

Interdisciplinary, Major & Minor



Tripura University
(A Central University)
Suryamaninagar
West Tripura

**Syllabus for
Four Years Under Graduate Programme
Under Science Discipline**

Subject: Geography (Interdisciplinary Course)
(NEP-2020)

Year-2023

1st Year (Certificate Course)
Semester-I
Contributions in Geography (Theoretical)

ID-GE- 1st Semester

Full marks-100 (Credit – 3)
(Internal Assessment-40; End Sem. Exam.-60)

Unit-1: Introduction to Geography

Definition, Concepts and Evolution of the term Geography; Divisions and Branches of Geography; Nature and Scope of Geography; Inter-relations of Geography with other Physical and Social Sciences

Unit-2: Contributors to Geography

Classical Contribution to Geography (Greeks and Romans); Indian and Chinese Contribution to Geography; Medieval Contribution to Geography by Arabs; Age of Discovery, Voyages and Renaissance in Europe; Modern Contribution to Geography: European and American

Unit-3: Approaches in Geography

Approaches to the study of Geography --- Regional and Systematic; Man-Environment Relationship: Determinism and Possibilism; Recent Trends in Geography; Contemporary Indian Geography

Unit-4: Paradigm Shift and Trends in Geography

Perspectives in Geography (Positivism, Humanism); Quantitative Revolution; Recent Trends in Physical and Human Geography; Contemporary Trends in Indian and International Geography

1st Year (Certificate Course)
Semester-I

Selected References:

1. Adhikari, S. (2006): Fundamentals of Geographical Thought, Chaitanya Publishing House, Allahabad
2. Adhikari, S. (2015): Fundamentals of Geographical Thought, Orient Blackswan Private Limited, New Delhi.
3. Dikshit, R. D. (2018): Geographical Thought: A Contextual History of Ideas, Prentice Hall, New Delhi.
4. Hartshorne, R. (2000): The Nature of Geography, Rawat Publication, New Delhi.
5. Hussain, M. (2014): Evolution of Geographical Thought, Rawat Publication, New Delhi.
6. HarmJ. deBlij (2001): Geography: Realms, Regions, and concepts, John Wiley & Sons.
7. Mandal, R.B & Sinha, VNP. (2016): Recent Trends & Concepts in Geography, Concept Publishing Company Pvt. Ltd., New Delhi.

2nd Year (Diploma Course)
Semester-III
Physical Geography (Theoretical)

**ID-GE- 3rd
Semester**

Full Marks-100 (Credit – 3)
(Internal Assessment-40; End Sem.Exam.-60)

Unit-1: Introduction to Physical Geography

Nature and Scope of Physical Geography; Different Branches of Physical Geography;
Geological Time Scale; Origin of the Earth: Big Bang Theory; Origin of the Continents and
Oceans; Continental Drift Theory and Plate Tectonic Theory.

Unit-2: Introduction to Lithology and Geomorphology

Internal Structure of the Earth; Types of Rocks: Characteristics and Classification; Folds and
Faults; Definition and Classification of Weathering and Mass Movement; Processes and
Landforms: Fluvial, Glacial, Arid and Coastal; Slope: Importance, Genetic Classification and
Components; Fundamental Concepts in Geomorphology (Concept 1-6 of Thornbury).

Unit-3: Climatology and Oceanography

Climatology: Composition and Structure of the Atmosphere; Atmospheric Pressure Belts and
General Wind System; Insolation and Heat Budget; Concept of Humidity, Evaporation and
Condensation; Types of Cloud; Precipitation: Causes and Forms, Types of Rainfall.

Oceanography: Surface Configuration of Ocean Floor: Pacific Ocean, Atlantic Ocean and
Indian Ocean; Temperature, Salinity and Density of Ocean Water; Oceanic Circulation System:
Pacific, Atlantic and Indian Ocean; Coral Reefs and Atoll.

Unit-4: Soil and Biogeography

Soil Geography: Definition; Components of Soil; Factors of Soil formation; Processes in
Soil formation; Soil Profile; Physical Properties (Texture, Structure and Moisture) and
Chemical Properties (pH and Organic Matter) of Soil; Major Soil Types of the World:
Zonal, Azonal and Intra-zonal Soil; Soil Erosion and Conservation.

Biogeography: Concept, Nature and Scope; Concept of Ecology and Basic Ecological
Principles; Concept and Components of Ecosystem; Trophic Structure; Food Chain and
Food Web; Concept of Biome, Major Biomes of the World: Forest, Grassland and Marine
Biome; Biogeochemical Cycles: Hydrological Cycle, Nitrogen Cycle and Carbon Cycle.

2nd Year (Diploma Course)

Semester-III

Selected References:

1. Singh, S.(1997): Physical Geography, Prayag Pustak Bhawan, Allahabad
2. Lal, D.S.(1998):Climatology, Sharada Pustak Bhawan,Allahabad
3. Khullar, D.R. (2003):India–A Comprehensive Geography, Kalyani Publisher, Chennai.
4. Dayal, P. (2011):A textbook of Geomorphology, Rajesh Publication, New Delhi
5. Singh, S. (2009): Geomorphology, Prayag Pustak Bhawan, Allahabad.
6. Ahmed, E. (2001): Geomorphology, Kalyani Publishers, Kolkata.
7. Ahmed, E. (1989): Physical Geography, Kalyani Publishers, New Delhi.
8. Monkhouse, F.J. (1971): Principles of Physical Geography, University of London Press Ltd.
9. Morgan, R.S and Wooldridge, S.W. (1988): An Outline of Geomorphology, Orient Longman.
10. Thornbury, W.D. (1984): Principles of Geomorphology, 2nd Edition Wiley Eastern Ltd., New Delhi.
11. Alan H. Strahler, Arthur Strahler (2005): Introducing Physical Geography, John Wiley and Sons, New York.
12. Singh, S. (2001): Environmental Geography, Prayag Pustak Bhawan, Allahabad.
13. Sahai, V.N. (2011): Fundamentals of Soil, Kalyani Publishers, New Delhi.
14. Gautam, A. (2009): Environmental Geography, Sharda Pustak Bhawan, Allahabad.

2nd Year (Diploma Course)
Semester-IV

Human Geography (Theoretical)

ID-GE- 4th Semester

Full Marks-100(Credit-3)

(Internal Assessment-40; End Sem.Exam.-60)

**Unit-1: Introduction to Human Geography
and Population Geography**

Human Geography: Concept, Nature and Scope; Fundamentals and Branches of Human Geography; Development of Human Geography; Inter-relations of Human Geography with other Social Sciences.

Population Geography: Distribution and Density of World Population; Age-Sex Composition of Population; Concept of Fertility, Mortality, Migration: Immigration and Emigration.

Unit-2: Social and Cultural Geography

Social Geography: Meaning, Nature and Scope; Social Groups; Social Processes; Social Wellbeing; Social Differentiation; Tribes and Castes; Distribution of Religion in India; Distribution of Language in India; Social Problems in India

Cultural Geography: Concept, Nature and Scope; Racial Division and World Distribution; Linguistic Distribution in the World; Cultural Diffusion and its Processes; Cultural Hearth and Cultural Realm.

Unit-3: Settlement Geography

Rural Settlement: Types and Patterns; Urban Settlement: Classification of Towns based on their Size and Functions; Census Categories of Urban units in India; Concept of City Region; Problems of Towns and Cities in India; Trends of Indian Urbanization.

Unit-4: Contemporary Issues

Ageing of Population; Decline in Sex-Ratio; Rural Development Programmes --- SJSY, MGNREGA, JANDHAN YOJANA and Rural Connectivity; Problems of Housing, Slums, Civic Amenities (Water and Transport); Case Study of Delhi, Mumbai, Kolkata, Chennai and Chandigarh with reference to Land Use and Urban Issues.

2nd Year (Diploma Course)

Semester - IV

Selected References:

1. Chandna, R. C. (2000): Geography of Population: Concept, Determinants and Patterns, Kalyani Publishers, New Delhi.
2. Clark, J.I. (1973): Population Geography, Pergamon Press, Oxford.
3. Hassan, M.I. (2005): Population Geography, Rawat Publication, New Delhi.
4. Mandal, R.B. (2008): Urban Geography: A Textbook, Concept Publishing Company, New Delhi.
5. Mitra, A. (1978): India's Population, Vol.I and II, Abhinav Publisher, Nagpur.
6. Ramachandran, R. (1989): Urbanisation and Urban Systems of India, Oxford University Press, U.K.
7. Siddhartha, K. (2016): Cities, Urbanisation and Urban Systems (Settlement Systems), Kitab Mahal Publishers and Distributors, New Delhi.
8. Zelinsky, W. (1966): A Prologue to Population Geography, Prentice Hall, N.J.
9. Broek Jan, O. M. and Jan Otto, Marius (1978): Geography of Mankind, McGraw Hill Companies.
10. Jordan Terry, G. and Lester, Rowntree (1990): The Human Mosaic: Thematic Introduction to Cultural Geography, Longman.



Tripura University

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Syllabus for

**Four Years Under Graduate Programme Under
Science Discipline**

Subject: Geography (Major Course)

(NEP-2020)

Year-2023

1st Year (Certificate Course)

Semester-I

Fundamentals of Geography and Major Contributions (Theoretical)

Major-GE-101

Full Marks-100(Credit-4)

(Internal Assessment-40; End Sem.Exam.-60)

Unit-1: Introduction to Geography

Definition, Concept and Evolution of the word 'Geography', Nature and Scope of Geography; Divisions and Branches of Geography; Inter-relation of Geography with other Physical and Social Sciences; Introduction to Physical Geography (Nature & Scope); Introduction to Human Geography (Nature & Scope); Major Geographic Traditions (Earth Science, Man-Environment relationship, Area studies and Spatial Analysis).

Unit-2: Contributors to Geography

Classical Contribution to Geography (Greeks and Romans); Indian and Chinese Contribution to Geography; Medieval Contribution to Geography by Arabs; Age of Discovery, Voyages and Renaissance in Europe; Modern Contribution to Geography: European and American.

Unit-3: Approaches, Dichotomy and Dualism in Geography

Approaches to the study of Geography --- Regional and Systematic; Man-Environment Relationship: Determinism and Possibilism; Dichotomy and Dualism: Physical vs. Human, Qualitative vs. Quantitative, System Approach vs. System Analysis.

Unit-4: Paradigm Shift and Trends in Geography

Perspectives in Geography (Positivism, Humanism); Quantitative Revolution; Applied Geography and Geoinformatics; Recent Trends in Physical and Human Geography; Contemporary Trends in Indian and International Geography

1st Year (Certificate Course)
Semester-I

Selected References:

1. Adhikari, S. (2006): Fundamentals of Geographical Thought, Chaitanya Publishing House, Allahabad.
2. Adhikari, S. (2015): Fundamentals of Geographical Thought, Orient Blackswan Private Limited, New Delhi.
3. Dikshit, R. D. (2018): Geographical Thought: A Contextual History of Ideas, Prentice Hall, New Delhi.
4. Hartshorne, R. (2000): The Nature of Geography, Rawat Publication, New Delhi.
5. Hussain, M. (2014): Evolution of Geographical Thought, Rawat Publication, New Delhi.
6. Harm J. deBlij (2001): Geography: Realms, Regions, and concepts, John Wiley & Sons.
7. Mandal, R.B & Sinha, VNP. (2016): Recent Trends & Concepts in Geography, Concept Publishing Company Pvt. Ltd., New Delhi, India.

1st Year (Certificate Course)

Semester-I

**Origin of the Earth
(Theoretical)**

Major-GE-102

Full Marks-60(Credit-2)

(Internal Assessment-24; End Sem.Exam.-36)

Unit-1: Concept, Hypotheses and Theories related to origin of the earth

Basic Concept of Solar System and its Structure; Monistic Concept: Gaseous Hypothesis of Kant, The Nebular Hypothesis of Laplace; Dualistic Concept: Hoyle's Supernova Hypothesis; Otto Schmidt's Interstellar Hypothesis; Big Bang Theory; Relevance of Rotation, Revolution and Inclination of the Earth.

Unit-2: Age of Earth, Origin and Evolution of Continents and Oceans

Age of the Earth on the basis of radioactive elements; Geological History of the Earth; Interior Structure of the Earth; Origin of the Continents and Oceans: Tetrahedral Hypothesis; Continental Drift Theory of Alfred Wegener.

1st Year (Certificate Course)
Semester-I

Selected References:

1. Gupte, D. (2022): The Evolution of Earth, Notion Press, Chennai.
2. Monkhouse, F.J (1971): Principles of Physical Geography, University of London Ltd.
3. Singh, S.(1997): Physical Geography, Prayag Pustak Bhawan, Allahabad
4. Strahler A.N. and Strahler A.M. (1992): Modern Physical Geography, John Wiley and Sons, New York.

1st Year (Certificate Course)

Semester-I

(Practical)

Major-GE-102

Full Marks-40(Credit– 2)

(Internal Assessment-16; End Sem.Exam.-24)

Sl. No.	Practical	Marks
1.	Scale	08
2.	Introduction to Maps	04
3.	Topographical Map introduction, Principle of Topo. sheet numbering	07
4.	Laboratory Notebook and Viva-voce	03+02
TOTAL		24

PRACTICAL: GE-102

1. Scale: Meaning, Definition and Use ; R.F. of Scale
Graphical representation of Linear, Comparative, Vernier and Diagonal Scale
2. Introduction to maps: Definition, Elements, Types and Classification, Principle of map design, Uses and Significance (from small to large scale), Map and Globe --- Similarities and Dissimilarities
3. Introduction to Topographical map (Concept of Contour, Latitude Longitude, Identification of Physical and Cultural features), Principle of Topographical Sheet numbering
4. Laboratory Notebook and Viva-voce

1st Year (Certificate Course)
Semester-I

Selected References:

1. Mitra, K., Ghosh, K. and Das M. (2006): B.A. General Practical Geography, Kalyani Publishers, Kolkata.
2. Monkhouse, F.J. (1971): Maps and Diagrams, Methuen, London.
3. Sarkar, A. (2015) Practical Geography: A systematic approach, Orient BlackSwan Private Ltd., New Delhi.
4. Saha, P. & Basu, P. (2015): Advanced Practical Geography– A Laboratory Manual, Books and Allied (P) Ltd., Kolkata.
5. Singh, R.L., Singh, Rana P.B. (2003): Elements of Practical Geography, Kalyani Publishers, New Delhi.
6. Singh, R. and Singh, K.: Map Work and Practical Geography, Central Book Depot, Allahabad.
7. Saikia, R. and Thakuria, G. (2015): Practical Geography, EBH Publishers (India), Guwahati.

1st Year (Certificate Course)
Semester-II
Geography of Asia and India
(Theoretical)

Major-GE-201

Full Marks-100(Credit– 4)

(Internal Assessment-40; End Sem.Exam.-60)

Unit-1: India—Location & Physical

Regional Setting and Regional Divisions; Physical Divisions and Drainage; Climate and Natural Vegetation; Soil types and Agricultural Regions

Unit-2: India—Population and Resources

Population composition (Races, Ethnic and Tribes); Population Density, Distribution and Growth; Minerals (Iron ore, Manganese), Energy Resources (Coal and Petroleum) and Industries (Iron and Steel, Cotton textile and Paper); Transport, Communication and Trade; Economy, Urbanization, Population Problems

Unit-3: Asia—Regional Setting and Physical

Asia in the context of the World (Location and Regional Setting); Physical and Regional Divisions; Major River Systems; Climate; Soil and Natural Vegetation

Unit-4: Asia--Agriculture, Population and Resources

Agriculture (Conditions of growth, Production and Distribution of Rice, Wheat, Jute and Tea); Distribution and Density of Population; Urbanization; Industry (Iron and steel, Electronics and automobile, Food processing industries of South-east and South Asia); Mineral and Energy Resources (Iron Ore, Coal, Petroleum in Middle-east); Regional Cooperation and Issues of South Asia and South-east Asian Countries

1st Year (Certificate Course)

Semester-II

Selected References:

1. Choudhury, N.: Geography of Asia, No.601 (Theory), Distance Education.
(Weblink:[https://www.distanceeducationju.in/pdf/Geo%20601%20\(1\)-compressed%20\(1\).pdf](https://www.distanceeducationju.in/pdf/Geo%20601%20(1)-compressed%20(1).pdf))
2. Husain, M. (2017): Geography of India, McGraw Hill Education, New Delhi.
3. IGNOU, BPSE-144 (2019): Introduction to South Asia, Chakradhar Publication.
4. Khullar, D.R. (2018): India: A Comprehensive Geography, Kalyani Publishers, New Delhi.
5. Nag, P. and Gupta, S.S. (1992): Geography of India, Concept Publishing Company, New Delhi.
6. Sharma, T.C. (2003): India: Economic and Commercial Geography, Vikas Publication, New Delhi.
7. Singh, J. (2003): India: A Comprehensive and Systematic Geography, Gyanodaya Prakashan, Gorakhpur.
8. Tiwari, R.C. (2007): Geography of India, Prayag Pustak Bhawan, Allahabad
9. Tirtha, R. (2001): Geography of Asia, Rawat Publications, Jaipur.

1st Year (Certificate Course)

Semester-II

Geomorphology (Theoretical)

Majorr-GE-202

Full Marks-60(Credit-2)

(Internal Assessment-24; End Sem. Exam.-36)

Unit-1: Fundamentals of Geomorphology

Nature and Scope of Geomorphology; Fundamental Concepts of W. D. Thornbury; Types of Rocks and associated landforms; Development of Drainage System on Uniclinal and Folded Structure; Mountain Building Theory (Kober and Holmes); Recent Trends in Geomorphology.

Unit-2: Processes and Forms in Geomorphology

Geomorphic agents, their processes and resultant landforms: Fluvial, Glacier, Wind, Groundwater and Sea waves; Weathering and Mass wasting (Meaning and Concept, Classification, Controlling factors, Geomorphic importance); Drainage Systems, Drainage Patterns (Definition, Classification); Slopes: Importance of Slope, Elements of Slope and Theories of Slope Evolution (W. M. Davis and W. Penck); Cycle of Erosion: Contribution of Davis; Interruption in Cycle of Erosion.

1st Year (Certificate Course)

Semester-II

Selected References:

1. Ahmed, E. (2001): Geomorphology, Kalyani Publishers, Kolkata.
2. Ahmed, E. (1989): Physical Geography, Kalyani Publishers, New Delhi.
3. Bloom, A.L. (1998): Geomorphology, Prentice-Hall India, New Delhi.
4. Chorley, R.J., Schumm, S.A. and Sugden D.E. (1984): Geomorphology, Methuenand Company Ltd., London.
5. Dayal, P. (2011): A text Book of Geomorphology, Rajesh Publication, New Delhi
6. Kale, V.S. & Gupta, A. (2001): Introduction to Geomorphology, Orient Longman.
7. Kale, V. & Gupta, A. (2004): Elements of Geomorphology, Oxford University Press, Kolkata.
8. Monkhouse, F.J. (1971): Principles of Physical Geography, University of London Press Ltd.
9. Morgan, R.S and Wooldridge, S.W. (1988): An Outline of Geomorphology, Orient Longman.
10. Singh, S. (1997): Physical Geography, Prayag Pustak Bhawan, Allahabad
11. Singh, S. (2009): Geomorphology, Prayag Pustak Bhawan, Allahabad
12. Strahler, A. (2016): Introducing Physical Geography, Wiley, New York.
13. Sparks, B.W. (1969): Geomorphology. Longman, London.
14. Stoddard, D.R. (1996): Process and Form in Geomorphology, Routledge, London.
15. Thornbury, W.D. (1984): Principles of Geomorphology, 2nd Edition Wiley Eastern Ltd., New Delhi.
16. Worcester, P.C. (1969): Text Book of Geomorphology, East West Press, New Delhi.

1st Year (Certificate Course)
Semester-II
(Practical)

Major-GE-202

Full Marks-40(Credit– 2)
(Internal Assessment-16; End Sem.Exam.-24)

Sl. No.	Practical	Marks
1.	Cartograms (Using MS Excel)	09
2.	Topographical map interpretation (Plateau Region)	10
3.	Laboratory Notebook and Viva–voce	03+02
TOTAL		24

PRACTICAL: GE-202C

1. Cartograms using MS Excel:

Line Graph, Bar Graph, Pie Chart, Age-Sex pyramid, Scatter diagram with Regression line

2. Topographical map interpretation (Plateau Region):

Broad Physiographic divisions and relief features

Serial Profile, Superimposed Profile, Projected Profile and Composite Profile

Morphometric analyses: Calculation of Relative relief, Dissection index, Average slope and Drainage density and their spatial distribution

Drainage patterns

Vegetation Map

Settlement types and patterns

Communication network Map

Transact Chart

3. Laboratory Notebook and Viva–voce

1st Year (Certificate Course) Semester-II

Selected References:

1. Saha, P. & Basu, P. (2015): Advanced Practical Geography– A Laboratory Manual, Books and Allied (P)Ltd., Kolkata.
2. Singh, R. L. & Singh, Rana P. B. (2003): Elements of Practical Geography, Kalyani Publishers, New Delhi.
3. Sarkar, A. (2015): Practical Geography: A Systematic approach, Orient BlackSwan Private Ltd., New Delhi.
4. Singh, R. & Singh, K.: Map Work and Practical Geography, Central Book Depot, Allahabad.

2nd Year (Diploma Course)
Semester-III
Population and Settlement Geography (Theoretical)

Major-GE-301

Full Marks-100 (Credit-4)

Unit-1: Population-Concept and Theory

(Internal Assessment-40;End Sem.Exam.-60)

Concept and Scope of Population Geography; Population Geography in India; Malthusian Theory of Population growth; Demographic Transition Theory; Cornucopian Theory of Population; Zero Population growth.

Unit-2: Population Dynamics

Distribution and Density of Population; Population Composition: Age, Sex, Literacy and Occupation; Fertility and Mortality of Population; Factors affecting Population change; Migration: Immigration and Emigration; Pattern of Migration

Unit-3: Settlement- Rural and Urban

Rural Settlement: Evolution and Growth related Concept of Blovet, Roy Burman & Ramachandran and Srivastava; Types and Patterns of Rural Settlement.

