalGeography. W. H. Freeman and Company, NewYork.
3. Hussain, Majid (2012). Human Geography. Rawat Publications, Jaipur. 4. Gregory, D. 1978. Ideology, Science and Human Geography, London,
4. Hutchinson.
5. James, M.R. and Bacon, R.S. 1990. The Cultural Landscape: An Introduction to HumanGeography, Prentice Hall.
6. Leong, G.C. and Morgan, G.C. 1992. Human and Economic Geography, Oxford UniversityPress.
7. Fellmann, J.D., Getis, A. and Getis, J. 1999. Human Geography: Landscapes of HumanActivities, 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.

Theory Credit : 4
Practical Credit: 0
No. of Required Classes : 60
No. of Contact Classes: 40
No. of Non-Contact Classes : 20

Particulars of Course Designer (Department of Geography, Gauhati University, geography@gauhati.ac.in)

Four Year Under-Graduate Programme

Subject: Geography
Semester: III
Course Name: **Geography as a Spatial Science**
Course Code: GGY0300104
Course Level: Intermediate
Theory (4 Credits, 60 classes of one-hour duration)
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 & 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

Unit I:

Defining the field of Geography: Study of the earth as the home of man; Place of geographyin relation to natural and social sciences; the changing definitions of geography and its multi-disciplinary nature.

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 (only basic concept) – Spatial distribution, Spatial concentration, Spatial organization, Spatial relationship.

Unit III:

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

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

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

Reading List

1. Abler, R.., Adams, J. and Gould, P.P., 1971: Spatial Organization: The Geographers' Viewof the World, Prentice-Hall, Englewood Cliff.
2. Ackerman, E.A., et al, 1965: The Science of Geography, Washington D.C., National Academyof Science/ National Research Council Pub. No. 1277.
3. Adhikari, Sudeepta, 2015: Fundamentals of Geographical Thought, Orient Blackswan Pvt.Ltd., New Delhi.
4. Chorley, Richard, J. and Haggett, Peter (eds), 1967: Models in Geography, Methuen, London.
5. Chorley, Richard, 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, UK.
8. Hartshorne, R.,1939: The Nature of Geography, Association of American Geographers, Lan-caster, Penn.
9. Hartshorne, R.,1959: Perspective on the Nature of Geography, Rand Mckully, Chicago.
10. Harvey, D., 1969: Explanation in Geography, St. Martin's Press, New York, 1969.
11. Johnston, R.J. et al.(eds), 1986: The Dictionary of Human Geography, Oxford, Basil Black-well.

Theory Credit : 4
Practical Credit: 0
No. of Required Classes : 60
No. of Contact Classes: 40
No. of Non-Contact Classes : 20

Particulars of Course Designer (Department of Geography, Gauhati University, geography@gauhati.ac.in)

Four Year Under-Graduate Programme

Subject: Geography
Semester: III
Course Name: **Geography of Disaste**r
Course Code: GGY0300204
Course Level: Intermediate
Theory (4 Credits, 60 classes of one-hour duration)
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 on 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.

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 & manmade hazard and disasters, Causes and impacts of Disasters. Factors affecting Vulnerability – Economic – Political - Environmental and SocialContexts.

Unit II:

Disaster Management Cycle; Disaster Management Phases - Prevention and Preparedness – Mitigation - Response and Recovery; Community-Based Disaster Management - Roles and Responsibilitiesof Communities.

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.

Unit IV:

Disasters and Development - Impact of Development Projects - 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 and Prevention with Reference to flood problem of Brahmaputra Valley.

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 ISBN:978-0-12-382174-4
2. Abbott, Patrick Leon (2008), Natural Disasters, McGraw-Hill, ISBN-13: 978-0072428650
3. Carresi A L, et al (2013) Disaster Management: International Lessons in Risk Reduction,Response and Recovery, Rutledge, U.K.
4. Carresi A L, et al (2013) Disaster Management: International Lessons in Risk Reduction,Response and Recovery, Routledge U.K.
5. Kurowa, Julio, Disaster Reduction: Living in harmony with nature Quebec or World, Peru,
6. Emdad Hague C, Mitigation of natural hazards and disasters: International perspectives,Springer, 2005.
7. Shaw Rajib and Krishnamurthy R R (2009) Disaster Management: Global Challenges andLocal Solutions, Universities Press.
8. Kapoor Mukesh, (2009) Disaster Management, Universities Press.
9. Diwan Parang, (2010) A Manual on Disaster Management, Pentagon Press.

Theory Credit : 4
Practical Credit: 0
No. of Required Classes : 60
No. of Contact Classes: 40
No. of Non-Contact Classes : 20

Particulars of Course Designer (Department of Geography, Gauhati University, geography@gauhati.ac.in)

Four Year Under-Graduate Programme

Subject: Geography
Semester: IV
Course Name: **Geomorphology**
Course Code: GGY0400104
Course Level: Intermediate
Part I: Theory (3 Credits, 45 classes of one-hour duration)
Part II: Practical (1 Credit, 15 classes of two-hours duration)
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 indifferent 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

Unit I:
History and Development of Geomorphic Ideas, Recent Trends in Geomorphology, Post-modern Geomorphology

Unit II:
Branches of Geomorphology and their Significance: Theoretical and Applied Geomorphology, Majorbranches- Structural, Fluvial, Glacial, Arid, Environmental and Paleogeomorphology.

Unit III:
Structure and Composition of the Earth: Earth Crust and Interior, Rocks and Minerals

Unit IV:
Fundamental Concepts and Theories of Geomorphology: System Concept- Steady State, Dynamic Equilibrium, Mountain Building Theories of Kober and Holmes, Continental Drift, Plate tectonicsand Isostasy.

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

Unit I: Practical works (16 marks) two questions of 8 marks each

1. Study of Topographical Maps: Topographical map content and numbering system, the General interpretation of toposheets in respect of physical characteristics. (3 Assignments)
2. Profile Drawing (serial, superimposed, projected and composite (3 Assignments)
3. Preparation of Slope Map / Relative Relief Map: Wentworth's method and Smith's method. (3 Assignments)
4. Delineation of drainage basin and drainage network, construction of cross and long profiles, stream ordering by Horton and Strahler's method (6 Assignments)
5. Interpretation of Geological map and Construction of cross –section (Two geological maps including one with interruptions) showing different sedimentary beds. (2 Assignments)

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, Arther L. (1978): Geomorphology- A Systematic Analysis of Late Cenozoic Land-forms, Prentice Hall, Englewood Cliffs, N.J.
2. Charlton, R. (2008) : Fundamentals of Fluvial Geomorphology, Routledge, USA and Canada.
3. Chorley, Richard J (1972): Spatial Analysis in Geomorphology, Harper and Row Publishers,New York, London.
4. Chorley, Richard J (ed) (1969): Water, Earth and Man, Methuen & Co.London. 5. Cooke, R.U and Warren, A. (1973): Geomorphology in Deserts, Bats ford, London
5. Crickmay, C.H. (1974): Works of River, The McMillan Press Ltd, London.
6. Davidson-Arnott , R., Bauer, B. and Houser, C. (2019): Introduction to Coastal Processesand Geomorphology, Cambridge University Press.
7. Derbishire, E. (ed) (1976): Geomorphology and Climate, Wiley, London 9. Dury, G.H. (1959): The Face of the Earth, Penguin Books.
8. Embelton, C. and Thorns, J. (1979): Processes in Geomorphology, Arnold Heinemann.
9. Gabler, R.E., Pettersen, J.F. and Trapasso, L.M. (2007): Essentials of Physical Geography,Thomson Brooks, USA.
10. Gregory, K.J. (1985): The Nature of Physical Geography, Edward Arnold, London.
11. Gutierrez, M. (2018): Geomorphology, CRC Press.

12. Heckmann, T. and Morche, D. (ed) (2019): Geomorphology of Proglacial Systems, Springer.
13. Huggett, R.J. (2018): Fundamentals of Geomorphology, 4th Edition, T F India and Routledge.
14. Hails, J.R. (ed) (1978): Applied Geomorphology, Elsevier Scientific Publishing Co., Oxford,New York.
15. Kale, V.S. (2023): Processes, Products and Cycles of Tectonic Geomorphology, Elsevier.
16. Leopold, L.B., Wolman M.G. and Miller, J.P. (1964): Fluvial Processes in Geomorphology,Freeman, San Francisco.
17. Morisawa, M.M. (ed) (1981): Fluvial Geomorphology, George Allen & Unwin, London.
18. Morisawa, M.M. (1985): River Forms and Process, Longman, London and New York.
19. Pitty, A.F. (1971): Introduction to Geomorphology, Barnes and Nobel, New York.
20. Richards, K. (1982: Rivers: Forms and Process in Alluvial Channels, The Blackburn Press,USA.
21. Sharma, H.S. (1982): Perspectives in Geomorphology, Vols I to IV, Concept, New Delhi.
22. Strahler, A.N. (2013): Introducing Physical Geography, 6th Edition, Wiley India Pvt. Ltd,New Delhi.
23. Thornbury, W.D. (1969): Principles of Geomorphology, Wiley International Edition.
24. Thomas, David S.G. and Goudie, A. (2000): The Dictionary of Physical Geography, Blackwellpublishing.
25. Wohl, E. (2020): Rivers in the Landscape, Wiley Blackwell.

Theory Credit : 3
Practical Credit: 1
No. of Required Classes : 60
No. of Contact Classes: 40
No. of Non-Contact Classes : 20

Particulars of Course Designer (Department of Geography, Gauhati University, geography@gauhati.ac.in)

Four Year Under-Graduate Programme

Subject: Geography
Semester: IV
Course Name: **Geography of India**
Course Code: GGY0400204
Course Level: Intermediate
Part I: Theory (3 Credits, 45 classes of one-hour duration)
Part II: Practical (1 Credit, 15 classes of two-hours duration)
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

Unit I:
India’s location, areal extent and their significance; geopolitical and strategic importance, administrative divisions.

Unit II:
Physical setting: Physiographic divisions and their characteristics; River and water bodies, Climate and its seasonal and regional characteristics; soil types and their distribution; vegetation and its distribution.

Unit III:
Population: Trend of growth, spatial variation in growth and distribution; Age and sex composition; Linguistic and religious composition. 12

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)

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 scenerio of Coal, Petroleum, Gas, hydro-power, potentiality of solar, wind, and nuclear power generation.

Part II

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 literacyrate in India. (2 assignment)
3. Spatial variation in the patterns of the religious composition of the population in India and Social composition of the population (SC, ST, and General) using pie-graph. (2 assignments)
4. Trend of food grains production (Rice, Wheat, Maize, Barley, Jowar, and Bajra) in Indiasince 1950-51 using band-graph. (1 assignment)
5. Mapping of the 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)

Unit II: Field Report (5 Marks)

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

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, NewDelhi.
2. Johnson,B.L.C.,ed.2001.GeographicalDictionaryofIndia.VisionBooks,NewDelhi.
3. Mandal R. B. (ed.), 1990: Patterns of Regional Geography – An International Vol. 3 –Indian perspective.
4. Sdyasuk Galina and P Sengupta (1967): Economic Regionalisation of India, Census of India

5. Sharma, T. C. 2003: India - Economic and Commercial Geography. Vikas Publ., New Delhi.
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,Gorakhpur.
8. Spate O. H. K. and Learmonth A. T. A., 1967: India and Pakistan: A General and RegionalGeography, Methuen.
9. Tirtha, Ranjit 2002: Geography of India, Rawat Publs., Jaipur & New Delhi.
10. Pathak, C. R. 2003: Spatial Structure and Processes of Development in India. RegionalScience Assoc.,Kolkata.
11. Tiwari, R.C. (2007) Geography of India. Prayag Pustak Bhawan,Allahabad. 12. Sharma, T.C. (2013) Economic Geography of India. Rawat Publication, Jaipur

Theory Credit : 3
Practical Credit: 1
No. of Required Classes : 60
No. of Contact Classes: 40
No. of Non-Contact Classes : 20

Particulars of Course Designer (Department of Geography, Gauhati University, geography@gauhati.ac.in)

Four Year Under-Graduate Programme

Subject: Geography
Semester: IV
Course Name: **Cartographic Techniques**
Course Code: GGY0400304
Course Level: Intermediate
Part I: Theory (3 Credits, 45 classes of one-hour duration)
Part II: Practical (1 Credit, 15 classes of two-hours duration)
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 more particularly focuses on various types of map scale and their construction; principles of map projection and construction of selected few; and preparation of thematic maps through the representation of 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.
2. Formulate zenithal, conical, and cylindrical projections effectively, dictating their choice, use, and limitations.
3. Distinguish between different types of thematic maps, and apply the concepts of Isopleth and Choropleth mapping.
4. Comprehend the shape, size of earth and the coordinate systems.

Part I

Unit I:
Cartography – Meaning, Development (Traditional and Modern Cartography) and Importance of Cartography in Geography.
Unit II:
Shape and size of the earth; coordinate system (latitude, (parallel) and longitude (meridian)).
Unit III:
Map: Characteristics, types, scale and content; Representation of point, line and area data in maps.
Unit IV:
Map Projections: Concept of Map Projection, Classification of Map Projection; principles of Constructing zenithal, conical and Cylindrical projections (basic idea), Choice of Map projection. with reference to an areal extent (whole world or any specific part) uses and limitations.
Unit V:
Thematic mapping: Concept and types; Isopleth and Choropleth mapping.

Part II

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 along 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 geographic data. (4 Assignments)

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. and Ormelling, F. J., 1994: International Cartographic Association: Basic Cartographic Vol., Pergaman Press.
2. Gupta, K.K. and Tyagi, V.C.,1992: Working with Map, Survey of India, DST, New Delhi.
3. Misra, R.P. and Ramesh, A.,1989: Fundamentals of Cartography, Concept, New Delhi.
4. MonkhouseF.J.andWilkinsonH.R.,1973:MapsandDiagrams,Methuen,London.
5. Rhind D. W. and Taylor D. R. F., (eds.), 1989: Cartography: Past, Present and Future, Elsevier, International Cartographic Association.
6. Robinson, A.H., 2009: Elements of Cartography,John Wiley and Sons, NewYork.
7. Singh R. L. and Singh R. P. B., 1999: Elements of Practical Geography, Kalyani Publishers.
8. Sarkar, A. (2015): Practical Geography: A Systematic Approach. Orient Black Swan Private Ltd., New Delhi.
9. Singh, L.R., 2013: Fundamentals of Practical Geography, Sharda Pustak Bhawan, Allahabad.
10. Talukder, S., 2008: Introduction to Map Projections, EBH Publishers (India),Guwahati.

Theory Credit : 3
Practical Credit: 1
No. of Required Classes : 60
No. of Contact Classes: 40
No. of Non-Contact Classes : 20

Particulars of Course Designer (Department of Geography, Gauhati University, geography@gauhati.ac.in)

Four Year Under-Graduate Programme

Subject: Geography
Semester: IV
Course Name: **Population and Settlement Geography**
Course Code: GGY0400404
Course Level: Intermediate
Part I: Theory (3 Credits, 45 classes of one-hour duration)
Part II: Practical (1 Credit, 15 classes of two-hours duration)
100 Marks (Theory =45 Marks, Practical=25 Marks, Internal Assessment = 30 Marks)

Course Objective:

1. This paper is a generic paper that intends to introduce students to the basic concepts of population and settlement geography and how the differential characteristics of population and settlement influence the overall 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

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 (5 Classes)
2. Distribution and density of population: Factors influencing population distribution and density; global pattern of population distribution. (4 Classes)
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 in the world. (8 Classes)
4. Theories of population growth: Malthusian Theory and Demographic Transition Theory. (3Classes)

5. Population composition and associated characteristic patterns in global contexts: Age-SexComposition; Rural-Urban Composition; Population ageing. (6 Classes)

Unit II: Settlement Geography

1. Defining the field of settlement of geography: Meaning and scope.
2. Rural and urban settlements: Factors influencing distribution pattern of settlements; Types of rural settlements; Morphology and Characteristics of rural and urban settlements. (7 Classes)
3. Concept of settlement hierarchy and urban fringe; Christaller's Central Place Theory. 4Classes)

Part II

Unit 1: 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 trend of decadal growth rates of population in Assam/N.E. India/India. (2 Exercises)
2. Choropleth map to show spatial pattern of decadal variation in 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. Map showing spatial variation in social/religious/rural-urban composition of population in Assam/N.E. India using pie-graph. (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 varied population size with spheres in Assam/N.E.India. (1 Exercise)

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. and Kanitkar T., 2000: Principles of Population Studies, Himalaya Publishing House.
3. Chandna R. C. and 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, Oxford.
6. Jones, H. R., 2000: Population Geography, 3rd ed. Paul Chapman, London.

