

## **INTRODUCTION:**

Higher Education in India is considered as a critical core in the development and growth strategy of the nation. According to NEP 2020, Higher Education should put an emphasis on recognising, identifying, and fostering each student's unique strengths by educating teachers and parents about the need of encouraging each student's holistic development in both curricular and co-curricular areas. It must be flexible enough to allow students to select their learning paths and programmes and, in turn, pick their own life choices based on their talents and interests. For a pluralistic world, there should be a focus on multidisciplinary and a comprehensive education in the sciences, social sciences, arts, humanities, and sports to ensure the unity and integrity of all knowledge.

Geography is a multifaceted discipline that explores the interactions between the natural and human worlds, and the spatial patterns and processes that shape our planet. It encompasses a broad range of sub-disciplines, including physical geography, human geography, environmental geography, and geospatial sciences, each with their unique perspectives and methodologies. The Four Year Undergraduate Programme (FYUGP) in Geography provides students with a comprehensive understanding of this dynamic field through a balanced mix of theoretical and practical courses.

The Bachelor of Arts/Science in Geography degree of Madhabdev University adapted as per the recommendations of NEP 2020 will also be of either three or four year duration, with multiple exit options within the period with appropriate certification. After completion of one year a UG certificate, after completion of two years a UG diploma, after completion of three years a Bachelor's degree in the programme will be provided to the students. The four year undergraduate programme in Geography will allow the student an opportunity to experience the full range of holistic and multidisciplinary education, along with the chosen Major and Minor choices of the students.

## **AIMS OF FOUR YEAR UNDER-GRADUATE PROGRAMME (FYUGP) IN GEOGRAPHY:**

The aims of Four Year Under-Graduate Programme (FYUGP) in Geography are:

1. Provide a comprehensive understanding of the discipline of geography: The FYUGP in Geography aims to introduce students to the breadth and depth of the field of geography, including its sub-disciplines, theories, methods, and applications. Students will gain a broad-based knowledge of the natural and human systems that shape the earth's landscapes and environments, as well as the social and cultural processes that influence them.

2. Develop critical thinking and analytical skills: The FYUGP in Geography aims to develop students' ability to analyze and interpret geospatial data and phenomena using a range of tools and technologies. Students will learn how to identify and evaluate spatial patterns, relationships, and trends, and apply critical thinking and problem-solving skills to real-world scenarios.

3. Foster an interdisciplinary and holistic approach to problem-solving: The FYUGP in Geography aims to cultivate an interdisciplinary and holistic approach to understanding and addressing complex issues that affect the environment, society, and economy. Students will learn how to integrate knowledge and methods from different disciplines, such as biology, geology, economics, sociology, and political science, to develop innovative and sustainable solutions to environmental and social problems.

4. Provide opportunities for experiential learning and research: The FYUGP in Geography aims to provide students with opportunities for experiential learning and research, through field trips, internships, research projects, and collaborations with faculty and peers. Students will gain hands-on experience in using geospatial technologies, conducting fieldwork, collecting and analyzing data, and communicating their findings to diverse audiences.

5. Prepare graduates for diverse career paths and lifelong learning: The FYUGP in Geography aims to prepare graduates for diverse career paths in the public, private, and non-profit sectors, as well as for further education and lifelong learning. Graduates will be equipped with a range of transferrable skills, including communication, teamwork, leadership, and problem-solving, that will enable them to adapt to changing professional and societal contexts.

### **COURSES OUTCOMES OF GEOGRAPHY:**

**1. Disciplinary knowledge:** Graduates of the FYUGP in Geography will possess a deep and comprehensive understanding of the principles, theories, and methodologies of the field of geography, including its sub-disciplines such as physical geography, human geography, and geomatics. They will have a strong foundation in the theoretical and empirical underpinnings of geography, and be able to apply this knowledge to analyze and interpret environmental and social phenomena. They will also be able to articulate the relevance and significance of geography to contemporary environmental and social issues.

**2. Geospatial literacy:** Graduates of the FYUGP in Geography will possess a strong foundation in geospatial literacy, including the ability to analyze and interpret geospatial data, use geographic information systems (GIS), and apply remote sensing techniques. They will have a thorough understanding of the principles of cartography, geodesy, and spatial statistics, and be able to apply these principles to real-world problems.

**3. Critical thinking and problem-solving:** Graduates of the FYUGP in Geography will be skilled critical thinkers and problem-solvers, able to identify and analyze complex environmental, social, and economic issues, and develop innovative and sustainable solutions. They will have experience in using qualitative and quantitative methods to collect and analyze data, and be able to communicate their findings effectively to diverse audiences.