Urban Settlement: Social and Cultural factors behind the urban growth; Classification of Towns based on their Size and Functions; Census Categories of Urban units in India.

Unit-4: Settlement-Models and Theories

Classical Models of Urban Morphology: Concentric Zone Theory, Sector Theory, Multiple Nuclei Theory; Hierarchy of Urban Centers: Central Place Theory; August Losch's theory of Market Centers; Concept of City Region; Problems of Towns and Cities in India.

2nd Year (Diploma Course)
Semester-III

Selected References:

1. Bhende, Asha. A. and Kanitkar, T. (1997): Principles of population studies, Hindustan Publishing House, Mumbai.
2. Chandna, R.C. (2013): Geography of Population, Kalyani publishers, New Delhi.
3. Ghosh, S. (1998): Introduction to settlement Geography, Orient Longman Ltd, Kolkata.
4. Mitra, A. (2004): India's Population, Abhinav Publisher, Nagpur.
5. Shrivastava, O.S. (1996): Demography and Population studies, Vikash Publishing House Ltd, Bhopal.
6. Yadav, J.P. (2004): Population Geography, Anmol Publication Pvt. Ltd., New Delhi.

2nd Year (Diploma Course)

Semester-III

Climatology (Theoretical)

Major-GE-302

Full Marks-60(Credit-2)

(Internal Assessment-24;End Sem.Exam.-36)

Unit-1: Atmospheric Temperature, Pressure and Wind System

Composition and Structure of the Atmosphere; Atmospheric Temperature: Insolation and Heat Budget, Horizontal and Vertical Distribution of Temperature, Heating and Cooling of the Atmosphere; Range of Temperature: Diurnal, Seasonal and Annual; Inversion of Temperature: Types and Significance.

Atmospheric Pressure: Vertical and Horizontal Distribution, Shifting of Pressure Belts, Pressure Gradient. Wind: Definition, Types, Wind Direction and related Laws; Factors affecting Wind Motion, Planetary, Periodic and Local Winds. Jet stream: Meaning, Significance, Properties, Types, Index Cycle of Jet Streams; Monsoon: Origin, Concept, Mechanism and relation with Jet Stream.

Unit-2: World Climatic Classification and Atmospheric Disturbances

Atmospheric Moisture: Humidity, Evaporation, Condensation, Fog, Cloud and Precipitation; Forms of Precipitation; Processes and Types of Rainfall; World Climatic Classification after Koppen and Thornthwaite.

Atmospheric Disturbances: Cyclone--Definition, Types, Characteristics; Anticyclone--Definition, Types, Characteristics; Thunderstorm--Definition, types, Characteristics, Conditions for Thunderstorm Development.

2nd Year (Diploma Course)
Semester-III

Selected References:

1. Barry and Chorley (1998) : Atmosphere, Weather and Climate, ELBS
2. Menon, P.A. (1989): Our weather, NBT, India.
3. Critchfield, H.J. (1990): General Climatology, Printice Hall of India Pvt. Ltd,
4. Lal, D.S. (Latest edition): Climatology, Sharada Pustak Bhawan, Allahabad.
5. Singh, S. Physical Geography, Prayag Pustak Bhawan, Allahabad.

2nd Year (Diploma Course)
Semester-III
(Practical)

Major-GE-302

Full Marks-40 (Credit-2)

(Internal Assessment-16;End Sem.Exam.-24)

Sl. No.	Practical	Marks
1.	Climatological instrument reading	4
2.	Drawing and Interpretation of Temperature–Rainfall Graph	4
3.	Climograph (After G. Taylor) and Hythergraph	4
4.	Analysis and Interpretation of Weather map	7
5.	Laboratory Notebook and Viva–voce	03+02
TOTAL		24

PRACTICAL: GE-302

1. Climatological instrument reading:
Fortin's Barometer
Six's Maximum and Minimum Thermometer
Dry and Wet Bulb Thermometer
2. Drawing and Interpretation of Temperature-Rainfall Graph
3. Climograph (After G. Taylor) and Hythergraph.
4. Analysis and Interpretation of Indian Weather
Map Summer case
Winter case
5. Laboratory Notebook and Viva–voce

2nd Year (Diploma Course)
Semester-III

Selected References:

1. Mitra, K., Ghosh, K. and Das M. (2006): B.A. General Practical Geography, Kalyani Publishers, Kolkata.
2. Monkhouse, F.J. (1971): Maps and Diagrams, Methuen, London.
3. Sarkar, A. (2015): Practical Geography: A systematic approach, Orient Black Swan Private Ltd., New Delhi.
4. Saha, P. & Basu, P. (2015): Advanced Practical Geography—A Laboratory Manual, Books and Allied (P)Ltd., Kolkata.
5. Singh, R.L., Singh, Rana P.B. (2003): Elements of Practical Geography, Kalyani Publishers, New Delhi.
6. Singh, R. and Singh, K.: Map Work and Practical Geography, Central Book Depot, Allahabad.
7. Saikia, R. and Thakuria, G. (2015): Practical Geography, EBH Publishers (India), Guwahati.

2nd Year (Diploma Course)
Semester-IV

**Geography of North-East India and
Tripura
(Theoretical)**

Major-GE-401

Full Marks-100(Credit– 4)

(Internal Assessment-40; End Sem. Exam.-60)

Unit-1: North-East India-Physical

Physiography and Drainage; Climate; Soil; Natural Vegetation; Forest Resources; Utilization, Distribution and Conservation of Forests; Natural Hazards

Unit-2: North-East India-Economic

Agriculture: Characteristics, Problems and Mitigation; Agricultural Resources: Food Crops, Plantation Crops (With Special Reference to Tea and Rubber), Horticulture; Minerals and Power Resources: Utilization and Distribution; Major Industries; Human Resource: Population Growth, Distribution and Density, Composition, Population explosion and its impact on Socio-Economic Environment; Transport and Communication

Unit-3: Tripura-Physical

Physiography and Drainage; Climate; Soil; Natural Vegetation; Forest Resources; Natural Hazards: Earthquake, Flood, River Bank Erosion, Landslide and Cyclone

Unit-4: Tripura-Economic

Agriculture: Characteristics and Problems: Food Crops, Plantation Crops, Horticultural Crops; Mineral and Power Resources; Human Resource: Population Growth, Distribution and Density of Population; Sex Ratio; Transport and Communication; Tourism Industry

2nd Year (Diploma Course)

Semester-IV

Selected References:

1. Khullar, D.R. (2018): India: A Comprehensive Geography, Kalyani Publication, New Delhi.
2. Husain, M. (2017): Geography of India, McGraw Hill Education, New Delhi.
3. Bhattacharya, N. (2009): North-east India: A Systematic Geography, New Delhi.
4. Taher, M. and Ahmed, P. (2002): Geography of North-east India, Sage Publications, New Delhi.
5. Bhowmik, I. and Chakraborti, D. (2011): Resources and Economy of Tripura, Eastern Book House Publishers (India), Guwahati.
6. Disaster Management (Soft Skill Course) Study Material prepared by BUGS of Geography, TU, 2017.

2nd Year (Diploma Course)
Semester-IV

**Soil and
Biogeography
(Theoretical)**

Full Marks-60(Credit-2)

Major-GE-402

(Internal Assessment-24;End Sem.Exam. -36)

Unit-1: Soil Geography

Definition and Components of Soil; Factors of Soil Formation; Processes in Soil formation; Soil Profile, Profile Development of Podzol, Chernozem and Laterite Soil; Physical Properties (Texture, Structure and Moisture) and Chemical Properties (pH and Organic Matter) of Soil; Major Soil Types of the World: Zonal, Azonal and Intra-zonal Soil; Soil Erosion and Conservation.

Unit-2: Biogeography

Concept, Nature and Scope of Biogeography; Concept of Ecology and Basic Ecological Principles; World Distribution of Plants and Animals; Concept and Components of Ecosystem; Trophic Structure; Food Chain and Food Web; Concept of Biome and Major Biomes of the World: Forest, Grassland and Marine Biome; Biogeochemical Cycles: Hydrological Cycle, Nitrogen Cycle and Carbon Cycle.

2nd Year (Diploma Course)

Semester-IV

Selected References:

1. Singh, S. (2001): Environmental Geography, Prayag Pustak Bhawan, Allahabad.
2. Sahai, V.N. (2011): Fundamentals of Soil, Kalyani Publishers, New Delhi.
3. Gautam, A. (2009): Environmental Geography, Sharda Pustak Bhawan, Allahabad.
4. Dash, M.C. (2001): Fundamental of Ecology, 2nd edition, Tata McGraw Hill, New Delhi
5. Dey, N.K., and Ghosh, P. (1993): India-A Study in Soil Geography, Sribhumi Publishing Company.
6. Morgan, R.P.C. (1995): Soil Erosion and Conservation, 2nd edition, Longman.
7. Chapman J.L. and Reiz, M.J. (1993): Ecology-Principle and Applications, Cambridge University Press.
8. Daji, J.A., Kadam, J.R., and Patil, N.D. (1996): A Textbook of Soil Science, Media Promoters and Publishers.
9. Barry, C. (1977): Biogeography- An Ecological and Evolutionary Approach, Cox Blackwell, Oxford.
10. Hagget, R. J. (1988): Fundamentals of Biogeography, Routledge, London.
11. Hagget, R. J. (1995): Geocology: An Evolutionary Approach, Routledge, London.
12. Jorge V.Crisci, Liliana Katinas, and Paula Posadas (2003): Historical Biogeography: An Introduction, Harvard Univ. Press, Massachusetts
13. Joy, T. (1993): Biogeography: A Study of Plants in the Ecosphere, Longman Sci & Tech., U.K.
14. Mac Donald, G. (2001): Biogeography-Introduction to Space, Time, and Life, Wiley

2nd Year (Diploma Course)
Semester-IV
(Practical)

Major-GE-402

Full Marks-40(Credit-2)

(Internal assessment-16;End Sem.Exam.--24)

Sl. No.	Practical	Marks
1.	Soil Testing with the help of Field Kit	5
2.	Topographical map interpretation (Plain Region)	10
3.	Trends in Population growth	04
4.	Laboratory Notebook and Viva-voce	03+02
TOTAL		24

PRACTICAL: GE-402C

1. Soil Testing with the help of Field Kit (pH, NPK and Organic matter)
2. Topographical Map Interpretation (Plain Region): Broad physiographic features, Drainage characteristics, Fluvial features, Natural vegetation, Types of Settlement and Settlement Density, Transport and Communication, Road Density, Transact Chart
3. Trends in Population growth in Tripura, North-East India and India (Population growth rate and Decadal growth rate)
4. Laboratory Notebook and Viva-voce

Selected References:

1. Saha, P. & Basu, P. (2015): Advanced Practical Geography–A Laboratory Manual, Books and Allied (P) Ltd., Kolkata.
2. Singh, R.L. & Singh, Rana P.B. (2003): Elements of Practical Geography, Kalyani Publishers, New Delhi.
3. Sarkar, A. (2015): Practical Geography: A Systematic approach, Orient Black Swan Private Ltd., New Delhi.
4. Singh, R. & Singh, K.: Map Work and Practical Geography, Central Book Depot, Allahabad.



Tripura University

(A Central University)

Suryamaninagar

West Tripura

Syllabus for Four Years Under Graduate Programme Under Science Discipline

Subject: Geography (Minor Course)

(NEP-2020)

Year-2023

1st Year (Certificate Course)
Semester-I

Contributions in
Geography (Theoretical)

Minor-GE-101

Full Marks-60 (Credit-3)

(Internal Assessment-24; End Sem. Exam.-36)

Unit-1: Introduction to Geography

Definition, Concept and Evolution of the word 'Geography'; Divisions and Branches of Geography; Nature and Scope of Geography; Inter-relations of Geography with other Physical and Social Sciences; Major Geographic Traditions (Earth Science, Man-Environment relationship, Area Studies and Spatial Analysis).

Unit-2: Contributors to Geography

Classical Contribution to Geography (Greeks and Romans); Indian and Chinese Contribution to Geography; Medieval Contribution to Geography by Arabs; Age of Discovery, Voyages and Renaissance in Europe; Modern Contribution to Geography: European and American.

Unit-3: Approaches, Dichotomy and Dualism in Geography

Approaches to the study of Geography -- Regional and Systematic; Man-Environment Relationship: Determinism and Possibilism; Dichotomy and Dualism: Physical vs. Human, Qualitative vs. Quantitative, System Approach vs. System Analysis); Recent trends in Geography; Contemporary Indian Geography.

Unit-4: Paradigm Shift and Trends in Geography

Perspectives in Geography (Positivism, Humanism); Quantitative Revolution; Recent Trends in Physical and Human Geography; Contemporary Trends in Indian and International Geography

1st Year (Certificate Course)

Semester-I

Selected References:

1. Adhikari, S. (2006): Fundamentals of Geographical Thought, Chaitanya Publishing House, Allahabad
2. Adhikari, S. (2015): Fundamentals of Geographical Thought, Orient Blackswan Private Limited, New Delhi.
3. Dikshit, R. D. (2018): Geographical Thought: A Contextual History of Ideas, Prentice Hall, New Delhi.
4. Hartshorne, R. (2000): The Nature of Geography, Rawat Publication, New Delhi.
5. Hussain, M. (2014): Evolution of Geographical Thought, Rawat Publication, New Delhi.
6. HarmJ. deBlij (2001): Geography: Realms, Regions, and Concepts, John Wiley & Sons.
7. Mandal, R.B and Sinha, VNP. (2016): Recent Trends and Concepts in Geography, Concept Publishing Company Pvt. Ltd., New Delhi, India.

1st Year (Certificate Course)
Semester-I
(Practical)

Minor-GE-101 (Practical)

Full Marks-40(Credit-1)

(Internal Assessment-16;End Sem.Exam.-24)

Sl. No.	Practical	Marks
1.	Scale	10
2.	Introduction to Maps, Topographical Map introduction, Principle of Topographical Sheet numbering	06
4.	Laboratory Notebook and Viva-voce	5+3
TOTAL		24

PRACTICAL: GE-101M

1. Scale: Meaning, Definition and its Uses; Calculation of R.F.
Graphical representation of Linear, Vernier and Diagonal Scale.
2. Introduction to maps: Definition, Elements, Types, Principle of map Design, Uses and Significance (from small to large scale), Map and Globe -- Similarities and Dissimilarities
Topographical Map introduction (Concept of Contour, Latitude & Longitude, Identification of Physical and cultural features), Principle of Topographical Sheet numbering
3. Laboratory Notebook and Viva-voce

1st Year (Certificate Course)

Semester-I

Selected References:

1. Mitra, K., Ghosh, K. and Das M. (2006): B.A. General Practical Geography, Kalyani Publishers, Kolkata.
2. Monkhouse, F.J. (1971): Maps and Diagrams, Methuen, London.
3. Sarkar, A. (2015): Practical Geography: A systematic approach, Orient Black Swan Private Ltd., New Delhi.
4. Saha, P. & Basu, P. (2015): Advanced Practical Geography–A Laboratory Manual, Books and Allied (P) Ltd., Kolkata.
5. Singh, R. L. & Singh, Rana P.B. (2003): Elements of Practical Geography, Kalyani Publishers, New Delhi.
6. Singh, R. & Singh, K.: Map Work and Practical Geography, Central Book Depot, Allahabad.
7. Saikia, R. & Thakuriah, G. (2015): Practical Geography, EBH Publishers (India), Guwahati.

1st Year (Certificate Course)
Semester-II

Geography of India, North-East India and Tripura
(Theoretical)

Minor-GE-201

Full marks-60(Credit-3)
(Internal Assessment-24;End Sem.Exam.-36)

Unit-1: India—Location and Physical

Regional Setting and Regional Divisions; Physical Divisions and Drainage; Climate and Natural Vegetation; Soil types and Agricultural Regions

Unit-2: India—Population and Resources

Population Composition (Race, Ethnic and Tribe); Population Density, Distribution and Growth; Minerals and Energy Resources (Iron Ore, Manganese, Coal and Petroleum) and Industries (Iron and Steel and Aluminium); Transport, Communication and Trade; Economy, Urbanization, Population Problems.

Unit-3: North-East India

Physical Divisions and Drainage; Climate and Natural Vegetation; Soils and Types of Agricultural Practices; Population Composition (Race, Ethnic and Tribe); Population Density, Distribution and Growth; Resources: Power and Minerals; Industries; Transport and Tourism

Unit-4: Tripura

General Geology and Physical Divisions; Physiography and Drainage; Climate and Natural Vegetation; Soils and Types of Agricultural Practices; Population Composition (Tribes and Communities); Resources, Minerals and Industries; Historical Sites and Tourism

1st Year (Certificate Course)

Semester-II

Selected References:

1. Bhowmik, I. & Chakraborti, D. (ed.) (2011): Resources and Economy of Tripura, Eastern Book House Publishers (India), Guwahati.
2. Bhattacharya, N.N. (2005): North East India: A Systematic Geography, Rajesh Publications, New Delhi.
3. Husain, M. (2017): Geography of India, McGraw Hill Education, New Delhi.
4. Khullar, D. R. (2018): India: A Comprehensive Geography, Kalyani Publishers, New Delhi.
5. Majumder, T. & Dev Verma, J. (2018): Geography of Tripura, Naya Pustakmahal, Agartala, India
6. Nag, P. & Gupta, S.S. (1992): Geography of India, Concept Publishing Company, New Delhi.
7. Singh, J. (2003): India: A Comprehensive and Systematic Geography, Gyanodaya Prakashan, Gorakhpur
8. Tirtha, R. (2002): Geography of India, Rawat Publications, Jaipur.
9. Tiwari, R.C. (2007): Geography of India, Prayag Pustak Bhawan, Allahabad.
10. Taher, M. and Ahmed, P. (2014): Geography of North-East India, Mani Manik Prakash, Guwahati

1st Year (Certificate Course)
Semester-II
(Practical)

Minor-GE-201 (Practical)

Full marks-40(Credit-1)

(Internal Assessment-16;End Sem.Exam.-24)

Sl. No.	Practical	Marks
1.	Interpretation of Topographical Map (Plateau region)	10
2.	Cartograms (Using MS Excel)	06
3.	Laboratory Notebook and Viva –voce	05+3
TOTAL		24

PRACTICAL: GE-201M

- 1.** Interpretation of Topographical Map (Plateau region):
Broad Physiographic divisions and Relief features
Serial Profiles (Superimposed, Composite, Projected)
Morphometric analyses (Relative relief, Dissection index, Average slope map, Drainage density map)
Vegetation Map
Settlement types and patterns
Communication network Map
Transact Chart
- 2.** Cartograms (Using MS Excel):
Line Graph, Bar Graph, Pie Chart
- 3.** Laboratory Notebook and Viva–voce

1st Year (Certificate Course) Semester-II

Selected References:

1. Saha, P. & Basu, P. (2015): Advanced Practical Geography –A Laboratory Manual, Books and Allied (P) Ltd., Kolkata.
2. Singh, R. L. & Singh, Rana P. B. (2003): Elements of Practical Geography, Kalyani Publishers, New Delhi.
3. Sarkar, A. (2015): Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi.
4. Singh, R. & Singh, K.: Map Work and Practical Geography, Central Book Depot, Allahabad.

2nd Year (Diploma Course)
Semester-III

Physical Geography (Theoretical)

Minor-GE-301

Full Marks-60(Credit-3)

(Internal Assessment-24; End Sem. Exam.-36)

Unit-1: Introduction to Physical Geography

Nature and Scope of Physical Geography; Different Branches of Physical Geography; Geological Time Scale; Origin of the Earth: Big Bang Theory; Origin of the Continents and Oceans, Continental Drift Theory and Plate Tectonic Theory

Unit-2: Introduction to Lithology and Geomorphology

Internal structure of the Earth; Types of Rocks: Characteristics and Classifications; Folds and Faults; Definition and Classification of Weathering and Mass movement; Processes and Landforms: Fluvial, Glacial, Arid and Coastal; Slope: Importance, Genetic Classification and Components of Slope; Fundamental Concepts in Geomorphology (Concept 1-6 of Thornbury).

Unit-3: Climatology and Oceanography

Climatology: Composition and Structure of the Atmosphere; Atmospheric Pressure Belts and General Wind System; Insolation and Heat Budget; Concept of Humidity, Evaporation and Condensation; Types of Cloud; Precipitation: Causes and Forms, Types of Rainfall.

Oceanography: Surface Configuration of Ocean Floor: Pacific Ocean, Atlantic Ocean and Indian Ocean; Temperature, Salinity and Density of Ocean Water; Oceanic Circulation System: Pacific Ocean, Atlantic Ocean and Indian Ocean; Coral Reefs and Atoll.

Unit-4: Soil and Biogeography

Soil Geography: Definition; Components of Soil; Factors of Soil Formation; Processes in Soil formation; Soil Profile; Physical Properties (Texture, Structure and Moisture) and Chemical Properties (pH and Organic Matter) of Soil; Major Soil types of the World: Zonal, Azonal and Intra-zonal Soils; Soil Erosion and Conservation.

Biogeography: Concept, Nature and Scope; Concept of Ecology and Basic Ecological Principles; Concept and Components of Ecosystem; Trophic Structure; Food Chain and Food Web; Concept of Biome and Major Biomes of the World: Forest, Grassland and Marine Biomes; Biogeochemical Cycle: Hydrological Cycle, Nitrogen Cycle and Carbon Cycle.