7. Lutz W., Warren C. S. and Scherbov S., 2004: The End of the World Population Growth inthe 21st Century, Earthscan.
8. Newbold, K. B., 2009: Population Geography: Tools and Issues, Rowman and LittlefieldPublishers.
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,Bhopal.
12. Maurya, S. D. (2009) Jansankya Bhugol, ShardaPustakBhawan, Allahabad.
13. Chandna, R. C. (2006), Jansankhya Bhugol, Kalyani Publishers, Delhi.
14. Roy, D. (2015), Population Geography, Books and Allied (P) Ltd., Kolkata.
15. Ahmad, A., Noin, D. and Sharma, H.N. (eds), 1997, Demographic Transition: The ThirdWorld Scenario, Rawat Publications, Jaipur and New Delhi, 1997.
16. Money, D.C., 1972: Patterns of Settlement, Evan Brothers, London.
17. Peters, G.L. and Larkin, R.P., 1979: Population Geography: Problems, Concepts and-Prospects, Kendall/ Hunt Iowa.
18. Singh, R.L. and Singh, K.N., (eds), 1975: Readings in Rural Settlement Geography, BHU,Varanasi.
19. Singh, R.Y., 1994: Geography of Settlements, Rawat Publications, Jaipur and New Delhi.
20. Maurya, S. D., 2014: Settlement Geography, Sharda Pustak Bhawan, Allahabad.

Theory Credit : 3
Practical Credit: 1
No. of Required Classes : 60
No. of Contact Classes: 40
No. of Non-Contact Classes : 20

Particulars of Course Designer (Department of Geography, Gauhati University, geography@gauhati.ac.in)

Four Year Under-Graduate Programme

Subject: Geography
Semester: V
Course Name: **Climatology, Biogeography and Oceanography**
Course Code: GGY0500104
Course Level: Higher
Part I: Theory (3 Credits, 45 classes of one-hour duration)
Part II: Practical (1 Credit, 15 classes of two-hours duration)
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 the atmospheric composition, characteristics, climatic classifications and weather forecasting techniques
2. Understand and apply knowledge of Approaches to study biogeography, bio-energy cycles, and the significance of conservation of forest and wildlife, 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 Oceand and oceanic currents.
5. Apply practical knowledge of Climatology, biogeography and Oceanography with the help of graphs, maps and diagrams.

Part I

Unit I: Climatology

1. Atmospheric Composition and Structure; and their variation with altitude, latitude and season.
2. Atmospheric temperature; horizontal and vertical distribution of temperature.
3. General Circulation, Jet Streams
4. Atmospheric Moisture – Evaporation, Humidity, Condensation, Fog, Precipitation,
5. Climatic classification of Koppen and Trewartha; Monsoon - Mechanism of development, distribution of monsoons, Trajectories and Irregularities, Effects of El-Nino, Walker oscillation.
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

Unit II: Biogeography

1. Role of physical and biological factors and distribution of plants and animals, Biomes and Biodiversity hotspots of the world.
2. Bio-energy cycles and food-chain
3. Concept of Bio-diversity; Conservation of forest and wildlife
4. Ecology and Ecosystem, Structure and functioning of the ecosystem
5. Soil as a component of the environment, soil formation process and factors, soil composition and horizon, Soil types and their distribution in India

Unit III: Oceanography

1. Submarine topography and configuration of Pacific, Atlantic and Indian Ocean floors.
2. Ocean temperature and salinity. Currents, tides, tsunamis. Ocean deposits. Coral reefs.

Part II

Unit I: Practical Works (16 marks) (Two questions of 8 marks each)

1. InterpretationofIndianWeathermapforMonsoonandnon–monsoonseasons/months based on various weather symbols depicted on maps. (2Assignments)
2. Preparation of weather reports of Indian subcontinent by analyzing the weather satellite images of at least three consecutive days (e.g. INSAT 3D, NOAA satellite). (3 Assignments)
3. Preparation of rainfall-temperature graphs; hythergraph, climograph and ergograph taking data from India/N.E. India/Assam (3 Assignments)
4. Calculation of average annual rainfall and variability of annual rainfall and preparation of rainfall distribution and variability maps(using isopleths).(2 Assignments)
5. Mapping of protected areas (National park, biosphere reserve and wildlife sanctuary) of Assam/N.E.India/India. (3Assignments)
6. Mapping of phytogeographic and zoogeographic regions of the world.(2 Assignments)
7. Mapping of Biodiversity hotspots of the world. (1 Assignment)
8. Mapping of Soil types of Assam/N.E. India and Soil horizons. (2 Assignments)

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

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

Reading List

1. Barry R. G. and Carleton A. M., 2001: Synoptic and Dynamic Climatology, Routledge, UK.
2. Barry R. G. and Corley R. J., 1998: Atmosphere, Weather and Climate, Routledge, New York.
3. Critchfield H. J., 1987: General Climatology, Prentice-Hall of India,New Delhi
4. Lutgens F. K., Tarbuck E. J. and Tasa D., 2009: The Atmosphere: An Introduction to Meteorology, Prentice-Hall, Englewood Cliffs, New Jersey.
5. Oliver J. E. and Hidore J. J., 2002: Climatology: An Atmospheric Science, Pearson Education, NewDelhi.
6. TrewarthaG.T.andHorneL.H.,1980:An Introduction to Climate,McGraw-Hill.
7. Gupta L S(2000): Jalvayu Vigyan, Hindi Madhyam Karyanvay Nidishalya, Delhi VishwaVidhyalaya,Delhi
8. Lal, D S (2006): Jalvayu Vigyan, Prayag Pustak Bhavan, Allahabad
9. Vatal, M (1986): Bhautik Bhugol, Central Book Depot, Allahabad
10. Singh, S (2009): JalvayuVigyan, PrayagPustakBhawan,Allahabad
11. Raj, Manideep Soil and Biogeography, Kalyani Publishers.,
12. Cox, C.B., Moore, P.D. and Ladle, R., 2016. Biogeography: an ecological and evolutionary approach. John Wiley &Sons.

Theory Credit : 3
Practical Credit: 1
No. of Required Classes : 60
No. of Contact Classes: 40
No. of Non-Contact Classes : 20

Particulars of Course Designer (Department of Geography, Gauhati University, geography@gauhati.ac.in)

Four Year Under-Graduate Programme

Subject: Geography
Semester: V
Course Name: Quantitative methods in Geography (Optional)
Course Code: GGY0500204
Course Level: Higher
Part I: Theory (3 Credits, 45 classes of one-hour duration)
Part II: Practical (1 Credit, 15 classes of two-hours duration)
100 Marks (Theory =45 Marks, Practical=25 Marks, Internal Assessment = 30 Marks)

Course Objective:
The paper Quantitative Methods in Geography throws light on the importance of data in geography.It deals with the methods and techniques of data collection, data tabulation, data interpretation and analysis through the application of some basic statistical measures. This paper provides an understanding of the pure and applied nature of geography along with the key elements in the discipline.

Course Outcome:
1. Understand quantification and its role in geographical studies along with merits and limitations of quantitative methods
2. Apply measures of central tendency and dispersion in analyzing geographical data 3. Comprehend the need for sampling and its types in the context of geography
3. Be able to classify geographical data by scale of measurement and understand the source and nature of such data
4. Perform Time Series Analysis and Correlation and Regression Analysis for geographical data.

Part I

Unit I:
Quantification and its significance in geographical study; advantages and limitations of quantitative methods in geography. (4classes)
Unit II:
Geographical Data: Nature, types and sources; scale of measurement (nominal, ordinal, interval and ratio). (4classes)
Unit III:
Measures of central tendency (mean, median and mode) and dispersion (range, quartile deviation, mean deviation, standard deviation and coefficient of variation) and their applications in geographical data analysis. (8classes)
Unit IV:
Sampling techniques: meaning of sampling and its need; types of sampling (simple random and stratified random). (6classes)
Unit V:
Time series analysis and its applications in geographical studies; Basic techniques of time series data analysis (semi-average, moving average and 1eastsquares).(6classes)

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 ana1ysis.(12 classes)

Part II:

Unit I: Practical Works (16 marks) (Two questions of 8 marks each)

1. Tabulation/Grouping of geographical data for making frequency distribution table; Preparation of Histogram, Frequency Polygon and Frequency Curve. (1+1assignments)
2. Computation of mean, median and mode for ungrouped and grouped data relating to geographical phenomena; Determination of median and mode using graphical methods; Determination of the 1ocation of spatia1 mean centre of sett1ements (using centrographic measure). (2+1+1 assignments)
3. Computation of the values of standard deviation and coefficient of variation of ungroupedand grouped data relating to some geographical phenomena (rainfall, landholding, income, production, etc) for comparison of distribution patterns. (1+1assignments)
4. Analysis of time series data of some geographical phenomena (rainfall, production, export value, import value, etc) using moving average and least squares methods. (2 assignments)
5. Computation of coefficient of correlation between two logically associated geographical phenomena using Spearman's rank correlation and Pearson's product-moment correlation formulae; Preparation of scatter diagram and fitting the line of linear regression of Y on X for any set of bi-variate data relating to meaningful geographical phenomena.

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

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

Reading List

1. Hammond P. and McCullagh P. S., 1978: Quantitative Techniques in Geography: An Introduction, Oxford University Press.
2. Sarkar, A. (2013) Quantitative Geography. techniques and presentations. Orient Black SwanPrivate Ltd., New Delhi.
3. Yeates M., 1974: An Introduction to Quantitative Analysis in Human Geography, McGrawHill, New York. 26
4. Mathews, J.A., 1987: Quantitative and Statistical Approaches to Geography: A PracticalManual Pergamon,Oxford.
5. Mahmood, A., 1999: Statistical Methods in Geographical Studies, Rajesh Publications,New Delhi.
6. Elhance, D.N., 1972: Fundamentals of statistics, KitabMaha1,A11ahabad
7. Monkhouse, F.J. Wilkinson, H.R., 1989: Maps Diagrams, B.I. Publications, New Delhi
8. Gregory, S., 1963: Statistical Methods and Geographers, Longman, London.

Theory Credit : 3
Practical Credit: 1
No. of Required Classes : 60
No. of Contact Classes: 40
No. of Non-Contact Classes : 20

Particulars of Course Designer (Department of Geography, Gauhati University, geography@gauhati.ac.in)

Four Year Under-Graduate Programme

Subject: Geography
Semester: V
Course Name: **Economic and Resource Geography (optional)**
Course Code: GGY0500304
Course Level: Higher
Part I: Theory (3 Credits, 45 classes of one-hour duration)
Part II: Practical (1 Credit, 15 classes of two-hours duration)
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 in-sights 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 worldwide.
4. Appraise industrial location factors using Weber's theory and understand the distribution and production of various industries globally
5. Evaluate the modes of transport, its influence on development and role in resource mobilization and economic development

Part I

Unit I:
Meaning, scope and Approaches of Economic Geography and Resources

Unit II:
Economic activity: meaning and classification; Production system: Role of land, labour and capital.

Unit III:
Agriculture sector: Factors influencing agriculture; types of agriculture; Von Thunen's model of agricultural location; Factors influencing cultivation of wheat, rice, coffee and tea, and their distribution and production in different parts of the world.

Unit IV:
Manufacturing sector: Factors influencing industrial location; Weber's theory of industrial location; Classification of industry; Factors, distribution and production of iron and steel, cotton textile and IT industries in the world; Special economic zones and technology parks

Unit V:

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

Unit VI:

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

Part II:

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. (4assignments)
2. Trend of production of wheat, rice, maize and barley in the world/USA using Band-graph.(2assignments)
3. Trend of balance of trade relations (export and import value) of India with USA, China and Japan in respect of major commodities using Bar-graph. (2 assignments)
4. Regional variation in fertilizer consumption and agricultural productivity in rice, wheat and barley in selected countries of the world using Bar-graph. (1assignment)
5. Inter-state/Inter-nation volume of movement of selected commodities and Inter-city movement of traffic/bus in N.E. India through flow cartogram.(2assignments)

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. and Alexander J. W., 2004: Economic Geography, Prentice-Hall Inc., NewDelhi
2. Coe N. M., Kelly P. F. and Yeung H. W., 2007: Economic Geography: A ContemporaryIntroduction, Wiley-Blackwell.
3. Hodder B.W. and Lee Roger,1974:Economic Geography, Taylor and Francis. 4. Combes P., Mayer T. and Thisse J. F., 2008: Economic Geography: The
4. Integration ofRegions and Nations, Princeton University Press. 5. Wheeler J. O., 1998: Economic Geography, Wiley..
5. Bagchi-Sen S. and Smith H. L., 2006: Economic Geography: Past, Present and Future, Taylorand Francis.
6. Willington D. E., 2008: Economic Geography, Husband Press.
7. Clark, Gordon L.; Feldman, M.P. and Gertler, M.S., eds. 2000: The Oxford 9. Saxena, H.M., 2013: Economic Geography, Rawat Publications, Jaipur.

Theory Credit : 3
Practical Credit: 1
No. of Required Classes : 60
No. of Contact Classes: 40
No. of Non-Contact Classes : 20

Particulars of Course Designer (Department of Geography, Gauhati University, geography@gauhati.ac.in)

Four Year Under-Graduate Programme

Subject: Geography
Semester: V
Course Name:**Social, Cultural and Political Geography (Optional)**
Course Code: GGY0500404
Course Level: Higher
Part I: Theory (3 Credits, 45 classes of one-hour duration)
Part II: Practical (1 Credit, 15 classes of two-hours duration)
100 Marks (Theory =45 Marks, Practical=25 Marks, Internal Assessment = 30 Marks)

Course Objective:

To appreciate the social and political dimensions of geographic phenomena. 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 various types of cultures, the role of cultural diffusion, and the attributes of cultural landscapes.
3. Evaluate social well-being levels and compose ternary diagrams to represent social composition.
4. Generate, analyze, and interpret maps denoting major conflict zones and interstate boundary disputes.
5. Understand the nature and scope of Political Geography, conceptualize geopolitics and comprehend geographic conflicts in various regions.

Part I

Unit I: Social Geography

1. Social Geography: Meaning and scope; its approaches; and contemporary trend of its development.
2. Concept and types of social space and social groups.
3. Social Well-being: Concept and Component: Housing, Health and Education; Concept ofHuman development and its measurements.
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.

Unit II: Cultural Geography

1. Meaning and scope of Cultural Geography and contemporary trend of its development
2. Types of culture: material and non-material

3. Concepts in cultural geography: Cultural diffusion, Cultural lag, cultural landscape, andcultural region.
4. Cultural ecology and folk geography; folk culture and rituals with special reference to Assam

Unit III: Political Geography

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

Part II

Unit I: Practical Works (16 marks) (Two questions of 8 marks each)

1. Level of Social well-being with the help of composite Z-score in India /North-East India. (1 Exercise)
2. Construction of Ternary Diagram representing the social composition of the population in India/North East India. (1 Exercise)
3. Sex disparity in literacy in India/North-East India using Sopher's Disparity Index. (1 Exercise)
4. Construction of a map of India highlighting the major conflict zones (2 Exercises), the states ofNorth-East India during Pre and Post-Independence periods (up to the present). (3 Exercises) along the border with China and Interstate boundary disputes in NE India.
5. Sketch of traditional house types of some selected tribes of North-East Indian states.
6. Preparation of a short video documentary on a folk ritual of a selected community of Assam.