**4. Interdisciplinary perspective:** Graduates of the FYUGP in Geography will have an interdisciplinary perspective on complex issues, drawing on knowledge and methods from diverse fields such as ecology, economics, sociology, and political science. They will be able to integrate this knowledge to develop holistic and nuanced understandings of complex issues, and develop innovative and sustainable solutions.

**5. Global and cultural competence:** Graduates of the FYUGP in Geography will have a global and cultural competence, with an understanding of the diverse cultural, social, and economic contexts in which environmental and social issues occur. They will be able to work effectively with people from different cultural backgrounds, and have a nuanced understanding of the implications of cultural differences for environmental and social problem-solving.

**6. Ethical and professional practice:** Graduates of the FYUGP in Geography will be committed to ethical and professional practice, with an understanding of the ethical and legal issues involved in environmental and social problem-solving. They will be able to work collaboratively and responsibly with colleagues and stakeholders, and have a commitment to lifelong learning and continuous professional development

## **PROGRAMME LEARNING OUTCOMES**

An undergraduate student of Geography should be able to:

**PLO 1.** Demonstrate a comprehensive understanding of the principles, concepts, and theories of geography, including its sub-disciplines such as physical geography, human geography, and geomatics.

**PLO 2.** Apply critical thinking and problem-solving skills to analyze and interpret geospatial data and phenomena, and develop innovative and sustainable solutions to environmental and social issues.

**PLO 3.** Utilize a range of geospatial technologies, including geographic information systems (GIS), remote sensing, and spatial statistics, to collect, manage, and analyze geospatial data.

**PLO 4.** Conduct fieldwork and research projects, utilizing both qualitative and quantitative methods, to collect and analyze data on environmental and social phenomena.

**PLO 5.** Communicate effectively in written, oral, and visual forms, to diverse audiences, including academic and non-academic audiences, using appropriate technologies and media.

**PLO 6.** Work effectively in diverse teams, demonstrating leadership, communication, and collaboration skills, to solve complex environmental and social problems.

**PLO 7.** Develop an interdisciplinary and holistic perspective on environmental and social issues, drawing on knowledge and methods from diverse fields such as ecology, economics, sociology, and political science.

**PLO 8.** Demonstrate global and cultural competence, with an understanding of the diverse cultural, social, and economic contexts in which environmental and social issues occur.

**PLO 9.** Apply ethical and professional standards, demonstrating a commitment to responsible and sustainable environmental and social practices.

**PLO 10.** Engage in lifelong learning and professional development, staying abreast of current trends and advances in the field of geography, and contributing to the advancement of the discipline through research and practice.

### **TEACHING LEARNING PROCESSES:**

The programme allows to use varied pedagogical methods and techniques both within classroom and beyond.

- Lecture
- Tutorial
- Power point presentation
- Documentary film on related topic
- Project Work/Dissertation
- Group Discussion and debate
- Seminars/workshops/conferences
- Field visits and Report/Excursions.
- Laboratory Work
- Mentor/Mentee.

### **TEACHING LEARNING TOOLS**

- Projector
- Smart Television for Documentary related topic
- LCD Monitor
- WLAN

- White/Green/Black Board
- Computer Lab with GIS and Remote Sensing tools
- Soil and Water Testing Lab
- UAV (Drones) Tracing Table
- Dumpy's Level, Theodolite
- GPS,
- Toposheets and Satellite Image
- Globes, Charts, Maps
- Plane Table Set, Prismatic Compass,
- Levelling Staff, Rotameter

### **ASSESSMENT**

- Home assignment
- Project Report
- Class Presentation: Oral/Poster/Power point
- Group Discussions In semester examinations
- End Semester examinations

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**DEPARTMENT OF GEOGRAPHY.**

**SEMESTER –I (MAJOR)**

**INTRODUCTION AND HISTORICAL DEVELOPMENT OF GEOGRAPHIC THOUGHT.**

**OR**

**EVOLUTION OF GEOGRAPHIC THOUGHT.-**

**CREDIT= 4**

Objectives of the Paper:

- This is a core paper that intends to introduce students to philosophical and methodological issues in the development of the discipline of geography.
- To assess the nature and trend of ancient, medieval and modern trends in the field of geography.

Course outcomes:

- The paper will be useful for students in understanding perspectives on the development and contemporary trends in geography and its systematic study.
- The paper will be useful for students preparing for UGC NET/SLET exams and other competitive exams including the civil service.

Learning outcomes:

- Develop philosophical and historical aptitude in context of evolution and development of geographical ideas, themes, approaches and knowledge.
- Develop a critical thinking regarding different schools, paradigm, ideological revolution and new sub-branches of geography.
- Enhance ability to critically evaluate the nature of geography as spatial science with changing space and time.