2nd Year (Diploma Course)

Semester-III

Selected References:

1. Singh, S.(1997): Physical Geography, Prayag Pustak Bhawan, Allahabad
2. Lal, D.S (1998): Climatology, Sharada Pustak Bhawan, Allahabad
3. Khullar, D.R. (2003): India–A Comprehensive Geography, Kalyani Publisher Chennai.
4. Dayal, P. (2011): A textbook of Geomorphology, Rajesh Publication, New Delhi
5. Singh, S. (2009): Geomorphology, Prayag Pustak Bhawan, Allahabad.
6. Ahmed, E. (2001): Geomorphology, Kalyani Publishers, Kolkata.
7. Ahmed, E. (1989): Physical Geography, Kalyani Publishers, New Delhi.
8. Monkhouse, F.J. (1971): Principles of Physical Geography, University of London Press Ltd.
9. Morgan, R. S and Wooldridge, S.W. (1988): An Outline of Geomorphology, Orient Longman.
10. Thornbury, W.D. (1984): Principles of Geomorphology, 2nd Edition Wiley Eastern Ltd., New Delhi.
11. Alan H. Strahler, Arthur Strahler (2005): Introducing Physical Geography, John Wiley and Sons, New York
12. Singh, S. (2001): Environmental Geography, Prayag Pustak Bhawan, Allahabad
13. Sahai, V.N. (2011): Fundamentals of Soil, Kalyani Publishers, New Delhi.
14. Gautam, A. (2009): Environmental Geography, Sharda Pustak Bhawan, Allahabad

2nd Year (Diploma Course)
Semester-III
(Practical)

Minor- GE-301 (Practical)

Full Marks-40(Credit-1)

(Internal assessment-16; End Sem.Exam. -24)

Sl. No.	Practical	Marks
1.	Identification of Rocks and Minerals	04
2.	Climatological Instrument reading	04
3.	Analysis and Interpretation of Weather Map	08
4.	Laboratory Notebook and Viva-voce	5+3
TOTAL		24

PRACTICAL: GE-301M

1. Identification of Rocks and Minerals
2. Climatological Instrument reading:

Fortin's Barometer
Six's Maximum and Minimum Thermometer
Dry and Wet Bulb Thermometer
3. Analysis and Interpretation of Indian Weather Map
Summer case
Winter case
4. Laboratory Notebook and Viva-voce

2nd Year (Diploma Course)
Semester-III

Selected References:

1. Mitra, K., Ghosh, K. and Das M. (2006): B.A. General Practical Geography, Kalyani Publishers, Kolkata.
2. Monkhouse, F.J. (1971): Maps and Diagrams, Methuen, London.
3. Sarkar, A. (2015): Practical Geography: A systematic approach, Orient Black Swan Private Ltd., New Delhi.
4. Saha, P. & Basu, P. (2015): Advanced Practical Geography–A Laboratory Manual, Books and Allied (P) Ltd., Kolkata.
5. Singh, R.L. & Singh, Rana P.B. (2003): Elements of Practical Geography, Kalyani Publishers, New Delhi.
6. Singh, R. & Singh, K.: Map Work and Practical Geography, Central Book Depot, Allahabad.
7. Saikia, R. & Thakuria, G. (2015): Practical Geography, EBH Publishers (India), Guwahati.

2nd Year (Diploma Course)
Semester-IV
Human Geography (Theoretical)

Minor-GE-401

Full Marks-60 (Credit – 3)
(Internal Assessment-24;End Sem.Exam.-36)

Unit-1: Introduction to Human Geography and Population Geography

Human Geography: Concept, Nature and Scope of Human Geography; Fundamentals and Branches of Human Geography; Development of Human Geography; Inter-relations of Human Geography with other Social Sciences.

Population Geography: Distribution and Density of World Population, Age-Sex Composition of Population, Concept of Fertility, Mortality; Migration: Immigration and Emigration.

Unit-2: Social and Cultural Geography

Social Geography: Meaning, Nature and Scope; Social Groups; Social Processes; Social Wellbeing; Social Differentiation: Tribes and Castes; Religion: Distribution in India; Language: Distribution in India; Social Problems in India.

Cultural Geography: Concept, Nature and Scope; Racial Division and Distribution; Linguistic Distribution of the World; Cultural Diffusion and its Processes; Cultural Hearth and Cultural Realm.

Unit-3: Settlement Geography

Rural Settlement: Types and Patterns; Urban Settlement: Classification of Towns based on their Size and Functions; Census Categories of Urban units in India; The Concept of City Region; Problems of Towns and Cities in India; Trends of Indian urbanization.

Unit-4: Contemporary Issues

Ageing of Population; Decline in Sex-ratio. Rural Development Programmes --- SJSY, MGNREGA, JANDHAN YOJANA and Rural Connectivity; Problems of Housing, Slums, Civic Amenities (Water and Transport); Case Study of Delhi, Mumbai, Kolkata, Chennai and Chandigarh with reference to Land Use and Urban Issues.

2nd Year (Diploma Course)
Semester-IV

Selected References:

1. Chandna, R. C.(2000): Geography of Population: Concept, Determinants and Patterns, Kalyani Publishers, New Delhi.
2. Clark, J.I. (1973): Population Geography, Pergamon Press, Oxford.
3. Hassan, M.I. (2005): Population Geography, Rawat Publication, New Delhi.
4. Mandal, R.B. (2008): Urban Geography: A Textbook, Concept Publishing Company, New Delhi.
5. Mitra, A. (1978): India's Population, Vol.I and II, Abhinav Publisher, Nagpur.
6. Ramachandran, R. (1989): Urbanisation and Urban Systems of India, Oxford University Press, U.K.
7. Siddhartha, K. (2016): Cities, Urbanisation and Urban Systems (Settlement Systems), Kitab Mahal Publishers and Distributors, New Delhi.
8. Zelinsky, W. (1966): A Prologue to Population Geography, Prentice Hall, N. J
9. BroekJan, O.M. and JanOtto, Marius (1978): Geography of Mankind, McGraw Hill Companies
10. Jordan Terry, G. and Lester, Rowntree (1990): The Human Mosaic: Thematic Introduction to Cultural Geography, Longman.

2nd Year (Diploma Course)
Semester-IV

Minor-GE-401 (Practical)

Full Marks-40(Credit –1)

(Internal assessment-16; End Sem.Exam. -24)

Sl. No.	Practical	Marks
1.	Interpretation of Topographical Map (Plain region)	12
2.	Trends in Population Growth	04
3.	Laboratory Notebook and Viva–voce	05+3
TOTAL		24

PRACTICAL: GE-401M

1. Interpretation of Topographical Map (Plain region): Broad physiographic features, Drainage characteristics, Fluvial features, Settlement types and Settlement Density, Communication Network, Transact Chart
2. Trends in Population Growth in Tripura, North-East India and India (Population Growth Rate and Decadal Growth)
3. Laboratory Notebook and Viva–voce

2nd Year (Diploma Course)
Semester-IV

Selected References:

1. Saha, P. & Basu, P. (2015): Advanced Practical Geography –A Laboratory Manual, Books and Allied (P) Ltd., Kolkata.
2. Singh, R. L. & Singh, Rana P. B. (2003): Elements of Practical Geography, Kalyani Publishers, New Delhi.
3. Sarkar, A. (2015): Practical Geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi.
4. Singh, R. & Singh, K.: Map Work and Practical Geography, Central Book Depot, Allahabad.

Syllabi
for
Four Years Under Graduate Programme
B.Sc., in Geography (Major Course)
as per NEP - 2020



Tripura University
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Suryamaninagar – 799022,
West Tripura

Tripura University
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Structure of Geography (UG Programme) as per NEP-2020 under Tripura University

Year	Sem	Major Discipline Specific Course (Core)	Theory	Practical
1st(Certificate Course)	I	Course-1 GE-101C	Fundamentals of Geography and major Contributions	---
		Course-2 GE-102C	Origin of the Earth	Scale, Introduction to Maps, Principle of topo. sheet Numbering
	II	Course-3 GE-201C	Geography of Asia and India	---
		Course-4 GE-202C	Geomorphology	Cartograms (Using MS Excel), Topographical map interpretation (Plateau region)
2nd(Diploma Course)	III	Course-5 GE-301C	Population and Settlement Geography	---
		Course-6 GE-302C	Climatology	Climatological instrument reading, Analysis and Interpretation of Weather map
	IV	Course-7 GE-401C	Geography of North East India and Tripura	---
		Course-8 GE-402C	Soil and Biogeography	Soil testing kit, Topographical map interpretation (Plain region)
3rd(Degree Course)	V	Course-9 GE-501C	Economic Geography	---
		Course-10 GE-502C	Oceanography and Tectonic Geography	Projection, Identification of Rocks and minerals
		Course-11 GE-503C	Environmental Geography	---
		Course-12 GE-504C	Agricultural Geography	Agriculture based Practical, Instrument Survey
	VI	Course-13 GE-601C	Social and Cultural Geography	---
		Course-14 GE-602C	Statistical Methods in Geography	Statistics,

				Interpretation of Geological Map
		Course-15 GE-603C	Fundamentals of Remote Sensing and GIS	---
		Course-16 GE-604C	Political Geography	Field Survey
4th(Degree with Honours and Research)	VII	Course-17 GE-701C	Research Methodology	---
		Course-18 GE-702C	Natural Resource Management	---
		Course-19 GE-703C	Geography of Tourism	---
		Course-20 GE-704C	Remote Sensing	Remote Sensing Practical
	VIII	Course-21 GE-801C	Advanced Geomorphology	---
		Course-22 GE-802C	Hazards and Disaster Management	---
		Course-23 GE-803C	Urban Geography	---
		Course-24 GE-804C	GIS	GIS Practical

Tripura University
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Semester-wise Marks Distribution for Geography
(UG Programme)
As Per NEP-2020 under Tripura University

Year	Semester	Theory			Practical		
		Internal Assessment	End Sem. Exam.	Total	Internal Assessment	End Sem. Exam	Total
1 st (Certificate)	I	40	60	100	---	---	---
		24	36	60	16	24	40
	II	40	60	100	---	---	---
		24	36	60	16	24	40
2 nd (Diploma)	III	40	60	100	---	---	--
		24	36	60	16	24	40
	IV	40	60	100	---	---	---
		24	36	60	16	24	40
3 rd (Degree)	V	40	60	100	---	---	--
		24	36	60	16	24	40
		40	60	100	---	---	--
		24	36	60	16	24	40
	VI	40	60	100	---	---	----
		24	36	60	16	24	40
		40	60	100	----	---	---
		24	36	60	16	24	40
4 th (Degree with Honours)	VII	40	60	100	---	---	---
		40	60	100			
		40	60	100			
		24	36	60			
	VIII	40	60	100	---	---	---
		40	60	100			
		40	60	100			
		24	36	60			
		Total Theory=2000			Total Practical=400		
	Grand Total(Theory+Practical)=2000+400=2400						

Tripura University

(A Central University)

Semester-wise Credit Distribution for Geography (UG Programme)As perNEP-2020

Year	Semester	Paper	Theory/Practical	Marks	Credits	Total Credit/Sem.
1	I	GE-101C	Theory	100	4	8
		GE-102C	Theory	60	2	
			Practical	40	2	
	II	GE-201C	Theory	100	4	8
		GE-202C	Theory	60	2	
			Practical	40	2	
2	III	GE-301C	Theory	100	4	8
		GE-302C	Theory	60	2	
			Practical	40	2	
	IV	GE-401C	Theory	100	4	8
		GE-402C	Theory	60	2	
			Practical	40	2	
3	V	GE-501C	Theory	100	4	16
		GE-502C	Theory	60	2	
			Practical	40	2	
		GE-503C	Theory	100	4	
		GE-504C	Theory	60	2	
			Practical	40	2	
	VI	GE-601C	Theory	100	4	16
		GE-602C	Theory	60	2	
			Practical	40	2	
		GE-603C	Theory	100	4	
		GE-604C	Theory	60	2	
			Practical	40	2	
4	VII	GE-701C	Theory	100	4	16
		GE-702C	Theory	100	4	
		GE-703C	Theory	100	4	
		GE-704C	Theory	60	2	
			Practical	40	2	
	VIII	GE-801C	Theory	100	4	16
		GE-802C	Theory	100	4	
		GE-803C	Theory	100	4	
		GE-804C	Theory	60	2	
			Practical	40	2	
TOTAL				2400	96	

3RD YEAR (DEGREE COURSE)

SEMESTER -V

Economic Geography (Theoretical)

Paper- GE-501C

Full Marks-100(Credit-4)
(Internal Assessment-40;End Sem.Exam.-60)

Unit-1: Introduction to Economic Geography

Definition, Concept, scope and development; Resource: Meaning and concept, Classification (according to use of resources and Dasmann's classification of natural resources), significance; Classification and types of economic activities; Factors affecting location of economic activities with spatial reference to agriculture(Von Thunen Theory); industry (Weber's Theory).

Unit-2: Primary Economic Activities

Intensive Subsistence Agriculture; Extensive Commercial Agriculture; Plantation Agriculture; Mixed Farming; Forestry: Lumbering-Tropical and Temperate; Fishing: Temperate and Tropical fishing ground; Mining: Definition, examples and types.

Unit-3: Secondary Economic Activities

Manufacturing: Meaning, types and determinants of location of industries; Industry: Iron and steel, Cotton Textile, Aluminium, Petroleum refining and Paper; Industrial Regions: Definition, Characteristics and delimitation; Industrial regions of India: (a)Hooghly region (b) Mumbai- Pune region (c) Madurai- Coimbatore region (d) Chhotanagpur region; Special Economic zones; Technology Parks.

Unit-4: Tertiary Economic Activities

Transport and trade: Major transport system of the world–Trans-Siberian Railway; Canadian Pacific Railway, Panama Canal Route, Suez Canal Route; Concept of World Trade Organization (WTO); Multinational Corporation (MNC) and International Trade; International Trade system of India; Recent status of Indian Economy.

Selected References:

1. Jones, C.F. and Darkenwald, G.G. (1954) — Economic Geography, Me Milan, New York.
2. Smith, D.N. (1971) — Industrial Location – An Economical Geographical Analysis, John Wiley, New York.
3. Morgan, W.B.and Munton ,R.J.C .(1971) : Agricultural Geography ,Methuen, London .
4. Leong, G.C.(2000), Human and Economic Geography ,Oxford University Press, New Delhi , Kolkata.
5. Roy , Prithwish ,Economic Geography, (Latest Edition),New Central Book Agency (p) Ltd., Kolkata.
6. Hartshorn ,T.A .Alexander,J.W, Economic Geography (Latest Edition) ,Printice Hall of India Pv5. Ltd.
7. Chattaraj , Guha (Latest Edition), Economic Resources, John Wiley publication ,New Delhi, Kolkata.
8. Gautam ,Alka ,Advanced Economic Geography, Sharada Pustak Bhawan, University Road ,Allahabad .
9. Saxena, H.M., Economic Geography, Rawat Publications ,Jaipur New Delhi,

3RD YEAR (DEGREE COURSE)

SEMESTER -V

Oceanography and Tectonic Geography (Theoretical)

Paper-GE-502C

Full Marks-60(Credit-2)
(Internal Assessment-24;End Sem.Exam.-36)

Unit-1: Introduction to Oceanography, Physical and Biological Ocean Properties and Ocean Management

Meaning, Scope and significance; Ocean Bottom Topography – Relief of Ocean Floor (Pacific, Indian and Atlantic), Origin of ocean basins, the origin of ocean waves, tides and ocean currents, Properties of Ocean Water: Salinity and Temperature (Horizontal and Vertical Distribution); Marine Ecosystems: Coral Reef, Mangrove; Marine Challenges and Management, Marine Policy: Integrated Coastal Zone Management (ICZM) with reference to India and SDG 14

Unit-2: Tectonic Geography and Structural Geology

Sea floor spreading and mid oceanic ridges; Isostasy: Models of Airy and Pratt; Plate Tectonics as a unified theory of global tectonics: Processes and landforms at plate margins, boundaries and hotspots, Plate movement mechanisms; Earthquake and earthquake belts; Volcanoes- types, distribution; Earth Movements: classifications and significance; Folding mechanisms, Fold morphology; Geometric classification of folds; associated landforms of folding; Faulting mechanisms, classifications and associated landforms

Selected References:

1. Siddhartha, K. (2018): *Oceanography, A brief Introduction*, Kitab Mahal.
2. D. S. Lal: *Oceanography*, Sharda pustak bhawan.
3. Savindra Singh: *Oceanography*, Pravalika Pustak Publications
4. R.C.Sarma & M Vatal: *Oceanography for Geographers*, **Surjeet Publications**
5. Mark Denny: *An Introduction to Oceanography How Ocean works*, Overseas Press
6. Pinet, P. R., (2008): *Invitation to Oceanography (Fifth Edition)*, Jones and Barlett Publishers, USA, UK and Canada
7. Condie, K.C. (2003). *Plate Tectonics and Crustal Evolution*, Butterworth-Heinemann, Oxford, Burlington.
8. Duff, D., (1993). *Holmes' Principles of Physical Geology*, Stanley Thornes, Cheltenham.
9. Erickson, J., (2001). *Plate Tectonics: Unravelling the Mysteries of the Earth*, Checkmark Books, New York.
10. Goudie, A.S. and Viles, H., (2010). *Landscapes and Geomorphology: A Very Short Introduction*, Oxford University Press, Oxford.
11. Holmes, A., (1978). *Principles of Physical Geology*, Van Nostr and Rheinhold, New York.
12. Huggett, R.J., (2011). *Fundamentals of Geomorphology*, Routledge, New York.
13. Kale, V.S. and Gupta, A., (2001). *Introduction to Geomorphology*, Orient Longman, Kolkata .
14. Keary, P. and Vine, M., (1997). *Global Tectonics*, Blackwell Scientific Publications, Oxford.
15. Ollier, C.D., (1981). *Tectonics and Landforms*, Longman Group Ltd., London.
16. Selby, M.J., (1985). *Earth's Changing Surface: An Introduction to Geomorphology*, Clarendon Press, Oxford .
17. Siddhartha, K., (2001). *The Earth's Dynamic Surface*, Kisalaya Publications, New Delhi •Singh, S., (2000). *Geomorphology*, Prayag Pustak Bhavan, Allahabad.
18. Strahler, A.H. and Strahler A.N., (1992). *Modern Physical Geography*, John Wiley & Sons, New York.
19. Summerfield, M.A., (1991). *Global Geomorphology: An Introduction to the Study of Landforms*, Longman, London
20. Summerfield, M.A., (ed.) (2000). *Geomorphology and Global Tectonics*, Wiley, Chichester .
21. Thorn, C., (1988). *Introduction to Theoretical Geomorphology*, Unwin Hyman, Boston .
22. Thornbury, W. D., (1960). *Principles of Geomorphology*, John Wiley & Sons, New York

3RD YEAR (DEGREE COURSE)

SEMESTER -V

(Practical)

Paper-GE-502 C

Full Marks – 40 (Credit -2)

(Internal Assessment-16; End Sem. Exam.-24)

Sl. No.	Practical	Marks
1.	Introduction of map Projection: Definition and classification and importance of map projections. Construction, characteristics and applications of followings projections. a. Cylindrical equal area projection. b. Simple conical projection with one standard parallel. c. Bonne's Projection. d. Polar Gnomonic Zenithal Projection e .Polar Stereographic Zenithal Projection f. Sinusoidal Projection	14
2.	Identification of rocks and minerals by Streak test and eye observation.	05
3.	Laboratory Notebook and Viva–voce	03+02
TOTAL		24

Selected References:

1. Mitra,K., Ghosh K. and Das, M.(2006):B.A. General Practical Geography, Kalyani Publishers, Kolkata.
2. Monkhouse,F.J. (1971): Maps and Diagrams, Methuen, London.
3. Sarkar,A. (2015): Practical Geography: A systematic approach, Orient Black Swan Private Ltd., New Delhi.
4. Saha, P.& Basu, P.(2015):Advanced Practical Geography– A Laboratory Manual, Books and Allied (P)Ltd., Kolkata.
5. Singh, R.L.,Singh, Rana P.B. (2003): Elements of Practical Geography, Kalyani Publishers, New Delhi.
6. Singh,R. and Singh,K.: Map Work and Practical Geography, Central Book Depot, Allahabad.
7. Saikia, R. and Thakuria,G.(2015):Practical Geography, EBH Publishers (India),Guwahati.
8. Singh, Gopal., (1998): Map Work and Practical Geography (4th Edition), Vikas Publishing House, Ahmedabad.
9. Gupta, K.K. and Tyagi V.C.,(1992): Working with Map, Survey of India, DST, New Delhi.
10. Misra, R.P.,(2014): Fundamentals of Cartography (Second Revised and Enlarged Edition), Concept Publishing, New Delhi.
11. Monkhouse, F. J. and Wilkinson, H. R.,(1973): Maps and Diagrams, Methuen, London.

3RD YEAR (DEGREE COURSE)

SEMESTER -V

Environmental Geography (Theoretical)

Paper- GE-503C

Full Marks-100(Credit– 4)

(Internal Assessment-40; End Sem.Exam.-60)

Unit-1: Introduction to Environmental Geography

Concept, Meaning, development, nature and scope of Environmental Geography, Recent Dimensions of Environmental studies in Geography; Major physical and cultural elements of environment; Functioning of environmental systems – role of biotic and abiotic elements.

Unit-2: Ecosystem Approach in Environmental Studies

Ecosystem Structure and function, terrestrial and aquatic ecosystems; Principle of ecology; human ecological adaptation; influence of man on ecology and environment; bio-geo- chemical cycles. Energy flow in an ecosystem; food chain, food web and Ecological pyramids.

Unit-3: Environmental Degradation and Hazards:

Water, Air, Noise and Solid waste problems in urban-industrial Environment, Water and soil pollution in rural landscape (with reference to India), Major pollutants: types, sources and effects. Global issues- Climatic Hazards and Management, Social Response to Climatic Hazard, Human response to Flood, Drought, Landslide, Earthquake and Cyclone, Forest Fires. Impact of Green revolution

Unit-4: Conservation and management of environment:

Environmental Perception, Environment Conservation and challenges in developing countries, Environmental Movements in India: *Bisnoi*, *Chipko*, Silent valley and Narmada. Environmental issues, policies and efforts in India, Concept of sustainable development, Significance of environmental laws, EIA (Environmental Impact Assessment).