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 31

Social Geography

1. Ahmad, A., 1999: Social Geography, Rawat Publications, Jaipur and New Delhi.
2. Ahmad, A., (ed), 1993: Social Structure and Regional development: A Social Geography Perspective, Rawat Publications, Jaipur.
3. Carter, John and Trevor, Jones. 1989: Social Geography: An Introduction to Contemporary Issues, Edward Arnold, London.
4. Eyles, J.: 'Social Geography', in Johnston, R.J., et al, The Dictionary of Human Geography.
5. Jones, E. and Eyles, J., 1977: An Introduction to Social Geography, Oxford University Press,Oxford and New York.

6. Jones, E,(ed), 1975: Readings in Social Geography, Oxford University Press, Oxford.
7. Sharma, H.N., 2000: 'Social Geography' in Singh, J. (ed.) Progress in Indian Geography(1996-2000), INSA, New Delhi.
8. Smith, D.M., 1977: Human Geography: A Welfare Approach, Edward Arnold, London.
9. Sopher, D.E. (ed), 1980: An Exploration of India: Geographical Perspectives on Society andCulture, Longman, London.
10. Srinivas, M.N., 1986: India: Social Structure, Hindustan Publishing Corporation, Delhi.
11. Taher, M., 1994: An Introduction to Social Geography: Concept and Theories, NEIGS,Guwahati. 37

Cultural Geography

1. Crans, Mike, 1998: Cultural Geography, Routledge, London.
2. Dancan, J. and Ley, D. (eds), 1992: Place/Culture/Representation, Routledge, London.
3. Gritzer, Charion, F., 1984:'The Scope of Cultural Geography', Journal of Geography, Volume65, pp.4-11.
4. Jackson, Richard.H.and Hudman, Lloyel. E., 1990: Cultural Geography, West PublishingCompany,New York.
5. Johnston, R.J., Gregory, Derek and Smith, David M. (eds), 1994: The Dictionary of HumanGeography, Blackwell, Oxford.
6. Jordan, T.G. and Rowntree, L.: The Human Mosaic: A Thematic Interpretation in CulturalGeography.
7. Noble, A.G. and Dutt, A.K. (eds), 1982: India: Cultural Pattern and Processes, West ViewPress /Boulder, Colorado.

Political Geography

1. Agnew, John A., Mamadouh, V.; Secor,A. and Sharp, J. 2015. The Wiley Blackwell Com-panion to Political Geography. Wiley-Blackwell.
2. Smith, Sara. 2020.Political Geography: A Critical Introduction, Wiley-Blackwell.
3. Dikshit, R.D. 2020. Political Geography: Politics of Place and Spatiality of Politics. Macmil-lan India.
4. Dwivedi, R L Misra,H N. 2019. Fundamentals of Political Geography. Surjeet Publications.

Theory Credit : 3
Practical Credit: 1
No. of Required Classes : 60
No. of Contact Classes: 40
No. of Non-Contact Classes : 20

Particulars of Course Designer (Department of Geography, Gauhati University, geography@gauhati.ac.in)

Four Year Under-Graduate Programme

Subject: Geography
Semester: V
Course Name:**Internship**
Course Code: GGY0500504
Course Level: Higher

Internship at a Glance:

- Credits: 4
- No of Hours: 120 (these may be offline or online)
- Internship to be undertaken after the 4th Semester examination, i.e. the Summer break and continued at convenience during the next semester.
- Marks to be reflected in the Grade Sheet of the 5th Semester (even if the internship requirements stretch onto the 6th semester. However, the student's marksheet will only be downloadable after the grades are entered)
- Two categories of Internship: (i). Skill internship (ii). Research Internship
- nternship can be intra-institutional
- A formal letter should be sent from the HoD /Principal of a College to the IPO as part of the initiation process.

On completion of internship 4 documents will need to be available.

1. Certificate of successful completion of Internship (see below for format)
2. Activity logbook (detailed day to day account of activities that should also contain period spent,
   work done, skill learnt or in process) (see Format below)
3. Evaluation report (The relevant sections are to be filled in and signed by the Internship Supervisor at the IPO and the Mentor at the Department or College) (see Format below)
4. A Report by the Intern (see Format below)

Internship Completion Certificate (from Internship Providing Organisation (IPO)

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

Skill Based Internship
During this period s/he was attached to ..... [Branch/Division/Lab] ..... and worked on .....[name of work]. She/He demonstrated [mention may be made of qualities like punctuality, regularity, commitment, teamwork, discipline, dedication and interest, and the skill learnt].
Research Internship
During this period she/he worked on ..... [aspect of lab work or research project] .....and undertook to do [specify activity like literature review, experiment design, data analysis, etc]. She/He demonstrated [qualities like punctuality, application, analytical capability, research aptitude, discipline and the specific set of research skills learnt].

Her /his performance was [any one of the following: Outstanding / Excellent / Very Good / Good / Average / Satisfactory / Poor].

Signature of Supervisor at IPO
Designation
Division/ Branch / Department
Host Institution/Organisation Name and Seal:

ACTIVITY LOGBOOK (to be maintained daily for the entire period of Internship)

IPO Name:
Department/Division:

Name of the Student:
Samarth Enrolment No.:
Academic Year:
Semester:

Date	Reporting Time	Deparure Time	Total Hous Engaged	Nature of Work	Theory	Hands on Activity	Field work	Student's Signature

Signature of Student

Signature of IPO Supervisor

Evaluation Report (Format)

Student Name:
Samarth Enrolment No:
Program and Semester:
Internship Type (Skill/Research):
Internship Providing Organisation:
Internship Supervisor:
Internship Period (give dates):

Evaluation Criteria:
The following to be assessed by the IPO Supervisor

1. Punctuality /Regularity: 4 marks
2. Conduct: 6 marks
3. Technical / Research Skills acquired: 15 marks
4. Analytical and Problem-solving skills: 15 marks
5. Communication skills: 5 marks
6. Capacity for teamwork: 5 marks

Signature of the IPO Supervisor:
The following to be assessed by the Mentor:

1. Activity Logbook: 10 marks
2. Report: 15 marks
3. Seminar Presentation on the work done: 15 marks
4. Overall Performance: 10 marks

Total Score (out of 100):

Signature of the Departmental Mentor:

Report of the Student (Format)

1. For the Cover Page:
    Student Name:
    Samarth Enrolment No:
    Program and Semester:
    Department and Name of Mentor:
    Internship Type (Skill/Research):
    Internship Providing Organisation / Lab / Department:
    Internship Supervisor (Name and Designation):
    Internship Period (give dates):
2. Acknowledgement
3. Table of Contents
4. List of Tables / Figures / Illustrations etc.
5. Introduction (A summary of the entire internship and containing details of the IPO
6. The nature of the work assigned
7. Details of the Internship and work done by the intern
8. Skills learned
9. Conclusion (this may contain an assessment by the intern of the outcome of the internship and the possible value of this work for the future).
10. References (manuals consulted and any other material used)

Signature of the Student

Four Year Undergraduate Programme

Subject: Geography
Semester: VI
Course Name: **Geography of Environment and Development**
Course Code: GGY0600104
Course Level: Higher
Part I: Theory (3 Credits, 45 classes of one-hour duration)
Part II: Practical (1 Credit, 15 classes of two-hours duration)
100 Marks (Theory =45 Marks, Practical=25 Marks, Internal Assessment = 30 Marks)

Course Objective:
This paper intends to introduce students to geography and environment interface. It seeks to develop insights among students on the relevance of environmental studies along with issues associated with its pollution, disaster and management of environmental problems

Course Outcome:

1. Understand the nature, scope, and significance of environmental geography, with emphasis on man-environment relationships and adaptation in different biomes.
2. Identify major environmental problems, comprehend their consequences, and understand the concepts of hazard, disaster, risk and vulnerability.
3. Evaluate the relationship between environment and development while understanding processes of sustainable development.
4. Comprehend and explain the concept, types and functioning of ecosystems; analyze energy flow and bio-geochemical cycles in ecosystems.
5. Evaluate critical themes in Environmental Geography, analyze biodiversity, conservation, water resource management and corporate ecological responsibility.

Part I
Unit I:
Environmental Geography: Nature, Scope and Significance; man-Environment Relationships, Historical progression, Adaptation in different Biomes

Unit II:
Major Environmental Problems: Pollution, Deforestation, Desertification, Global Warming, and Bio-Depletion; Hazard, Disaster, Risk and Vulnerability; Types of hazard/disaster (Natural and Man made).
Unit III:
Ecosystem: concept and types of ecosystem; functioning of ecosystem; Energy flow in ecosystem;bio-geochemical cycles; biosphere as an ecosystem.

Unit IV:
Environment and Development: ecology and equity, concept of environment and development; development processes: Nature and trend of development, sustainable development.

Unit V:
Thematic Issues in Environment Geography: The Population–Consumption–Technology Nexus Bio-diversity, Conservation, and Protected Areas, Water Resources and Fishing Livelihoods, Corporate ecological responsibility

Part II

Unit I: Practical Works (16 marks) (Two questions of 8 marks each)

1. Exploring satellite imageries and topographic sheets to observe bank line change of Brahmaputra River from any selected stretch in three different time periods and preparation of map therefrom. (1 exercise) (Satellite images can be downloaded from https://earthexplorer.usgs.gov/
2. Survey of India topographic sheets can be downloaded freely from https://soinakshe.uk.gov.in/mtr/
3. Mapping of major wetlands in a district and computation of shape and size (area) based distribution. (1 exercise)
4. Preparation of a map of a nearby wetland and identify the changes in dimension, water level and encroachment it faced during the last one decade. Present your data in tabular form along with the map (field-based). (1 exercise)
5. Preparation of a long-term precipitation time series curve for any selected station of N.E. Indiausing moving average method by downloading the annual rainfall data for any district/stationof Assam for at least 30 years (1 exercise)

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, Ludhiana.
2. Cunninghum W. P. and Cunninghum M. A., 2004: Principals of Environmental Science: Inquiry and Applications, Tata Macgraw Hill, New Delhi.
3. Goudie A., 2001: The Nature of the Environment, Blackwell, Oxford.
4. Singh, R.B. (Eds.) (2009) Biogeography and Biodiversity. Rawat Publication, Jaipur
5. Miller G. T., 2004: Environmental Science: Working with the Earth, Thomson Brooks Cole, Singapore.
6. MoEF, 2006: National Environmental Policy-2006, Ministry of Environment and Forests, Government of India.
7. Singh, R.B. and Hietala, R. (Eds.) (2014) Livelihood security in Northwestern Himalaya: Case studies from changing socio-economic environments in Himachal Pradesh, India. Advances in Geographical and Environmental Studies, Springer

8. Odum, E. P. et al, 2005: Fundamentals of Ecology, Ceneage Learning India. 9. Singh S., 1997: Environmental Geography, Prayag Pustak Bhawan. Allahabad.
9. UNEP, 2007: Global Environment Outlook: GEO4: Environment For Development, United Nations Environment Programme.
10. Singh, M., Singh, R.B. and Hassan, M.I. (Eds.) (2014) Climate change and biodiversity: Proceedings of IGU Rohtak Conference, Volume 1. Advances in Geographical and Environmental Studies, Springer
11. Singh, R.B. (1998) Ecological Techniques and Approaches to Vulnerable Environment, NewDelhi, Oxford & IBH Pub..
12. Alc´antara-Ayala, I. (2002). Geomorphology, natural hazards, vulnerability and prevention of natural disasters in developing countries. Geomorphology, 47(2-4), 107-124.
13. Goudie, A., Ayala, I. A. (2010). Geomorphological hazards and disaster prevention. Cambridge University Press.
14. https://www.undrr.org/publications
15. http://sdmassam.nic.in/dmp.htmlddmp 17.
16. https://ndma.gov.in/sites/default/files/PDF/DMact2005.pdfhttp : //sdmassam.nic.in/pdf/publication/un

Theory Credit : 3
Practical Credit: 1
No. of Required Classes : 60
No. of Contact Classes: 40
No. of Non-Contact Classes : 20

Particulars of Course Designer (Department of Geography, Gauhati University, geography@gauhati.ac.in)

Four Year Under-Graduate Programme

Subject: Geography
Semester: VI
Course Name:**Introduction to Remote Sensing andGIS**
Course Code: GGY0600204
Course Level: Higher
Part I: Theory (3 Credits, 45 classes of one-hour duration)
Part II: Practical (1 Credit, 15 classes of two-hours duration)
100 Marks (Theory =45 Marks, Practical=25 Marks, Internal Assessment = 30 Marks)

Course Objective:

1. This paper is a core paper that intends to introduce students to the interface of Remote Sensingand GIS
2. It seeks to develop new insights among students on the relevance of geospatial studies within thefield of geography.

Course Outcome:

1. Interpret and analyze remote sensing data for different 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 using GIS, including layer extraction, buffer, and proximity analysis
4. To 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 & analysis.

Unit I: Introduction to Remote Sensing

1. Remote Sensing: Definition and History of Development. (3 classes)
2. Principles of Remote Sensing System: Energy sources, EMR and its interaction with Atmosphere and Earth Features; Platform, Sensor and Resolutions; Aerial and Satellite Remote Sensing; Fundamentals of Photogrammetry.(6classes)
3. Remote Sensing data products, sources and characteristics; Elements of Image Interpretation (Visual & Digital); Digital Image Processing: Image Enhancement and Classification (Supervised and Un-supervised). (6classes)
4. Application of Remote Sensing: Land, Vegetation and Water (3 classes)

Unit II: Introduction to GIS

1. Geographical Information System (GIS): Definition, Development, Components, and Functions; Open source GIS. (3 classes)
2. GIS Data Types & Structures: Spatial and Non-Spatial Data; Raster and Vector Data Structure, Database Management System (DBMS). (3 classes)
3. Data Layer Extraction and Spatial Analysis: Buffer, proximity and viewshed analysis; overlay analysis. (4 Classes)
4. Application of GIS in geographical studies (site/habitat suitability analysis, network analysis, flood damage estimation) (4 classes)

Part II

Unit I: Practical Works (16 marks) (Two questions of 8 marks each)

1. Aerial photo interpretation and visual interpretation of satellite imagery and preparation of thematic maps. 2 assignments
2. Analysis of aerial photographs and satellite images: Determination of photo scale and object height from aerial photos (using a mirror stereoscope); Digital classification of satellite images:supervised and unsupervised. 3 assignments
3. Geo-referencing and Data layer creation: geometric correction, digitization of different layers using point, line and polygon, attribute data input and their thematic representation, Buffer analysis, Overlay analysis. (3 Assignments)

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: A Remote Sensing Perspective, Prentice Hall.
3. Joseph, G. 2005: Fundamentals of Remote Sensing, United Press India.
4. Lillesand T. M., Kiefer R. W. and Chipman J. W., 2004: Remote Sensing and Image Interpretation, Wiley. (Wiley Student Edition).
5. Nag P. and Kudra, M., 1998: Digital Remote Sensing, Concept, New Delhi.
6. Rees W. G., 2001: Physical Principles of Remote Sensing, Cambridge University Press.
7. Singh R. B. and Murai S., 1998: Space-informatics for Sustainable Development, Oxford and IBH Pub.
8. Wolf P. R. and Dewitt B. A., 2000: Elements of Photogrammetry: With Applications in GIS,McGraw-Hill.
9. Sarkar, A. (2015): Practical Geography: A Systematic Approach. Orient Black Swan Private Ltd., New Delhi.
10. Chauniyal, D.D. (2010): Sudur Samvedanevam Bhogolik Suchana Pranali, Sharda Pustak Bhawan,Allahabad.
11. Burrough, P.A. and Mc Donnel, R.A.,1998: Principles of Geographical Information Systems,Oxford University Press.

Theory Credit : 3
Practical Credit: 1
No. of Required Classes : 60
No. of Contact Classes: 40
No. of Non-Contact Classes : 20

Particulars of Course Designer (Department of Geography, Gauhati University, geography@gauhati.ac.in)

Four Year Under-Graduate Programme

Subject: Geography
Semester: VI
Course Name:**Urban Geography**
Course Code: GGY0600304
Course Level: Higher
Part I: Theory (3 Credits, 45 classes of one-hour duration)
Part II: Practical (1 Credit, 15 classes of two-hours duration)
100 Marks (Theory =45 Marks, Practical=25 Marks, Internal Assessment = 30 Marks)

Course Objectives:

1. This paper introduces the students to the field of urban geography and its major aspects.
2. It seeks to develop new insights among students on the relevance of an urban geography and associated problems in a rapidly urbanizing world.