UNITS	NAME	CONTENT	TOTAL HOUR
1. ( 10 Marks)	Introduction to Geography .	a. Meaning, scope and relevance of Geography. b. Geography as an integrating discipline.	5
2. (20 Marks)	Development of Geography—Classical and Medieval period.	a. Evolution of Geographical thinking with reference to Greek, Roman and Indian Scholars. b. Arab Geographical thought in Medieval Period. c. Impact of Exploration and discoveries in middle age.	25

3. (20 Marks)	Development of Geography— Modern period	a. Evolution of Geographical thinking in Germany, France, Britain, United States of America.	15
4. (20 Marks)	Debates in Geography	a. Dualism and Dichotomies in Geography. b. Debates on Physical Vs Human; Determinism Vs Possibilism ; Systematic Vs Regional; c. Paradigm shift in Geography	15

### Reading List

- Evolution of geographical Thought by Majid Hussain
- Modern Geographic Thought by Richard Peet
- Geographical thought by Lalita Rana
- Evolution of geographical Thought by E-Book, Dr Krishnanand
- Geographical thought by R D Dikshit
- Geographical thought by A Nayak
- Geographic Thought A Praxis Perspective by G Henderson
- Bhogolik Bhabadarsha Aru Samajik Bhugule by Gitali Hazarika ( Assamese Medium)

### **SEMESTER –I ( MINOR) PHYSICAL GEOGRAPHY. CREDIT-4**

Objectives of the Paper :

- To introduce students to the principles of physical geography and their applications.
- To enable students to develop a deep understanding of the processes that drive physical geography.
- To enable students to apply the principles of physical geography to practical real world situation.

Learning outcomes:

- Explain the basic concepts and principles of Physical geography.
- Identify the major processes that shape the earth's physical environment.

- Analyze how physical geography processes impact human activities and development.
- Apply critical thinking skills to analyse and solve problems related to physical geography.

UNITS	NAME	CONTENT	TOTAL HOUR
1. (10 Marks)	Introduction to Physical Geography.	a. Definition and scope of Physical Geography. b. Branches of Physical Geography. c. Earth and its component.	8
2. (20 Marks)	Lithosphere	a. Origin and evolution of Earth. ( Tidal Hypothesis, Binary star hypothesis, Big bang Theory, Chamberlin and Moulton's Planetsimal Hypothesis, Nebular Hypothesis ). b. Internal Structure of the earth. c. Isostasy.	18
3. (20 Marks)	Geomorphic processes ( Endogenetic and Exogenetic)	a. Earth Movement: Types of Fold and Fault; Plate Tectonic ; b. Earthquakes and Volcanoes. ( Cause, effect and distribution). c. Exogenetic Processes- Weathering , Mass wasting, d. Cycle of Erosion ( Davis and Penck).	18
4. (20 Marks)	Landforms	a. Rocks and Minerals. b. Evolution of Landforms ( Erosional and Depositional )----Fluvial, Karst, Aeolian, Glacial and Coastal.	16

Reading list:

- 1 Physical geography by Strahler A and Strahler A
- 2 Essential of Physical Geography by Petersen J
- 3 Fundamentals of physical geography by M Hussain, Rawat Publication, Jaypur
- 4 Principles of physical geography by Monk House F J
- 5 Prakritic Bhugol (Pratham Khanda) by Pachimuddin Ahmed , Assamese medium
- 6 Prakritic Bhugol by Bhuban Gogoi, Assamese medium
- 7 Physical geography by A Dasgupta and A N Kapoor
- 8 Physical geography by Savindra Singh
- 9 Bhugol Bijnan Pratham khanda by Dr Harendra Nath Sarmah and Dr Hariprasanna Das, GU Publication



**SEMESTER –II ( MAJOR)**  
**GEOMORPHOLOGY**  
**CREDIT-4**

Objectives of the paper:

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

Learning outcomes:

- This course will help students to understand the evolution and development of various landforms and the associated geomorphic processes in different geo-environmental setting.
- It enables students to apply geomorphic knowledge and techniques to investigate different land features and the causes of changes in spatiotemporal contexts.
- It will help students to get exposure to the theories and concepts related to the development of the earth and its relief features.