Selected References:

1. Singh,S.(2001): Environmental Geography, Prayag Pustak Bhawan, Allahabad.
2. Gautam,A. (2009): Environmental Geography, Sharda Pustak Bhawan, Allahabad.
3. Dash, M.C. (2001):Fundamental of Ecology, 2nd edition,Tata Mc Graw Hill, New Delhi
4. ChapmanJ.L.and Reiz,M.J.(1993):Ecology-Principle and Applications, Cambridge University Press.
5. Hagget,R.J.(1995):Geoecology: An Evolutionary Approach, Routledge, London.
6. Agarwal, D.P. (1992): *Man and Environment in India through Ages*, Books & Books, New Delhi.
7. Arthur N. Strahler and Alan H. Strahler (1973 1st Ed): “*Environmental Geoscience – Interaction between natural systems and man*”, Wiley International Ed.
8. Bala Krishnan, M., 1998: *Environmental Problems and Prospects in India*, Oxford & IBH Pub., New Delhi.
9. Barrow, C. J. (2003): *Environmental Change and Human Development*. Arnold Publication.
10. Blowers, Andrews, (1993): “*Planning for a sustainable Environment*,” Earth scan Publication, London.
11. Botkin, D.B., and Keller,E.A.(2013): *Environmental Science*, Wiley, New Delhi
12. Gole, P., (2001): *Nature Conservation and Sustainable Development in India*, Rawat Pub., Jaipur
13. Goudie, A. (1986): *The Human Impact on the Natural Environment*, 2nd edition, Blackwell Pub. Co., London
14. Lohani, B. N. (1997). *Environmental impact assessment for developing countries in Asia (Vol 1)*. Manila: ADB.
15. Smith,K.(2001):*Environmental Hazards:AssessingRiskandReducingDisaster*, Routledge

**Agricultural Geography
(Theoretical)**

**Full Marks-60(Credit-2)
(Internal Assessment-24; End Sem.
Exam.-36)**

Unit-1: Fundamentals of Agricultural Geography

Meaning, Scope and Importance of Agricultural Geography; Factors Influencing Agriculture: Physical-Climate, Soil, Relief, Water Resources, Economic-Landholding, Technology, Market, Transport, Social & Political-Land Reforms, Government Policies; Cropping Patterns and Agricultural Productivity; Concept of Agricultural Region; Agricultural Regions of India: Agro- Climatic Regions (Planning Commission); Agro-ecological and Crop Combination Regions

Unit-2: Agricultural Development and Challenges:

Types of Farming: Subsistence Farming, Commercial Farming, Mixed Farming, Shifting Agriculture; Challenges in Agriculture: Soil Erosion, Water Scarcity, Pests and Diseases, Deforestation, Impact of Climate Change on Agriculture; Introduction to Sustainable Practices: Organic Farming, Agroforestry, Crop Rotation, Importance of Technology in Agriculture: Farm Mechanization, Irrigation Systems, Biotechnology

Selected References:

1. Alka Gautam(2012): "*Agricultural Geography* "Sharda Pustak Bhawan, Allahabad.
2. Bryant,C.R., Johnston,T.R.(1992),"*Agriculture in the City Country side*",Belhaven Press, London.
3. Burch,D.,Gross,J.and Lawrence,G.(eds.)(1999),"*Restructuring Global and Regional Agriculture*", Ashgate Publishing Company, Burlington.
4. Cakmak,I.and Welch,R.M.(eds)(2009),"*Impacts of agriculture on Human Health and Nutrition*", EOLSS Publications, UK.
5. Ferroni, Marco (2013):"*Transforming Indian agriculture-India2040:Productivity, Markets and Institutions*" , Sage Publications, New Delhi.
6. Grigg David (1995): "*An introduction to agricultural geography*",(second edition), Routledge, London and New York.
7. Illbery,B.W.(1985):"*Agricultural Geography, Social & Economic Analysis*", Oxford University Press.
8. Mohammad,N.(1992):"*New Dimension in Agriculture Geography*",Vol. I to VIII, Concept Publishing Company, New Delhi.
9. Mohammad,N.and Rai,S.C.(2014):"*Agricultural Diversification and Food Security in the Mountain Ecosystem*", Concept Publishing Company, New Delhi.
10. Randhawa,M.S.(1980):"*An History of Agriculture in India*",Vols.I,II, III,IVICAR, New Delhi
11. Roling, N.G.,and Wagerutgers,M.A.E.(eds.)(1998):"*Facilitating Sustainable Agriculture*",Cambridge University Press, Cambridge.
12. Shafi,M.(2006):"*Agricultural Geography*",Pearson Education,Delhi.
13. SingJasbir and Dhillon,S.S.(1994): "*Agricultural Geography*"Tata Mc Graw Hill,New Delhi.
14. Shrivastava,Sahay,Vidyarti and Singh(2010): "*Second Green Revolution Vs.Rainbow Revolution*".
15. Tiwari,R.andSingh,B.(1994):"*Krishi Bhoogol*",Prayag Pustak Bhandar,Allahabad. (Hindi). 15. White P. (2007) :"*Emergence of agriculture:A global view*",Routledge, London.
16. WrightJ.(2009):"*Sustainable agriculture and food security in an era of oil scarcity*", Earthscan, London.
17. Young,A.(1998):"*Landuse Resources: Now and for the Future*",Cambridge University Press, Cambridge.

3RD YEAR (DEGREE COURSE)

SEMESTER -V

PRACTICAL

Paper-GE-504C

FullMarks-40(Credit– 2)

(Internal Assessment-16; End Sem.Exam.-24)

Sl. No.	Practical	Marks
1.	• Survey and mapping of agricultural land use and cropping patterns (observational study, using toposheets and satellite images (Google Earth interpretation) • Agricultural Density • Crop combination method Rafiullah's method	09
2.	Surveying with instruments (Selection of any one by Lottery during Examination) a. Prismatic Compass Survey for Closed Traversing of a Quadrangular area b. Survey with Dumpy Level along a road c. Triangular measurements of height and distance by Transit Theodolite with accessible base	10
4.	Laboratory Notebook and Viva–voce	3+2=5
TOTAL		24

Selected References:

1. Saha, P.& Basu, P.(2015):Advanced Practical Geography– A Laboratory Manual, Books and Allied (P)Ltd., Kolkata.
2. Singh, R.L.&Singh, RanaP.B.(2003):Elements of Practical Geography, Kalyani Publishers, New Delhi.
3. Sarkar,A.(2015):Practical Geography:A Systematic approach, Orient Black Swan Private Ltd.,New Delhi.
4. Singh, R. & Singh,K.: Map Work and Practical Geography, Central Book Depot, Allahabad.

3rd Year (Degree Course)

Semester-VI

Social and Cultural Geography

(Theoretical)

Paper-GE-601C

Full Marks-100(Credit-4)

(Internal Assessment-40;End Sem.Exam.-60)

Unit-1: Introduction to Social Geography

Meaning, Concept, Nature and Scope; Society and Environment: Influence of Environment on Society and Society on Environment; Social Categories: Tribe, Caste, Language and Religion; Space in Social Geography: Concept and Types

Unit-2: Human Settlement

Origin and Growth of Human Settlement: Rural and Urban; Factors influencing Rural Settlement with special reference to India; Socio-Cultural characteristics of Urban Settlement with special reference to India; Rural-Urban Dichotomy and Rural-Urban Continuum.

Unit-3: Introduction to Cultural Geography

Meaning, Nature and Scope of Cultural Geography; Themes in Cultural Geography: Cultural Region, Cultural Diffusion, Cultural Ecology, Cultural Integration and Cultural Landscape; Cultural Hearth and Cultural Realms; Concept of Race, Language and Religion their divisions and distribution.

Unit-4: Economy towns and cities

Forms of Economy: Food gathering and Agriculture in Tribal Societies; Land use in Traditional and Modern Societies; Towns and Cities: Site and Situation, Cities in Modern Era, Facets of Contemporary Cities; Distribution of large Metropolises

Selected References:

1. Ahmad, A. (2006): *Social Geography*, Rawat Publications, New Delhi.
2. Broek, J. O. M. and Webb, J. W. (1978): *A Geography of Mankind*, McGraw Hill International Book Company, London.
3. Johnston, R. J., Gregory, D., Pratt, G. and Watts, M. (edited) (2000): *The Dictionary of Human Geography*, Blackwell Publishing, Oxford, UK.
4. Jordan Terry, G. and Rowntree, L. (1990): *The Human Mosaic: A Thematic Introduction to Cultural Geography*, Harper Collins Publishers, New York.
5. Smith, S. J., Pain, R., Martson, S. A. and Jones, J. P. (2009): *The SAGE Handbook of Social Geographies*.
6. Sopher, D. (1980): *An Exploration of India*, Cornell University Press, Ithasa.
7. Taher, M. (2005): *An Introduction to Social Geography*, North East India Geographical Society, Gauhati University, Guwahati

3rd year (Degree Course)

Semester -VI

Statistical Methods in Geography

(Theoretical)

Paper-GE-602C

Full Marks-60(Credit-2)

(InternalAssessment-24;EndSem.Exam.-36)

Unit-1: Basics of Statistics and Statistical Measurement and assessment:

Definition, Importance, use and applications of statistical techniques in geography, Sources of statistical data in geography; Scales of measurement: Nominal, Ordinal, Interval and Ratio; Frequency Distribution, Typical Patterns of Frequency Distribution; Measurement of Central Tendencies; Measurement of Dispersion-Variance, Standard deviation, Mean deviation, Quartiles; Computation of Index of Skewness and Kurtosis, Concept of probability assessment, Probability assessment of discrete and continuous random variable.

Unit-2: Hypothesis Testing and Techniques of Bivariate Analysis:

Concept of Population and sample, Sampling Methods, Testing of hypothesis, Hypothesis-Null hypothesis and Alternative hypothesis, Parametric and Non-parametric Tests, Student's 't' test and Chi square test ; Concept of covariance and correlation, Pearson's Product moment Correlation Coefficient, Spearman's Rank Correlation Coefficient, Straight line regression equation.

Selected References:

1. Alvi, Z.(1995):“*Statistical Geography: Methods and Applications*”, Rawat Publications, Jaipur
2. David Ebdon (1989):“*Statistics in Geography-A Practical Approach*”,2nd Edn.,Blackwell Publishing.
3. Gupta,C.B.(1978):“*An Introduction to Statistical Methods*”,Vikas Pub.House,New Delhi.
4. John Matthews,(1981):“*Quantitative & Statistical Approaches to Geography:A Practical Manual*”, Pergamon Press.
5. Karlekar Shrikant (2007):“*Statistical Methods in Geography*”, Diamond Publication, Pune.
6. Karlekar, Shrikant and Kale, Mohan (2006):“*Statistical Analysis of Geographical Data*”, Diamond Publication, Pune.
7. King,L.J.(1991): “*Statistical Analysis in Geography*”,Prentice Hall, Englewood.
8. Mahmood,A.(1977):“*Statistical Methods in Geographical Studies*”,Rajesh Publications, New Delhi.
9. Mandal,R.B.(1981):“*Statistics for Geographers & Social Scientists*”,Rawat Publication.
10. Pal,Saroj K(1982):“*Statistical Techniques, A Basic Approach to Geography*”,Tata McGraw Hill Publishing Comp. Ltd. New Delhi.
11. Peter Rogerson:“*Statistical Methods for Geography*”,3rd Edn. Sage Publishing New Delhi.
12. Rogerson P.A.(2001) :“*Statistical for Geography*”,SAGE publication, New Delhi.
13. Shaw G. & Wheller D. (1985) : “*Statistical Techniques in Geographical Analysis*”, John Wiley & Sons, New York.

3rd Year (Degree Course)
Semester -VI

(Practical)

Paper-GE-602 C

FullMarks-40 (Credit-2)

(Internal Assessment-16;End Sem.Exam.-24)

Sl. No.	Practical	Marks
1.	Diagrammatic representation of Frequency distribution (Histogram, Frequency Polygon, Normal and Skewed Distribution, Ogive) Calculation and Diagrammatic representation of Measures of central Tendency Calculation and Diagrammatic representation of Measures of Partition Values	10
2.	Construction of cross section and Interpretation of Geological maps a) Simple Folded maps b) Simple Uniclinal maps c) Folded maps with unconformity	9
4.	Laboratory Notebook and Viva-voce	03+02
TOTAL		24

Selected References:

1. Mitra,K., Ghosh,K.and Das M.(2006): B.A. General Practical Geography, Kalyani Publishers, Kolkata.
2. Monkhouse,F.J. (1971): Maps and Diagrams, Methuen, London.
3. Sarkar,A.(2015):Practical Geography: A systematic approach, Orient Black Swan Private Ltd.,New Delhi.
4. Saha, P.& Basu,P.(2015):Advanced Practical Geography–A Laboratory Manual, Books and Allied (P)Ltd., Kolkata.
5. Singh, R.L.,Singh, Rana P.B. (2003): Elements of Practical Geography, Kalyani Publishers, New Delhi.
6. Singh,R. and Singh,K.: Map Work and Practical Geography, Central Book Depot, Allahabad.
7. Saikia,R.and Thakuria,G.(2015):Practical Geography, EBH Publishers (India),Guwahati.
8. Singh, Gopal., (1998): Map Work and Practical Geography (4th Edition), Vikas Publishing House, Ahmedabad.
9. Gupta, K.K. and Tyagi V.C.,(1992): Working with Map, Survey of India, DST, New Delhi.
10. Misra, R.P.,(2014): Fundamentals of Cartography (Second Revised and Enlarged Edition), Concept Publishing, New Delhi.

3rd Year (Degree Course)

Semester-VI

Paper-GE-603C Fundamentals of Remote Sensing and GIS (Theoretical)

Full Marks-100 (Credit-4)

(Internal Assessment-40;End Sem.Exam.-60)

Unit-1: Introduction to Remote Sensing

Definition of Remote Sensing, developmental stages, electromagnetic waves, spectrum, regions, wavelength, frequencies and applications. Types-Satellites, Sensors, Energy Interaction in the Atmosphere (Scattering, Absorption, Refraction and Reflection); Remote Sensing Platforms and Types; Process of remote sensing, interaction of radiation with atmosphere and targets, resolutions of remote sensing, visible region of the spectrum

Unit-2: Geographic Information System (GIS):

Concept of Geographic Information System (GIS); Components of GIS; Origin of GIS; Functions of GIS; Advantages of GIS, Basic Concepts about Spatial Information, Spatial vs. Non-spatial data ; Spatial data models – Raster and Vector ; Data Conversions ; Comparison between Raster and Vector Data, advantages and disadvantages of raster and vector data Advantages of GIS

Unit-3: Image Classification and Interpretation

Satellite products and its spectral characteristics, composite images, band ratios; Land use land cover classification schemes- Visual image interpretation, elements, stages of interpretation and interpretation keys. Image classification- supervised, unsupervised, and principal component analysis (PCA) and accuracy assessment

Unit-4: Applications of Remote Sensing and GIS:

Disaster Management, Meteorological Studies, Agricultural and Irrigation Studies, Forestry Studies, Hydrological Studies, Natural Resource, Oceanic and Coastal mapping, Soil resource mapping, Urban and Rural Mapping and Management Visual Interpretation using Satellite Data: Forest monitoring, Water resources and Urban Sprawl analysis (Change detection)

Selected References:

1. Bhatia, B. (2008): *Remote Sensing and GIS*, Oxford University Press, New Delhi.
2. Lillesand, T., Ralph, M., Kiefer, W. and Chipman, J. W. (2016): *Remote Sensing and Image Interpretation*, Wiley, New Delhi
3. Reddy, M. A. (2010): *Textbook of Remote Sensing & Geographical Information System*, B. S. Publications, Hyderabad.
4. Campbell, J.B.(2002): *Introduction to Remote Sensing*. Taylor Publications
5. Drury, S.A., (1987): *Image Interpretation in Geology*, Allen and Unwin
6. Gupta, R.P.(1990): *Remote Sensing Geology*. Springer Verlag
7. Jensen, J.R.(2000): *Remote Sensing of the Environment: An Earth Resource Perspective*. Prentice Hall.
8. Joseph George, (2003): *Fundamentals of Remote Sensing*. Universities Press
9. Lillesand, T.M., and Kieffer, R.M., (1987): *Remote Sensing and Image Interpretation*, John Wiley.
10. Sabbins, F.F., (1985): *Remote Sensing Principles and interpretation*. W.H. Freeman and company

3rd Year (Degree Course)

Semester-VI

Political Geography (Theoretical)

Full Marks-60(Credit-2)

Paper-GE-604C

(Internal Assessment-24;End Sem.Exam.-36)

Unit-1: Introduction and themes in Political Geography

Definition, Nature and Scope; Elements of Political Geography, location, Size and shape in Political Geography; Trends in Development in Political Geography; Concept of State, Centrifugal and Centripetal Forces in the State, Factor affecting the State; Concept of Nation, Difference between State and Nation; Territorial, Federalism and other forms of Government, Neo-colonialism.

Unit-2: Geopolitics and Frontiers and Boundaries:

Origin and Concept; Geo-strategic theories: Mackinder's Heartland Theory, Spykman Rim land Theory & Mahan's Sea power; Geostrategic importance of Indian Ocean, Neopolitics of World Natural Resources; Definition and Difference between Frontiers and Boundaries, Classification of International Boundaries, Maritime Boundaries; Boundaries of India ; Characteristics and Problems; Regional Organisations of Cooperation (SAARC, ASEAN, OPEC, EU).

Selected References:

1. Adhikari S., 1997: Political Geography, Rawat Pub. Jaipur.
2. Cohen S.B., 1973: Geography and Politics in divided world. Oxford, New York.
3. Dixit R.D., 1982: Political Geography. Tata McGraw Hill, New Delhi.
4. Dwivedi R.L., 1996: Political Geography. Chaitanya Prakashan , Allahabad.
5. Moor R., 1981: Modern Political Geography. McMillan, London.
6. Pounds N.G., 1972: Political Geography. McGraw Hill, London.
7. Taylor P., 1998: Political Geography, Prentice Hall.

3rd Year (Degree Course)
Semester-VI
(Practical)

Paper-GE-604C

Full Marks-40 (Credit-2)

(Internal assessment-16;End Sem.Exam.-24)

Sl. No.	Practical	Marks
1.	Field Survey The Department is required to perform a field tour (Outside state/within State). • Objective and Methodology in relation to Physical and Cultural landscape of either a Rural or Urban area. • The Field will include Preparation of questionnaire for Household Survey. • The page limit of the field report should be 30-32 pages inclusive of text, maps, diagrams and photographs. Note: The Department shall undertake field tours solely as a team or, if desired, will collaborate with other Colleges to organise field tours most conveniently. Field Report and Viva-voce	14+10
TOTAL		24

Selected References:

1. Saha, P.& Basu, P.(2015): Advanced Practical Geography–A Laboratory Manual, Books and Allied
2. (P)Ltd., Kolkata.
3. Singh, R.L. & Singh, Rana P.B. (2003): Elements of Practical Geography, Kalyani Publishers, New Delhi.
4. Sarkar,A.(2015):Practical Geography: A Systematic approach, Orient Black Swan Private Ltd., New Delhi.
5. Singh, R.& Singh,K.: Map Work and Practical Geography, Central Book Depot, Allahabad.

**Syllabi
for
Four Years Under Graduate Programme
B.Sc., in Geography (Minor Course)
as per NEP - 2020**



**Tripura University
(A Central University)
Suryamaninagar – 799022
West Tripura**

Approved
Amal K.

Tripura University
(A Central University)

**Minor/Elective Course Structure of Geography (UG Programme)
as per NEP-2020 under Tripura University**

Year	Semester	Minor/ Elective Course	Theory	Practical
1' (Certificate Course)	I	Course-1 GE-101M	Contributions in Geography	Scale, Introduction to Maps, Principle of topo. sheet numbering
	II	Course-2 GE-201M	Geography of India, North-east India and Tripura	Cartograms (using MS Excel), Topographical map Interpretation (Plateau region)
2' (Diploma Course)	III	Course-3 GE-301M	Physical Geography	Identification of rocks and minerals, Climatological instruments reading, Analysis and Interpretation of Weather map
	IV	Course-4 GE-401M	Human Geography	Topographical map interpretation (Plain region), Trends in Population growth
3' (Degree Course)	V	Course-5 GE-501M	Environmental Geography	Instrument Survey
	VI	Course-6 GE-601M	Economic Geography	Projection
4' (Degree with Honours and Research)	VII	Course-7 GE-701M	Hydrology	Hydrology related Practical
	VIII	Course-8 GE-801M	Industrial Geography	Quantitative Techniques

Tripura University
(A Central University)

**Semester-wise Marks Distribution for Geography
(UG Programme) as per NEP-2020 under Tripura University**

Year	Semester	Theory			Practical		
		Internal Assessment	End Sem. Exam.	Total	Internal Assessment	End Sem. Exam	Total
1 (Certificate)	I	24	36	60	16	24	40
	II	24	36	60	16	24	40
2 (Diploma)	III	24	36	60	16	24	40
	IV	24	36	60	16	24	40
3 (Degree)	V	24	36	60	16	24	40
	VI	24	36	60	16	24	40
4 (Degree with Honours)	VII	24	36	60	16	24	40
	VIII	24	36	60	16	24	40
		Total Theory=480			Total Practical=320		
	Grand Total (Theory+Practical)=480+320=800						



Tripura University
(A Central University)

Semester-wise Credit Distribution for Geography (UG Programme) as per NEP-2020

Year	Semester	Course	Theory/Practical	Marks	Credits	Total Credit/Sem.
1	I	GE-101M	Theory	60	3	4
			Practical	40	1	
	II	GE-201M	Theory	60	3	4
			Practical	40	1	
2	III	GE-301M	Theory	60	3	4
			Practical	40	1	
	IV	GE-401M	Theory	60	3	4
			Practical	40	1	
3	V	GE-501M	Theory	60	3	4
			Practical	40	1	
	VI	GE-601M	Theory	60	3	4
			Practical	40	1	
4	VII	GE-701M	Theory	60	3	4
			Practical	40	1	
	VIII	GE-801M	Theory	60	3	4
			Practical	40	1	
TOTAL				800	32	

3rd Year (Degree Course)
Semester-V
Environmental Geography
(Theoretical)

Paper-GE-501M

Full Marks-60 (Credit-3)

(Internal Assessment-24; End Sem. Exam-36)

Unit-1: Introduction to Environmental Geography

Concept, development, nature and scope of Environmental Geography, Recent Dimensions of Environmental studies in Geography; Major physical and cultural elements of environment; Functioning of environmental systems – role of biotic and abiotic elements.

