FOUR YEARS UNDERGRADUATE PROGRAMME (FYUGP) BASED ON NEP-2020

DEPARTMENT OF GEOGRAPHY

BODOLAND UNIVERSITY, KOKRAJHAR

Rangalikhata, 783370

Curriculum structure for Four Years Undergraduate Programme (FYUGP) based on NEP-2020
Department of Geography, Bodoland University, Kokrajhar

Semester	Major Course (4 credit)	Minor Course (4 credit)	IDC (3 credit)	AEC (2 credit)	SEC (3 credit)	VAC (4 credit)	Summer Internship	ADL/REM/ Dissertation	Total credit
SEMI	GEOMAJ101-4 Basics of Geography	GEOMIN101-4 Physical Geography (Part I)	GEOIDC101-3 Introduction to Geography	AEC101-2	GEOSEC101-3 Map making & analysis	GEOVAC101-4 Geography of Environment & Sustainability Practical or NCC/NSS: NCC/NSS activity should incorporate exercises for Environment sustainability			20
SEMII	GEOMAJ102-4 Domains of Geography	GEOMIN102-4 Physical Geography (Part II)	GEOIDC102-3 Environmental Geography	AEC102-2	GEOSEC102-3 Quantitative techniques for spatial analysis (Option-A) Or Basics of Remote sensing and GIS (Option-B)	GEOVAC102-4 Environmental Studies			20

Exit with a Certificate (40 credits and Internship of 4 credit)									
SEMIII	GEOMAJ201-4 Basics of Cartography GEOMAJ202-4 Climatology & Oceanography	GEOMIN201-4 Fundamentals of Cartography	GEOIDC201-3 Natural Hazards and Disaster Management	AEC201-2	GEOSEC201-3 Geography of Assam Tourism				20
SEMIV	GEOMAJ203-4 Evolution of Geographical Thought GEOMAJ204-4 Human Geography GEOMAJ205-4 Regional Planning and Development	GEOMIN202-4 Human Geography		AEC202-2			Internship of 30 hours (Students need to submit a report on the completion of the assignment. The production of a certificate from the organization where the internship is performed is mandatory.)		20
Exit with a Diploma (80 Credits and Internship of 4 Credits)									
SEMV	GEOMAJ301-4 World Regional Geography	GEOMIN301-4 Geography of India							20

	GEOMAJ302-4 Geography of Asia								
	GEOMAJ303-4 Geography of India								
	GEOMAJ304-4 Quantitative Methods in Geography								
SEMVI	GEOMAJ305-4 Geomorphology	GEOMIN302-4 Economic Geography							20
	GEOMAJ306-4 Economic Geography								
	GEOMAJ307-4 Remote Sensing and Geographic Information System								
	GEOMAJ308-4 Soil and Biogeography Geography								

Exit with a Bachelor Degree in Geography (120 credits)									
SEMVII	GEOMAJ401-4 Advanced Climatology GEOMAJ402-4 Applied Cartographic& Quantitative Techniques GEOMAJ403-4 Computational tools for Geography Dissertation Writing	GEOMIN401-4 Social, Cultural and Political Geography						GOEREM401-4 Research Methodology	20
SEMVIII	**Geomorphology Special Paper (A)** GEOMAJ404-4 Geography of North-East India								20

		GEOMIN402-4 Fundamentals of Remote Sensing and GIS							
								GEOADL401-4 Advanced Geomorpholoy	
								GEOADL402-4 Environmental Geomorpholoy	
								GEOADL403-4 Practical -II	
								GEOREM402-12 Dissertation	
SEMVIII	**Population Geography Special Paper (C)**								**20**
	GEOMAJ404-4 Geography of Noth-East India								

		GEOMIN402-4 Fundamentals of Remote Sensing and GIS							
								GEOADL401-4 Fertility Studies	
								GEOADL402-4 Mortality Studies	
								GEOADL403-4 Practical-II	
								GEOREM402-12 Dissertation	
SEMVIII	**Social Geography Special paper (B)**								**20**
	GEOMAJ404-4 Geography of North-East India								
		GEOMIN402-4 Fundamentals of Remote Sensing and GIS							

								GEOADL401-4 Social Geography	
								GEOADL402-4 Geography of Culture	
								GEOADL403-4 Practical-II	
								GEOREM402-12 Dissertation	
Exit Degree in Honours and Research (160 credit)									
Total Credits	80	32	9	8	9	8	2	12	160

Code explanation:

MAJ=Major; MIN=Minor; IDC=Interdisciplinary; AEC=Ability Enhancement Course; SEC=Skill Enhancement Course, VAC= Value Added Course