UNITS	NAME	CONTENT	TOTAL HOUR
1. (10 Marks)	Introduction to Geomorphology.	a. Meaning and Scope. b. Fundamental Geomorphic concept. c. Introduction to Geomorphic processes.	13
2. (20 Marks)	Geomorphic processes ( Endogenetic)	a. Internal Structure of the earth. b. Isostasy. c. Earth Movement: Types of Fold and Fault; Plate Tectonic ; d. Concept of Geosyncline and theories of Mountain building ( Kober and Holme) e. Earthquakes and Volcanoes. ( Cause, effect and distribution).	17
3. (20 Marks)	Geomorphic processes ( Exogenetic)	a. Exogenetic Processes- Weathering , Mass wasting, b. Cycle of Erosion ( Davis and Penck).	13
4. (20 Marks)	Evolution of landforms	a. Classification of landforms. b. Evolution of Landforms ( Erosional and Depositional )----Fluvial, Karst,	17

		Aeolian, Glacial and Coastal.	
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**Reading List**

- 1 Introducing Physical geography by Strahler AN
- 2 Principles of geomorphology by Thorn Bury, W D
- 3 Perspectives in geomorphology by sharma HS (Vols I to IV), concept New Delhi Publication
- 4 Quarternary geomorphology in India by Bali chandra Das, Sandipan Ghose
- 5 A Text Book of Geomorphology by Philip G Worcester
- 6 Geomorphology by Savindra Singh
- 7 Introducing To geomorphology by Vishwas S Kale and Avijit Gupta
- 8 Fundamentals geomorphology by Huggett RJ 2018
- 9 Geomorphology by Dr Y I Singh
- 10 Physical geography by Mazid Hussain

**SEMESTER –II ( MINOR)  
HUMAN GEOGRAPHY  
CREDIT-4**

Objectives of the Paper :

- Identify and understand the basic concepts , theories and approaches of human geography –including population, urbanization, culture and politics.
- Develop the skills to understand the complex relationship between human and their physical and social environment
- To appreciate the importance of human geography is understanding contemporary world issues and challenges

Learning outcomes:

- Students will be able to identify and describes the fundamental concepts , theories and approaches of human geography.
- Students will be able to apply the skill of analysis and interpretation to a range of geographical phenomenon.
- Students will be able to recognized the significance of human geography in addressing contemporary world issues and challenges.

UNITS	NAME	CONTENT	TOTAL HOUR
1. (10 Marks)	Introduction to Human Geography	a. Definition, scope and contemporary relevance of Human geography. b. Environmental Determinism, Possibilism, Neo-determinism.	12
2. (20 Marks)	Population	a. Population growth and distribution. b. Population composition. c. Theories of population-	15

		Demographic Transition Theory and Malthus Theory.	
3. (20 Marks)	Space and Culture	a. Social space—Concept and types. b. Cultural regions : World and India. c. Cultural Diffusion- meaning and factors. d. Races –Classification and distribution. e. Geographies of Welfare and Well being: Concept and Component— Healthcare, Housing and Education.	18
4. (20 Marks)	Settlements	a. Types of Rural Settlements. b. Classification of Urban settlements. c. Trends of Worlds Urbanization spl. reference to India.	15

### **Reading List**

- 1 Human Geography majid Hussain, Rawat Publication, Jaipur
- 2 Manab Bhugol by Prassanda kalita, Pachimuddin Ahmed ( Assamese Medium)
- 3 The Dictionary of Human geography by Johnston R, Gregory D, Pratt G
- 4 The Dictionary of human Geography by Johnston R, Gregory, d Pratt.et al(2008)
- 5 Manav Bhugol by kaushik, SD(2010) Rastogi Publication, meerut
- 6 Manav Bhugol by Maurya, SD (2012), Shardapustak Bhawan, Allahabad
- 7 Manav Bhugol by Bhuyan, MC, G.U.

### **SEMESTER –III ( MAJOR) CLIMATOLOGY AND BIOGEOGRAPHY CREDIT-4**

Objectives of the Paper :

- To scientific understanding of the physical aspects of Eart’s climate system and the factors that influence climate change.
- To explore the global balance of energy and transfer of radiation in the atmosphere through in-depth quantitative analysis and the general circulation of winds.
- To highlight important atmospheric phenomena and their direct bearing on man. It emphasis on understanding the weather phenomena and its impact on day to day life.
- To understand how natural surrounding and huan activities are responsible for the distribution of plants and animals.

Learning outcomes:

- Students will be able to understand the mean global atmospheric circulations and disturbances.
- Response to Global warming at individual as well as societal level; responding to issues of climate change and its impact.

- Weather interpretation and forecasting.