Unit-2: Ecosystem Approach in Environmental Studies:

Ecosystem Structure and function, terrestrial and aquatic ecosystems; Principle of ecology; human ecological adaptation; influence of man on ecology and environment; bio-geo-chemical cycles. Energy flow in an ecosystem; food chain, food web and Ecological pyramids.

Unit-3: Environmental Degradation and Hazards:

Water, Air, Noise and Solid waste problems in urban-industrial Environment, Water and soil pollution in rural landscape (with reference to India), Major pollutants: types, sources and effects. Global issues- Climatic Hazards and Management, Human response to Flood, Drought, Landslide, Earthquake and Cyclone, Forest Fires.

Unit-4: Conservation and management of environment:

Environmental Perception, Environment Conservation and challenges in developing countries, Environmental Movements in India: *Bisnoi*, *Chipko*, Silent valley and Narmada. Environmental issues, policies and efforts in India, Concept of sustainable development.

Selected References:

1. Singh, S. (2001): Environmental Geography, Prayag Pustak Bhawan, Allahabad.
2. Gautam, A. (2009): Environmental Geography, Sharda Pustak Bhawan, Allahabad.
3. Dash, M.C. (2001): Fundamental of Ecology, 2nd edition, Tata Mc Graw Hill, New Delhi
4. Chapman J.L. and Reiz, M.J. (1993): Ecology-Principle and Applications, Cambridge University Press.
5. Hagget, R.J. (1995): Geoecology: An Evolutionary Approach, Routledge, London.
6. Agarwal, D.P. (1992): *Man and Environment in India through Ages*, Books & Books, New Delhi.
7. Arthur N. Strahler and Alan H. Strahler (1973 1st Ed): "*Environmental Geoscience – Interaction between natural systems and man*", Wiley International Ed.
8. Balakrishnan, M., 1998: *Environmental Problems and Prospects in India*, Oxford & IBH Pub., New Delhi.
9. Barrow, C. J. (2003): *Environmental Change and Human Development*. Arnold Publication.
10. Blowers, Andrews, (1993): "*Planning for a sustainable Environment*," Earthscan Publication, London.
11. Botkin, D.B., and Keller, E.A. (2013): *Environmental Science*, Wiley, New Delhi
12. Gole, P., (2001): *Nature Conservation and Sustainable Development in India*, Rawat Pub., Jaipur
13. Goudie, A. (1986): *The Human Impact on the Natural Environment*, 2nd edition, Blackwell Pub. Co., London
14. Lohani, B. N. (1997). *Environmental impact assessment for developing countries in Asia (Vol 1)*. Manila: ADB.
15. Smith, K. (2001): *Environmental Hazards: Assessing Risk and Reducing Disaster*, Routledge

3rd Year (Degree Course)
Semester-V
Environmental Geography
(Theoretical)

Paper-GE-501M

Full Marks-60 (Credit-3)

(Internal Assessment-24; End Sem. Exam.-36)

Unit-1: Introduction to Environmental Geography

Concept, development, nature and scope of Environmental Geography, Recent Dimensions of Environmental studies in Geography; Major physical and cultural elements of environment; Functioning of environmental systems – role of biotic and abiotic elements.

Unit-2: Ecosystem Approach in Environmental Studies:

Ecosystem Structure and function, terrestrial and aquatic ecosystems; Principle of ecology; human ecological adaptation; influence of man on ecology and environment; bio-geo-chemical cycles. Energy flow in an ecosystem; food chain, food web and Ecological pyramids.

Unit-3: Environmental Degradation and Hazards:

Water, Air, Noise and Solid waste problems in urban-industrial Environment, Water and soil pollution in rural landscape (with reference to India), Major pollutants: types, sources and effects. Global issues- Climatic Hazards and Management, Human response to Flood, Drought, Landslide, Earthquake and Cyclone, Forest Fires.

Unit-4: Conservation and management of environment:

Environmental Perception, Environment Conservation and challenges in developing countries, Environmental Movements in India: *Bisnoi*, *Chipko*, Silent valley and Narmada. Environmental issues, policies and efforts in India, Concept of sustainable development.

Selected References:

1. Singh, S. (2001): Environmental Geography, Prayag Pustak Bhawan, Allahabad.
2. Gautam, A. (2009): Environmental Geography, Sharda Pustak Bhawan, Allahabad.
3. Dash, M.C. (2001): Fundamental of Ecology, 2nd edition, Tata Mc Graw Hill, New Delhi
4. Chapman J.L. and Reiz, M.J. (1993): Ecology-Principle and Applications, Cambridge University Press.
5. Hagget, R.J. (1995): Geoecology: An Evolutionary Approach, Routledge, London.
6. Agarwal, D.P. (1992): *Man and Environment in India through Ages*, Books & Books, New Delhi.
7. Arthur N. Strahler and Alan H. Strahler (1973 1st Ed): "*Environmental Geoscience – Interaction between natural systems and man*", Wiley International Ed.
8. Balakrishnan, M., 1998: *Environmental Problems and Prospects in India*, Oxford & IBH Pub., New Delhi.
9. Barrow, C. J. (2003): *Environmental Change and Human Development*. Arnold Publication.
10. Blowers, Andrews, (1993): "*Planning for a sustainable Environment*," Earthscan Publication, London.
11. Botkin, D.B., and Keller, E.A. (2013): *Environmental Science*, Wiley, New Delhi
12. Gole, P., (2001): *Nature Conservation and Sustainable Development in India*, Rawat Pub., Jaipur
13. Goudie, A. (1986): *The Human Impact on the Natural Environment*, 2nd edition, Blackwell Pub. Co., London
14. Lohani, B. N. (1997). *Environmental impact assessment for developing countries in Asia (Vol 1)*. Manila: ADB.
15. Smith, K. (2001): *Environmental Hazards: Assessing Risk and Reducing Disaster*, Routledge

3rd Year (Degree Course)
Semester-V
(Practical)

Paper-GE-501M (Practical)

Full Marks-40(Credit-1)

(Internal Assessment-16;End Sem.Exam.-24)

Sl. No.	Practical	Marks
1.	Instrument Survey Dumpy level Prismatic compass Theodolite	16
2.	Laboratory Notebook and Viva-voce	5+3
TOTAL		24

Selected References:

1. Mitra, K., Ghosh K. and Das M. (2006): B.A. General Practical Geography, Kalyani Publishers, Kolkata.
2. Sarkar, A. (2015): Practical Geography: A systematic approach, Orient Black Swan Private Ltd., New Delhi.
3. Saha, P. & Basu, P. (2015): Advanced Practical Geography—A Laboratory Manual, Books and Allied (P) Ltd., Kolkata.
4. Singh, R. L. & Singh, Rana P. B. (2003): Elements of Practical Geography, Kalyani Publishers, New Delhi.
5. Saikia, R. & Thakuria, G. (2015): Practical Geography, EBH Publishers (India), Guwahati.

**3rd Year (Degree Course)
Semester-VI**

Economic Geography

Paper-GE-601M

**Full marks-60(Credit-3)
(Internal Assessment-24; End Sem.Exam.-36)**

Unit-1:Introduction to Economic Geography

Concept, scope and development; Resource: Meaning and concept, Classification, significance; Classification and types of economic activities; Factors affecting location of economic activities with spatial reference to agriculture (Von Thunen Theory); industry (Weber's Theory).

Unit-2: Primary Economic activities

Intensive Subsistence Agriculture; Extensive Commercial Agriculture; Plantation Agriculture; Mixed Farming; Forestry: Lumbering-Tropical and Temperate; Fishing: Temperate and Tropical fishing ground; Mining: Definition, examples and types.

Unit-3: Secondary Economic activities

Manufacturing: Meaning, types and determinants of location of industries; Industry: Iron and steel, Cotton Textile, Aluminum, Petroleum refining and Paper; Industrial regions of India: (a) Hooghly region (b) Mumbai- Pune region (c) Madurai- Coimbatore region (d) Chhota Nagpur region

Unit-4:Tertiary Economic activities

Transport and trade: Major transport system of the world-Trans-Siberian Railway; Canadian Pacific Railway, Panama Canal Route, Suez Canal Route; Concept of World Trade Organization (WTO); Multinational Corporation (MNC) and International Trade; International Trade system of India; Recent status of Indian Economy.

Selected References:

1. Jones, C.F. and Darkenwald, G.G. (1954) — Economic Geography, Me Milan, New York.
2. Smith, D.N. (1971) — Industrial Location — An Economical Geographical Analysis, John Wiley, New York.
3. Morgan, W.B. and Munton, R.J.C. (1971) : Agricultural Geography, Methuen, London.
4. Leong, G.C. (2000), Human and Economic Geography, Oxford University Press, New Delhi, Kolkata.
5. Roy, Prithwish, Economic Geography, (Latest Edition), New Central Book Agency (p) Ltd., Kolkata.
6. Hartshorn, T.A. Alexander, J.W., Economic Geography (Latest Edition), Printice Hall of India Pvt. Ltd.
7. Chattaraj, Guha (Latest Edition), Economic Resources, John Wiley publication, New Delhi, Kolkata.
8. Gautam, Alka, Advanced Economic Geography, Sharada Pustak Bhawan, University Road, Allahabad.
9. Saxena, H.M., Economic Geography, Rawat Publications, Jaipur, New Delhi.

**3rd Year (Degree Course)
Semester-VI**

Practical

Paper-GE-601M (Practical)

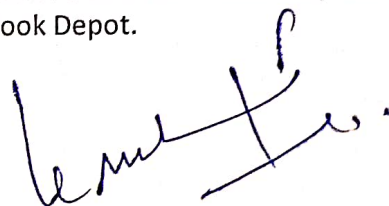
Full Marks-40 (Credit -1)

(Internal Assessment-16; End Sem. Exam. 24)

Sl. No.	Practical	Marks
1.	Projection Construction, Characteristics application of followings projection: Cylindrical equal area projection. Simple conical projection with one standard parallel. Bonne's projection.	16
2.	Laboratory Note Book and Viva-voce	05+3
Total		24

Selected References:

1. Saha, P & Basu, P. (2015): Advanced Practical Geography-A Laboratory Manual, Books and Allied (P) Ltd., Kolkata
2. Singh. R.L. & Singh, Rana, P. B (2003): Element of Practical Geography, Kalyani Publishers, New Delhi
3. Sankar, A. (2015): Practical Geography: A systematic approach. Orient Black Sawn Privat Ltd., New Delhi.
4. Singh, R & Singh, K.: Map Work and Practical Geography, Central Book Depot.



**4-Year Under Graduate Programme
Honours in Research in Geography
(NEP 2020)**

**Fourth Year Syllabus for Geography
(Major & Minor Courses)**



Tripura University

(A Central University)
Suryamaninagar-799022,
West Tripura

Structure of Fourth Year Bachelor's Degree with Honours in Research in Geography

Semester	Major/ Minor	Course/Paper	Credit	Marks	Total Credit
Sem. -VII	Major 17	GE 701R -Tropical Geomorphology	04	40+60=100	20
	Major 18	GE 702R – Hazard and Disaster Management	04	40+60=100	
	Major 19	GE 703R - Urban Geography	04	40+60=100	
	Major 20	GE 704R - Remote Sensing and GIS (Theory and Practical)	04	40+60=100	
	Minor 7	GE 701M - Natural Resource Management (offering to other subject students)	04	40+60=100	
Sem. -VIII	Major 21	GE 801R – Research Methodology	04	40+60=100	20
		GE 802R - Research Project/ Dissertation	12	300	
	Minor 8	GE 801M - Disaster Management (offering to other subject students)	04	40+60=100	
				1000	40

GE= Geography, R= Honours in Research, M=Minor

SEMESTER – VII

4th Year Bachelor's Degree with Honours in Research
SEMESTER - VII
GE 701R Tropical Geomorphology

Full Marks- 100 (Credit - 4)

(Internal Assessment- 40; End Sem. Exam- 60)

Course Objectives (COs):

1. To provide a comprehensive understanding of the concepts, scope, principles, and climatic, hydrological, geological, and tectonic controls of tropical geomorphology, with particular emphasis on morphogenetic regions and the distinctive characteristics of tropical environments.
2. To develop an understanding of tropical geomorphic processes, including weathering, laterization, bauxitization, saprolite formation, slope processes, rainfall-induced erosion, and the role of vegetation and land cover in shaping tropical landscapes.
3. To examine the evolution and characteristics of major tropical landforms and geomorphic systems, including fluvial, arid, glacial, karst, and coastal landforms, and to understand their associated cycles of erosion under different tropical environmental conditions.
4. To critically assess the influence of human activities and environmental changes on tropical geomorphic evolution, including deforestation, agriculture, shifting cultivation, plantations, river impoundments, land-use change, and urbanisation, with particular emphasis on land subsidence, infrastructure challenges, and sustainable geomorphic and environmental management.

Course Learning Outcomes (CLOs)

1. Understanding the role of climate, especially temperature and rainfall, in shaping tropical landscapes.
2. Explain major tropical processes like deep chemical weathering, laterization and fluvial erosion.
3. Identify key tropical landforms: inselbergs, laterite plateaus, tropical river features.
4. Analyze the impact of human activities like deforestation, jhum cultivation, urbanization etc. on tropical landforms.
5. Assess geomorphic knowledge for resources management, planning and disaster management in tropical regions.
6. Apply geomorphic knowledge for resource management, planning and disaster management.
7. Interpret maps, toposheets and satellite images to recognize tropical landforms.

Unit-I: Introduction

Definition, Scope of Tropical Geomorphology; Concept of Morphogenetic Regions; Difference between Tropical Geomorphology and Temperate Geomorphology; Geological and Tectonic framework of the tropical lands; Tropical climate and Hydrology: Characteristics of Tropical Climate, Runoff, Water Balance, Ground Water Dynamics.

Unit-II: Geomorphic Processes in the Tropics

Weathering: Weathering and vertical zonation; Effects of weathering; Laterization; Bauxitization; Saprolite Formation; Tropical Slopes: Characteristics of tropical slopes; Hill slopes processes in the tropical regions; Erosion and land cover in the tropics: Erosion from tropical rainfall; Rainfall erosivity; Impact of landcover in the geomorphic processes in the tropics — Tropical Rainforest.

Unit-III: Evolution of Tropical Landforms

Characteristics of River systems of the humid tropical region; Fluvial cycle of erosion; Characteristics of Arid areas in tropical region; Arid cycle of erosion; Glaciation in tropical mountains; Glacial cycle of erosion; Development of Karst topography in tropical conditions; Karst cycle of erosion; Characteristics of tropical coasts; Marine cycle of erosion.

Unit-IV: Human impact on Geomorphic Evolution

Role of deforestation; Role of agriculture; Role of shifting cultivation; Role of tree plantations; Impoundments along rivers and their effects — physical, hydrological, ecological and biological; Land use changes; Urban Geomorphology: Land subsidence and infra-structural challenges in rapidly growing tropical cities.

Suggested Readings:

1. Gupta, Avijit : Tropical Geomorphology; Cambridge University Press. Cambridge, U.K.
2. Joshi, Veena U. : An Introduction to Tropical Geomorphology; Mangalam Publications.
3. Sharma, H.S. : Tropical Geomorphology — A morphometric study of Rajasthan; Concept Publishing Company.
4. Singh, Savindra : Geomorphology; Pravalika Publications.
5. Thomas, Michael F. : Geomorphology in the Tropics: A study of Weathering and Denudation in Low Latitudes; John Wiley & Sons.
6. Wirthmann, Alfred : Geomorphology of the Tropics; Springer Science & Business Media.

4th Year Bachelor's Degree with Honours in Research
SEMESTER - VII
GE 702R Hazard and Disaster Management

Full Marks: 100 (Credit: 4)
(Internal Assessment: 40; End Semester Examination: 60)

Course Objectives (COs):

1. The course aims to develop an understanding of the concepts and principles of hazard and disaster management.
2. Introduces different types of hazards, disaster risk reduction, and disaster governance.
3. The course also emphasizes disaster resilience and regional disaster issues in Northeast India and Tripura.

Course Learning Outcomes (CLOs):

1. Explain the fundamental concepts and classifications of hazards, disasters, risk, vulnerability, resilience, and disaster management
2. Identify major natural, environmental, and biological hazards.
3. Assess disaster risk, vulnerability, and governance mechanisms.
4. Apply disaster risk reduction and disaster management strategies.
5. Evaluate disaster issues and resilience in Northeast India and Tripura.

Unit-I: Concepts and Perspectives in Hazards and Disaster Management

Concepts: Hazard, Disaster, Risk, Vulnerability, Capacity and Resilience; Hazard-Disaster Relationship; Classification of Hazards: Natural, Anthropogenic, Technological, Biological ; Disaster Risk Reduction (DRR); Disaster Management Cycle ; Human-Environment Interactions and Disasters; Changing Perspectives in Disaster Studies: From Relief to Resilience

Unit-II: Natural Hazards and Environmental Change

Geological Hazards: Earthquakes, Volcanoes, Tsunamis, Landslides ; Hydro-Meteorological Hazards: Floods, Cyclones, Droughts, Heat Waves, Thunderstorms and Lightning; Environmental Hazards: Wildfires, Climate Change and Extreme Events. (For Each Hazard: Causes and Characteristics, Spatial Distribution, Impacts, Prediction and Early Warning, Mitigation Measures)

Unit-III: Vulnerability, Risk and Disaster Governance

Concepts of Vulnerability and Risk Assessment; Social Dimensions of Disasters: Gender, Children and Elderly, Marginalised Communities; Indigenous Knowledge and Community Resilience; Biological Hazards: Epidemics and Pandemics; Pandemics and Public Health Emergencies; Disaster Governance in India: Disaster Management Act, 2005, NDMA, SDMA and DDMA, Role of Government, NGOs and Civil Society; Sendai Framework for Disaster Risk Reduction.

Unit-IV: Disaster Risk Reduction and Regional Perspectives

Hazard Mapping and Risk Zonation; Remote Sensing and GIS in Disaster Management; Early Warning Systems; Community-Based Disaster Management; Preparedness, Response; Rehabilitation and Reconstruction; Disaster Education and Awareness; Earthquake Hazard in Northeast India; Floods and Riverbank Erosion in Northeast India; Landslides in Hilly Regions; Climate Change Vulnerability in Northeast India; Urban Flooding in Agartala; Indigenous Coping Mechanisms and Community Resilience in Tripura

Suggested Readings:

1. Carter, W. N. (1999). *Disaster management: A disaster management handbook*. Manila: ADB
2. Disaster Management Act, 2005.
3. District Disaster Management Authority, West Tripura. *District Disaster Management Plan, West Tripura District (2025–26)*.
4. Gauba, N. (2012). *Disaster Management and Preparedness: Based on the Syllabus Prescribed by UGC for Disaster Management Education*. CBS.
5. Government of Tripura. *State Disaster Management Policy*. Revenue Department, Government of Tripura.
6. Hyndman, D. W., & Hyndman, D. (2013). *Natural Hazards and Disasters* (4th ed.). Brooks/Cole
7. IPCC Assessment Reports.
8. National Disaster Management Authority (NDMA) Guidelines.
9. National Institute of Disaster Management (NIDM) Training Manuals.
10. Pandey, M. (2014). *Disaster Management*. Wiley.
11. Raj, J. L., Moran, D., Deori, S., Basumatari, D., Borah, N. P., & Das, R. (2026). Review on Natural hazard Risk assessment and Public Policy of North East Region of India. *Lecture Notes in Civil Engineering*, 127–145. https://doi.org/10.1007/978-981-95-4009-9_10.
12. Sendai Framework for Disaster Risk Reduction 2015-2030
13. Singh, J., & Bora, P. (2014). *Development, Disaster and Displacement in North East India*. Mittal.
14. Singh, R. B. (Ed.). (2006). *Natural Hazards and Disaster Management: Vulnerability and Mitigation*. Rawat.
15. Vaidyanathan, S. (2025). *An Introduction to Disaster Management: Natural Disasters and Man-Made Hazards*. CBS.
16. Wisner, B., Blaikie, P., Cannon, T., & Davis, I. (2014). *At risk: natural hazards, people's vulnerability and disasters*. Routledge.

4th Year Bachelor's Degree with Honours in Research
SEMESTER - VII
GE 703R Urban Geography

Full Marks- 100 (Credit - 4)

(Internal Assessment- 40; End Sem. Exam- 60)

Course Objective (COs):

1. Understanding the nature, scope and evolution of Urban Geography and the development of urban centres in ancient, medieval and colonial times.
2. To understand urbanization and its trends in global and Indian contexts.
3. Study of urban morphology, city ecology, urban hierarchy, spatial structure and major models of urban growth and development.
4. Understanding CBDs, urban social structure, social segregation, residential mobility, neighbourhood change and formal and informal urban economies
5. Introducing digital urbanism, e-economy and the changing character of contemporary cities.
6. Knowledge of urban planning principles, urban renewal programs and major projects such as IDSMT, AMRUT and Smart Cities Mission.
7. Understanding urban problems in the fields of housing, transport, water, drainage and sanitation and exploring strategies for sustainable urban development and urban forestry.

Course Learning Outcomes (CLOs):

1. Describe the nature, scope, evolution, and main theories of urban geography. Examine the tendencies and historical development of urbanization in India and around the world.
2. Assess urban functions, residential mobility, CBD dynamics, social segregation, and the function of formal, informal, and digital economies.
3. Evaluate regional development and urban planning concepts and methods, such as metropolitan planning, urban regeneration projects, and Smart City projects, in the Indian context.
4. Analyse how globalization affects urban expansion and sustainable urban development, and suggest ways to manage housing, transportation, water supply, drainage, sanitation, and urban forestry in Indian cities.

Unit-I: Theoretical Foundations and Evolution

Nature, scope, and evolution of urban geography as a field of study; Development of urban centres during ancient, medieval, and colonial periods; Urbanization Dynamics: Global and Indian trends of urbanization.