First digit Course level; Second & Third digit=Sl.no of course in the category (paper serial Number) and Last digit=Credits, e.g.: MAJ101-4

Curriculum Structures for
Four Year Undergraduate Programme (FYUGP) based on NEP-2020
Department of Geography, Bodoland University, Kokrajhar
Total Credits= 160

SEMESTER – I							
Course code	**Course title**	**Credit**	**Credit Distribution (L+T+P)**	**End Semester Marks**	**Internal Marks**	**Practical**	**Total Marks**
GEOMAJ101-4	Basics Of Geography	4	(4+0+0)	70	30	00	100
GEOMIN101-4	Physical Geography (Part I)	4	(4+0+0)	70	30	00	100
GEOIDC101-3	Introduction to Geography	3	(3+0+0)	50	00	00	50
AEC101-2	As opted by the student	2	(2+0+0)	50	00	00	50
GEOSEC101-3	Map making & Analysis	3	(2+0+1)	40	00	10	50
GEOVAC101-4	Geography of Environment & Sustainability	4	(3+0+1)	50	30	20	100
Total credits		**20**					**450**

SEMESTER – II							
Course code	**Course title**	**Credit**	**Credit Distribution (L+T+P)**	**End Semester Marks**	**Internal Marks**	**Practical**	**Total Marks**
GEOMAJ102-4	Domains of Geography	4	(4+0+0)	70	30	00	100
GEOMIN102-4	Physical Geography (Part II)	4	(4+0+0)	70	30	00	100
GEOIDC102-3	Environmental Geography	3	(3+0+0)	50	00	00	50
AEC102-2	As opted by the student	2	(2+0+0)	50	00	00	50
GEOSEC102A-3 Or GEOSEC102B-3	Quantitative techniques for spatial analysis (Option A) Basics of Remote sensing and GIS (Option B)	3	(2+0+1)	40	00	10	50
GEOVAC102-4	Environmental Studies	4	(3+0+1)	50	30	20	100

SEMESTER – III							
Course code	**Course title**	**Credit**	**Credit Distribution (L+T+P)**	**End Semester Marks**	**Internal Marks**	**Practical**	**Total Marks**
GEOMAJ201-4	Basics of Cartography	4	(3+0+1)	50	30	20	100
GEOMAJ202-4	Climatology & Oceanography	4	(3+0+1)	50	30	20	100
GEOMIN201-4	Fundamentals of Cartography	4	(3+0+1)	50	30	20	100
GEOIDC201-3	Natural Hazards and Disaster Management	3	(3+0+0)	50	00	00	50
AEC201-2	As opted by the student	2	(2+0+0)	50	00	00	50
GEOSEC201-3	Geography of Assam Tourism	3	(2+0+1)	40	00	10	50
Total credits		**20**					**450**
Total credits		**20**					**450**

SEMESTER – IV							
Course code	**Course title**	**Credit**	**Credit Distribution (L+T+P)**	**End Semester Marks**	**Internal Marks**	**Practical**	**Total Marks**
GEOMAJ203-4	Evolution of Geographical Thought	4	(4+0+0)	70	30	00	100
GEOMAJ204-4	Human Geography	4	(3+0+1)	50	30	20	100
GEOMAJ205-4	Regional Planning and Development	4	(4+0+0)	70	30	00	100
GEOMIN202-4	Human Geography	4	(3+0+1)	50	30	20	100
AEC202-2	As opted by the student	2	(2+0+0)	50	00	00	50
INTERNSHIP	Report Submission with certificate from concern organization	2	(2+0+0)	00	00	50	50
Total credits		**20**					**500**

SEMESTER – V							
Course code	**Course title**	**Credit**	**Credit Distribution (L+T+P)**	**End Semester Marks**	**Internal Marks**	**Practical**	**Total Marks**
GEOMAJ301-4	World Regional Geography	4	(3+0+1)	50	30	20	100
GEOMAJ302-4	Geography of Asia	4	(3+0+1)	50	30	20	100
GEOMAJ303-4	Geography of India	4	(3+0+1)	50	30	20	100
GEOMAJ304-4	Quantitative Methods in Geography	4	(3+0+1)	50	30	20	100
GEOMIN301-4	Geography of India	4	(3+0+1)	50	30	20	100
Total credits		**20**					**500**