Course Outcome:

1. Comprehend the nature, scope, and trends of urban geography; understand classification of towns, and their origin and growth
2. Understand patterns of urbanization in various countries, components of urban growth, and decipher urban morphology through theories
3. Grasp distinct concepts in urban areas like city-region, urban agglomeration, rural-urban continuum, and decipher modern urban developments such as smart cities
4. Identify and analyze prevalent urban issues and problems, such as housing, slums, traffic congestion, pollution, and urban waste disposal
5. Evaluate trends and patterns of urbanization in India; familiarize with urban development policies and programs, and understand emerging urban issues in specific regions

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; Schemes of city classification (J.M. Houston's, G. Taylor's and L. Mumford Schemes). (12 classes)

Unit II:

Patterns of Urbanisation in Developed and developing countries; Components of Urbanization and urban population growth; Organization of urban space: Urban Morphology and land use structure; Theories of the internal structure of Towns: the Sector Theory of Homer and Hoyt, and the Multiple Nuclei Theory of Harris and Ullman (10 classes)

Unit III:

Concept of city-region, urban agglomeration, urban sprawl, umland and periphery, rural-urban dichotomy and continuum, urban fringe, satellite town, new town, smart cities. (8 classes)

Unit IV:
Urban issues and problems: Housing, slums, civic amenities (transportation and drinking water), traffic congestion, pollution (air, land, water, noise), urban waste disposal and crime. (8 classes)

Unit V:
Urbanization and urban development planning in India: Trend and regional patterns of urbanization; national urban development policies and programmes; emerging urban issues in Delhi NCR, Mumbai and Guwahati. (7 classes)

Part II:

Unit I: Practical Works (16 marks) (Two questions of 8 marks each)

1. Plotting of million cities of India by using proportionate sphere method. (1 Exercise)
2. Map showing distribution of class I and II urban centres in Assam/NE India by using proportionate sphere method. (1 Exercise)
3. Determination of spatial mean centres of urban settlements using weighted (Population as weight) centrographic measure in Assam and NE India.(2 Exercises)
4. Calculation of distribution pattern of urban settlements in a District/State of N.E. Indiausing Nearest Neighbour Analysis. (1 Exercise)
5. Choropleth map showing spatial pattern of level of urbanization in Assam and N.E. India. (2Exercises)
6. Determination of rank-size relationship of urban centres in Assam/N.E. India/India. (1 Exercise)
7. Urban population potential mapping based on selected urban centres of Assam/N.E. India.(1 Exercise)
8. Delineation of urban influence zones of selected urban centres of Assam/N.E. India usingReilly's breaking point formula. (1 Exercise)

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, Jaipur.
2. Bansal, S.C. (2010): Urban Geography, Meenakshi Prakashan, Meerut.
3. Fyfe N. R. and Kenny J. T., 2005: The Urban Geography Reader, Routledge.
4. Graham S.and Marvin S., 2001: Splintering Urbanism: Networked Infrastructures,Technological Mobilitiesand the Urban Condition, Routledge.
5. Hall T., 2006: Urban Geography, Taylor and Francis.
6. Kaplan D. H., Wheeler J. O. and Holloway S. R., 2008: Urban Geography, John Wiley.
7. Knox P. L. and McCarthy L., 2005: Urbanization: An Introduction to Urban Geography, Pearson Prentice Hall New York.
8. Knox P. L. and Pinch S., 2006: Urban Social Geography: An Introduction, Prentice- Hall.

9. Kundu, A. (1992): Urban Development and Urban Research in India, Khanna Publication,New Delhi. 42
10. Nangia, S. (1976): Delhi Metropolitan Region: A Study in Settlement Geography, RajeshPublication, New Delhi.
11. Pacione M., 2009: Urban Geography: A Global Perspective, Taylor and Francis.
12. Ramachandran R (1989): Urbanisation and Urban Systems of India, Oxford University Press,New Delhi
13. Sassen S., 2001: The Global City: New York, London and Tokyo, Princeton University Press.
14. Siddhartha K and Mukherjee S, (1996): Cities, Urbanisation and Urban Systems, Transworldmedia and communication, New Delhi
15. Singh, R.B. (Eds.) (2001) Urban Sustainability in the Context of Global Change, SciencePub., Inc., Enfield (NH), USA and Oxford & IBH Pub., New Delhi.
16. Singh, R.B. (Ed.) (2015) Urban development, challenges, risks and resilience in Asian megacities Advances in Geographical and Environmental Studies, Springer.

Theory Credit : 3
Practical Credit: 1
No. of Required Classes : 60
No. of Contact Classes: 40
No. of Non-Contact Classes : 20

Particulars of Course Designer (Department of Geography, Gauhati University, geography@gauhati.ac.in)

Four Year Under-Graduate Programme

Subject: Geography
Semester: VI
Course Name:**Surveying Techniques (Optional)**
Course Code: GGY0600404
Course Level: Higher
Part I: Theory (3 Credits, 45 classes of one-hour duration)
Part II: Practical (1 Credit, 15 classes of two-hours duration)
100 Marks (Theory =45 Marks, Practical=25 Marks, Internal Assessment = 30 Marks)

Course Objective:
This course on Surveying Techniques provides a general understanding of the field of surveying including the use of modern survey tools to enhance knowledge and skill for field-based geographic study. It focuses on various types of field survey instruments; principles of different types of ground surveying, and methods of carrying out surveys for the preparation of maps/plans for different spatial contexts.

Course Outcome:

1. Understand the meaning, types, and significance of field surveying 2. Learn the principles of plane, geodetic surveying and triangulation 3. Master the principles and techniques of several surveying tools
2. Gain proficiency in methods of radiation, intersection, traversing, contouring and leveling in surveying
3. Understand the basics of GPS, its principles and applications

Part I

Unit I:
Field surveying: Its meaning, types and significance in geography. (2 Classes)

Unit II:
Principles of surveying: plane and geodetic surveying; Principles of triangulation. (3Classes)

Unit III:
Principles and Techniques of surveying by Plane Table, Prismatic Compass, Theodolite, DumpyLevel and Total Station (8 Classes)

Unit IV:
Methods of radiation, intersection, traversing, contouring and leveling in surveying. (4Classes)

Unit V:
GPS: Basic concept, principles and utilities (3Classes)

Part II:

Unit I: Practical Works (16 marks) (Two questions of 8 marks each)

1. Preparation of a plan or a map of an area within the college campus or any suitable area using Plane Table (applying both radiation and intersection methods) (2 Assignments)
2. Open and Closed Traverse Surveying with Prismatic Compass: Preparation of plan alongwith adjustment of closing errors. (2 Assignments)
3. Closed Traverse Surveying with Theodolite: Plotting of data for preparation of a plan through computation of Reduced Bearing, Consecutive Co-ordinates and Independent Co-ordinates; Measurement of height of object/objects using Theodolite (2 Assignments)
4. Profile levelling and contouring in a selected area by Dumpy Level (2 Assignments)
5. Preparing a map of a short trail along with prominent features by using hand-held GPS and associated software/freeware. (2 Assignments)

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 Inc., Englewood Cliff.
2. Misra, R.P. and Ramesh, A., 1995: Fundamentals of Cartography, Concept Publishing Company, New Delhi.
3. Robinson, A.H., et al: Elements of Cartography, John Wiley Sons, New York. Raisz, E.: Principles of Cartography, McGraw Hills, London.
4. Kenetkar, T.P. and Kulkarni, S.U.: Surveying and Levelling, Vol. I II, Vidyarthi Gritha Prakashan, Pune.
5. Das, A.K. 2021: Pocket Size Handbook on Handling of GPS for Field Studies, GTAD and Aranyak, Guwahati (In PDF format).

Theory Credit : 3
Practical Credit: 1
No. of Required Classes : 60
No. of Contact Classes: 40
No. of Non-Contact Classes : 20

Particulars of Course Designer (Department of Geography, Gauhati University, geography@gauhati.ac.in)

Four Year Under-Graduate Programme

Subject: Geography
Semester: VI
Course Name:**Geography of North East India (Optional)**
Course Code: GGY0600504
Course Level: Higher
Part I: Theory (3 Credits, 45 classes of one-hour duration)
Part II: Practical (1 Credit, 15 classes of two-hours duration)
100 Marks (Theory =45 Marks, Practical=25 Marks, Internal Assessment = 30 Marks)

Course Objectives:

1. This paper intends to introduce students to the northeastern parts of India having a special identityamidst the Indian Union.
2. It seeks to develop new insights among students on the significance of geographical dimensions ofthe native region.
3. A field study is incorporated to make the students understand meso-regional diversity in respect ofits land, people and economy.

Course Outcome:

1. Understand geographical, climatic, and physiographic features of North-East India and their implications
2. Analyze demographic trends and social structures, including ethnicities, languages, and religions
3. Evaluate patterns and transformations in agricultural production, highlighting shifting cultivation and contemporary changes
4. Assess industrial development in relation to agriculture, with focus on regional industries and challenges they face
5. Examine transport, communication system and trade patterns in North-East India, emphasizing issues and potential of Act East policy

Part I

Unit I:
North-East India and its locational and strategic significance; Administrative divisions.; Physical setting: Physiographic divisions of NE India and their characteristics; Rivers and water bodies, Climate and its characteristics; forest cover; protected forest areas, soil types and their distribution.

Unit II:
Population: Trend of growth, variation in growth and distribution at state levels, ethnic composition; Age and sex composition; Linguistic and religious composition, literacy level, educational and healthcare infrastructures.

Unit III:
Production pattern and characteristics of agriculture in the region of rice, jute and tea at the state level; characteristics of shifting cultivation in the hill region; contemporary transformations in the agricultural sector including horticulture, Pisciculture etc.

Unit IV:
Agriculture and Industrial development scenario: Regional pattern of Industrial development, Distribution and production of coal, Petroleum and cement in the region; Potentiality of agro-based, handloom and handicraft industries in the region; problems of Industrial development in the region.

Unit V:
Transport, Communication system and trade: patterns of transport and communication systems (state level scenario); nature of trade in the region; problems and prospects of Act East policy towards improving the trade relations.

Part II:

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 (Source: censusindia.gov.in). (2 assignments)
2. Choropleth mapping to show spatial variation in urbanization level in NE India. (1 assignment)
3. Spatial variation in the patterns of the religious composition of the population in NE Indiaand Social composition of the population (SC, ST and General) in N.E. India using a carto-statistical tool (2 assignments)
4. Trend of food grains production (Rabi and Kharif crops) in Northeast India using band-graph. (1assignment)
5. Map showing the distribution of major tribal groups in North-East India. (1assignment)

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. and Kar, B.K.: Geography of Assam, Rajesh Publications, New Delhi.
2. Taher, M and Ahmed, P.: Geography of North East India, Mani Manik Prakash, Guwahati. 3. Das,M..M.:PeasantAgricultureinAssam,Inter–IndiaPublications,NewDelhi.
3. Gopal Krishnan, R : Geography of North East India

4. Bhattacharya, P.2006 : Trend in Tourism Potentiality, Bani Mandir,Guwahati 6. Bhagabati, A.K.(ed):Biodiversity of Assam, Eastern Book House, Guwahati 7. Bhattacharyya, N.N. : North East India, Rajesh Publication, New Delhi
5. Srivastava, S.C. : Demographic Profile of N.E. India, Mittal Publications.
6. Basic Statistics of NE Inda, NEC, Shillong (various issues- accessible in PDF format) 10. India tourist statistics, Ministry of Tourism, Govt. of India (various issues - accessible in PDF format)

Theory Credit : 3
Practical Credit: 1
No. of Required Classes : 60
No. of Contact Classes: 40
No. of Non-Contact Classes : 20

Particulars of Course Designer (Department of Geography, Gauhati University, geography@gauhati.ac.in)

Four Year Under-Graduate Programme

Subject: Geography
Semester: VII
Course Name: **Geographical Thought**
Course Code: GGY0700104
Course Level: Higher
Theory (4 Credits, 60 classes of one-hour duration)
100 Marks (Theory =60 Marks, Internal Assessment = 40 Marks)

Course Objectives:
This course explores the evolution of geographical thought from ancient times to the present, focusing on key theories, methodologies, and debates within the discipline of geography. Students will engage critically with various paradigms and reflect on the future directions of geographical inquiry.

Course Outcomes:

1. Comprehend the historical evolution of geographical thought and identify key contributing figures and cultures.
2. Discuss the socio-political contexts affecting geographical theories and understand the effect of technology on geographical research.
3. Understand the application of an interdisciplinary approach to geography and the changing nuances of space and place.
4. Evaluate the shifts in geographical approaches and impact of methodologies on research.
5. Analyze the implications of climate change and future urban geography in geographical thought.

Part I

Unit 1: Geography through the ages: Study Hours:12 hours

1. Ancient, Dark age, Medieval Philosophies, age of exploration and discoveries and European renaissance on the emergence of modern geography.
2. Foundations of modern geography: Contribution of German (Humboldt, Ritter, Ratzel), French (Paul Vidal de la Blache), [48] British and American geographers.
3. Debates –Systematic and Regional, Ideographic and Nomothetic, Paradigms and paradigm shifts in Geography

Unit 2: Evolution of geographic thought

1. Environmental Determinism, Possibilism, Human Ecology, Morphology of Landscape, Areal differentiation and their impact in the development of the field.
2. Regional geography and its methodologies iii. Quantitative revolution and its critiques
3. Behavioral geography and Humanistic approaches, Radicalism, Welfare approach, Modernism

Unit 3: Towards Post Modern Geography

1. Socio-spatial dialectic ii. Gender perspective
2. New environmentalism and applied geography iii.Geopolitics and geo-strategy in the contemporary world

Unit 4: Methodological Innovations in Geography

1. Qualitative methodologies and ethnographic approaches in geography
2. Quantitative methods in geographic enquiry
3. Statistical analysis (descriptive and inferential statistics)
4. Mathematical modeling (e.g. gravity model, spatial interaction model, spatial diffusion model, density gradient model and their applications)
5. Geographic information systems (GIS) and spatial data analysis
6. Remote sensing and GPS data collection

Reading List

1. Arentsen M., Stam R. and Thuijis R., 2000: Post-modern Approaches to Space, ebook. 2. Bhat, L.S. (2009) Geography in India (Selected Themes). Pearson
2. Bonnett A., 2008: What is Geography? Sage.
3. Dikshit R. D., 1997: Geographical Thought: A Contextual History of Ideas, Prentice– Hall India.
4. Hartshone R., 1959: Perspectives of Nature of Geography, Rand MacNally and Co.
5. Holt-Jensen A., 2011: Geography: History and Its Concepts: A Students Guide, SAGE.
6. Hussain, M., 1989: Evolution of Geographic Thought, Rawat Publications, Jaipur.
7. Johnston R. J., (Ed.): Dictionary of Human Geography, Routledge.
8. Johnston R. J., 1997: Geography and Geographers, Anglo-American Human Geography since 1945, Arnold, London.
9. Kapur A., 2001: Indian Geography Voice of Concern, Concept Publications.
10. Martin Geoffrey J., 2005: All Possible Worlds: A History of Geographical Ideas, Oxford.
11. Soja, Edward 1989. Post-modern Geographies, Verso, London. Reprinted 1997: Rawat Publ., Jaipur and New Delhi

Theory Credit : 4
No. of Required Classes : 60
No. of Contact Classes: 40
No. of Non-Contact Classes : 20

Particulars of Course Designer (Department of Geography, Gauhati University, geography@gauhati.ac.in)

Four Year Under-Graduate Programme

Subject: Geography
Semester: VII
Course Name: **Field Techniques in Geography**
Course Code: GGY0700204
Course Level: Higher
Part I: Theory (3 Credits, 45 classes of one-hour duration)
Part II: Practical (1 Credit, 15 classes of two-hours duration)
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 emphasizes methodologies for collecting, analyzing, and interpreting geographic data. The course is structured to guide students from basic field observation techniques to advanced spatial data analysis, fostering both independent and collaborative skills relating to acquiring knowledge.