Unit-II: Urban Morphology

Contemporary city ecology; Planning region in Urban Arena-concept, delineation and significance; Urban hierarchy and spacing: models of Christaller and Philbrick ; Role of urban hierarchy in regional planning; Urban morphology: Concentric model of Burgess and Sector model of Hoyt; Multi nuclei model of Harris and Ullman ; Social segregation in the city ; Urban social area analysis after Shvky and Bell.

Unit-III: Socio-Economic Structure and Infrastructure

CBD Dynamics: Areal definition, historical processes of the Central Business District, and the zone in transition; Urban social structure, social segregation, residential mobility, and neighbourhood transformation; Analysis of basic and non-basic functions; formal and informal urban economies; Digital Urbanism and its platforms; Concept of e-economy.

Unit-IV: Planning, Policy, and Sustainable Development

Principles of urban planning: Indian context; Urban Renewal Missions, IDSMT, AMRUT and Smart City initiatives; Metropolitan planning analysis of cities like Chandigarh, Mumbai, Guwahati, and Udaipur; Impacts of globalization on urban forms and sustainable urban development; Management of housing, transport, water, drainage, sanitation of Indian megacities and solution-strategies, Concept of urban forestry.

Suggested Readings:

1. A.Siddhartha, K. & Mukherjee, S. (1996): Cities, Urbanization and Urban Systems, Transworld Media and Communication Pvt. Ltd., New Delhi
2. Beanjen-Garnier, J & Chabot, G. (1967): Urban Geography, Jhonwiley, New York
3. Berry, B. J. L. & Horton, F. F. (1970): Geographic Perspectives on Urban Systems. Prentice Hall Englewood Cliffs, New Jersey
4. Hall, T. (ed) (2006): Urban Geography. Routledge, London
5. Johnson J. H. (1966): Urban Geography- An Introductory Analysis, Progamon Press, Oxford, London
6. Karen, S. C. (1999): Cities and Complexity, Univeristy of California, Barkley, USA, Sage Publications, New Delhi
7. King L. J. &Regionald G. G. (1978): Cities, Space and Behavior: The Elements of Urban Geography, Prentice Hall, Inc. Englewood Cliffs, New Jersey, USA
8. Mandel, R. B. (2002) Urban Geography- A Text Book. Concept Publishing Company, New Delhi
9. Mayer, H. M. & Kohn CF (1967): Urban Geography, Central Depot, Allahabad, India
10. Northham Ray, M. (1975): Urban Geography, John Wiley & Sons, Inc., New York
11. Peter, R. (2000): Urban Regeneration, University of Dundee, UK, Sage Publications, New Delhi
12. Ranan, P. (2001): Handbook on Urban Studies, University of Glasgow, UK. Sage Publications, New Delhi
13. Saskia S. (2000): Cities in a World Economy, University of Chicago, USA. Sage Publications, New Delhi
14. Stephen, W. (2004): Planning and Urban Change, Sage Publications, New Delhi
15. Elias. M. Awad, " Electronic Commerce", Prentice-Hall of India Pvt Ltd.
16. RaviKalakota, Andrew B. Whinston, "Electronic Commerce-A Manager's guide", Addison-Wesley.
17. Efraim Turban, Jae Lee, David King, H.Michael Chung, "Electronic Commerce–A ManagerialPerspective", Addison-Wesley

4th Year Bachelor's Degree with Honours in Research
SEMESTER–VII
GE 704R Remote Sensing, GIS and Spatial Analysis
(Theoretical)

Full Marks - 60 (Credit-2)
(Internal Assessment - 24; End Semester Examination -36)

Course Objectives (COs):

1. Develop an understanding of the principles and applications of digital remote sensing, image processing and contemporary Earth observation systems.
2. Familiarize students with digital image correction, enhancement, spectral indices, change detection and introductory object-based image analysis.
3. Develop knowledge of advanced GIS concepts and spatial analysis techniques, including spatial databases, geodatabases, coordinate systems, terrain analysis and network analysis.
4. Develop practical skills in the use of GIS and Remote Sensing software for georeferencing, digitisation, image processing, spectral-index generation, spatial analysis and DEM-based terrain analysis.
5. Enable students to apply Remote Sensing and GIS techniques to urban planning, watershed management, disaster risk reduction, environmental monitoring and sustainable development.

Course Learning Outcomes (CLOs):

1. Explain the principles of digital remote sensing, digital image characteristics, image corrections, enhancement techniques and contemporary Earth observation systems.
2. Interpret and apply digital image processing techniques, including radiometric, geometric and atmospheric corrections, image enhancement, False Colour Composite (FCC) and spectral indices such as NDVI, NDWI and NDBI.
3. Apply GIS concepts and spatial analysis techniques, including spatial queries, buffering, overlay, clipping, intersection and other geoprocessing operations.
4. Demonstrate practical proficiency in georeferencing, digitisation, attribute-data creation and editing, spatial analysis and map preparation using GIS software.
5. Generate and interpret DEM-derived terrain parameters such as slope and aspect and apply them to geographical analysis.
6. Demonstrate basic understanding and application of spatial databases, geodatabases, coordinate systems, map projections, network analysis, Web GIS and open-source GIS platforms such as QGIS.
7. Apply and interpret Remote Sensing and GIS techniques to selected geographical problems related to urban planning, watershed management, disaster risk reduction, environmental monitoring and sustainable development.
8. Organize and communicate geospatial analysis through appropriate maps, practical records/project reports and oral presentations/viva-voce.

Unit-I: Digital Remote Sensing and Image Processing

Digital Image Characteristics; Radiometric, Geometric and Atmospheric Corrections; Image Enhancement Techniques; Spectral Indices (NDVI, NDWI and NDBI); Object-Based Image Analysis (Introductory); Digital Change Detection Techniques; Contemporary Earth Observation Systems-Landsat, Sentinel, Cartosat, Resourcesat and UAV (Drone)-based Remote Sensing.

Unit-II: Advanced GIS and Spatial Analysis

Spatial Database Management; Geodatabases; Coordinate Systems and Projection Management; Spatial Analysis Techniques-Buffer, Overlay, Clip, Intersect, Union and Spatial Query; Digital Elevation Models (DEM) and Terrain Analysis; Network Analysis; Introduction to Web GIS and Open-source GIS (QGIS); Applications of GIS and Remote Sensing in Urban Planning, Watershed Management, Disaster Risk Reduction, Environmental Monitoring and Sustainable Development.

Suggested Readings:

1. Burrough, P. A. & McDonnell, R. A. (1998). *Principles of Geographical Information Systems*. Oxford University Press.
2. Campbell, J. B. & Wynne, R. H. (2011). *Introduction to Remote Sensing* (5th ed.). Guilford Press.
3. Chang, K.-T. (2019). *Introduction to Geographic Information Systems* (9th ed.). McGraw-Hill Education.
4. Jensen, J. R. (2015). *Introductory Digital Image Processing: A Remote Sensing Perspective* (4th ed.). Pearson.
5. Joseph, G. (2005). *Fundamentals of Remote Sensing*. Universities Press.
6. Lillesand, T. M., Kiefer, R. W. & Chipman, J. W. (2015). *Remote Sensing and Image Interpretation* (7th ed.). Wiley.

4th Year Bachelor's Degree with Honours in Research
SEMESTER–VII
GE 704R Remote Sensing, GIS and Spatial Analysis
(Practical)

Full Marks - 40 (Credit-2)
(Internal Assessment-16; End Semester Examination -24)

Sl. No.	Practical	Marks
1.	Laboratory Exercises using GIS and Remote Sensing Software comprising: Georeferencing of Topographical Maps and Satellite Images; Digitisation of Point, Line and Polygon Features; Creation and Editing of Attribute Data; Spatial Analysis (Buffer, Overlay, Clip and Spatial Query); Digital Image Enhancement; Preparation of False Colour Composite (FCC); Generation of Spectral Indices (NDVI/NDWI/NDBI); Digital Change Detection and DEM-based Terrain Analysis (Slope and Aspect Mapping).	19
	Practical Record Book/Project Report and Viva-voce	3+2
	Total	24

Suggested Readings:

1. Chang, K.-T. (2021). *Introduction to Geographic Information Systems* (10th ed.). McGraw-Hill Education.
2. Jensen, J. R. (2015). *Introductory Digital Image Processing: A Remote Sensing Perspective* (4th ed.). Pearson.
3. Lillesand, T. M., Kiefer, R. W. & Chipman, J. W. (2015). *Remote Sensing and Image Interpretation* (7th ed.). John Wiley & Sons.
4. Saha, P. & Basu, P. (2015). *Advanced Practical Geography: A Laboratory Manual*. Books and Allied (P) Ltd., Kolkata.
5. Sarkar, A. (2015). *Practical Geography: A Systematic Approach*. Orient BlackSwan, New Delhi.
6. Singh, R. L. & Singh, R. P. B. (2003). *Elements of Practical Geography*. Kalyani Publishers, New Delhi.

4th Year Bachelor's Degree with Honours in Research

SEMESTER- VII

GE 701M Natural Resource Management

Full marks-100 (Credit-4)

(Internal Assessment-40; End Sem. Exam. -60)

Course Objectives (COs):

1. To develop an understanding of the concepts, classification, and significance of natural resources and their role in human development.
2. To familiarise students with the distribution and characteristics of major natural resources and resource regions of India.
3. To examine the relationship between population growth, resource utilization, and environmental sustainability.
4. To introduce the principles, policies, and strategies for the conservation and sustainable management of natural resources at global, national, and regional levels.
5. To enhance awareness of the roles of government, non-governmental organizations, and local communities in natural resource conservation and management.

Course Learning Outcomes (CLOs):

1. Explain the concept, classification, and changing perspectives of natural resources, and evaluate the importance of their conservation and management.
2. Analyse the spatial distribution and significance of India's major resource regions and natural resources, including energy, land, water, and forests.
3. Assess the impact of population growth and patterns of resource consumption on resource availability and environmental sustainability in India.
4. Evaluate resource conservation policies and sustainable resource development strategies, and examine the roles of government agencies, NGOs, and local communities in natural resource management.
5. Identify the major challenges in natural resource management in India and propose appropriate conservation and sustainable management approaches.

Unit-I: Introduction to Natural resources

Meaning and changing concepts of natural resources; Concept and Importance of conservation and management of natural resources; Classification of resources: Basis of classification and classification scheme

Unit-II: Resources and Resource regions of India

Major Resource Regions of India; Distribution of Resources in India: Energy resources, Land Resources, Water Resources, Forest Resources.

Unit-III: Population and resource use

Population growth and trends and patterns of resource use in India; Resource consumption and its consequences on the environment.

Unit-IV: Resource management and conservation policies

Policies for resources conservation: Global, National and Regional policies; Concept and need of Sustainable resource development; Role of government, NGOs and community in the conservation and management of natural resources; problems in the management of Natural resources in India.

Suggested Readings:

1. Cutter S. N., Renwick H. L. and Renwick W., 1991: Exploitation, Conservation, Preservation: A Geographical Perspective on Natural Resources Use, John Wiley and Sons, New York.
2. Gadgil M. and Guha R., 2005: The Use and Abuse of Nature: Incorporating This Fissured Land: An Ecological History of India and Ecology and Equity, Oxford University Press. USA.
3. Holechek J. L. C., Richard A., Fisher J. T. and Valdez R., 2003: Natural Resources:

4. Ecology, Economics and Policy, Prentice Hall, New Jersey.
5. Jones G. and Hollier G., 1997: Resources, Society and Environmental Management, Paul Chapman, London.
6. Klee G., 1991: Conservation of Natural Resources, Prentice Hall, Englewood.
7. Mather A. S. and Chapman K., 1995: Environmental Resources, John Wiley and Sons, New York.
8. Mitchell B., 1997: Resource and Environmental Management, Longman Harlow, England.
9. Owen S. and Owen P. L., 1991: Environment, Resources and Conservation, Cambridge University Press, New York.
10. Rees J., 1990: Natural Resources: Allocation, Economics and Policy, Routledge.London

SEMESTER -VIII

4th Year Bachelor's Degree with Honours in Research

SEMESTER- VIII GE 801R Research Methodology

Full Marks-100 (Credit-4)
(Internal Assessment-40; End Semester Examination-60)

Course Objectives (COs)

1. Introduce students to the fundamental concepts, types, approaches and processes of research, with special reference to geographical research.
2. Develop skills in identifying and formulating research problems, objectives, hypotheses/research questions and appropriate research designs.
3. Familiarize students with various sources and methods of data collection, field survey techniques, and the application of GPS, Remote Sensing and GIS in geographical research.
4. Develop competencies in the organization, analysis, interpretation and presentation of geographical data using appropriate tabular, graphical, statistical, cartographic and digital techniques.
5. Develop students' ability to prepare research proposals, dissertations, project reports and seminar papers while adhering to research ethics, academic integrity, citation and referencing conventions.

Course Learning Outcomes (CLOs)

1. Explain the nature, significance, types and major stages of the research process in geographical studies.
2. Formulate research problems, objectives, hypotheses/research questions and suitable research designs based on relevant literature.
3. Apply appropriate qualitative and quantitative methods of data collection, including field surveys, observation, questionnaires, interviews, FGD, case studies and document analysis.
4. Demonstrate basic proficiency in using GPS, Remote Sensing, GIS and spreadsheet tools for geographical data collection, organization and analysis.
5. Organize, analyze, interpret and present geographical data using tables, graphs, diagrams, maps and other appropriate techniques.
6. Prepare research proposals, dissertations, project reports and seminar papers following appropriate scientific structure, APA referencing and academic writing conventions.
7. Demonstrate ethical research practices, academic integrity and awareness of plagiarism in the conduct and reporting of research.
8. Apply research methodology to selected problems in physical, human and environmental geography and communicate research findings systematically.

Unit-I: Introduction to Research

Meaning, Nature and Significance of Research; Scientific Method; Types of Research-Basic, Applied, Qualitative and Quantitative; Research Process; Identification and Formulation of Research Problem, Research Ethics

Unit-II: Research Design and Data Collection

Research Design: Statement of the problem, objectives, and hypothesis/ research questions, methodology, significance, organization of the work, review of literature and referencing
Sources of Data-Primary and Secondary; Methods of Data Collection-Observation, Questionnaire, Schedule, Interview and Focus Group Discussion (FGD), Ethnography, Interpretive Phenomenological Analysis (IPA), Open-Ended Surveys, Document Analysis, case study.

Field Survey Methods in Geography; Use of GPS, Remote Sensing and GIS in Geographical Research; Pilot Survey and Pre-testing of Questionnaire.

Unit-III: Data Organization and Presentation

Editing, Coding, Classification and Tabulation of Data; Preparation of Tables, Graphs and Diagrams; Cartographic Representation of Geographical Data; Interpretation of Maps, Tables and Graphs; Use of Spreadsheet and GIS Software for Data Organization.

Unit-IV: Scientific Report Writing

Structure of Research Proposal; Structure of Research Report; Citation and Referencing (APA Style); Bibliography; Plagiarism and Academic Integrity; Preparation of Dissertation, Project Report and Seminar Paper; Applications of Research Methodology in Physical, Human and Environmental Geography.

Suggested Readings:

1. Creswell, J. W. & Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (5th ed.). Sage Publications.
2. Kothari, C. R. (2004). *Research Methodology: Methods and Techniques* (2nd ed.). New Age International (P) Ltd.
3. Kumar, R. (2019). *Research Methodology: A Step-by-Step Guide for Beginners* (5th ed.). Sage Publications.
4. Misra, R. P. (2002). *Research Methodology: A Handbook*. Concept Publishing Company.
5. Clifford, N., Cope, M., Gillespie, T. & French, S. (Eds.). (2016). *Key Methods in Geography* (3rd ed.). Sage Publications.
6. Gomez, B. & Jones III, J. P. (Eds.). (2010). *Research Methods in Geography: A Critical Introduction*. Wiley-Blackwell.

4th Year Bachelor's Degree with Honours in Research
SEMESTER-VIII
GE 801M Disaster Management

Full Marks: 100 (Credit: 4)
Internal Assessment: 40; End Semester Examination: 60)

Course Objectives (COs):

The course aims to equip students with a comprehensive understanding of hazards, disasters, vulnerability, risk, resilience and Disaster Risk Reduction, while developing their ability to assess disaster risks, understand disaster governance and community-based disaster management, analyze regional vulnerabilities, particularly in Northeast India, and critically examine key challenges in disaster management.

Course Learning Outcome (CLOs):

1. Explain the basic concepts of hazards, disasters, risk, vulnerability, resilience, and disaster risk reduction.
2. Assess vulnerability and disaster risk using hazard mapping and community-based disaster management approaches.
3. Examine disaster governance in India and the role of national, state, local, and international disaster management frameworks.
4. Evaluate the major challenges in disaster management and suggest appropriate mitigation and recovery measures.
5. Apply disaster risk reduction strategies to strengthen community resilience and promote sustainable development.

Unit-I: Concepts and Perspectives in Hazard and Disaster Management: Concepts: Hazard, Disaster, Risk, Vulnerability, Adaptation, Coping Capacity and Resilience; Hazard-Disaster Relationship; Classification of Hazards: Natural, Anthropogenic; Disaster Risk Reduction (DRR); Disaster Management Cycle; Human-Environment Interactions and Disasters.

Unit-II: Vulnerability Assessment and Disaster Risk Reduction: Dimensions and Determinants of Vulnerability: Social, Economic, Demographic and Environmental Perspectives; Risk Assessment of Vulnerable Populations: Women, Children, Elderly, Persons with Disabilities and Indigenous Communities; Community-based Disaster Management: Preparedness, Response, Rehabilitation and Reconstruction; Hazard Mapping and Risk Zonation.

Unit-III: Governance and Regional Perspectives: Disaster Governance in India: Disaster Management Act, 2005; NDMA; SDMA and DDMA; Role of government agencies, NGOs and Civil society; Sendai Framework for Disaster Risk Reduction; Regional Perspectives on Disaster Risk Reduction: Northeast India with a focus on Floods and Riverbank erosion, Landslides, Earthquake, Glacial Lake Outburst Flood (GLOF) and Climate Change vulnerability.

Unit-IV: Challenges and Issues in Disaster Management: Institutional limitation; Infrastructural Gaps; Resource Constraint; Technological challenges; Post-disaster recovery challenges; Policy and Planning challenges.

Suggested Readings:

1. Carter, W. N. (1999). Disaster management: A disaster management handbook. Manila: ADB
2. Disaster Management Act, 2005.
3. District Disaster Management Authority, West Tripura. *District Disaster Management Plan, West Tripura District (2025–26)*.
4. Gauba, N. (2012). *Disaster Management and Preparedness: Based on the Syllabus Prescribed by UGC for Disaster Management Education*. CBS.
5. Government of Tripura. *State Disaster Management Policy*. Revenue Department, Government of Tripura.
6. Hyndman, D. W., & Hyndman, D. (2013). *Natural Hazards and Disasters* (4th ed.). Brooks/Cole
7. IPCC Assessment Reports..
8. National Disaster Management Authority (NDMA) Guidelines.
9. National Institute of Disaster Management (NIDM) Training Manuals.
10. Pandey, M. (2014). *Disaster Management*. Wiley.
11. Raj, J. L., Moran, D., Deori, S., Basumatari, D., Borah, N. P., & Das, R. (2026). *Review on Natural hazard Risk assessment and Public Policy of North East Region of India*. *Lecture Notes in Civil Engineering*, 127–145. https://doi.org/10.1007/978-981-95-4009-9_10.
12. Sendai Framework for Disaster Risk Reduction 2015-2030
13. Singh, J., & Bora, P. (2014). *Development, Disaster and Displacement in North East India*. Mittal.
14. Singh, R. B. (Ed.). (2006). *Natural Hazards and Disaster Management: Vulnerability and Mitigation*. Rawat.
15. Vaidyanathan, S. (2025). *An Introduction to Disaster Management: Natural Disasters and Man-Made Hazards*. CBS.
16. Wisner, B., Blaikie, P., Cannon, T., & Davis, I. (2014). *At risk: natural hazards, people's vulnerability and disasters*. Routledge.

4-Year Under Graduate Programme
Honours in Geography
(NEP 2020)

Fourth Year Syllabus for Geography
(Major & Minor Courses)



Tripura University

(A Central University)
Suryamaninagar - 799022,
West Tripura

Structure of Fourth Year Bachelor's Degree with Honours in Geography

Semester	Major/ Minor	Course/Paper	Credit	Marks	Total Credit
Sem. - VII	Major 17	GE 701C -Tropical Geomorphology	04	40+60=100	20
	Major 18	GE 702C – Hazard and Disaster Management	04	40+60=100	
	Major 19	GE 703C - Urban Geography	04	40+60=100	
	Major 20	GE 704C- Remote Sensing (Theory and Practical)	04	40+60=100	
	Minor 7	GE 701M - Natural Resource Management (offering to other subject students)	04	40+60=100	
Sem. - VIII	Major 21	GE 801C - Research Methodology	04	40+60=100	20
	Major 22	GE 802C - Natural Resource Management	04	40+60=100	
	Major 23	GE 803C - Geography of Tourism	04	40+60=100	
	Major 24	GE 804C - GIS (Theory and Practical)	04	40+60=100	
	Minor 8	GE 801M - Disaster Management (offering to other subject students)	04	40+60=100	
				1000	40

GE= Geography, C=Core, M=Minor

SEMESTER – VII

4th Year Bachelor's Degree with Honours

SEMESTER: VII

GE 701 C Tropical Geomorphology

Full Marks- 100 (Credit - 4)

(Internal Assessment- 40; End Sem. Exam- 60)

Course Objectives (COs):

1. To provide a comprehensive understanding of the concepts, scope, principles, and climatic, hydrological, geological, and tectonic controls of tropical geomorphology, with particular emphasis on morphogenetic regions and the distinctive characteristics of tropical environments.
2. To develop an understanding of tropical geomorphic processes, including weathering, laterization, bauxitization, saprolite formation, slope processes, rainfall-induced erosion, and the role of vegetation and land cover in shaping tropical landscapes.
3. To examine the evolution and characteristics of major tropical landforms and geomorphic systems, including fluvial, arid, glacial, karst, and coastal landforms, and to understand their associated cycles of erosion under different tropical environmental conditions.
4. To critically assess the influence of human activities and environmental changes on tropical geomorphic evolution, including deforestation, agriculture, shifting cultivation, plantations, river impoundments, land-use change, and urbanisation, with particular emphasis on land subsidence, infrastructure challenges, and sustainable geomorphic and environmental management.