SEMESTER – VI							
Course code	**Course title**	**Credit**	**Credit Distribution (L+T+P)**	**End Semester Marks**	**Internal Marks**	**Practical**	**Total Marks**
GEOMAJ305-4	Geomorphology	4	(3+0+1)	50	30	20	100
GEOMAJ306-4	Economic Geography	4	(3+0+1)	50	30	20	100
GEOMAJ307-4	Remote Sensing and Geographic Information System	4	(3+0+1)	50	30	20	100
GEOMAJ308-4	Soil and Biogeography Geography	4	(3+0+1)	50	30	20	100
GEOMIN302-4	Economic Geography	4	(4+0+0)	70	30	00	100
Total credits		**20**					**500**

SEMESTER – VII							
Course code	**Course title**	**Credit**	**Credit Distribution (L+T+P)**	**End Semester Marks**	**Internal Marks**	**Practical**	**Total Marks**
GEOMAJ401-4	Advanced Climatology	4	(4+0+0)	70	30	00	100
GEOMAJ402-4	Applied Cartographic & Quantitative Techniques	4	(4+0+0)	70	30	00	100
GEOMAJ403-4	Practical - I	4	(4+0+0)	70	30	00	100
GEOREM401-4	Research Methodology	4	(4+0+0)	70	30	00	100
GEOMIN401-4	Social, Cultural and Political Geography	4	(3+0+1)	70	00	30	100
Total credits		**20**					**500**

SEMESTER - VIII							
Course code	**Course title**	**Credit**	**Credit Distribution (L+T+P)**	**End Semester Marks**	**Internal Marks**	**Practical**	**Total Marks**
GEOMAJ404-4	Geography of North-East India	4	(4+0+0)	70	30	00	100
GEOMIN402-4 GEOMIN402-4	Fundamentals of Remote Sensing and GIS	4	(4+0+0)	70	30	00	100
GEOADL401-4	Advanced Geomorphology (Option A)	4	(4+0+0)	70	30	00	100
	Fertility Studies (Option C)						
	Social Geography (Option B)						
GEOADL402-4	Environmental Geomorphology (Option A)	4	(4+0+0)	70	30	00	100
	Mortality Studies (Option C)						
	Geography of Cultural (Option B)						
GEOADL403-4	Practical-II	4	(0+0+4)	00	20	80	100
Note: **GEOREM402-12 is optional in lieu of Paper= GEOADL401-4, GEOADL402-4 and GEOADL403-4**							
GEOREM402-12	Dissertation	12	(6+0+6)	120	60	120	300
Total credits		**20**					**500**

List of Minor courses in Undergraduate Course in Geography:

Semester	Paper code	Credit	Paper title
SEMI	GEOMIN101-4	4+0+0=4	Physical Geography part I
SEMII	GEOMIN102-4	4+0+0=4	Physical Geography part II
SEMIII	GEOMIN201-4	3+0+1=4	Fundamentals of Cartography
SEMIV	GEOMIN202-4	3+0+1=4	Human Geography
SEMV	GEOMIN301-4	4+0+0=4	Geography of India
SEMVI	GEOMIN302-4	3+0+1=4	Economic Geography
SEMVII	GEOMIN401-4	3+0+1=4	Social, Cultural & Political Geography
SEMVIII	GEOMIN402-4	4+0+0=4	Fundamentals of Remote Sensing and GIS

List of SEC:

Semester	Paper code	Credit	Paper title
SEMI	GEOSEC101-3	2+0+1=3	Map making and Analysis
SEMII	GEOSEC102A-3 GEOSEC102B-3	2+0+1=3 2+0+1=3	Quantitative Techniques for Spatial Analysis-Option A Or Basics of Remote Sensing and GIS- Option B
SEMIII	GEOSEC201-3	2+0+1=3	Geography of Assam Tourism

List of IDC:

Semester	Paper code	Credit	Paper title
SEMI	GEOIDC101-3	3+0+0=3	Introduction to Geography
SEMII	GEOIDC102-3	3+0+0=3	Environmental Geography
SEMIII	GEOIDC201-3	3+0+0=3	Natural Hazards & Disaster management

List of value added course:

Semester	Paper code	Credit	Paper title
SEMI	GEOVAC101-4	3+0+1=4	Geography of Environment and Sustainability NCC/NSS activity should incorporate exercises for Environment sustainability
SEMII	GEOVAC102-4	3+0+1=4	Environmental Studies

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY

Semester-I

Core course

Course title: Basics of Geography

Course code: GEOMAJ101-4

Total Credits: 4 (Theory 4)

Course Objectives:

- The objective of this paper is to provide students with a foundational understanding of the discipline of Geography. It aims to familiarize students with the meaning, nature, and scope of Geography as a spatial science and emphasize its relevance in the present day.
- To provide general knowledge on the subject.
- To highlight the relationship of Geography with other disciplines.
- To introduce the development of the subject matter with time.
- To give the basic idea of the Earth's Coordinate System.