Course Outcome:

1. Interpret field data critically, analyze data with adequate techniques & tools, and have proficiency in preparing detailed field reports.
2. Able to carry out geographic measurements and analyses, using GIS/GPS for land, water, soil, and biogeographical studies.
3. Apply field techniques in advanced scenarios including urban planning and environmental management, showcasing application through presenting mini-research projects.
4. Understand importance, prepare and plan for geographic fieldwork, observe and sketch accurately (Unit 1).
5. Implement qualitative and quantitative methods for data collection and use technology tools in managing data

Part I
Unit 1: Introduction to Field Studies in Geography :
Overview of geographic fieldwork: purpose and importance Planning and preparation for field research, Introduction to field safety and ethical considerations Basic techniques: observation, note-taking, and sketching

Unit 2: Data Collection Techniques:
Quantitative methods: surveys, sampling strategies
Qualitative methods: interviews, focus groups, participatory observations, Use of technology in fieldwork: (i) use of analogues tools and techniques like, Prismatic compass/Theodolight/ Dumpy's level (ii) Introduction and use of basic digital tools and techniques like, GPS/ GIS/ RS for collecting, organizing and mapping of physical and human geographic data

Unit 3: Geographic Measurement and Analysis
Land use assessment, soil analysisand basics of the tools used in this field Water quality measurements and hydrological assessments Biogeographic surveys, identification of species and

assessment of biodiversity Application possibilities of GIS/ GPS and RS in land use assessment, water and water quality, soil as well as biogeographical study

Unit 4: Data Interpretation and Reporting
Data analysis techniques: statistical analysis, thematic analysis Using software tools for data visualization (e.g., GIS, SPSS) Critical interpretation of field data, Preparing field reports and presentations

Unit 5: Advanced Field Applications and Case Studies
Case studies on urban planning, rural development, and environmental management Advanced GIS applications in field settings, Field project: design and execute a mini-research project Presentation of field projects and peer review

Part II:
Unit I: Practical Works (16 marks) (Two questions of 8 marks each)

1. Field observation in the local area and preparation of a brief report on physical and human aspects, supported by field sketches, photographic as well as textual documentation
2. Close traverse survey with Prismatic Compass and theodolight for preparing a plane with scale and necessary error correction
3. Profile levelling and countering in the premise of the academic institution using Dumpy's level and preparation of a large scale map
4. Collection of point, line and area data with GPS and prepare a map from the data generated in digital mapping environment
5. Use of remote sensing data (aerial photo/ satellite image) to prepare thematic map using GIS platform or analogous method of interpretation

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 Publications.
2. Dikshit, R. D. 2003: The Art and Science of Geography: Integrated Readings. Prentice Hall of India, New Delhi.
3. Evans, M., 1988: Participant Observation: The Researcher as Research Tool in Qualitative Methods in Human Geography, eds. J. Eyles and D. Smith, Polity.
4. Mukherjee, N., 1993: Participatory Rural Appraisal: Methodology and Application. Concept Pub. Co., New Delhi.
5. Mukherjee, N., 2002: Participatory Learning and Action: with 100 Field Methods. Concept Pub Co., New Delhi.
6. Robinson, A., 1998: "Thinking Straight and Writing That Way", in Writing Empirical Research Reports: A Basic Guide for Students of the Social and Behavioural Sciences, eds. by F. Pryczak and R. Bruce Pryczak, Publishing: Los Angeles.
7. Special Issue on "Doing Fieldwork" The Geographical Review 91:1-2 (2001).
8. Stoddard R. H., 1982: Field Techniques and Research Methods in Geography, Kendall/Hunt.

9. Wolcott, H. 1995. The Art of Fieldwork.Alta Mira Press, Walnut Creek, CA.
10. Monkhouse, F.J. and Wilkinson, H.R., 1989: Maps and Diagrams, B.I. Publications Ltd., Mumbai.
11. Singh R. L. and Singh R. P. B., 1999: Elements of Practical Geography, Kalyani Publishers.
12. Singh, L.R., 2013: Fundamentals of Practical Geography, ShardaPustakBhawan, Allahabad.
13. Sarkar, A., 2015: Practical Geography: A Systematic Approach. Orient Black Swan Private Ltd., New Delhi.
14. Misra, R. P. and Ramesh, A., 1989: Fundamentals of Cartography, Concept Publishing Company, New Delhi.

Theory Credit : 3
Practical Credit: 1
No. of Required Classes : 60
No. of Contact Classes: 40
No. of Non-Contact Classes : 20

Particulars of Course Designer (Department of Geography, Gauhati University, geography@gauhati.ac.in)

Four-Year Under-Graduate Programme

Subject: Geography
Semester: VII
Course Name: **Climate Change and Sustainability Science**
Course Code: GGY0700304
Course Level: Higher
Part I: Theory (3 Credits, 45 classes of one-hour duration)
Part II: Practical (1 Credit, 15 classes of two-hours duration)
100 Marks (Theory =45 Marks, Practical=25 Marks, Internal Assessment = 30 Marks)

Course Objectives

This course explores the scientific foundations, societal impacts, and potential climate change and sustainability solutions. 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 in mitigating climate change.
4. Develop and propose innovative solutions to enhance sustainability.
5. Apply interdisciplinary knowledge to address challenges in climate change and sustainability.

Part I

Unit 1: Introduction to Climate Science
Overview of the Earth's climate system
Historical and recent trends in climate data
Greenhouse gases and their role in climate change
Impacts of human activities on climate
Basic climate modelling and predictions

Unit 2: Impacts of Climate Change
Physical impacts: sea-level rise, changing weather patterns, extreme weather events
Biological impacts: species extinction, shifts in biodiversity
Socio-economic Impacts: on Agriculture, infrastructure, and human health
Regional case studies highlighting specific vulnerabilities and impacts

Unit 3: Mitigation Strategies
Renewable energy technologies and efficiency
Carbon capture and sequestration techniques
Urban planning and green architecture

Agricultural practices and forest management
Policy frameworks and international agreements
Unit 4: Sustainability and Adaptation
Concepts of sustainability: ecological, social, and economic dimensions
Adaptive strategies for communities and ecosystems
Sustainable water and land use management
Building resilience in urban and rural settings
Innovative technologies in adaptation measures

Unit 5: Case Studies and Project Work
Analysis of successful global and local sustainability projects
Role of non-governmental organizations (NGOs) and community participation
Designing a small-scale sustainability project or initiative
Group presentations on proposed projects
Integrating local knowledge with scientific approaches

Part II

Practical

Unit I: Practical Works (16 marks) (Two questions of 8 marks each)

1. Climate Data Analysis and Visualization (Understand temperature, rainfall, and CO_2 trends using real-world datasets.) Use of Excel/R/GEE with IMD or NASA climate data (e.g., NASA POWER, NOAA, CRU)

2 Carbon Footprint Assessment of Household or Institution (Estimate and reflect on personal or institutional contribution to GHG emissions.) Online calculators, primary surveys, carbon accounting worksheets

3 Monitoring Urban Heat Island Effect (Analyze temperature differences between urban core and rural fringes.)Temperature data loggers, field temperature recording, satellite thermal images

4 Preparation of Local Climate Profile (LCP)(Document climatic trends and vulnerability of a local area.) Use IMD data, participatory surveys, graphical analysis

5 Green Audit of College/institution Campus (Assess sustainability in energy, water, and waste management.) Audit checklist, survey, measurement tools, report preparation

6 Rainwater Harvesting Feasibility Study (Identify potential sites and benefits of rainwater harvesting.) Rooftop mapping, rainfall-runoff estimation, hydrological calculations

7 Climate Action Plan Design for Local Area (Synthesize knowledge to propose climate mitigation/adaptation strategies.) Interdisciplinary project with SDG linkage, stakeholder consultation

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 (3rd Edition). Pearson Education.
2. IPCC Reports (Intergovernmental Panel on Climate Change)
    - Climate Change 2021: The Physical Science Basis
    - Climate Change 2022: Impacts, Adaptation, and Vulnerability
    - Climate Change 2022: Mitigation of Climate Change

    [Available at https://www.ipcc.ch/]
3. Steffen, W., Sanderson, A., Tyson, P. D., et al. (2004): Global Change and the Earth System: A Planet Under Pressure. Springer-Verlag. Houghton, J. T. (2015)
4. Global Warming: The Complete Briefing (5th Edition). Cambridge University Press.
5. Parry, M. L., Canziani, O. F., Palutikof, J. P., et al. (2007):Climate Change 2007: Impacts, Adaptation, and Vulnerability. Cambridge University Press.
6. Oreskes, N., & Conway, E. M. (2011): Merchants of Doubt. Bloomsbury Press.
7. Meadows, D. H., Meadows, D. L., Randers, J., & Behrens, W. W. (1972) :The Limits to Growth. Club of Rome.
8. Raworth, K. (2017):Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist. Random House.
9. Jackson, T. (2011):Prosperity Without Growth: Economics for a Finite Planet. Routledge.
10. United Nations Framework Convention on Climate Change (UNFCCC)
    - Paris Agreement (2015)

    [Available at https://unfccc.int/]
11. United Nations Sustainable Development Goals (SDGs)

    Agenda 2030 for Sustainable Development

    [Available at https://sdgs.un.org/]
12. Ministry of Environment, Forest and Climate Change (MoEFCC), Government of India

    National Action Plan on Climate Change (NAPCC)

    [Available at https://moef.gov.in/]
13. World Bank Group
    - Turn Down the Heat: Why a 4°C Warmer World Must Be Avoided (2012).

    [Available at https://openknowledge.worldbank.org/]
14. Ravindranath, N. H., & Sathaye, J. (2002): Climate Change and Developing Countries. Springer Netherlands.
    - Focuses on challenges faced by developing nations.
15. TERI (The Energy and Resources Institute)
    - Reports on India's climate action, adaptation strategies, and sustainability initiatives.

Theory Credit : 3
Practical credit: 1
No. of Required Classes : 60
No. of Contact Classes: 40
No. of Non-Contact Classes : 20

Particulars of Course Designer (Department of Geography, Gauhati University, geography@gauhati.ac.in)

Subject: Geography
Semester: VII
Course Name: **Micro Area Studies and Regional Analysis**
Course Code: GGY0700304
Course Level: Higher
Part I: Theory (3 Credits, 45 classes of one-hour duration)
Part II: Practical (1 Credit, 15 classes of two-hours duration)
100 Marks (Theory =45 Marks, Practical=25 Marks, Internal Assessment = 30 Marks)

Course Objectives:
This course focuses on the micro-spatial study of specific geographical, political and cultural areas of a region considering the micro areas as field laboratories of the subject geography, and emphasizing intensive studies and regional analysis. It is designed to improve the deep understanding of the students towards investigating the problems and potential of the micro areas on the one hand and to create ability amongst them to conduct independent research, analyze regional data, and understand the dynamism of specific micro areas within a broad geographical framework of a region.

Course Outcome:

1. Understand and distinguish the nuanced concepts, different theories and methodologies utilized in Micro Area Studies.
2. Comprehend and execute diverse research methods and techniques in area studies, ensuring ethical conduct.
3. Apply learned concepts and methods to perform detailed analyses of chosen micro areas, highlighting problems and potential solutions.
4. Understand the interdependence between regional dynamics and global issues, incorporating case studies for comprehensibility.
5. Demonstrate independent research skills by conducting a detailed study on a selected micro area, analyzing data, presenting findings, and refining analytical skills.

Part I

Unit 1: Introduction to Micro Area Studies (12 hours)
Definition, nature and scope of micro area studies. Emergence of micro area studies in the field of Geography, Importance of studying micro areas, consideration of micro area as field laboratory, difference between micro area study and macro area study.
Historical Development: Conceptual and methodological development of the micro area studies in India and abroad. Key concepts: Basic theories and methods adopted in micro area studies.
Micro landscapes: Physical and cultural components, human response to micro landscapes, impact of social and physical processes on micro landscapes.

Unit 2: Research Methodologies in Area Studies (12 hours)

Participatory Appraisal methods and techniques Interdisciplinary approaches in micro area studies Qualitative and quantitative research methods. Selection of micro areas for case study,and primary field survey methodology. Data collection techniques specific to regional analysis. Ethics and considerations in conducting micro area/ regional studies.

Unit 3: Micro Area Studies - Focused Analyses (12 hours)
Deep dive into problems and potential of specific regions (e.g., a village, municipality area/ ward, urban fringe, micro ecological setting, habitat etc).
Physical, Ecological,culturaland political character analysis of chosen micro areas. Comparative studies on different micro areas, micro area planning and development.

Unit 4: Regional Dynamics and Global Impact (12 hours)
How regional characteristics influence national and international issues.
Case studies on regional conflict, economic development, and cultural exchange. Role of geographical boundaries and political entities in shaping regional dynamics. Regional development plans and policies.

Unit 5: Independent Project work(12 hours)
Students select a micro area for detailed study.
Application of research methodologies to gather and analyze data. Presentation of findings in written formats.
Peer review and critique sessions to refine analytical skills.

Part II:

Unit I: Practical Works (16 marks) (Two questions of 8 marks each)

1. Micro-spatial risk assessment using GIS-based multi-criteria decision analysis (MCDA) and analytical hierarchy process (AHP) (2exercises).
2. Mapping of physical and cultural features of micro areasin different physical settings in Assam/N.E. India using toposheets and satellite imageries. (2exercises).
3. Participatory mapping of land use and land cover of micro areas, such as village, urban wards etc (2 exercises).
4. Identification and mapping of micro landscapes, resource base, problems and potentials of micro areas through field survey(2exercise).
5. Dag survey and mapping techniques using cadastral map (2exercise).
6. Toposequence through transact walk in an urban or a rural area (2exercise). 6. Questionnaire design for micro area study (1 exercise).

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, Robert, B. (1947): Area Studies with Special Reference to their Implications for Research in Social Sciences, Social Science Research Council, New York.
2. David Ludden (1998): Area studies in the age of globalization, University of Pennsylvania.
3. Mukherjee, N. (1993). Participatory rural appraisal: methodology and applications. Concept Publishing Company.
4. Cahnman, Warner J. (1948): Outline of a Theory of Area Research" Annals of the Association of American Geographers, vol.38.No 4, pp.233-243.
5. Labh, Kapileswar (1986): Area Studies in India: Retrospect and Prospect, Unpublished Seminar Paper, Centre for Himalayan Studies, North Bengal University.
6. Mukherjee, N. (1995). Participatory rural appraisal and questionnaire survey (comparative field experience and methodological innovations).
7. Ullman Edward L. (1953): Human Geography and Area Research, Annals of the Association of Area Research Vol.43, No I.
8. Chambers, R. (1981). Rapid rural appraisal: rationale and repertoire. Public administration and development, 1(2), 95-106.
9. Chambers, R. (1981). Rapid rural appraisal: rationale and repertoire. Public administration and development, 1(2), 95-106.
10. McCracken, J. A., Pretty, J. N., & Conway, G. R. (1988). An introduction to rapid rural appraisal for agricultural development. An introduction to rapid rural appraisal for agricultural development.
11. Krosnick, J. A. (2018). Questionnaire design. The Palgrave handbook of survey research, 439-455.
12. Lietz, P. (2010). Research into questionnaire design: A summary of the literature. International journal of market research, 52(2), 249-272.
13. Codó, E. (2008). Interviews and questionnaires. The Blackwell guide to research methods in bilingualism and multilingualism, 158-176.
14. Hennink, M. M. (2013). Focus group discussions. Oxford University Press.
15. Lawrence Neuman, W. (2014). Social research methods: Qualitative and quantitative approaches.
16. Acharya Amitav (2006): International Relations and Area Studies: Towards a New Synthesis, Institute of Defence and Strategic Studies, Nanyong Technological University, Singapore.
17. Appadurai Arjun (1996): Modernity at Large: Cultural Dimensions of Globalisation , Minneapolis, University of Minnesota Press.
18. Bates, Robert H (1997): Area Studies and the Discipline: A Useful Controversy, Political Science and Politics 30 (2).
19. Droselle,-Jean B. (1952): Area Studies: problems of method, International Social Science Bulletin, Vol. IV, No.IV.
20. Grieb, Kenneth J (1974): Area Studies and the Traditional Disciplines,The History Teacher, Vol. 7, No.2.
21. Morgenthau, Hans (1952): Area Studies and the Study of International Relations, International Social Science Bulletin, Vol. IV, No.IV.
22. Murdoch, George P. (1950): The conceptual basis of Area Research, World Politics, Vol. 2, No IV.
23. Julian H. (1950): Area Research Theory and Practice, Social Science Research Council, New York.