Course Learning Outcomes (CLOs)

1. Understanding the role of climate, especially temperature and rainfall, in shaping tropical landscapes.
2. Explain major tropical processes like deep chemical weathering, laterization and fluvial erosion.
3. Identify key tropical landforms: inselbergs, laterite plateaus, tropical river features.
4. Analyze the impact of human activities like deforestation, jhum cultivation, urbanization etc. on tropical landforms.
5. Assess geomorphic knowledge for resources management, planning and disaster management in tropical regions.
6. Apply geomorphic knowledge for resource management, planning and disaster management.
7. Interpret maps, toposheets and satellite images to recognize tropical landforms.

Unit -I: Introduction

Definition, Scope of Tropical Geomorphology; Concept of Morphogenetic Regions; Difference between Tropical Geomorphology and Temperate Geomorphology; Geological and Tectonic framework of the tropical lands; Tropical climate and Hydrology: Characteristics of Tropical Climate, Runoff, Water Balance, Ground Water Dynamics.

Unit -II: Geomorphic Processes in the Tropics

Weathering: Weathering and vertical zonation; Effects of weathering; Laterization; Bauxitization; Saprolite Formation; Tropical Slopes: Characteristics of tropical slopes; Hill slopes processes in the tropical regions; Erosion and land cover in the tropics: Erosion from tropical rainfall; Rainfall erosivity; Impact of landcover in the geomorphic processes in the tropics — Tropical Rainforest.

Unit -III: Evolution of Tropical Landforms

Characteristics of River systems of the humid tropical region; Fluvial cycle of erosion; Characteristics of Arid areas in tropical region; Arid cycle of erosion; Glaciation in tropical mountains; Glacial cycle of erosion; Development of Karst topography in tropical conditions; Karst cycle of erosion; Characteristics of tropical coasts; Marine cycle of erosion.

Unit –IV: Human impact on Geomorphic Evolution

Role of deforestation; Role of agriculture; Role of shifting cultivation; Role of tree plantations; Impoundments along rivers and their effects — physical, hydrological, ecological and biological; Land use changes; Urban Geomorphology: Land subsidence and infra-structural challenges in rapidly growing tropical cities.

Suggested Readings:

1. Gupta, Avijit : Tropical Geomorphology; Cambridge University Press. Cambridge, U.K.
2. Joshi, Veena U. : An Introduction to Tropical Geomorphology; Mangalam Publications.

3. Sharma, H.S. : Tropical Geomorphology — A morphometric study of Rajasthan; Concept Publishing Company.
4. Singh, Savindra : Geomorphology; Pravalika Publications.
5. Thomas, Michael F. : Geomorphology in the Tropics: A study of Weathering and Denudation in Low Latitudes; John Wiley & Sons.
6. Wirthmann, Alfred : Geomorphology of the Tropics; Springer Science & Business Media.

4th Year Bachelor's Degree with Honours
SEMESTER - VII
GE 702C Hazard and Disaster Management

Full Marks: 100 (Credit: 4)
(Internal Assessment: 40; End Semester Examination: 60)

Course Objectives (COs)

1. The course aims to develop an understanding of the concepts and principles of hazard and disaster management.
2. Introduces different types of hazards, disaster risk reduction, and disaster governance.
3. The course also emphasizes disaster resilience and regional disaster issues in Northeast India and Tripura.

Course Learning Outcomes (CLOs)

1. Explain the fundamental concepts and classifications of hazards, disasters, risk, vulnerability, resilience, and disaster management
2. Identify major natural, environmental, and biological hazards.
3. Assess disaster risk, vulnerability, and governance mechanisms.
4. Apply disaster risk reduction and disaster management strategies.
5. Evaluate disaster issues and resilience in Northeast India and Tripura.

Unit-1: Concepts and Perspectives in Hazards and Disaster Management

Concepts: Hazard, Disaster, Risk, Vulnerability, Capacity and Resilience; Hazard-Disaster Relationship; Classification of Hazards: Natural, Anthropogenic, Technological, Biological ; Disaster Risk Reduction (DRR); Disaster Management Cycle ; Human-Environment Interactions and Disasters; Changing Perspectives in Disaster Studies: From Relief to Resilience

Unit- II: Natural Hazards and Environmental Change

Geological Hazards: Earthquakes, Volcanoes, Tsunamis, Landslides ; Hydro-Meteorological Hazards: Floods, Cyclones, Droughts, Heat Waves, Thunderstorms and Lightning; Environmental Hazards: Wildfires, Climate Change and Extreme Events. (For Each Hazard: Causes and Characteristics, Spatial Distribution, Impacts, Prediction and Early Warning, Mitigation Measures)

Unit- III: Vulnerability, Risk and Disaster Governance

Concepts of Vulnerability and Risk Assessment; Social Dimensions of Disasters: Gender, Children and Elderly, Marginalised Communities; Indigenous Knowledge and Community Resilience; Biological Hazards: Epidemics and Pandemics; Pandemics and Public Health Emergencies; Disaster Governance in India: Disaster Management Act, 2005, NDMA, SDMA and DDMA, Role of Government, NGOs and Civil Society; Sendai Framework for Disaster Risk Reduction.

Unit -IV: Disaster Risk Reduction and Regional Perspectives

Hazard Mapping and Risk Zonation; Remote Sensing and GIS in Disaster Management; Early Warning Systems; Community-Based Disaster Management; Preparedness, Response; Rehabilitation and Reconstruction; Disaster Education and Awareness; Earthquake Hazard in Northeast India; Floods and Riverbank Erosion in Northeast India; Landslides in Hilly Regions; Climate Change Vulnerability in Northeast India; Urban Flooding in Agartala; Indigenous Coping Mechanisms and Community Resilience in Tripura

Suggested Readings:

1. Carter, W. N. (1999). Disaster management: A disaster management handbook. Manila: ADB
2. Disaster Management Act, 2005.
3. District Disaster Management Authority, West Tripura. *District Disaster Management Plan, West Tripura District (2025–26)*.
4. Gauba, N. (2012). *Disaster Management and Preparedness: Based on the Syllabus Prescribed by UGC for Disaster Management Education*. CBS.
5. Government of Tripura. *State Disaster Management Policy*. Revenue Department, Government of Tripura.

6. Hyndman, D. W., & Hyndman, D. (2013). *Natural Hazards and Disasters* (4th ed.). Brooks/Cole
7. IPCC Assessment Reports.
8. National Disaster Management Authority (NDMA) Guidelines.
9. National Institute of Disaster Management (NIDM) Training Manuals.
10. Pandey, M. (2014). *Disaster Management*. Wiley.
11. Raj, J. L., Moran, D., Deori, S., Basumatari, D., Borah, N. P., & Das, R. (2026). Review on Natural hazard Risk assessment and Public Policy of North East Region of India. Lecture Notes in Civil Engineering, 127–145. https://doi.org/10.1007/978-981-95-4009-9_10.
12. Sendai Framework for Disaster Risk Reduction 2015-2030
13. Singh, J., & Bora, P. (2014). Development, Disaster and Displacement in North East India. Mittal.
14. Singh, R. B. (Ed.). (2006). *Natural Hazards and Disaster Management: Vulnerability and Mitigation*. Rawat.
15. Vaidyanathan, S. (2025). *An Introduction to Disaster Management: Natural Disasters and Man-Made Hazards*. CBS.
16. Wisner, B., Blaikie, P., Cannon, T., & Davis, I. (2014). *At risk: natural hazards, people's vulnerability and disasters*. Routledge.

4th Year Bachelor's Degree with Honours

SEMESTER -VII

GE 703C Urban Geography

Full Marks: 100 (Credit 4)

(Internal Assessment 40; End. Sem. Exam: 60)

Course Objective (COs):

1. Understanding the nature, scope and evolution of Urban Geography and the development of urban centres in ancient, medieval and colonial times.
2. To understand urbanization and its trends in global and Indian contexts.
3. Study of urban morphology, city ecology, urban hierarchy, spatial structure and major models of urban growth and development.
4. Understanding CBDs, urban social structure, social segregation, residential mobility, neighbourhood change and formal and informal urban economies
5. Introducing digital urbanism, e-economy and the changing character of contemporary cities.
6. Knowledge of urban planning principles, urban renewal programs and major projects such as IDSMT, AMRUT and Smart Cities Mission.
7. Understanding urban problems in the fields of housing, transport, water, drainage and sanitation and exploring strategies for sustainable urban development and urban forestry.

Course Learning Outcomes (CLOs):

1. Describe the nature, scope, evolution, and main theories of urban geography. Examine the tendencies and historical development of urbanization in India and around the world.
2. Assess urban functions, residential mobility, CBD dynamics, social segregation, and the function of formal, informal, and digital economies.
3. Evaluate regional development and urban planning concepts and methods, such as metropolitan planning, urban regeneration projects, and Smart City projects, in the Indian context.
4. Analyse how globalization affects urban expansion and sustainable urban development, and suggest ways to manage housing, transportation, water supply, drainage, sanitation, and urban forestry in Indian cities.

Unit -I: Theoretical Foundations and Evolution

Nature, scope, and evolution of urban geography as a field of study; Development of urban centres during ancient, medieval, and colonial periods; Urbanization Dynamics: Global and Indian trends of urbanization.

Unit -II: Urban Morphology

Contemporary city ecology; Planning region in Urban Arena-concept, delineation and significance; Urban hierarchy and spacing; models of Chrisaller and Philbrick ; Role of urban hierarchy in regional planning; Urban morphology: Concentric model of Burgess and Sector model of Hoyt; Multi nuclei model of Harris and Ullman ; Social segregation in the city ; Urban social area analysis after Shevky and Bell.

Unit -III: Socio-Economic Structure and Infrastructure

CBD Dynamics: Areal definition, historical processes of the Central Business District, and the zone in transition; Urban social structure, social segregation, residential mobility, and neighbourhood transformation; Analysis of basic and non-basic functions; formal and informal urban economies; Digital Urbanism and its platforms; Concept of e-economy.

Unit -IV: Planning, Policy, and Sustainable Development

Principles of urban planning: Indian context; Urban Renewal Missions, IDSMT, AMRUT and Smart City initiatives; Metropolitan planning analysis of cities like Chandigarh, Mumbai, Guwahati, and Udaipur; Impacts of globalization on urban forms and sustainable urban development; Management of housing, transport, water, drainage, sanitation of Indian megacities and solution-strategies, Concept of urban forestry.

Suggested Readings:

1. A.Siddhartha, K. & Mukherjee, S. (1996): Cities, Urbanization and Urban Systems, Transworld Media and Communication Pvt. Ltd., New Delhi
2. Beanjen-Garnier, J & Chabot, G. (1967): Urban Geography, Jhonwiley, New York
3. Berry, B. J. L. & Horton, F. F. (1970): Geographic Perspectives on Urban Systems. Prentice Hall Englewood Cliffs, New Jersey
4. Hall, T. (ed) (2006): Urban Geography. Routledge, London
5. Johnson J. H. (1966): Urban Geography- An Introductory Analysis, Progamon Press, Oxford, London
6. Karen, S. C. (1999): Cities and Complexity, Univeristy of California, Barkley, USA, Sage Publications, New Delhi
7. King L. J. &Regionald G. G. (1978): Cities, Space and Behavior: The Elements of Urban Geography, Prentice Hall, Inc. Englewood Cliffs, New Jersey, USA
8. Mandel, R. B. (2002) Urban Geography- A Text Book. Concept Publishing Company, New Delhi
9. Mayer, H. M. & Kohn CF (1967): Urban Geography, Central Depot, Allahabad, India
10. Northham Ray, M. (1975): Urban Geography, John Wiley & Sons, Inc., New York
11. Peter, R. (2000): Urban Regeneration, University of Dundee, UK, Sage Publications, New Delhi
12. Ranan, P. (2001): Handbook on Urban Studies, University of Glasgow, UK. Sage Publications, New Delhi
13. Saskia S. (2000): Cities in a World Economy, University of Chicago, USA. Sage Publications, New Delhi
14. Stephen, W. (2004): Planning and Urban Change, Sage Publications, New Delhi
15. Elias. M. Awad, " Electronic Commerce", Prentice-Hall of India Pvt Ltd.
16. RaviKalakota, Andrew B. Whinston, "Electronic Commerce-A Manager's guide", Addison-Wesley.
17. Efraim Turban, Jae Lee, David King, H.Michael Chung, "Electronic Commerce—A ManagerialPerspective", Addison-Wesley

4th Year Bachelor's Degree with Honours
SEMESTER–VII
GE 704C Remote Sensing (Theoretical)

Full Marks - 60 (Credit-2)
(Internal Assessment - 24; End Semester Examination -36)

Course Objective (COs):

1. Basic principles of Digital Image Processing, image data sources and formats, image errors, geometric and radiometric corrections, image enhancement and spatial filtering.
2. Understanding ground truth collection, pattern recognition, and techniques of supervised and unsupervised image classification.
3. The fundamentals of photogrammetry, the characteristics and importance of aerial photographs, and the difference between aerial photographs and topographic maps.
4. Understanding remote sensing data products, ground truth equipment and use of spectro-radiometers.
5. Preparation of remote sensing outputs such as computer printouts, thematic maps and dot-density maps and their interpretation.

Course Learning Outcomes (CLOs):

1. Describe the basic ideas of digital image processing, such as the creation of digital images, data sources, data formats, hardware and software requirements, and sources of picture faults.
2. Using suitable training and ground truth data demonstrate the fundamentals of pattern recognition and carry out supervised and unsupervised picture classification.
3. Explain the fundamentals of photogrammetry, analyze aerial photos, differentiate them from topographical maps, and discuss the importance of digital photogrammetry, block adjustment, DEM, and ortho-mosaic creation.
4. Analyse and interpret remote sensing outputs presented as computer printouts, thematic maps, and dot density maps for geographical and environmental applications.

Unit- I: Digital Image processing

Definition of digital image; sources of data; data formats; hardware & software consideration for Digital Image Processing; sources of error in images; Geometric corrections: rectification, registration, geo-referencing; resampling technique; radiometric correction; image enhancement; spatial filtering; ground truth collection for image classification; training verification; Concept of Pattern Recognition; Techniques of unsupervised & supervised classification.

Unit -II Photogrammetry and remote sensing data products

Photogrammetry: Basic Principles; Basic Characteristics of Aerial Photographs; Difference between Aerial Photograph and Topographical Map; Significance of Aerial Photos. Digital Photogrammetry, block adjustment; DEM; Ortho-mosaic Remote sensing data products ; Ground truth collection - commonly used ground truth equipment ;use of spectro-radiometers; Display forms - computer printouts, thematic maps, dot density maps.

Suggested Readings:

1. Remote Sensing and Image Interpretation. Lillesand, TM and Kiefer, RW. John Willey and Sons, 2008.
2. Remote Sensing and GIS. B. Bhatta by Oxford Publishers 2015.
3. Introduction to Geographic Information System. Kang-Tsung Chang, McGraw-Hill 2015.
4. Concepts & Techniques of GIS. C. P. Lo Albert, K.W. Yonng, Prentice Hall (India) Publications.
5. Basics of Remote sensing & GIS. S. Kumar, Laxmi Publications.
6. James B. Campbell & Randolph H. Wynne. Introduction to Remote Sensing, The Guilford Press, 2011.
7. Textbook of Remote Sensing and Geographical Information systems. M. Anji Reddy, BS Publications, Hyderabad. 2011. ISBN: 81-7800-112-8.
8. Remote Sensing and GIS. A.M.Chandra and S.K. Gosh, Narosa Publishing Home, New Delhi 2009.
9. Introducing Digital Image Processing. John R. Jenson, Prentice Hall, New Jersey 1986.

10. Techniques for Image Processing and Classification in Remote Sensing. Robert A. Schowengerdt, 1984. ISBN 13: 9780126289800
11. Fundamentals of Remote sensing. George Joseph, 2005, 2nd edition, University Press Pvt, Ltd, Hyderabad.
12. Principles of Geographical Information Systems for Land Resources Assessment by P.A. Burrough
13. Elements of Photogrammetry by PAUL R. WOLF, 3rd edition, ISBN 007-123689-9
14. Introduction to Modern Photogrammetry (Paperback) by Edward M. Mikhail, James S. Bethel
15. Manual of Photogrammetry – American Society of Photogrammetry By ALBERT.D
16. Aerial Photographic Interpretation by D. R. Lueder, McGraw-Hill Companies
17. Photogrammetry- Vol I by Krauss, J., - Springer – Verlag Publications
18. Photogrammetry 3rd Edition by Moffitt, Francis H. & Mikhail, Edward M., - Harper and Row Publishers.
19. Principles and Applications of Photo Geology By Shiv Pandey
20. John R. Jenson, .Introductory Digital Image Processing., Prentice Hall Series, 1996.
21. John A. Richards, Springer-Verlag, .Remote Sensing Digital Image Analysis. 1999.
22. Rafael C. Gonzalez, .Digital Image Processing (2nd Edition)., Prentice Hall, 2002.
23. Gopi, “Advanced surveying: Total station, GIS and Remote Sensing”, Pearson Education India, 2007.
24. Borden D. Dent, Jeffrey Troguson, Thomas W. Hodler, “Cartography: Thematic map Design”, McGraw-Hill Higher Education, 2008.
24. Bhatia, B. (2008): Remote Sensing and GIS, Oxford University Press, New Delhi.

4th Year Bachelor's Degree with Honours
SEMESTER–VII
GE 704C Remote Sensing (Practical)

Full Marks - 40 (Credit-2)
(Internal Assessment-16; End Semester Examination -24)

Course Learning Outcomes (CLOs):

1. Acquire, download, import, export, and convert open-source remote sensing datasets from different web sources,
2. To prepare satellite imagery for analysis, use image pre-processing methods such as geometric rectification and image registration.
3. Interpret land use/land cover (LULC) features from satellite imagery using visual interpretation techniques.
4. Classify images both supervised and unsupervised image classification and evaluate the classified outputs for thematic mapping and geographical analysis.

Course Content:

Sl no	Practical	Marks
1.	Introduction to RS software	4
2.	Satellite image annotation	4
3	Open source data downloading from various sites; export, import of files; conversion of file format; rectification; registration, Visual image interpretation of satellite imagery; interpretation of landuse/landcover map; supervised & unsupervised classification	10
4	Laboratory notebook and viva voce	6
TOTAL		24

Suggested Readings:

1. Remote Sensing and Image Interpretation. Lillesand, TM and Kiefer, RW. John Willey and Sons, 2008.
2. Remote Sensing and GIS. B. Bhatta by Oxford Publishers 2015.
3. Introduction to Geographic Information System. Kang-Tsung Chang, McGraw-Hill 2015.
4. Concepts & Techniques of GIS. C. P. Lo Albert, K.W. Yonng, Prentice Hall (India) Publications.
5. Basics of Remote sensing & GIS. S. Kumar, Laxmi Publications.
6. James B. Campbell & Randolph H. Wynne. Introduction to Remote Sensing, The Guilford Press, 2011.
7. Textbook of Remote Sensing and Geographical Information systems. M. Anji Reddy, BS Publications, Hyderabad. 2011. ISBN: 81-7800-112-8.
8. Remote Sensing and GIS. A.M.Chandra and S.K. Gosh, Narosa Publishing Home, New Delhi 2009.
9. Introducing Digital Image Processing. John R. Jenson, Prentice Hall, New Jersey 1986.
10. Techniques for Image Processing and Classification in Remote Sensing. Robert A. Schowengergt, 1984. ISBN 13: 9780126289800
11. Fundamentals of Remote sensing. George Joseph, 2005, 2nd edition, University Press Pvt, Ltd, Hyderabad.
12. Principles of Geographical Information Systems for Land Resources Assessment by P.A. Burrough
13. Elements of Photogrammetry by PAUL R. WOLF, 3rd edition, ISBN 007-123689-9
14. Introduction to Modern Photogrammetry (Paperback) by Edward M. Mikhail, James S. Bethel
15. Manual of Photogrammetry – American Society of Photogrammetry By ALBERT.D
16. Aerial Photographic Interpretation by D. R. Lueder, McGraw-Hill Companies
17. Photogrammetry- Vol I by Krauss, J., - Springer – Verlag Publications
18. Photogrammetry 3rd Edition by Moffitt, Francis H. & Mikhail, Edward M., - Harper and Row Publishers.
19. Principles and Applications of Photo Geology By Shiv Pandey
20. John R. Jenson, .Introductory Digital Image Processing., Prentice Hall Series, 1996.
21. John A. Richards, Springer-Verlag, .Remote Sensing Digital Image Analysis. 1999.
22. Rafael C. Gonzalez, .Digital Image Processing (2nd Edition)., Prentice Hall, 2002.
23. Gopi, “Advanced surveying: Total station, GIS and Remote Sensing”, Pearson Education India, 2007. 24. Borden D. Dent, Jeffrey Troguson, Thomas W. Hodler, “Cartography: Thematic map Design”, McGraw-Hill Higher Education, 2008.
24. Bhatia, B. (2008): Remote Sensing and GIS, Oxford University Press, New Delhi.

4th Year Bachelor's Degree with Honours
SEMESTER- VII
GE 701M Natural Resource Management
Full marks-100 (Credit-4)
(Internal Assessment-40; End Sem. Exam. -60)

Course Objectives (COs):

1. To develop an understanding of the concepts, classification, and significance of natural resources and their role in human development.
2. To familiarise students with the distribution and characteristics of major natural resources and resource regions of India.
3. To examine the relationship between population growth, resource utilization, and environmental sustainability.
4. To introduce the principles, policies, and strategies for the conservation and sustainable management of natural resources at global, national, and regional levels.
5. To enhance awareness of the roles of government, non-governmental organizations, and local communities in natural resource conservation and management.