Course outcome: Upon completing this paper, students will be able to:

- Understand the meaning, definition, nature, and scope of Geography as a spatial science and recognize its relevance in contemporary society.
- Recognize Geography as an interdisciplinary and integrated discipline, understanding its various branches and the chronological advancement of the field.
- Comprehend fundamental concepts in Geography, such as spatial and temporal variation, spatial. association, spatial interaction, spatial diffusion, spatial organization, human ecology, and the system concept
- Demonstrate proficiency in reading and interpreting maps, understanding their importance in Geography, and identifying different types of maps.
- Analyze and interpret the interrelationships among physical and cultural features using topographical maps. The course outcome focuses on equipping students with a strong foundational knowledge of Geography,enabling them to apply spatial thinking and analytical skills to understand and Interpret the world around them.

Course Content:

Units	Course Content	No. of Classes-60 (60 hours of classes)	Credits (4+0=4)
I	• Meaning, nature and scope of Geography • Geography as a spatial science, present day relevance of Geography. • Relation of Geography with natural, social and earth sciences	15	1
II	• Branches of Geography: Geography as interdisciplinary and integrated discipline. • Development of Geography: Chronological advancement and contemporary trends.	15	1
III	• Fundamental Concepts in Geography: Spatial and	15	1

	temporal variation, spatial association, spatial interaction, spatial diffusion, spatial organization, human ecology, system concept		
IV	• Map and Geography:Importance of map in Geography, Types of maps • Representation of interrelationship among the physical and cultural features from Topographical Maps and Interpretation.	15	1

Suggested Books:

1. "Physical Geography" by James F. Petersen, Dorothy Sack, and Robert E. Gabler
2. "Human Geography: People, Place, and Culture" by Erin H. Fouberg, Alexander B. Murphy, and Harm J. de Blij
3. Hartshorne, R. (1955). The nature of geography.
4. Knox, P. L., & Marston, S. A. (2001). Places and regions in global context: human geography. Prentice Hall.
5. Getis, A., Fellmann, J. D., Getis, J., & Barker, B. W. (1994). Introduction to geography. William C. Brown Publishers.
6. Monkhouse, F. J. (2008). A dictionary of geography. Transaction Publishers.
7. Singh, G. (2009). Map Work and Practical Geography. Vikas Publishing House.
8. Singh, L. R. (2009). Fundamentals of Practical Geography. Sharda Pustak Bhavan.
9. Singh, R. L. (1979). Elements of practical geography.
10. "The New Geography of Jobs" by Enrico Moretti
11. "Prisoners of Geography: Ten Maps That Tell You Everything You Need to Know About Global Politics" by TimMarshall"The Power of Place: Geography, Destiny, and Globalization's Rough Landscape" by Harm de Blij"The Revenge of Geography: What the Map Tells Us About Coming Conflicts and the Battle Against Fate" by Robert D. Kaplan
12. "Geography: A Very Short Introduction" by John A. Matthews and David T. Herbert "Why Geography Matters: More Than Ever" by Harm de Blij

Note: These recommended reading books provide students with additional resources to deepen their understanding of the subject and explore diverse topics within Geography.

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY

Semester-I

Minor course

Course title: Physical Geography (Part-I)

Course code: GEOMIN101-4

Total Credits: 4 (Theory 4)

Course Objectives:

- To introduce students to the fundamental concepts and principles of physical geography.
- To familiarize students with the processes and features shaping the Earth's landforms, climates, and ecosystems.
- To develop students' understanding of the interconnectedness of physical systems and their impacts on human activities.
- To enhance students' ability to analyze and interpret spatial patterns and processes in physical geography.
- To cultivate students' appreciation for the dynamic nature of the Earth's physical environment and the importance of environmental sustainability.

Course Outcome: This course provides a comprehensive understanding of the physical processes and features that shape the Earth's surface. It covers the study of landforms, weather patterns, climate systems, ecosystems, and natural hazards. The course aims to develop students' knowledge of physical geography concepts and their ability to analyze and interpret spatial patterns and processes in the natural environment.

Course Content:

Units	Course Content	No. of Classes-60 (60 hours of classes)	Credits (4+0=4)
I	• Introduction to Physical Geography: Scope, nature, and significance of physical geography; scientific methods in physical geography. • Earth's Structure and Composition: Layers of the Earth, plate tectonics, earthquakes, and volcanoes.	20	4
II	• Geomorphology: Landforms, fluvial processes, weathering and erosion, coastal processes, and glacial landscapes.	14	
III	• Weather and Climate: Atmospheric composition, elements of weather, climate classification, and global climate patterns.	14	
IV	• Biogeography: Ecosystems, biodiversity, biomes, and ecological processes.	12	

Suggested Books:

1. "Physical Geography" by James F. Petersen, Dorothy Sack, and Robert E. Gabler.
2. "Physical Geography: The Global Environment" by Joseph Holden.