24. Whitaker, Urban (1959): An Application of Area Studies to the Teaching of General Education Courses in International Relations, Vol.5, No.4.

Theory Credit : 3
Practical Credit: 1
No. of Required Classes : 60
No. of Contact Classes: 40
No. of Non-Contact Classes : 20

Particulars of Course Designer (Department of Geography, Gauhati University, geography@gauhati.ac.in)

Four Year Under-Graduate Programme

Subject: Geography
Semester: VII
Course Name: **Research Methodology in Geography**
Course Code: GGY0700504
Course Level: Higher
Part I: Theory (3 Credits, 45 classes of one-hour duration)
Part II: Practical (1 Credit, 15 classes of two-hours duration)
100 Marks (Theory =45 Marks, Practical=25 Marks, Internal Assessment = 30 Marks)

Course Objectives:
This course is designed to equip students with the fundamental skills necessary for conducting research in geography. Through a combination of theoretical lectures, practical exercises, and hands-on projects, students will learn the intricacies of academic research, focusing on geographical contexts. The course will adhere to the Graduate Attributes outlined by the University Grants Commission (UGC) and will integrate Bloom's Taxonomy to ensure a comprehensive learning experience.

Course Outcome:

1. Understand the role and significance of geographic research, be able to evolve research problem and review literature.
2. Design an effective geographic research proposal, understand sources and types of geographical data, and learn primary data processing techniques.
3. Analyze quantitative and qualitative geographical data using software and understand the significance of geospatial data analysis and GIS.
4. Ability to write a research paper and present geographic research effectively while understanding ethical considerations in research.
5. Update on recent advances in geographic research, innovative data collection methods and understanding the role of big data in geographic research.

Part I

Unit 1: Introduction to Research in Geography (12 hours)
Geographic research: Definition and characteristics; Domain of geographic research and its relation with other allied fields; significance of geographic research.
Types of geographic research: Basic & Applied, Qualitative & Quantitative, Longitudinal, Cross-sectional and Comparative.
Evolving a research problem; Identifying research gaps; Formulating objectives and research questions.
Review of Literature and its need; Sources of geographical literature (Journals, books and online sources)

Unit 2: Research Design and Methodology (12 hours)
Designing a geographic research proposal (Statement of the problem, Review of research works, Objectives, Research questions, Hypotheses, Database and methodology, Significance, Organization of the work and References).
Types of research designs (experimental, quasi-experimental, non-experimental)
Nature of geographical data (Physical geographic and human geographic data; Spatial and non-spatial data); Sources of geographical data: Primary (Pilot survey, Field survey, Household survey, interview, field observation, focus group discussion), Secondary (Census, NFHS, NSS, Remote Sensing, Maps and various govt. agencies), and Tertiary (Research articles, books, reports, etc).
Sampling Techniques: Probability and non-probability sampling; Sample size determination Primary data processing techniques: Manual and Computer-based using softwares like MS Excel, SPSS, R, etc.

Unit 3: Data Analysis in Geography (12 hours)
Quantitative Data Analysis: Meaning and significance
Statistical methods in geography (Application of the measures of central tendency, dispersion, correlation, regression, etc; Time series analysis; Spatial statistics).
Use ofsoftwares for data analysis (MS Excel, SPSS, R, etc) Qualitative Data Analysis: Meaning and significance
Techniques of analysing qualitative data (Content analysis, thematic analysis, perception analysis, etc)
Use of qualitative data analysis software (NVivo)
Significance of geospatial data analysis and GIS in geographical research

Unit 4: Writing and Presenting Geographic Research (12 hours)
Research Paper Writing: Structure of a research paper (Abstract including key words, Introduction, Objectives and research questions, Database and methodology, Analysis and discussion, Findings and conclusion, References)
Academic writing styles and referencing system
Presentation Skills: Preparing slides and posters for geographic presentations; Oral presentation techniques
Ethical Considerations in Research; Ethical issues specific to geographic research Obtaining ethical clearances and handling sensitive data
Structure of a Research Report: Preliminaries, Text, Tables, Figures and Appendices; Citations, References and Bibliography; Research/Project Report Writing; Executive Summary.

Unit 5: Conducting Advanced Geographic Research (12 hours)
Recent Advances in Geographic Research New methodologies in spatial analysis
Innovations in data collection (e.g., Drone technology) Spatial modelling and Predictive analysis in geography The role of big data in geographic research
Funding Opportunities in Geographic Research and Preparing Grant Proposal.

Part II:

Unit I: Practical Works (16 marks) (Two questions of 8 marks each)

1. Preparationof household survey schedule/questionnaire for socio-economic study/demographic study/social change study/health status study
2. Preparation of village/area survey schedule for environment/infrastructure study.
3. Preparation of survey schedule/questionnaire for rural market study.
4. Preparation of survey schedule/questionnaire for perception-based urban environment study.
5. Preparation of sketch-map of rural/urban landscape.
6. Construction of cross-section profile of landuse and landcover scenario in selected urban/rural localities.
7. Application of statistical techniques for sample data analysis (both for small and large samples) for hypothesis testing.

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: Qualitative, quantitative, and mixed methods approaches. Sage publications.
2. Engel, R. J., & Schutt, R. K. (2016). The practice of research in social work. Sage Publications."Qualitative Inquiry and Research Design: Choosing Among Five Approaches" by John W. Creswell
3. Steinberg, S. L., & Steinberg, S. J. (2015). GIS research methods: incorporating spatial perspectives.
4. Gomez, B., & Jones III, J. P. (Eds.). (2010). Research methods in geography: A critical introduction (Vol. 6). John Wiley & Sons.
5. Nayak, A., & Jeffrey, A. (2013). Geographical thought: An introduction to ideas in human geography. Routledge."Statistical Methods for Geography: A Student's Guide" by Peter A. Rogerson

Theory Credit : 3
Practical Credit: 1
No. of Required Classes : 60
No. of Contact Classes: 40
No. of Non-Contact Classes : 20

Particulars of Course Designer (Department of Geography, Gauhati University, geography@gauhati.ac.in)

Four Year Under-Graduate Programme

Subject: Geography
Semester: VIII
Course Name: **Project Formulation and Execution**
Course Code: GGY0800104
Course Level: Higher
Part I: Theory (4 Credits, 60 classes of one-hour duration)
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 necessary for implementing community-based or research-based projects.
4. To familiarize students with reporting, monitoring, and evaluation (M&E) tools.
5. To ensure students are prepared to submit a project proposal and conduct a basic field investigation or case study.

Learning Outcomes

By the end of the course, students will be able to: -

1. Design and formulate viable project proposals based on research or development problems.
2. Prepare logical frameworks, timelines, and budgets using standard templates. -
3. Apply basic tools for primary and secondary data collection. -
4. Understand project implementation strategies, stakeholder analysis, and risk management. -
5. Monitor, evaluate, and report project outcomes effectively.

Unit I: Introduction to Project Formulation

- Definition, nature, and significance of projects
- Types of projects: academic, research, social, entrepreneurial
- Project life cycle: Conceptualization to closure
- Need assessment and problem identification
- Participatory planning and stakeholder involvement

Unit II: Project Planning Tools and Techniques

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

Unit III: Budgeting and Resource Mobilization

- Estimating project costs: capital vs. operational
- Budget preparation and justification
- Resource mapping: human, financial, material
- Proposal writing for funding: components and formats
- Introduction to government schemes, CSR, and donor funding

Unit IV: Project Execution, Monitoring and Evaluation

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

Unit V: Documentation and Final Reporting

- Project documentation techniques: field notes, journals, photos, GIS/maps
- Data analysis, interpretation, and visualization (basic)
- Report writing: structure, style, 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%)

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. United Nations Development Programme.
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: A Step-by-Step Guide for Beginners. Sage.
3. Kothari, C. R. (2019). Research Methodology: Methods and Techniques. New Age International.
4. Chambers, R. (1997). Whose Reality Counts? Putting the First Last. Intermediate Technology Publications.

Field-Based Learning Component:

Each student is required to: -
Identify a local issue or theme based on Honours subject. - Formulate a project proposal in consultation with faculty. - Conduct at least 5–7 days of fieldwork, surveys, or institutional visits. - Submit a final project report for evaluation.

Theory Credit : 4
Practical Credit: 0
No. of Required Classes : 60
No. of Contact Classes: 40
No. of Non-Contact Classes : 20

Particulars of Course Designer (Department of Geography, Gauhati University, geography@gauhati.ac.in)

Four Year Undergraduate Programme

Subject: Geography
Semester: VIII
Course Name: **Geography of Rural Landscape and Livelihood**
Course Code: GGY0800204
Course Level: Higher
Part I: Theory (3 Credits, 45 classes of one-hour duration)
Part II: Practical (1 Credit, 15 classes of two-hours duration)
100 Marks (Theory =45 Marks, Practical=25 Marks, Internal Assessment = 30 Marks)

Course Description:
This course explores the geographical aspects of rural landscapes and the various livelihoods dependent on them. It examines the interactions between physical geography, human activities, and economic practices that shape rural areas. The course emphasizes understanding the complexities of rural life, land use planning, resource management, and sustainable development.

Course Outcome:

1. Understand the nature and importance of rural landscapes and their historical development
2. Analyze the environmental context of rural landscapes and understand its challenges 3. Identify principles of sustainable development applicable to rural settings and assess their success
3. Assess the socio-economic dynamics of rural areas, including demographic changes, livelihood diversification, and community response.
4. Examine rural development strategies and future perspectives, highlighting rural development plans, GIS applications, and potential trends.

Part I

Unit 1: Introduction to Rural Landscapes (12 hours)
Understanding Rural Landscapes: Meaning and nature of rural landscapes, difference between rural landscapes and urban landscapes, the role of landscape studies in the field of geography.
Historical development: Evolution of landscape studies in Geography in India and abroad. Concepts of rural landscapes: natural landscapes and cultural landscapes, waterscapes, sacred landscapes, community landscapes. Interdisciplinary approaches in studying rural landscapes.

Unit 2: Rural Landscapes and Environmental Context(12 hours)

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

Unit 3: Socio-economic Aspects of Rural landscapes(12 hours)
Demographic characteristics and population dynamics in rural areas, rural depopulation, rural to urban migration, agricultural and physiological density.

Socio-economic aspects: landscapes and livelihoods relationship, rural life and livelihoods, traditional knowledge and skills of landscape design and management, transformation of rural landscapes, rural resource utilization and management, community response to rural landscapes.
Rural livelihood diversification and resilience strategies, rural occupational shift.

Unit 4: Sustainable Development in Rural Areas (12 hours) Principles of sustainable development applicable to rural settings, Sustainable agricultural practices (organic farming, pisciculture, agroforestry, ethnoforestry, etc), Rural infrastructural development (transport and communication, housing, civic amenities, water resources), Case studies of successful sustainable rural development projects

Unit 5: Rural Development Planning and Future Perspectives (12 hours) Government rural development plans and programmes
Geographic Information Systems (GIS) applications in rural planning Future trends in rural geography (smart agriculture, renewable energy)
Preparing for the future: Addressing rural migration, urbanization pressures on rural areas, ruralisation. Impact of rural development plans and policies of Government on rural landscapes and livelihoods.

Part II: Practical (1 credit, 25 Marks, 15 Classes of two-hour duration)

Unit I: Practical Works (16 marks) (Two questions of 8 marks each)

1. Mapping of physical and cultural landscapes in the rural areas of Assam and Northeast Assam, India using appropriate cartographic techniques (2exercises).
2. Show the rural-urban migration trend in Assam or Northeast India using appropriate statistical method (2exercises).
3. Mapping and analyzing of agricultural and physiological density at district level of Assam/ Northeast (2exercises).
4. Mapping land use patterns in the Agro-Climatic Context of Assam using suitable methods (1 exercise).
5. Questionnaire design for rural landscape and livelihood study(1 exercise).

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. The Wiley-Blackwell companion to cultural geography, 225-237.
2. Claval, P. (2005). Reading the rural landscapes. Landscape and urban planning, 70(1-2), 9-19.
3. Gallent, N., Juntti, M., Kidd, S., & Shaw, D. (2008). Introduction to rural planning: economies, communities and landscapes. Routledge.
4. Hebinck, P., & Van Averbeke, W. (2007). 14 Livelihoods And Landscapes: People, Resources And Land Use. In Livelihoods and Landscapes (pp. 335-360). Brill.
5. Sick, D. (Ed.). (2014). Rural livelihoods, regional economies, and processes of change. New York: Routledge.
6. Sourav Saha, Nityananda Deka and Abani Kumar Bhagabati (2020): Participatory Water Resource Management in the Bhutan Himalayan Foothill Environment of Baksa District, Assam, International Journal of Rural Management, Sage publication, Pp.1-19,

7. Maharjan, K. L., & Joshi, N. P. (2013). Climate change, agriculture and rural livelihoods in developing countries. Japan: Springer.
8. Scoones, I. (2015). Sustainable livelihoods and rural development (p. xv). Rugby: Practical Action Publishing.
9. Sourav Saha, N.Deka and A.K. Bhagabati (2020): Landscape characteristics and their changes in a Brahmaputra floodplain village, Assam, Geographical Review of India, The Geographical Society of India, Kolkata, vol.82,pp113-128
10. Tambe, S. (2022). Sustainable livelihoods approach. In Teaching and learning rural livelihoods: A guide for educators, students, and practitioners (pp. 45-56). Cham: Springer International Publishing.
11. Ellis, F., & Freeman, H. A. (2004). Rural livelihoods and poverty reduction policies. Routledge.
12. Ellis, F. (2000). Rural livelihoods and diversity in developing countries. Oxford university press.
13. Deka, N., Bhagabati, A.K. and Ando, K. (2010): Rural Land Use in the Brahmaputra Floodplain
14. Environment, Assam: The Case of Muktapur Village, ContemporaryIndia, Vol.1, NIHU Programme Contemporary India Area Studies (INDAS), Japan, Pp. 177-193. ISSN. 2185-9833.
15. Saha, S. and Deka, N. (2018): Evolution of Landscape in a Floodplain Village of the Brahmaputra Valley, Assam, Indian Journal of Landscape Systems and Ecological Studies, Kolkata, Vol.41, No.1, pp.120-132.
16. Borsotto, P, Henke, R. Macri, M.C. and Salvioni, C. (2008): Participation in Rural Landscape Conservation Schemes in Italy, Landscape Research, 33:3, pp. 347-363.
17. Kizo, T., Primdahl, L. Kristensen and Busk, A.G. (2010): Introduction: Landscape Change and Rural Development, Landscape Research, vol.35, no.6, pp. 571-576.
18. Wu. J. (2013): Landscape Sustainability Science: Ecosystem Service and Human Well-being in Changing landscapes, Landscape Ecology, Vol.28, issue 6, pp.999-1023.
19. Yangang, F. And Jisheng, L. (2008): Cultural Landscape Evolution of Traditional Agricultural Villages in North China: Case of Qianzhai Village in Shandong Province, Chinese Geographical Science, Vol.18, Issue 4, pp.308-315.

63

Theory Credit : 3
Practical Credit: 1
No. of Required Classes : 60
No. of Contact Classes: 40
No. of Non-Contact Classes : 20

Particulars of Course Designer (Department of Geography, Gauhati University, geography@gauhati.ac.in)

Four Year Under-Graduate Programme

Subject: Geography
Semester: VIII
Course Name: **Introduction to Hydrology**
Course Code: GGY0800304
Course Level: Higher
Part I: Theory (3 Credits, 45 classes of one-hour duration)
Part II: Practical (1 Credit, 15 classes of two-hours duration)
100 Marks (Theory =45 Marks, Practical=25 Marks, Internal Assessment = 30 Marks)

Part I:

Course Description:
This course introduces the fundamental concepts of hydrology, emphasizing the study of water on Earth. It covers the hydrological cycle, water resources management, and contemporary hydrological issues. The course prepares students to analyze hydrological data and understand the impact of water management on the environment.