UNITS	NAME	CONTENT	TOTAL HOUR
1. (10 Marks)	Atmospheric Temperature and Insolation.	a. Composition and Structure of Atmosphere. b. Temperature : Factors and distribution. c. Insolation, Heat budget , Temperature Inversion.	9
2. (20 Marks)	Atmospheric Pressure and Winds.	a. Pressure belts, Planetary winds, Pressure gradient, General Circulation, Jet stream, Monsoon. b. Concept of Airmass and Fronts c. Cyclones and Anticyclones, Tropical Cyclones , Extra Tropical Cyclones, Local winds	18
3. (20 Marks)	Atmospheric Moisture.	a. Evaporation, Humidity, Condensation, Fog and Clouds, precipitation—types. b. Atmospheric stability and instability. c. Basis of Koppen’s climate Classification , its characteristics and related plants and animal life.	15
4. (20 Marks)	Biogeography.	a. Definition , scope and Significance of Bio-geography. b. World distribution of plants and its relation with soil, climate and human activities. c. World distribution of animals and its relation with vegetation, climate and human activities. d. Soil- forming processes, classification and distribution of soils, soil horizon and profile, soil erosion and conservation, major soil types of Assam and India.	18

Reading list :

- 1 Climatology by D S Lal
- 2 Climatology, Atmosphere, weather and Climate by K Siddhartha, Kitab Mahal
- 3 Climatology by Singh S
- 4 Biogeography by Robinson
5. Introduction to Biogeography by N.N. Sarma.
6. Biogeography by Savindar Singh.

**SEMESTER –III ( MAJOR)  
HUMAN GEOGRAPHY**

#### CREDIT-4

Objectives of the Paper :

- To understand the basic concepts , theories and approaches of human geography.
- To develop the skills required to analyse and interpret geographical phenomena.
- To appreciate the importance of human geography is understanding contemporary world issues and challenges.

Learning outcomes:

- Students will be able to identify and describes the fundamental concepts , theories and approaches of human geography.
- Students will be able to apply the skill of analysis and interpretation to a range of geographical phenomenon.
- Students will be able to recognized the significance of human geography in addressing contemporary world issues and challenges.

UNITS	NAME	CONTENT	TOTAL HOUR
1. (10 Marks)	Introduction to Human Geography	a. Definition, scope and contemporary relevance of Human geography. b. Environmental Determinism, Possibilism, Neo-determinism. c. Man- environment relationship in various geographical environment. ( Plateaus, hills, cold and hot region).	12
2. (20 Marks)	Population	a. Population growth and distribution. (Concept of Over-population, under-population and optimum population.) b. Population composition.( Age-Sex , Rural –Urban, Literacy). c. Population Dynamics: Fertility, Mortality and Migration—Measures, Determinants and Implications. d. Theories of population- Demographic Transition Theory and Malthus Theory. e. Contemporary Issues—Ageing of Population, Declining Sex Ratio, HIV/ AIDS.	16
3. (20 Marks)	Space and Culture	a. Social space—Concept and types. b. Cultural regions : World and India. c. Cultural Diffusion- meaning and factors. d. Races –Classification and distribution. ( World and India) e. Geographies of Welfare and Well being: Concept and Component— Healthcare, Housing and Education.	16

4. (20 Marks)	Settlements	a. Origin and growth of human settlements and its classification. b. Types of Rural Settlements. c. Functional Classification of Urban settlements. d. Trends of Worlds Urbanization spl. reference to India. e. Urban issues : problems of housing, slums, civic amenities ( water and transport). f. Christaller's theory of market place.	16
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### **Reading List**

1. Human Geography majid Hussain, Rawat Publication, Jaipur
2. Manab Bhugol by Prassanda kalita, Pachimuddin Ahmed ( Assamese Medium)
3. The Dictionary of Human geography by Johnston R, Gregory D, Pratt G
4. The Dictionary of human Geography by Johnston R, Gregory, d Pratt.et al(2008)
5. Manav Bhugol by kaushik, SD(2010) Rastogi Publication, meerut
6. Manav Bhugol by Maurya, SD (2012), Shardapustak Bhawan, Allahabad
7. Manav Bhugol by Bhuyan, MC, G.U.
8. Principles of Human Geography By Memoria , CB and Singh, P , Kitab Mahal
9. An Introduction to Climate by Trewartha, G T and Horne, H L

## **SEMESTER –III ( MINOR) CLIMATOLOGY AND BIOGEOGRAPHY CREDIT-4**

### Objectives of the Paper :

- To scientific understanding of the physical aspects of Earth's climate system and the factors that influence climate change.
- To explore the global balance of energy and transfer of radiation in the atmosphere through in-depth quantitative analysis and the general circulation of winds.
- To highlight important atmospheric phenomena and their direct bearing on man. It emphasis on understanding the weather phenomena and its impact on day to day life.
- To understand how natural surrounding and human activities are responsible for the distribution of plants and animals.
- The main objective of the paper is to sensitize the students towards global climatological, biogeographical and marine issues.

Learning outcomes:

- Students will be able to understand the mean global atmospheric circulations and disturbances.
- Response to Global warming at individual as well as societal level; responding to issues of climate change and its impact.
- Weather interpretation and forecasting.