Course Learning Outcomes (CLOs):

1. Explain the concept, classification, and changing perspectives of natural resources, and evaluate the importance of their conservation and management.
2. Analyse the spatial distribution and significance of India's major resource regions and natural resources, including energy, land, water, and forests.
3. Assess the impact of population growth and patterns of resource consumption on resource availability and environmental sustainability in India.
4. Evaluate resource conservation policies and sustainable resource development strategies, and examine the roles of government agencies, NGOs, and local communities in natural resource management.
5. Identify the major challenges in natural resource management in India and propose appropriate conservation and sustainable management approaches.

Unit -I: Introduction to Natural resources

Meaning and changing concepts of natural resources; Concept and Importance of conservation and management of natural resources; Classification of resources: Basis of classification and classification scheme

Unit– II: Resources and Resource regions of India

Major Resource Regions of India; Distribution of Resources in India: Energy resources, Land Resources, Water Resources, Forest Resources.

Unit -III: Population and resource use

Population growth and trends and patterns of resource use in India; Resource consumption and its consequences on the environment

Unit – IV: Resource management and conservation policies

Policies for resources conservation: Global, National and Regional policies; Concept and need of Sustainable resource development; Role of government, NGOs and community in the conservation and management of natural resources; problems in the management of Natural resources in India.

Suggested Readings:

1. Cutter S. N., Renwick H. L. and Renwick W., 1991: Exploitation, Conservation, Preservation: A Geographical Perspective on Natural Resources Use, John Wiley and Sons, New York.
2. Gadgil M. and Guha R., 2005: The Use and Abuse of Nature: Incorporating This Fissured Land: An Ecological History of India and Ecology and Equity, Oxford University Press. USA.

3. Holechek J. L. C., Richard A., Fisher J. T. and Valdez R., 2003: Natural Resources: Ecology, Economics and Policy, Prentice Hall, New Jersey.
4. Jones G. and Hollier G., 1997: Resources, Society and Environmental Management, Paul Chapman, London.
5. Klee G., 1991: Conservation of Natural Resources, Prentice Hall, Englewood.
6. Mather A. S. and Chapman K., 1995: Environmental Resources, John Wiley and Sons, New York.
7. Mitchell B., 1997: Resource and Environmental Management, Longman Harlow, England.
8. Owen S. and Owen P. L., 1991: Environment, Resources and Conservation, Cambridge University Press, New York.
9. Rees J., 1990: Natural Resources: Allocation, Economics and Policy, Routledge.London

SEMESTER - VIII

4th Year Bachelor's Degree with Honours

SEMESTER- VIII

GE 801C Research Methodology

Full Marks-100 (Credit-4)

(Internal Assessment-40; End Semester Examination-60)

Course Objectives (COs)

1. Introduce students to the fundamental concepts, types, approaches and processes of research, with special reference to geographical research.
2. Develop skills in identifying and formulating research problems, objectives, hypotheses/research questions and appropriate research designs.
3. Familiarize students with various sources and methods of data collection, field survey techniques, and the application of GPS, Remote Sensing and GIS in geographical research.
4. Develop competencies in the organization, analysis, interpretation and presentation of geographical data using appropriate tabular, graphical, statistical, cartographic and digital techniques.
5. Develop students' ability to prepare research proposals, dissertations, project reports and seminar papers while adhering to research ethics, academic integrity, citation and referencing conventions.

Course Learning Outcomes (CLOs)

1. After successful completion of the course, students will be able to:
2. Explain the nature, significance, types and major stages of the research process in geographical studies.
3. Formulate research problems, objectives, hypotheses/research questions and suitable research designs based on relevant literature.
4. Apply appropriate qualitative and quantitative methods of data collection, including field surveys, observation, questionnaires, interviews, FGD, case studies and document analysis.
5. Demonstrate basic proficiency in using GPS, Remote Sensing, GIS and spreadsheet tools for geographical data collection, organization and analysis.
6. Organize, analyze, interpret and present geographical data using tables, graphs, diagrams, maps and other appropriate techniques.
7. Prepare research proposals, dissertations, project reports and seminar papers following appropriate scientific structure, APA referencing and academic writing conventions.
8. Demonstrate ethical research practices, academic integrity and awareness of plagiarism in the conduct and reporting of research.
9. Apply research methodology to selected problems in physical, human and environmental geography and communicate research findings systematically.

Unit-1: Introduction to Research

Meaning, Nature and Significance of Research; Scientific Method; Types of Research-Basic, Applied, Qualitative and Quantitative; Research Process; Identification and Formulation of Research Problem, Research Ethics

Unit-II: Research Design and Data Collection

Research Design: Statement of the problem, objectives, and hypothesis/ research questions, methodology, significance, organization of the work, review of literature and referencing Sources of Data-Primary and Secondary; Methods of Data Collection-Observation, Questionnaire, Schedule, Interview and Focus Group Discussion (FGD), Ethnography, Interpretive Phenomenological Analysis (IPA), Open-Ended Surveys, Document Analysis, case study. Field Survey Methods in Geography; Use of GPS, Remote Sensing and GIS in Geographical Research; Pilot Survey and Pre-testing of Questionnaire.

Unit-III: Data Organization and Presentation

Editing, Coding, Classification and Tabulation of Data; Preparation of Tables, Graphs and Diagrams; Cartographic Representation of Geographical Data; Interpretation of Maps, Tables and Graphs; Use of Spreadsheet and GIS Software for Data Organization.

Unit-IV: Scientific Report Writing

Structure of Research Proposal; Structure of Research Report; Citation and Referencing (APA Style); Bibliography; Plagiarism and Academic Integrity; Preparation of Dissertation, Project Report and Seminar Paper; Applications of Research Methodology in Physical, Human and Environmental Geography.

Suggested Readings:

1. Creswell, J. W. & Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (5th ed.). Sage Publications.
2. Kothari, C. R. (2004). *Research Methodology: Methods and Techniques* (2nd ed.). New Age International (P) Ltd.
3. Kumar, R. (2019). *Research Methodology: A Step-by-Step Guide for Beginners* (5th ed.). Sage Publications.
4. Misra, R. P. (2002). *Research Methodology: A Handbook*. Concept Publishing Company.
5. Clifford, N., Cope, M., Gillespie, T. & French, S. (Eds.). (2016). *Key Methods in Geography* (3rd ed.). Sage Publications.
6. Gomez, B. & Jones III, J. P. (Eds.). (2010). *Research Methods in Geography: A Critical Introduction*. Wiley-Blackwell.

4th Year Bachelor's Degree with Honours
SEMESTER-VIII
GE 802C Natural Resource Management

Full marks-100 (Credit-4)
(Internal Assessment-40; End Sem. Exam.-60)

Course Objectives (COs)

1. To understand the concept, classification, and changing perspectives of natural resources, and appreciate the importance of their conservation and sustainable management.
2. To develop knowledge of the distribution, characteristics, and resource potential of major natural resources and resource regions in India, with special emphasis on North East India.
3. To examine the relationship between population dynamics, patterns of resource utilization, and their environmental and socio-economic consequences in India and North East India.
4. To introduce the principles, policies, and strategies of natural resource conservation and sustainable resource development at global, national, and regional levels.
5. To enhance awareness of the roles of government, non-governmental organizations (NGOs), and local communities in the conservation and management of natural resources, and the challenges associated with resource management in India and North East India.

Course Learning Outcomes (CLOs)

1. Explain the concepts, classification, and evolving perspectives of natural resources, and evaluate the significance of their conservation and sustainable management.
2. Analyse the distribution, characteristics, and resource potential of major resource regions and natural resources of India and North East India, including energy, land, water, and forest resources.
3. Assess the relationship between population growth, resource use, and consumption patterns, and examine their environmental and developmental implications in India and North East India.
4. Evaluate global, national, and regional policies related to natural resource conservation and sustainable development, and explain their relevance in resource management.
5. Critically examine the roles of government agencies, NGOs, and local communities in natural resource conservation and management, and propose suitable strategies to address resource management challenges in India and North East India.

Unit – I: Introduction to Natural resources

Meaning and changing concepts of natural resources; Concept and Importance of conservation and management of natural resources; Classification of resources: Basis of classification and classification scheme.

Unit– II: Resources and Resource regions of India and North East India

Major Resource Regions of India and North East India; Distribution of Resources in India and North - East India: Energy resources, Land Resources, Water Resources, Forest Resources; Resource Potential of North east India.

Unit -III: Population and resource use

Population growth and trends and patterns of resource use in India and north east India; Resource consumption and its consequences.

Unit -IV: Resource management and conservation policies

Policies for resources conservation: Global, National and Regional policies; Concept and need of Sustainable resource development; Role of government, NGOs and community in the conservation and management of natural resources; problems in the management of Natural resources in India and North East India.

Suggested Readings:

1. Cutter S. N., Renwich H. L. and Renwick W., 1991: Exploitation, Conservation, Preservation: A Geographical Perspective on Natural Resources Use, John Wiley and Sons, New York.
2. Gadgil M. and Guha R., 2005: The Use and Abuse of Nature: Incorporating This Fissured Land: An Ecological History of India and Ecology and Equity, Oxford University Press. USA.
3. Holechek J. L. C., Richard A., Fisher J. T. and Valdez R., 2003: Natural Resources: Ecology, Economics and Policy, Prentice Hall, New Jersey.
4. Jones G. and Hollier G., 1997: Resources, Society and Environmental Management, Paul Chapman, London.
5. Klee G., 1991: Conservation of Natural Resources, Prentice Hall, Englewood.
6. Mather A. S. and Chapman K., 1995: Environmental Resources, John Wiley and Sons, New York.
7. Mitchell B., 1997: Resource and Environmental Management, Longman Harlow, England.
8. Owen S. and Owen P. L., 1991: Environment, Resources and Conservation, Cambridge University Press, New York.
9. Rees J., 1990: Natural Resources: Allocation, Economics and Policy, Routledge.London

4th Year Bachelor's Degree with Honours

SEMESTER VIII

GE 803C Geography of Tourism

Full Marks -100 (Credt-4)

(Internal Assesment-40, End Sem Exam-60)

Course Objective (COs):

1. To understand the concept, types, components, importance and factors affecting tourism.
2. Study of the natural, cultural, ethnic and heritage tourism resources of India with special reference to North East India.
3. Understanding tourism infrastructure, transportation, accommodation and motivation for travel.
4. Study of the economic, socio-cultural and environmental impact of tourism.
5. Understanding of tourism planning, carrying capacity, visitor management, marketing and promotion.
6. Understanding development in sustainable and responsible tourism.

Course Learning Outcomes (CLOs):

1. Gain a thorough grip of the socioeconomic relevance of tourism as well as its types, concepts, and geographical aspects.
2. Determine and assess tourist resources and examine how tourism affects the environment, culture, economy, and society.
3. In tourism development, apply the concepts of carrying capacity, visitor management, sustainable tourism, and tourism planning.
4. Develop analytical and practical skills in tourism resource assessment, destination planning, and tourism promotion for sustainable regional development

Unit I: Conceptual Framework

Concept, definition, nature and importance of Tourism; Typology of Tourism: Domestic, International, Inter-regional and Intra regional, Mass Tourism; Components of Tourism and Approach to the study of Tourism; Socio-economic significance of Tourism; Factors Influencing Tourism: Historical, Natural, Socio-Cultural and Economic; Concept of eco-tourism.

Unit-II: Tourist Resource of India

Tourist Resource of India: characteristics and classification; Changing nature of Tourist Resource in India (both natural and man-made); Ethnic and Heritage Tourism in India – Characteristics and importance; Performing Arts and Promotional Tourism in India. Case studies on Tourism Development from North- East India.

Unit-III Tourism Infrastructure and Impact of Tourism

Concept of Tourism infrastructure – travel and accommodation; Tourism and Transport: travel motivation, view of Lundberg and Robinson; Cultural exchange and Tourism development; Economic, Socio-cultural, and Environmental impacts of Tourism.

Unit IV- Tourism Planning

Tourism and Economic Development; Tourism planning and planning processes; general model of planning process; tourism planning at national, regional and local level; managing tourism and environmental change; visitor management; concept of carrying capacity; Tourism Marketing and Promotion. Concept of sustainable tourism.

Suggested Readings:

1. Bhatia, A. K. : International Tourism Management, Sterling, New Delhi, 2001.
2. Chandra, R: Wildlife and Ecotourism: Trends, Issues and Challenges, Akansha, New Delhi, 2005.
3. Erlet, C. and Lowman, G.: Ecotourism: A Sustainable Options?, John Wiley, New York, 1994.
4. Hall, C. M. and S. J. Page: The Geography of Tourism and Recreation: Environment, Place and Space, Routledge, London, 1999.
5. Honey, M.: Ecotourism and Sustainable Development: Who owns Paradise, Island Press, Washington, 1999.
6. Kumar, A: Tourism Management, Commonwealth Publishers, New Delhi, 1997.
7. Micheal Hall, C. and Stephen Page: Tourism in South and Southeast Asia: Issues and Cases, Butterworth-Heinemann, Oxford, 2000.
8. Milton, D. R. : A Geography of World Tourism, Prentice Hall, New Jersey, 1993
9. Pran, N. S.: Successful Tourism Management Volume I: Fundamentals of Tourism, Sterling Publishers, New Delhi, 1997
10. Sharma, K. K.: Tourism in India, Classic Publishing House, Jaipur, 1991.
11. Sharma, U.: Panorama of Tourism in India, Printwell, Jaipur, 1996
12. Stephen, W. and Neil, J.: ecotourism: Impacts, Potentials and Possibilities, Butterworth-Heinemann, London, 1999.
13. Weaver, D. B.: The Encyclopedia of Ecotourism, CABI Publishing, New York, 2001.
14. WilliamsS.: Tourism Geography: A new synthesis (Second edition), Routledge, London, 2009.

4th Year Bachelor's Degree with Honours
SEMESTER-VIII
GE 804C Geographical Information System (Theory and Practical)

Full Marks - 100 (Credit-4)
(Internal Assessment-40; End Semester Examination -60)

Course Objectives (COs):

1. The course is designed to provide fundamental knowledge and practical skills in GIS, spatial data management, geospatial analysis, and thematic mapping.
2. to enables students to apply open-source GIS and modern geospatial technologies for spatial and terrain analysis, LULC mapping, change detection, and addressing urban, environmental, and disaster-related challenges.
3. To familiarizes students with emerging technologies such as Web GIS, UAVs, AI/ML, Google Earth Engine, and LiDAR.

Course Learning Outcome (CLO): :

1. Explain the fundamentals of GIS, spatial data models, coordinate systems, map projections, and geospatial data sources.
2. Apply GIS tools and techniques for data creation, management, visualization, and thematic mapping using open-source GIS software.
3. Analyze spatial data using geospatial techniques such as buffering, overlay, terrain, network, and interpolation techniques.
4. Evaluate the applications of remote sensing, GIS, AI, UAVs, LiDAR, and cloud-based geospatial technologies in solving geographical and environmental problems.
5. Develop GIS-based thematic maps and spatial models for land use planning, environmental management, urban studies, and disaster risk assessment.

(Theoretical)

Unit I-Fundamentals of GIS and Spatial Data Management: Concept and components of GIS; Raster and Vector Data Models; Spatial and attribute data; Topology; Co-ordinate system (Geographic and Projected Coordinate system) and map datum and projection ; Sources of Spatial data; Open Geo-spatial data.

Unit II- Geospatial Analysis, Applications and Emerging Technologies: Concept and principles of geospatial analysis; Spatial analytical techniques: Buffering, Overlay, Proximity, Network and Terrain Analysis; Digital Elevation Model (DEM); Spatial Interpolation; GIS application in physical and human geography; Web GIS and Cloud-based geospatial platform; Mobile GIS and UAV (drone) based mapping; Artificial (AI) and Machine Learning (ML) in GIS; Google Earth Engine (GEE) and LiDAR technology in GIS.

(Practical)

Unit III- Introduction to GIS Interface (Using Open-source GIS); Georeferencing scanned maps; Digitization of point, line and polygon features, Editing and Topology checking; Attribute table creation and management; Spatial and Attribute Querying; GIS data visualization and thematic mapping.

Unit IV-Spatial analysis using Buffer, Overlay, Clip, Intersect and Dissolve; Terrain analysis using DEM: Slope, Aspect and Hillshade mapping; Network analysis and land suitability modelling; Land Use Land Cover Mapping and Change Detection using Satellite Imagery; Spatial Interpolation; Preparation of thematic maps for urban, environmental and disaster risk assessment application.

Suggested Readings:

1. Bolstad, P. (2016). *GIS Fundamentals. A First Text on Geographic Information Systems*. Elder Press.
2. Burrough, P.A., & McDonnell, R.A. (1998). *Principles of Geographical Information Systems*. Oxford University Press.
3. Chang, K.T. (2017). *Introduction to Geographic Information Systems* (4th ed.). McGraw Hill Education.
4. Demers, M.N. (2008). *Fundamentals of Geographical Information Systems* (4th ed.). John Wiley & Sons Inc.
5. Heywood, I. (2003). *An Introduction to Geographical Information Systems* (2nd ed.). Pearson.
6. Law, M., & Collins, A. *Getting to Know ArcGIS Pro 3.2* (5th ed.). Esri Pr.
7. Lo, C.P., & Yeung, A.K.W. (2002). *Concepts and Techniques of Geographic Information Systems*. Prentice Hall.
8. Longley, P.A., Goodchild, M.F., Maguire, D.J., & Rhind, D.W. (2015). *Geographic Information Science and Systems* (4th ed.). Wiley.
9. QGIS Documentation (latest version).
10. Reddy, M.A. (2001). *Textbook of Remote Sensing and Geographic Information Systems*. B. S. Publications.
11. Sahu, K.C. (2007). *Textbook of remote sensing and Geographical Information Systems*. Atlantic Publishers.

4th Year Bachelor's Degree with Honours
SEMESTER-VIII
GE 801M Disaster Management

Full Marks: 100 (Credit: 4)
(Internal Assessment: 40; End Semester Examination: 60)

Course Objectives (COs):

1. The course aims to equip students with a comprehensive understanding of hazards, disasters, vulnerability, risk, resilience and Disaster Risk Reduction, while developing their ability to assess disaster risks, understand disaster governance and community-based disaster management, analyze regional vulnerabilities, particularly in Northeast India, and critically examine key challenges in disaster management.

Course Learning Outcome (CLO):

1. Explain the basic concepts of hazards, disasters, risk, vulnerability, resilience, and disaster risk reduction.
2. Assess vulnerability and disaster risk using hazard mapping and community-based disaster management approaches.
3. Examine disaster governance in India and the role of national, state, local, and international disaster management frameworks.
4. Evaluate the major challenges in disaster management and suggest appropriate mitigation and recovery measures.
5. Apply disaster risk reduction strategies to strengthen community resilience and promote sustainable development.

Unit I- Concepts and Perspectives in Hazard and Disaster Management: Concepts: Hazard, Disaster, Risk, Vulnerability, Adaptation, Coping Capacity and Resilience; Hazard-Disaster Relationship; Classification of Hazards: Natural, Anthropogenic; Disaster Risk Reduction (DRR); Disaster Management Cycle; Human-Environment Interactions and Disasters

Unit II-Vulnerability Assessment and Disaster Risk Reduction: Dimensions and Determinants of Vulnerability: Social, Economic, Demographic and Environmental Perspectives; Risk Assessment of Vulnerable Populations: Women, Children, Elderly, Persons with Disabilities and Indigenous Communities; Community-based Disaster Management: Preparedness, Response, Rehabilitation and Reconstruction; Hazard Mapping and Risk Zonation.

Unit III-Governance and Regional Perspectives: Disaster Governance in India: Disaster Management Act, 2005; NDMA; SDMA and DDMA; Role of government agencies, NGOs and Civil society; Sendai Framework for Disaster Risk Reduction; Regional Perspectives on Disaster Risk Reduction: Northeast India with a focus on Floods and Riverbank erosion, Landslides, Earthquake, Glacial Lake Outburst Flood (GLOF) and Climate Change vulnerability.

Unit IV-Challenges and Issues in Disaster Management: Institutional limitation; Infrastructural Gaps; Resource Constraint; Technological challenges; Post-disaster recovery challenges; Policy and Planning challenges.

Suggested Readings:

1. Carter, W. N. (1999). Disaster management: A disaster management handbook. Manila: ADB
2. Disaster Management Act, 2005.
3. District Disaster Management Authority, West Tripura. *District Disaster Management Plan, West Tripura District (2025–26)*.
4. Gauba, N. (2012). *Disaster Management and Preparedness: Based on the Syllabus Prescribed by UGC for Disaster Management Education*. CBS.
5. Government of Tripura. *State Disaster Management Policy*. Revenue Department, Government of Tripura.
6. Hyndman, D. W., & Hyndman, D. (2013). *Natural Hazards and Disasters* (4th ed.). Brooks/Cole
7. IPCC Assessment Reports..
8. National Disaster Management Authority (NDMA) Guidelines.
9. National Institute of Disaster Management (NIDM) Training Manuals.
10. Pandey, M. (2014). *Disaster Management*. Wiley.
11. Raj, J. L., Moran, D., Deori, S., Basumatari, D., Borah, N. P., & Das, R. (2026). *Review on Natural hazard Risk assessment and Public Policy of North East Region of India. Lecture Notes in Civil Engineering*, 127–145. https://doi.org/10.1007/978-981-95-4009-9_10.
12. Sendai Framework for Disaster Risk Reduction 2015-2030
13. Singh, J., & Bora, P. (2014). *Development, Disaster and Displacement in North East India*. Mittal.
14. Singh, R. B. (Ed.). (2006). *Natural Hazards and Disaster Management: Vulnerability and Mitigation*. Rawat.
15. Vaidyanathan, S. (2025). *An Introduction to Disaster Management: Natural Disasters and Man-Made Hazards*. CBS.
16. Wisner, B., Blaikie, P., Cannon, T., & Davis, I. (2014). *At risk: natural hazards, people's vulnerability and disasters*. Routledge.