3. "Geosystems: An Introduction to Physical Geography" by Robert W. Christopherson and Ginger Birkeland.
4. "The Atmosphere: An Introduction to Meteorology" by Frederick K. Lutgens and Edward J. Tarbuck.
5. "Geomorphology" by Savindra Singh.
6. "Climatology" by John E. Oliver.
7. "Introduction to Hydrology" by Warren Viessman Jr. and Gary L. Lewis.
8. "Soil Science: An Introduction to the Properties and Management of Soils" by D. L. Rowell.
9. "Biogeography: An Ecological and Evolutionary Approach" by C. Barry Cox, Peter D. Moore, and Richard Ladle.
10. "Environmental Management: A Comprehensive Approach for Sustainable Development" by Erlet Shaqe.

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY
Semester-I
Interdisciplinary Course (IDC)
Course title: Introduction to Geography
Course code: GEOIDC101-3
Total Credits: 3 (Theory 3)

Course Objectives:

- This interdisciplinary paper intends to introduce the students to the evolution of the universe, solar system and our planet Earth. It will also elucidate the coordinate system to understand how to find the location of any place/object over the earth's surface.
- This paper shall provide a detailed understanding of earth movements and insight into different landform orders.
- This course shall develop an understanding of the man-environment relationship and the origin of human settlements.
- Students will be well-versed in population dynamics and migration·

Course Outcome:

- Students will learn about the origin of the universe, the solar system, and on Earth. They will learn about the geological time scale and the Earth's interior.
- Students will learn about the different landforms formed on the surface of the Earth and the forces responsible for their formation.
- Students will be able to identify the coordinate system and time zones, which are of utmost importance to know the position of any place or object on the Earth's surface.
- Students will learn and understand the interplay of humans and the environment, and the effects of humans on the environment, human settlements and patterns of urbanisation.

Course Content:

Units	Course Content	No. of Classes-45 (45 hours of classes)	Credits (2+1=3)
I	• Origin of Universe: Solar System; Origin of Earth: Big Bang theory; concept of Geological Time scale. • The earth's coordinate system: latitudes and parallels; longitudes and meridians; Time zones: International Date Line (IDL), local and standard time zones, Indian Standard Time (IST).	15	3
II	• Internal structure of the earth, earth's Movements, Plate Tectonics; Continental Drift theory • Order of Landforms: first, second and third order • Concepts of man-environment relationship: environmental Determinism, Possibilism and Neo-determinism;	15	
IIII	• World Population: Growth, Distribution and density; Demographic Transition theory and Malthus theory • Migration: types and causes • Origin and evolution of human settlement: types, patterns and morphology of rural and Urban settlements	15	

Suggested Book:

1. Strahler A. N. and Strahler A. H., 2008: Modern Physical Geography, John Wiley & Sons, New York.
2. Husain M., 2002: Fundamentals of Physical Geography, Rawat Publications, Jaipur.
3. Monkhouse, F. J. 2009: Principles of Physical Geography, Platinum Publishers, Kolkata.
4. Goudie, A. 1984: The Nature of the Environment: An Advanced Physical Geography, Basil Blackwell Publishers, Oxford.
5. Chandna, R.C. (2010) Population Geography, Kalyani Publisher.
6. Hussain, Majid (2012) Manav Bhugol. Rawat Publications, Jaipur
7. Jordan-Bychkov et al. (2006) The Human Mosaic: A Thematic Introduction to Cultural Geography. W. H. Freeman and Company, New York.
8. Johnston R; Gregory D, Pratt G. et al. (2008) The Dictionary of Human Geography, Blackwell Publication.
9. Hassan, M.I. (2005) Population Geography, Rawat Publications, Jaipur.

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY
Semester – I
Skill Enhancement Course (SEC)
Course title: Map making and Analysis
Course code: GEOSEC101-3
Total Credits: 3 (Theory 2+ Practical 1)

Course Objective:

- This paper has been designed to enhance the skill of the students towards map making and analysis.
- It aims to help learners acquire knowledge about the basic cartographical aspects of map making and analysis.