UNITS	NAME	CONTENT	TOTAL HOUR
1. (10 Marks)	Atmospheric Temperature and Insolation.	a. Composition and Structure of Atmosphere. b. Temperature : Factors and distribution. c. Insolation, Heat budget , Temperature Inversion.	9
2. (20 Marks)	Atmospheric Pressure and Winds.	d. Pressure belts, Planetary winds, Pressure gradient, General Circulation, Jet stream, Monsoon. e. Concept of Airmass and Fronts f. Cyclones and Anticyclones, Tropical Cyclones , Extra Tropical Cyclones, Local winds	18
3. (20 Marks)	Atmospheric Moisture.	d. Evaporation, Humidity, Condensation, Fog and Clouds, precipitation—types. e. Atmospheric stability and instability. f. Basis of Koppen’s climate Classification , its characteristics and related plants and animal life.	15
4. (20 Marks)	Biogeography.	e. Definition , scope and Significance of Bio-geography. f. World distribution of plants and its relation with soil, climate and human activities. g. World distribution of animals and its relation with vegetation, climate and human activities. h. Soil- forming processes, classification and distribution of soils, soil horizon and profile, soil erosion and conservation, major soil types of Assam and India.	18

Reading list :

- 1 Climatology by D S Lal
- 2 Climatology, Atmosphere, weather and Climate by K Siddhartha, Kitab Mahal
- 3 Climatology by Singh S
- 4 Biogeography by Robinson

5. Introduction to Biogeography by N.N. Sarma.
6. Biogeography by Savindar Singh.

**SEMESTER –IV ( MAJOR)**  
**HYDROLOGY, OCEANOGRAPHY AND ENVIRONMENTAL GEOGRAPHY**

**CREDIT-4**

Objectives of the Paper :

- To Study the interrelationship between water and its environment and enhance the learner's understanding about hydrological cycle mainly precipitation, evapotranspiration, runoff and groundwater.
- To study the physiography of ocean floor with ocean water movements.
- To acquaint the students with various aspects of Environment, ecology , ecosystem and learn about environmental degradation and restoration.

Course outcomes:

- Students will be able to understand the characteristics of river basin and problems of regional hydrology.
- They will be able to understand the dynamics of ocean floor topography , oceanic movement, salinity and temperature of the ocean.
- Appreciate the structure and functions of ecosystems with examples.
- Understand the environmental problems and relevant management strategies.
- Acquire knowledge about the new environmental policies and the need to revise policies to tackle the environmental issues .

UNITS	NAME	CONTENT	TOTAL HOUR
1. (15 Marks)	Hydrology.	a. Hydrological Cycle. b. Precipitation, interception, evaporation, evapo-transpiration, infiltration, ground water, run off and over land flow. c. Characteristics of river basins, basin surface run off, measurement of river discharge, floods and droughts.	15
2. (20 Marks)	Oceanography.	a. Ocean floor topography . b. Bottom configuration of Atlantic, Pacific and Indian ocean. c. Ocean Salinity and Temperature— distribution and determinants. d. Tides and currents : Ocean currents of the Atlantic, Pacific and Indian Ocean. e. Ocean resource and marine deposits.	15
3. (15 Marks)	Ecology.	a. Ecology and Ecosystem- concept, types, structure, and functioning of ecosystem. b. Biomes : concept and types.	15



		c. Environmental problems in Tropical, Temperate and Polar Ecosystem. d. Threat to Biodiversity and its conservation.	
4. (20 Marks)	Environment Degradation.	a. Environmental impact assessment and management. b. Disaster and Disaster management. c. Global and regional environmental programmes—Functions of UNEP and UNDP. d. Concept of Sustainable Development.	15

Reading list:

- 1 Principles of Physical Geography by Monkhouse, F J
- 2 Physical Geography by Singh, Savindra
- 3 Principles of Geomorphology by Thornburry, W D
- 4 Physical Geography by Strahler, A.N.
- 5 Fundamentals of Hydrology by Sanjay Akhuri and H.M. Akhuri
- 6 Fundamentals of Hydrology by Savindra Singh
- 7 Oceanography by Dr Y.I. Singh
- 8 Oceanography for Geographers by Sarmah and Vatal
- 9 Oceanography by Savindra Singh
- 10 Oceanography by D.S. Lal
- 11 The Environment By Park, C 1997
- 12 Environmental Geography by Savindra Singh
- 13 Geography and Man's Environment by Strahler, A.H & A.H. Stahler
- 14 Environmental Geography by Savindra Singh and Mohit Kumar

**SEMESTER –IV ( MAJOR)  
FUNDAMENTALS OF ECONOMIC GEOGRAPHY  
CREDIT-4**

Objectives of the Paper :

- To convey an understanding of the fundamental concepts of Economic Geography.
- To understand the dynamics of Economic activities, man's resources use, population pressure on resource base.