Course Outcome:

1. Understand the essential principles and scopes of hydrology, and the components and pathways of the hydrological cycle.
2. Proficient in hydrological data collection and recording techniques, and be able to implement these methods in models for resource management.
3. Develop insight into the processes of basin runoff, river flow, flood occurrences, their causes, effects, and manage associated issues.
4. Understand the characteristics of the water table, aquifers, groundwater flow, and exploration techniques, and evaluate contamination measures.
5. Analyze water resource management, sustainability issues, implications of climate change on hydrological systems, and evaluate relevant case studies.

Unit 1: Fundamentals of Hydrology

Meaning and Scope of hydrology; Importance of hydrological studies in geography. Hydrological cycle: Components and water flow pathways- precipitation, infiltration, evaporation, transpiration, surface runoff, storage, through flow, ground water flow; Water distribution on the earth and the water budget

Unit 2: Hydrological Measurement and Data Analysis

1. Hydrological Data collection and recording techniques: Rainfall Measurement, Installation and calibration of rainfall gauges, Streamflow measurements from stream gauging stations, Evapotranspiration measurement methods, Groundwater level measurement methods
2. Rainfall-Runoff modelling and Groundwater modelling using statistical data and GIS for water resource management

Unit 3: Surface Water Hydrology

1. Concept of basin runoff; Factors affecting basin runoff; Sources of river flow, Types of flow, Factors causing river flow variation; Concepts of water discharge, Effects of water discharge on channel morphology
2. Flood hydrology: Definition and causes of flood; Flood occurrence pattern- seasonality and frequency; Effects and management issues
3. Anthropogenic activities and River Health issues and concerns

Unit 4: Groundwater Hydrology

1. Concept of water table and the aquifer: Aquifers classification (confined, unconfined and leaky); Aquifer Parameters: (porosity, recharge and discharge, hydraulic conuctivity, transmissivity, storativity, specific yield); Groundwater flow - Steady state and unsteady state flow, Driving forces of groundwater flow
2. Groundwater recharge; Groundwater exploration: Geological, Hydrological and Geophysical Methods
3. Sources of groundwater contamination; Water quality parameters and remedial measures; sustainable groundwater use

Unit 5: Hydrological Issues and Water Resource Management

1. Water resource management and sustainability; Impact of climate change on hydrological systems.
2. Case studies on water management policies and their effectiveness.

Part II: Practical (1 credit, 25 Marks, 15 Classes of two-hour duration)

Unit I: Practical Works (16 marks) (Two questions of 8 marks each)

1. To estimate runoff from daily water discharge data and to compare the seasonal variation patterns of basin runoff taking i. Two major tributaries of Brahmaputra river, one north bank and one south bank tributary and also taking ii. Two months -one winter and one summer months (December and July) (2 Exercises)
2. To prepare discharge hydrographs of Brahmaputra and any one of its major tributaries atleast for three years taking a gap of five years and to analyse the trend of discharge pattern in the rivers. (2 Exercises)
3. To prepare a stage-discharge hydrograph of Brahmaputra at any two gauge sites for a particular year and to compare the patterns in discharge and stage variations in the river. (2 Exercises)

4. To construct stage-discharge rating curves[6] separately for all months of the year, for monsoon months (may to October) and for non-monsoon months (November to April taking monthly average data of a period of 5/10 years for Brahmaputra or one of its major tributaries and to analyse the seasonal relationship pattern between stage and discharge. (2 Exercises)
5. To prepare a rainfall variability map of Assam/Brahmaputra Valley based on relevant necessary data and to analyse the rainfall variability pattern. (1 Exercise)
6. Collection and mapping of monthly /seasonal fluctuation data of ground water level of selected wells (at least 10) in a locality (village/ward). (1 Exercise)

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. Madan Mohan and Mimi Das Saikia, 2009, Hydrology , PHI Learning Pvt. Ltd Subramanya, K. (2013). Engineering hydrology, 4e. Tata McGraw-Hill Education. Chorley, R. J. (Ed.). (2019). Introduction to fluvial processes. Routledge. Brutsaert, W. (2005). Hydrology: an introduction. Cambridge University Press.
2. Maidment, D. R. (1993). Handbook of hydrology (Vol. 9780070, p. 397323). New York: McGraw-Hill. Te Chow, V. (2010). Applied hydrology. Tata McGraw-Hill Education.
3. Davie, T. (2008). Fundamentals of hydrology. Routledge.
4. Sharp, J. J., &Sawden, P. G. (2013). BASIC hydrology. Elsevier. Dingman, S. L. (2015). Physical hydrology. Waveland press. Lane, B. (2002). Statistical Methods in Hydrology.
5. "Principles of Hydrology" by R. Ward and M. Robinson.
6. "Applied Hydrology" by V.T. Chow, D.R. Maidment, and L.W. Mays. Access to hydrological databases and software for practical exercises.

Theory Credit : 3
Practical Credit: 1
No. of Required Classes : 60
No. of Contact Classes: 40
No. of Non-Contact Classes : 20

Particulars of Course Designer (Department of Geography, Gauhati University, geography@gauhati.ac.in)

Four Year Under-Graduate Programme

Subject: Geography
Semester: VIII
Course Name: **Geography of Health**
Course Code: GGY0800404
Course Level: Higher
Part I: Theory (3 Credits, 45 classes of one-hour duration)
Part II: Practical (1 Credit, 15 classes of two-hours duration)
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, health behaviour, and the distribution of health services. The course is designed to provide students with the analytical tools needed to understand and evaluate health issues from a geographical perspective, fostering skills in spatial analysis, critical thinking, and policy evaluation.

Course Outcome:

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

Part I:

Unit 1: Introduction to Health Geography (12 hours)
Overview: Definitions, scope, and importance of health geography.
Key Concepts: Health, wellness, illness, disease; geographic distribution. Approaches of study: ecological, social and spatial.
Historical Development: Evolution of health geography as a discipline. Dualism between medical geography and geography of health.

Unit 2: Environmental Health (12 hours)
Environmental Influences: Impact of physical and built environments on health.
Case Studies: Analysis of environmental health issues like air quality and water sanitation. Tools and Techniques: Introduction to methodologies for assessing environmental health risks.

Unit 3: Diseases and its Transmission (12 hours)

Classification of diseases: genetic, zoonotic, communicable, non-communicable, occupational, deficiency diseases and malnutrition. Disease occurrence: emergence, re-emergence and persistence. Modes of transmission of major diseases (Malaria, Japanese encephalitis, tuberculosis, hepatitis, AIDS and COVID-19) and their broad global distribution.

Unit 4: Disease Ecology and its mapping (12 hours)
Disease Distribution: Patterns and processes influencing disease spread. factors influencing disease transmission (pathological, physical, environmental, social, cultural and economic); Epidemiological Applications: Using geographic methods to track and control outbreaks. Advanced GIS Applications: Utilizing GIS in disease surveillance and epidemiological research.

Unit 5: Health Policy and Planning (12 hours)
Health Systems: Meaning and components; Universal government-funded health system; Role of WHO and UNICEF in global health care; SDG3 for good health and Well-being.
Policy Analysis: Spatial analysis of health policies and their implications.family welfare, immunization, National Health Mission and its programmes,
Future Challenges: Discussion on emerging health issues like during COVID-19 and the role of health geography in addressing them.

Part II:
Unit I: Practical Works (16 marks) (Two questions of 8 marks each)

1. Mapping of health status indicators (hospital beds, primary health centres, doctors,para-medics, etc.) in Assam/N.E. India using Z-score method. (1 Exercise)
2. Trend of infant mortality and maternal mortality rates in India in relation to selected developed and developing counties using line graph. (3 Exercises)
3. Choropleth mapping of infant mortality in India at state level. (1 Exercise)
4. Correlation analysis between any physical determinants (monthly rainfall/monthly average temperature) and epidemiological incidence of a disease (monthly malaria cases) in any district of Assam. (1 Exercise)
5. Map showing spatial variation of disease incidence rate in India/N.E. India at state level. (1 Exercise)
6. Mapping of seasonal variation in the occurrence of Covid-19 cases in Assam atdistrict level using pie graph. (1 Exercise)
7. Preparation of questionnaire for healthcare and health status survey. (1 Exercise)
8. Computation of distribution pattern of hospitals, health centres, etc. using nearest neighbour analysis. (1 Exercise)

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. AkhtarRais (Ed.), 1990 : Environment and Health Themes in Medical Geography, AshishPublishing House, New Delhi.
2. Anthamatten P, (2011), Introduction to the Geography of Health, Rawat Publications, Jaipur
3. Avon Joan L. and Jonathan A Patzed.2001 : Ecosystem Changes and Public Health,Baltimin, John Hopling Unit Press(ed).
4. Banerji, D. (1986) :Social Sciences and Health Services in India, LokPrakashan,New Delhi.
5. Bradley,D.,1977: Water, Wastes and Health in Hot Climates, John Wiley Chichesten.

6. Brown, T., McLafferty, S., Moon, G. (2010): A Companion to Health and Medical Geography, Wiley Blackwell, UK
7. Christaler George and HristopolesDionissios, 1998: Spatio Temporal Environment HealthModelling , Boston Kluwer Academic Press.
8. Cliff, A.D. and Peter,H., 1988 : Atlas of Disease Distributions, Blackwell Publishers, Oxford.
9. Curtis, S.(2004):Health and Inequality: Geographical Perspectives,Sage Publications,London
10. Gatrell, A.,andLoytonen, 1998 : GIS and Health, Taylor and Francis Ltd, London.
11. Hardham T. and TannavM.,(eds): Urban Health in Developing Countries; Progress, Projects, Earthgoan, London.
12. Mishra, R.P.(1970): Medical Geography of India, National Book Trust ofIndia.
13. Mishra, R.P.(2002)), Geography of health : a treatise on geography of life and death in India, Concept Publishing Co., New Delhi
14. Murray C. and A. Lopez, 1996 : The Global Burden of Disease, Harvard University Press.
15. Moeller Dade wed., 1993: Environmental Health, Cambridge, Harward Univ. Press.
16. National Health Missionhttps://nhm.gov.in/
17. National Health Portal India https://www.nhp.gov.in/healthprogramme/national-healthprogrammes
18. Phillips, D. and Verhasselt, Y., 1994: Health and Development, Routledge, London.
19. Shaw, M., Dorling, D. and Mitchell, R, (2002) Health, Place and Society, Pearson, London
20. Tromp, S., 1980: Biometeorology: The Impact of Weather and Climate on Humans and their Environment, Heydon and Son.

Theory Credit : 3
Practical Credit: 1
No. of Required Classes : 60
No. of Contact Classes: 40
No. of Non-Contact Classes : 20

Particulars of Course Designer (Department of Geography, Gauhati University, geography@gauhati.ac.in)

Four Year Under-Graduate Programme

Subject: Geography
Semester: VIII
Course Name: **Gender Geography**
Course Code: GGY0800504
Course Level: Higher
Part I: Theory (3 Credits, 45 classes of one-hour duration)
Part II: Practical (1 Credit, 15 classes of two-hours duration)
100 Marks (Theory =45 Marks, Practical=25 Marks, Internal Assessment = 30 Marks)

Course Description:
This course explores the intersection of gender and geography, examining how spatial processes are influenced by and in turn, influence gender relations. It covers theoretical frameworks, empirical studies, and methodological approaches to understanding gender in geographical contexts. The course aims to equip students with the ability to analyze gendered dimensions of spatial phenomena, policy implications, and social justice in various geographic settings.

Course Outcome:

1. Understand the historical development, theoretical approaches, and growth of gender geography, particularly in India.
2. Comprehend key concepts of gender and feminist geography including gender roles, gender identity, and misconceptions about gender and sexuality.
3. Analyze the gendering of both private and public spaces and how urban and rural dynamics affect genders.
4. Evaluate how intersections of gender with race, class, and sexuality shape spatial experiences.
5. Examine the spatial patterns and bases for gender inequalities and their influence on social wellbeing indicators.

Part I:

Unit I: Historical Development, Theories in Gender studies and methodological Approach:
Understanding the growth and development of gender geography across the global and India.
Theories and Methods: Liberal feminism, Marxist feminism, Radical Feminism, Post-modernism and feminism

Unit II: Gender and Feminist Geography- Key concepts and contexts:
Sex and gender, gender roles, gender stereotyping, femininity, masculinity and sexuality within the context of geography, gender identity and sexual expression, intersectionality and gender, patriarchy, gender equality, common misconceptions about gender and sexuality;

Unit III: Gender and Space:
1. Gendering of private and public spaces
A. Historical Gender Roles in Private and Public Spaces:-

B-Gendered Acts in Public Spaces and women's mental health C-Discrimination and Gender Diversity 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 in Different Spaces
   C. Fear of Crime and Spatial Avoidance

Unit IV: Spatial Pattern of Gender Inequalities:

Inequality in Family:
Natality Inequality.
Inequality in education iv. Employment inequality, v. Ownership Inequality
Inequality in access to health and other indicators of social wellbeing.

Unit V: Women and Social Institutions

i.Kinship: Kinship terminologies, Matrilineal vs Patrineal System
ii.Family: Nuclear, Joint and Extended, Position of women in family
iii.Marriage: Types of marriages in India, Dowry vs Bride price, Property Rights

Part II:

Unit I: Practical Works (16 marks) (Two questions of 8 marks each)

1. Use of qualitative methods in gender geography research: Ethnographic Fieldwork, Life Story Interviews, Intersectional Analysis, Participatory Research Methods and Focus Group Discussions, Case Study
2. Gender Disparity Maps to show disparity in literacy by Sophers Disparity Index
3. Measuring of Gender Development Index, Gender Gap Index
4. Preparation of questionnaire cum schedule for research on Gender Geography

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 Bina, 1994. A Field of One's Own: Gender and Land Rights in South Asia, Cambridge University Press.
2. Elizabeth Ermarth, 2000. What Counts as Feminist Theory? Feminist Theory, Vol. 1.pp.13-118.
3. Gross, Elizabeth. 1992. 'What is Feminist Theory?' in Helen Crowley and Susan Himmelweil (Eds.) Knowing Women: Feminism and Knowledge, Polity Press, pp. 355-369

4. Gregory Derek et al., 2009. Dictionary of Human Geography, 5th Edition, Wiley 5.Jaggar, Alison. 1983. 'The Politics of Liberal Feminism' in Feminist Politics and Human Nature, Sussex: Rowland and Allenfield. Pp. 173-206.
5. Lorraine Code, 2007 'Feminist Epistemologies and Women's Lives' in Linda Martín Alcoff and Eva FederKittay (eds.) The Blackwell Guide to Feminist Philosophy, Malden: Blackwell Publishers. Pp. 211-234.
6. Massey Doreen, 1994. Space, Place and Gender, University of Minnesota Press, Minneapolis. 10. Walby Sylvia, 1990. Theorizing Patriarchy, Wiley Blackwell publishers.
7. Mazumdar Vina and N Krishnaji (eds), 2001. Enduring Conundrum: India's Sex Ratio, Centre for Women's Development Studies, Rainbow Publishers, Delhi. Page 160 of 184 Department of Geography University of Delhi Delhi - 110 007
8. Phadke Shilpa, Ranade Shilpa and Sameera Khan, 2011. Why Loiter: Women and Risk on Mumbai Streets, Penguin
9. Spain Daphne, 1992. Gendered Spaces, University of North Carolina Press.
10. Mc Dowell Linda, 1999. Gender, Identity and Place: Understanding Feminist Geographies, Blackwell Publishers, Oxford. 8. McDowell, Linda and Sharp, Joanne, eds. 1997. Space/Gender/Knowledge: Feminist Readings. London: Arnold.
11. Tong, Rosemarie. 2009. 'Liberal Feminism' in Feminist Thought: A More Comprehensive Introduction, Philadelphia: Westview Press. Pp. 11-47

Theory Credit : 3
Practical Credit: 1
No. of Required Classes : 60
No. of Contact Classes: 40
No. of Non-Contact Classes : 20

Particulars of Course Designer (Department of Geography, Gauhati University, geography@gauhati.ac.in)

Skill Enhancement Course (SEC)

Subject: Geography
Semester: I
Course Name: **Essentials of Map Making**
Course Code: SEC0100103
Course Level: Foundation & Introductory
Part I: Theory (2 Credits, 30 classes of one-hour duration)
Part II: Practical (1 Credit, 15 classes of two-hours duration)
75 Marks (Theory =30 Marks, Practical=25 Marks, Internal Assessment = 20 Marks)

Learning objectives:

1. Provides a general understanding of methods and techniques of map-making and their importance in diverse disciplines.
2. Focuses on various themes of techniques; principles of different types of symbols, methods for the preparation of maps or plans in different environments, and representation of various features of the earth's surface using different map-making techniques.