Course Outcome:

- This paper will help to provide knowledge about the concept of scale, its different types and application in different fields of geography;
- It will help to develop intensive knowledge and skill about the basic concepts of map, its types and classification; thematic maps and their classifications
- The learners can explore the different methods of representations of geographic data with the help of map.
- This paper also assists to hand on experience to different techniques of map making and analysis.

Course Content:

Units	Course Content	No. of Classes-45 (30 hours of classes one hour +30hours of classes of two hours)	Credits (2+1=3)
	Part-A (Theory)		
I	• Concept of Scale, its types and Application, Conversion of scale, Concept of least count in Vernier Scale. • Concept of map, map classification and types; • Importance of map in Geography • Map Scale and Types, • Thematic maps and their classification, • Base map and its preparation • Elements of map reading and Interpretation of toposheet • Principles of Map Design and layout. • Mapping techniques and generalization principles	15	1
II	• Concept of Geographical data representation through Chorochromatic, Choroschematic, Isopleths and Choropleth maps. • Concept of spot heights, Bench Mark, Triangulation stations, Contours and their use in Topographical Maps of India. • Cartogram and Diagrammatic Data Presentation by Line, Bar and Circle • Point, Line and Areal Data representation through Cartographic Overlays.	15	1

Part-B (Practical)			
III	• Graphical Construction of Plain, Comparative and Diagonal Scale. • Construction of Thematic Maps with the help of physical and socio-economic geographical data. • Geographical data representation with the help of Bar diagram, pie chart and Block diagram • Preparation of Isopleth and Choropleth maps with the help of Geographical Data • Representation of interrelationship among the physical and cultural features from Topographical Maps and Interpretation. • Drawing of a representative part from topographical map, such as - Mountain, Plateau, Hills and Ridges, Piedmont, Floodplain, Valley (U-shaped and V-shaped), spurs and their characteristics • Survey of India topographical maps: Reference scheme of old and open series, Information on the margin of maps	15	1

Suggested Book:

1. Cuff J. D. and Mattson M. T., 1982: *Thematic Maps: Their Design and Production*, Methuen
2. Young Books
3. Dent B. D., Torguson J. S., and Holder T. W., 2008: *Cartography: Thematic Map Design* (6th
4. Edition), Mcgraw-Hill Higher Education
5. Gupta K. K. and Tyagi V. C., 1992: *Working with Maps*, Survey of India, DST, New Delhi.
6. Kraak M.-J. and Ormeling F., 2003: *Cartography: Visualization of Geo-Spatial Data*,
7. Prentice-Hall.
8. Mishra R. P. and Ramesh A., 1989: *Fundamentals of Cartography*, Concept, New Delhi.
9. Sharma J. P., 2010: *Prayogic Bhugol*, Rastogi Publishers, Meerut.
10. Singh R. L. and Singh R. P. B., 1999: *Elements of Practical Geography*, Kalyani Publishers.
11. Slocum T. A., Mcmaster R. B. and Kessler F. C., 2008: *Thematic Cartography and*
12. *Geovisualization* (3rd Edition), Prentice Hall.
13. Tyner J. A., 2010: *Principles of Map Design*, The Guilford Press.
14. Sarkar, A. (2015) Practical geography: A systematic approach. Orient Black Swan Private
15. Ltd., New Delhi

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY
Semester-I
Value added course (VAC)
Course title: Geography of Environment and Sustainability
Course code: GEOVAC101-4
Total Credits: 4 (Theory 3 + Report writing 1)

Course Objectives:
This course provides an introduction to the fundamental concepts and principles of geography as they relate to the environment and sustainable development. It explores the complex interactions between human activities and the natural environment, focusing on the challenges and opportunities for achieving sustainable development. Students will develop a solid understanding of key environmental issues, spatial patterns, and sustainable development strategies through lectures, discussions, case studies, and fieldwork.

Course Outcome: By the end of the course, students should be able to:

- Understand the basic concepts and principles of geography related to the environment and sustainable development.
- Identify and analyze the major environmental challenges facing the world today.
- Examine the spatial patterns of environmental issues and their impacts on different regions.
- Evaluate the interrelationships between human activities and the natural environment.
- Explore and discuss sustainable development strategies and their implications.
- Apply geographic tools and techniques to analyze and solve environmental problems.
- Develop critical thinking and analytical skills in assessing environmental issues.
- Gain fieldwork experience and apply theoretical knowledge in practical scenarios.