- To understand the rationale for the location of industries and agricultural activities in its geographical perspectives and human land use by locational theories.

Learning outcomes:

- Students will be able to understand the concept of economic geography and various economic activities taking place in the world.
- Understand the relationship between geographical condition and economic development.

UNITS	NAME	CONTENT	TOTAL HOUR
1. (15 Marks)	Introduction to Economic Geography.	a. Meaning, nature and scope of Economic Geography. b. Approaches to study Economic geography. c. Fundamental concepts in Economic Geography.	10
2. (20 Marks)	Introduction to Resources.	a. Resource, Concept and resource creating factor. b. Classification and Types of resources. c. Zimmerman's Functional Theory of Resources. d. Distribution of major power resources in the world: coal, petroleum, natural gas and development of hydro and solar power. e. Role of technology in resource utilization: resource crisis and conservation of resources.	20
3. (15 Marks)	Economic activities.	a. Concept and classification of economic activity. b. Factors effecting location of economic Activity with special reference to Agriculture ( Von Thunen theory) , Industry ( Weber's theory).	10
4. (20 Marks)	Primary, Secondary , tertiary and Quaternary activities	a. Primary activities: Subsistence and Commercial agriculture, forestry, fishing and mining. b. Secondary activities: Manufacturing ( Cotton Textiles, Iron and Steel), Concept of Manufacturing Regions, Special Economic Zones and Technology Parks. c. Tertiary activities: Transport , trade and Commerce. d. Quaternary activities: ICT	20

Reading list:

1. A New Approach to Economic Geography by Gurha, J.I. and Chattaraj, P.R.
2. Economic Geography by Alexander, J.W.
3. Geography of Resources by Nagi, B.S.

**SEMESTER –IV ( MAJOR)**  
**CARTOGRAPHY AND STATISTICAL METHODS IN GEOGRAPHY.**  
**CREDIT-4**

Objectives of the Paper :

This paper provides a general understanding of the field of cartography including its modern developments and importance in geographic studies. It more particularly focuses on various types of map scale and their construction; principles of map projection and construction of selected few; and thematic mapping.

Learning outcomes:

- Understanding the importance of various cartographic techniques in geographical study.
- General understanding of map type, map scale and map content.
- Acquire knowledge about the various techniques of surveying and its utility in geographical studies.

UNITS	NAME	CONTENT	TOTAL HOUR
1. (15 Marks)	Introduction to Map Projection.	a. Scale : Definition, Classification , and Conversion of scale . b. History of development of map projection, classification and use of different types of map projection, choices of map projection. c. Projection in GIS Software.	10
2. (20 Marks)	Cartographic methods.	a. Basic principles of surveying and their necessity in geography ; Vertical and horizontal control. b. Surveying and leveling— i) Plane table surveying—different methods. ii) Prismatic compass surveying—closed and open traverse, calculation of included angle, correction of bearing, omitted measurement. iii) Theodolite traversing—measurement of height. iv) Levelling—different types.	15

		c. Introduction to modern techniques- Remote sensing, GIS and GPS.	
3. (10 Marks)	Introduction to Statistical methods.	a. Use of Data in Geography: Geographical Data Matrix, significance of Statistical Methods in Geography, Sources of Data, Scales of measurement ( Nominal, Ordinal, Interval , Ratio).	10
4. (25 Marks)	Quantitative methods.	a. Measures of Central Tendency—Mean, Median and Mode , and their application in data analysis. b. Concept of dispersion- mean deviation, standard deviation and quartile deviation and their utility in the study of Geographical phenomena. c. Concept of correlation and regression, techniques of measuring correlation and regression and their application in Geographical studies. d. Sampling and its application in Geographical studies.	25

Reading list:

1. Statistical geography Methods and Applications by Zamir alvi
2. Byavaharik Bhugol Bijnan, GU, by Deka, P. and Bhattacharya, N.N.
3. Elements of Cartography by Robinson, A.H.
4. Fundamentals of Cartography by Misra, R.P. and Ramesh, A
5. Statistical Methods in Geographical Studies by Mahmood, A.

**SEMESTER –IV ( MAJOR)  
PRACTICAL  
CREDIT-4**

Objectives of the Paper :

Nnh The main objective of this paper is to make students aware about different types of map, various morphometric techniques used in drainage analysis , different types of diagram ,various types of map projection and its uses. V cnjjjjjn

Learning outcomes:

- Preparation of various maps and diagrams related to geographical studies.
- Students will became skilled at preparing , reading and analyzing different physical and cultural maps.