Learning outcomes:

1. Understanding the importance of various techniques of preparation of maps.
2. General understanding of the preparation of different types of plans and maps.
3. An acquaintance of different cartographic techniques for the representation of various facets of the earth's surface.

Part I

Unit 1: Introduction

Definition and importance of map.

Unit 2: Types of map

Based on scale (Small, Medium and Large scale maps); Based on information content (General purpose, thematic and special purpose maps); Characteristics of topographical maps; Interpretation of topographical map and data generation.

Unit 3: Map elements

Map elements with respect to the location of physical and cultural features on the earth's surface, and their principles and techniques of representation (Point, line and polygon).

Unit 4: Concept of the base map

Types of the thematic map; map reading; map design, layout and typography

Unit 5: Thematic mapping

Principles and techniques of representation of physical and human geographic data; Types of thematic mapping: Choropleth, Isopleth, Chorochromatic

PRACTICAL

Unit I: To attempt 2 questions in total 8 marks each (16 Marks)

1. Preparation of an administrative/physical map of India containing necessary map elements using appropriate typography. (1 Assignment)
2. Preparation of thematic maps for representing human geographic data using choropleth, isopleth, dot, sphere and proportionate circle techniques. (5 Assignments)
3. Interpretation of topographical maps of India for preparation of qualitative thematic maps (Landuse/Land cover map); Construction of Transect Chart showing the relationship between selected physical and cultural elements along a cross-section from the topographical map. (2 Assignments)

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

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

Suggested Readings

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

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Skill Enhancement Course:

Subject: Geography
Semester: II
Course Name: **Data Collection, Analysis and Mapping**
Course Code: SEC0200103
Course Level: Foundation & Introductory
Part I: Theory (2 Credits, 30 classes of one-hour duration)
Part II: Practical (1 Credit, 15 classes of two-hours duration)
75 Marks (Theory =30 Marks, Practical=25 Marks, Internal Assessment = 20 Marks)

Course Outcomes:

Understand the fundamental principles of data collection, processing and visualization Acquire practical skills in collecting spatial and non-spatial data using various methods and technologies.

Develop proficiency in statistical analysis of various data

Apply data representation and mapping skills to real-world phenomena.

Unit 1

1. Nature and types of data and data collection: Spatial and non-spatial data; Qualitative and Quantitative data; Primary and Secondary data; Sampling techniques in data collection: simple random, stratified and purposive sampling. (10 classes)

Unit 2

1. Data processing and analysis: primary data processing and tabulation; data grouping; application of summary measures (Central tendency and dispersion) in data analysis (Ungrouped and grouped data)

Unit 3

1. Representation of spatial and non-spatial data: Graphical representation of data (Bar, Line and Circle); Concept of map and map scale; Thematic mapping of spatial data (Choropleth and Isopleth)

Practical

Unit I: To attempt 2 questions in total 8 marks each (16 Marks)

1. Tabulation/Grouping of spatial and non-spatial data for making frequency distribution table; Preparation of Histogram, Frequency Polygon and Frequency Curve. (3 assignment)
2. Computation of mean, median and mode for ungrouped and grouped data; and Determination of median and mode using graphical methods. (3 assignments)
3. Computation of standard deviation and coefficient of variation of ungrouped and grouped data relating to various phenomena (rainfall, landholding, income, production, etc.) for comparison of distribution patterns. (3 Assignments)

4. Representation of spatial (Physical and human) data through Choropleth and Isopleth mapping and Pie cartogram. (3 Assignments)
5. Processing and tabulation of excel data and preparation of frequency distribution table using filtering method (For attributes like age structure, sex composition, caste composition, education and occupation, production, etc.). (3 assignments)
6. Preparation of Bar Diagram (Simple and Composite) for representation of (State/District level) population and production of food grains in India or any state. (2 assignments)
7. Preparation of Pie Diagram for representation of Land use or Population composition in Assam /N.E. India. (1 Assignments)
8. Preparation of a Power Point presentation of the above mentioned assignments (At least 5) using MS office package. (1 Assignments)

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

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

Suggested readings:

1. Aslam Mahmood - *Statistical Methods in Geographical Studies*. Rajesh Publications.
2. R.L. Singh – *Elements of Practical Geography.* Kalyani Publishers.
3. Majid Husain – *Models in Geography,* Rawat Publications.
4. S.P. Gupta – *Statistical Methods,* Sultan Chand & Sons.
5. L.R. Singh – *Fundamentals of Practical Geography,* Sharda Pustak Bhawan.
6. Swapan Kumar Maity – *Essential Graphical Techniques in Geography*, Springer.
7. Joan Lambert – *Microsoft Office 2019 Step by Step,* Microsoft Press.
8. R. Parameswaran – *Computer Applications in Business*, S. Chand Publishing.
9. Jinjer Simon – *Excel Data Analysis: Your visual blueprint for analyzing data, charts and PivotTables,* Wiley India.
10. A. Sarma & G. Sharma – *Computer Applications in Geography*, Rajesh Publications.

Skill enhancement course

Subject: Geography
Semester: III
Course Name: **Geography of Tourism**
Course Code: SEC0300103
Course Level: Intermediate
Part I: Theory (2 Credits, 30 classes of one-hour duration)
Part II: Practical (1 Credit, 15 classes of two-hours duration)
75 Marks (Theory =30 Marks, Practical=25 Marks, Internal Assessment = 20 Marks)

Course Objective:
This paper introduces the students to the field of tourism from a spatial perspective. It seeks to develop new insights among students on how tourism and allied activities are shaped by the geography of an area and also how such activities are responsible for shaping economic, social and environmental context from global to local levels.

Course Outcome:

1. Understand the interplay between geography and tourism, including the roles of intermediaries and suppliers.
2. Differentiate various forms of tourism like eco-tourism, cultural tourism, and adventure tourism, and understand their sustainability implications.
3. Evaluate the economic, environmental, and societal impacts of tourism and understand the nuances of national and regional tourism policies.
4. Evaluate tourism attraction resources, infrastructure, and services within the context of India and Northeast India.
5. Critical analysis of the recent trends in tourist flow, exploring case studies in different geographical contexts in India.

Unit I:
Nature and Scope: Concept of tourism and its relationship with Geography; Role of Intermediaries and suppliers; Geographical parameters of tourism as postulated by Robinson.

Unit II:
Types and forms of tourism: Nature Tourism (Eco-Tourism), Cultural Tourism, Adventure tourism, Medical Tourism, Pilgrimage; Sustainable Tourism; Meetings, Incentives, Conventions and Exhibitions (MICE)Tourism

Unit III:
Tourism attraction (resources), infrastructure and services: In the context of India and northeast India

Unit IV:
Recent Trends of Tourist flow: International and Domestic (India); Case studies of tourism development in different geographical contexts in India: Himalayas, Desert, North-East India and Coastal Areas.

Unit V:

Impact of Tourism on Economy, Environment and Society; National Tourism Policy, Tourism policy of northeastern states

Part II: Practical (1 credit, 25 Marks, 15 Classes of two-hour duration)

Unit I: Practical Works (16 marks) (Two questions of 8 marks each)

1. Trend of growth of tourist arrivals (International and domestic) in India/ Assam using moving average method (2 Assignments)
2. Trend of tourist arrivals in the northeastern states of India in comparison to a top ranking tourist arriving state of India using Band-graph. (2 Assignments)
3. Representation of the relationship among the rainfall, temperature and tourist arrival for any year or a specific period for any state of NE India by using the appropriate carto-statistical technique. (2 Assignments)
4. Preparation of a map of Assam to show important tourist destinations along with their road, railway and air connectivity. (2 Assignments)
5. Preparation of a tourist map of N.E. India showing the inflow of tourists (domestic and international) to major national parks and wildlife sanctuaries/ prepare a tracking map of an area of tourism interest using GPS (2 Assignments)
6. Preparation of a map of NE India showing the inflow of tourist destinations (viz. Pilgrimage, nature, historical, adventure, wildlife, ethno-cultural destinations) and describe their significance. (2 destinations)

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. Bhattacharya, P. (2011): Tourism in Assam:Trend and Potentialities, Banimandia, Guwahati
2. Dhar, P.N. (2006) International Tourism: Emerging Challenges and Future Prospects. Kanishka, NewDelhi.
3. Hall, M. and Stephen, P. (2006) Geography of Tourism and Recreation – Environment, Place and Space, Routledge, London.
4. Kamra, K. K. and Chand, M. (2007) Basics of Tourism: Theory, Operation and Practise, Kanishka Publishers, Pune.34
5. Page, S. J. (2011) Tourism Management: An Introduction, Butterworth-Heinemann- USA. Chapter2.
6. Raj, R. and Nigel, D. (2007) Morpeth Religious Tourism and Pilgrimage Festivals

7. Management: An International perspective by, CABI, Cambridge,USA,www.cabi.org.
8. Tourism Recreation and Research Journal, Center for Tourism Research and Development,Lucknow
9. Singh Jagbir (2014) “Eco-Tourism” Published by - I.K. International Pvt. Ltd. S-25, Green Park Extension, Uphaar Cinema Market, New Delhi, India (www.ikbooks.com).
10. Market Research Division, Dept. of Tourism, Govt. of India, India Tourist Statistics (avail-able in PDF form), New Delhi
11. UNWTO: Tourism Barometer (available in their web portal to have a fresh glimpse of globaltourism statistics/ other relevant sites may also be consulted)

Four-Year Undergraduate Programme in Geography
Gauhati University

Eligibility Criteria of the programme, if any: For B.A. programme No Precondition, For B.Sc. programme 10 + 2 with Science

Semester	Course name	Major/Minor	Course code	Credits	Credit distribution of the course			Pre-requisites of the course (if any)	Internal marks	External Marks
					L	T	P			
I	Introduction to Physical Geography	**Major 1 & Minor1 (for Minor stream) & Minor 1 (*For Major in other subjects*)**	GGY 0100104	4	4	0	0	No	40	60
II	Introduction to Human Geography	**Major 2 & Minor2 (for Minor stream & Minor 2 (*For Major in other subjects*)**	GGY 0200104	4	4	0	0	No	40	60
III	Geography as a Spatial Science	**Major 3 & Minor3 (for Minor stream)**	GGY 0300104	4	4	0	0	No	40	60
III	Geography of Disaster	**Major 4 & Minor4(For Minor stream) & Minor 3 (*for Major in other subjects*)**	GGY0300204	4	4	0	0	No	40	60
IV	Geomorphology	**Major 5**	GGY 0400104	4	3	0	1	No	30	T-45 P-25
	Geography of India	**Major6 & Minor5 (for Minor stream) & Minor 4 (*For Major in other subjects*)**	GGY 0400204	4	3	0	1	No	30	T-45 P-25
	Cartographic Techniques	**(Major7)**	GGY 0400304	4	3	0	1	No	30	T-45 P-25
	Population and Settlement Geography	**Major 8 & Minor6 (for Minor stream)**	GGY0400404	4	3	0	1	No	30	T-45 P-25

V	Climatology, Biogeography and Oceanography	**Major 9 & Minor 7 (for Minor stream) & Minor 5 (*For Major in other subjects*)**	GGY 0500104	4	3	0	1	No	30	T-45 P-25
	Quantitative methods in Geography	**Major 10**	GGY 0500204	4	3	0	1	No	30	T-45 P-25
	*Economic and Resource Geography	**Major 11 & Minor 8(for Minor stream) *(Choose any one of these two papers)**	GGY 0500304	4	3	0	1	No	30	T-45 P-25
	*Social, Cultural and Political Geography		GGY 0500404	4	3	0	1	No	30	T-45 P-25
	Internship		GGY 0500504	4				No		100
VI	Geography of Environment and Development	**Major 12 & Minor 9 (for Minor stream)**	GGY 0600104	4	3	0	1	No	30	T-45 P-25
	Introduction to Remote Sensing and GIS	**Major13**	GGY 0600204	4	3	0	1	No	30	T-45 P-25
	Urban Geography	**Major14 & Minor 10 (for Minor stream)**	GGY 0600304	4	3	0	1	No	30	T-45 P-25
	*Surveying Techniques	**Major 15 & Minor 11(for Minor stream) & Minor 6 (*For Major in other subject)* *(Choose any one of these two papers)**	GGY 0600404	4	3	0	1	No	30	T-45 P-25
	*Geography of North East India		GGY 0600504	4	3	0	1	No	30	T-45 P-25

FYUGP in Geography (Major/Minor)

Template for Common courses

Programme name (AEC/VAC/MDC/SEC)	Eligibility Criteria of the programme, if any	Semester	Course name	Course code	Credits	Credit distribution of the course			Pre-requisite of the course (if any)	Internal marks	External Marks
						L	T	P			
SEC	No	1	Essential of Map Making	SEC01001 03	3	3	0	0	No	30	45
SEC	NO	2	Data Collection. Analysis and mapping	SEC02001 03	3	3	0	0	No	30	45
SEC	NO	3	Geography of Tourism	SEC03001 03	3	3	0	0	No	30	45

<u>Students need to take 5 papers in the 7th and 8th semesters each</u>

Template for Geography (Fourth Year) (FYUGP in Geography with Honours)

Eligibility Criteria of the programme, if any: **Geography** as a MAJOR subject or Geography as a MINOR Subject up to 3rd Year with a minimum of 24 credits

Semester	Course name	Course code	Credits	Credit distribution of the course			Pre-requisites of the course (if any)	Internal marks	External Marks
				L	T	P			
VII	Geographical Thought	GGY 0700104	4	4	0	0	No	40	60
	Field Techniques in Geography	GGY 0700204	4	3	0	1	No	30	T-45 P-25
	Climate Change and Sustainability Science	GGY 0700304	4	3	0	1	No	30	T-45 P-25
	Micro Area Studies and Regional Analysis	GGY 0700404	4	3	0	1	No	30	T-45 P-25
	Research Methodology in Geography	GGY 0700504	4	3	0	1	No	30	T-45 P-25
VIII	Project Formulation and Execution	GGY 0800104	4	4	0	0	No	40	60
	Geography of Rural Landscape and Livelihood	GGY 0800204	4	3	0	1	No	30	T-45 P-25
	Introduction to Hydrology	GGY 0800304	4	3	0	1	No	30	T-45 P-25
	Geography of Health	GGY 0800404	4	3	0	1	No	30	T-45 P-25
	Gender Geography	GGY 0800504	4	3	0	1	No	30	T-45 P-25

Template for Geography (Fourth Year) (FYUGP in Geography Honours with Research)

Eligibility Criteria of the programme, if any: **Geography** as a MAJOR subject or Geography as a MINOR Subject up to 3rd Year with a minimum of 24 credits

Semester	Course name	Course code	Credits	Credit distribution of the course			Pre-requisites of the course (if any)	Internal marks	External Marks
				L	T	P			
VII	Geographical Thought	GGY 0700104	4	4	0	0	No	40	60
	Field Techniques in Geography	GGY 0700204	4	3	0	1	No	30	T-45 P-25
	Climate Change and Sustainability Science	GGY 0700304	4	3	0	1	No	30	T-45 P-25
	Micro Area Studies and Regional Analysis	GGY 0700404	4	3	0	1	No	30	T-45 P-25
	Research Methodology in Geography	GGY 0700504	4	4	0	0	No	40	60
VIII	Project Formulation and Execution	GGY 0800104	4	4	0	0	No	40	60
	Dissertation	GGY0800216	16	16	0	0	No	0	400