Course Content:

Units	Course Content	No. of Classes-45 (30hours of classes of one hour+ 30 hours of classes of two hours)	Credits (3+1=4)
	Part-A (Theory)		
I	Introduction to Geography and Sustainable Development: • Definition and scope of Environment Geography Concept of sustainable development, • Environmental Systems and Processes: Earth's physical systems: lithosphere, hydrosphere, atmosphere, biosphere; Natural processes and cycles: climate, weather, erosion, and soil formation	10	3
II	Environmental Challenges and Global Issues: • Climate change and global warming: Biodiversity loss and conservation, Deforestation and land degradation, Pollution and waste management • Human-Environment Interactions: Population growth and environmental impacts, Urbanization and sustainable cities, Agriculture and food security • Sustainable Development Goals (SDGs): Overview of the United Nations SDGs, Linking sustainable development to	10	

	environmental issues		
III	Environmental Policy and Governance: • International agreements and conventions on the environment, National and local environmental policies and regulations, Stakeholder engagement and decision-making processes • Environmental Impact Assessment: Principles and process of environmental impact assessment Case studies of environmental impact assessments • Sustainable Development Strategies: Sustainable transportation and mobility, Waste reduction and recycling	10	
Part-B (Report writing)			
IV	Fieldwork and Practical Application: • Field trip to a local environmental site or project: Data collection, analysis, and reporting	15	1

Suggested Book:

1. Saxena, H.M.1999: Environmental Geography, Rawat Publication.
2. Mahapatra, A.C, Barik,S.K & Rao,C.S.1999 : Man and Environment, Star Publishing House, Shillong.
3. Chandna, R.C. 2002:Environmental Geography, Kalyani Publication, Ludhiana.
4. Singh, S. 2015: Environmental Geography,Pravalika Publications,Allahabad.
5. Goudie,A. 2001:The Nature of the Environment, Blackwell,Oxford.
6. MoEF,2006: National Environmental Policy-2006,Ministry of Environment and Forest, Government of India.
7. Odum,E.P et al.2005: Fundamentals of Ecology, Cengage Learning of India.
8. Monkhouse, F. J.2008: A dictionary of geography. Transaction Publishers.
9. "The Geography of Environmental Change: An Introduction to Sustainable Development" by R. J. Johnston and D. Gregory
10. "Environmental Science: Earth as a Living Planet" by Daniel B. Botkin and Edward A. Keller
11. "Sustainable Development: Principles, Frameworks, and Case Studies" by Nick Jenkins, Alastair Jones, and Michael Wallace
12. "Geography: Realms, Regions, and Concepts" by Harm J. de Blij, Peter O. Muller, and Jan Nijman
13. "Environmental Geography: Science, Land Use, and Earth Systems" by William M. Marsh and John Grossa
14. "Sustainable Development: Concepts, Rationalities, and Strategies" by Frans H. J. M. Coenen
15. "Introduction to Environmental Impact Assessment: Principles and Procedures" by John Glasson, Riki Therivel, and Andrew Chadwick"Sustainable Cities: Concepts and Strategies for Eco-City Development" by Yang Zhang and Yan Song

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY

Semester-II

Core course

Course title: Domains of Geography

Course code: GEOMAJ102-4

Total Credits: 4 (Theory 4)

Course Objectives:

- To introduce the significant branches of Geography.
- To provide dynamics of the spheres of the earth.
- To highlight the relationship between humans and the environment from the earth's inception.
- To provide an overview of humans and culture and to show how ethnicity, race and language play a vital role in forming the cultural landscape.

Course Outcome:

- This paper will help the students differentiate between physical and Human Geography.
- Students will understand human perception and behaviour concerning their environment.
- This paper will help the students learn how human, physical and environmental components of the earth interact.

Course Content:

Units	Course Content	No. of Classes-60 (60 hours of classes)	
Part-A (Physical Geography)			
I	• Physical Geography: Nature, Scope, Contents, and Interrelationship • Biosphere: concept of biosphere; global distribution of flora and fauna; concepts and types of biodiversity	13	
II	Manand Environment Relationship; • Elements of environment; physical and human environment; constraints and opportunities of the environment. • Impact of environment on man, Human adaptation to to environment: cold desert, mountain, plain, hot desert and riverine lands	16	
Part-B (Human Geography)			
III	• Meaning, nature and scope of Human Geography • Schools of Human Geography: Environmental Determinism and Possibilism; concept of space and place • Concept of culture, ethnicity, race, religion and language	16	
IV	• Mapping of major racial group in the world • Mapping of major racial group of India	15	

	• Mapping of linguistic and religious region in the world • Mapping of linguistic region of India.		