UNITS	NAME	CONTENT	TOTAL HOUR
1. (20 Marks)	Geomorphology.	<ul style="list-style-type: none"> <li>a. Topographical map – Interpretation of topographical map , profile drawing ( serial, superimposed, projected and composite), transact chart.</li> <li>b. Morphometric analysis: Drainage ordering, basin area demarcation, drainage density, Bifurcation ratio.</li> <li>c. Slope analysis—Wentworth’s method and Smith’s Methods.</li> </ul>	15
2. (10 Marks)	Climatology.	<ul style="list-style-type: none"> <li>a. Interpretation of various weather symbols depicted on maps.</li> <li>b. Preparation of rainfall- temperature graph: Hythergraph, Climograph and Ergograph.</li> </ul>	15
3. (10 Marks)	Biogeography and oceanography.	<ul style="list-style-type: none"> <li>c. Mapping of Protected areas ( National park, biosphere reserve, Wildlife sanctuary),</li> <li>a. Mapping of Bio-diversity hotspots of India.</li> </ul>	10
4. (30 Marks)	Cartography	<ul style="list-style-type: none"> <li>a. Prepare Zenithal Polar Gnomonic Projection, Zenithal Equal Area Projection, Cylindrical Equal area Projection, Gall’s Stereographic Projection, Mercator’s Projection, Conical One Standard Projection.</li> <li>b. Conduct Surveying <ul style="list-style-type: none"> <li>-i) Plane Table Surveying—Radial and intersection.</li> <li>ii) Dumpy’s level-Profile leveling ,contouring .</li> </ul> </li> <li>c. Isopleth map ( Rainfall Variability map) ; Choropleth map ( Population distribution by Multiple Dot Method, Population Density)</li> <li>d. Population growth: Line graph , Composite Bar graph.</li> <li>e. Digital Cartography: Geo-visualization techniques and web cartography</li> </ul>	20

### Reading List

- 1 Byavaharik Bhugol Bijnan, GU, by Deka, P. and Bhattacharya, N.N.
- 2 Elements of Practical Geography by Singh, R.L. and Singh Rana, P.B.

**SEMESTER –IV ( MINOR)  
ECONOMIC GEOGRAPHY  
CREDIT-4**

Objectives of the Paper :

- To convey an understanding of the fundamental concepts of Economic Geography.
- To understand the dynamics of Economic activities, man's resources use, population pressure on resource base.
- To understand the rationale for the location of industries and agricultural activities in its geographical perspectives and human landuse by locational theories.

Learning outcomes:

- Students will be able to understand the concept of economic geography and various economic activities taking place in the world.
- Understand the relationship between geographical condition and economic development.
- Understand the factors of agricultural landuse, various agricultural systems of the world and emerging scenario of the agriculture.
- Understand the factors of industrial location, various types of it,
- Evaluate the socio-economic and environmental implications of various types of industry.

UNITS	NAME	CONTENT	TOTAL HOUR
1. (10 Marks)	Introduction to Economic Geography	a. Meaning, nature and scope of Economic Geography. b. Approaches to study Economic geography.	10
2. (20 Marks)	Geography of Resource	a. Resources: meaning and classification. b. Distribution of mineral resources in the world: Iron ore, aluminum. c. Distribution of major power resources in the world: Coal, petroleum, natural gas, and development of hydel and solar power. d. Role of technology in resource utilization: resource crisis and conservation of resources.	20
	Agricultural	a. Determinants of agriculture.	10

3. (15 Marks)	Geography.	<ul style="list-style-type: none"> <li>b. World distribution of major crops ( Rice, Wheat, Cotton, Jute, Tea, Coffee, Sugercane).</li> <li>c. Agricultural regions of India and World-- Whitelessey's classification .</li> <li>d. Von Thunen's theory of agricultural location.</li> </ul>	
4. (20 Marks)	Industrial Geography.	<ul style="list-style-type: none"> <li>a. Factors affecting the location of Industry.</li> <li>b. Weber's Theory of industrial location.</li> <li>c. Classification and characteristics of Industry-Small, medium and heavy industry.</li> <li>d. Industrial regions of India.</li> <li>e. Impact of industrialization in India ; Environment, social and economic.</li> </ul>	20

Reading list:

- 1 Economic Geography by Alexander, J.W.
- 2 Geography of Resources by Nagi, B.S.
- 3 A New Approach to Economic Geography by Gurha, J.I. and Chattaraj, P.R.
- 4 Economic Geography by Hartshorn, T.A. and Alexander, J.W.
- 5 Economic Geography by saxena, H.M..