Suggested Books:

1. Conserva H. T., 2004: Illustrated Dictionary of Physical Geography, Author House, USA.
2. Goudie, A., 1984: The Nature of the Environment: An Advanced Physical Geography, Basil Blackwell Publishers, Oxford.
3. Hamblin, W. K., 1995: Earth's Dynamic System, Prentice-Hall, N.J.
4. Husain M., 2002: Fundamentals of Physical Geography, Rawat Publications, Jaipur.
5. Monkhouse, F. J. 2009: Principles of Physical Geography, Platinum Publishers, Kolkata.
6. Singh, Savindra (2017): Physical Geography, Pravallika Publications, Allahabad.
7. Strahler A. N. and Strahler A. H., 2008: Modern Physical Geography, John Wiley & Sons, New York.
8. Hussain, Majid (2021, Sixth Edition): Human Geography, Rawat Publication, Jaipur.
9. Hassan, M.I. (2005) Population Geography, Rawat Publications,Jaipur
10. Daniel, P.A. and Hopkinson, M.F. (1989) The Geography of Settlement, Oliver & Boyd, London.
11. Johnston R, Gregory D, Pratt G. et al. (2008) The Dictionary of Human Geography, Blackwell Publication.
12. Jordan-Bychkov et al. (2006) The Human Mosaic: A Thematic Introduction to Cultural Geography. W. H. Freeman and Company, NewYork.
13. Hussain, Majid (2012) Manav Bhugol. Rawat Publications, Jaipur.

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY

Semester-II

Minor Course

Course title: Physical Geography (Part-II)

Course code: GEOMIN102-4

Total Credits: 4 (Theory 4)

Course Outcome:

This course provides a comprehensive understanding of the physical processes and features that shape the Earth's surface. It covers the study of weather patterns, climate systems, ecosystems, and natural hazards. The course aims to develop students' knowledge of physical geography concepts and their ability to analyze and interpret spatial patterns and processes in the natural environment.

Course Objectives:

- To develop students' understanding of the interconnectedness of physical systems and their impacts on human activities.
- To enhance students' ability to analyze and interpret spatial patterns and processes in physical geography.
- To cultivate students' appreciation for the dynamic nature of the Earth's physical environment and the importance of environmental sustainability.

Course Content:

Units	Course Content	No. of Classes-45 (45 hours of classes)	Credits (4+0=4)
I	• Climatology: Climate change, atmospheric circulation, monsoons, El Niño, and natural hazards.	9	4
II	• Hydrology: Water cycle, rivers, lakes, groundwater, and water management.	9	
III	• Soils and Pedology: Soil formation, properties, classification, and soil erosion. • Biogeography and Biodiversity: Plant and animal distributions, conservation, and ecological restoration.	18	
IV	• Environmental Management: Sustainable development, natural resource management, and environmental policies	9	

Suggested Books:

1. "Physical Geography" by James F. Petersen, Dorothy Sack, and Robert E. Gabler.
2. "Physical Geography: The Global Environment" by Joseph Holden.
3. "Geosystems: An Introduction to Physical Geography" by Robert W. Christopherson and Ginger Birkeland.
4. "The Atmosphere: An Introduction to Meteorology" by Frederick K. Lutgens and Edward J. Tarbuck.
5. "Geomorphology" by Savindra Singh.
6. "Climatology" by John E. Oliver.
7. "Introduction to Hydrology" by Warren Viessman Jr. and Gary L. Lewis.

8. "Soil Science: An Introduction to the Properties and Management of Soils" by D. L. Rowell.
9. "Biogeography: An Ecological and Evolutionary Approach" by C. Barry Cox, Peter D. Moore, and Richard Ladle.
10. "Environmental Management: A Comprehensive Approach for Sustainable Development" by Erlet Shaqe.

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY

Semester-II

Interdisciplinary Course (IDC)

Course title: Environmental Geography

Course Code: GEOIDC102-3

Total Credits: 3 (Theory 3)

Course Objective:

- This course aims to deliver its learners with both theoretical and practical knowledge on the relationship between society and environment.
- The course aims to develop values towards the environment among the learners and induce sensitivity towards environmental protection/preservation and restoration.

Course Outcome: After the successful completion of this course, students will be able to:

- Understand the various concepts related to the environment, and explore the scope and approach to society-environment relationship in geography.
- Able to acquire knowledge on principles of ecosystem and functioning that governs the stability and sustainability of the ecosystem.
- Identify the impacts of humans in degradation of environmental problems and the role of society to management and restoration of the environment.
- Analyse different environmental issues at regional and local context and assess impact on health and development.
- Acquire hand on skills to identify quality of water and soil, identify their causes, appreciate the possibility of conservation of biodiversity and practise precautionary measures to protect the environment.

Course Content:

Units	Course Content	No. of Classes-45 (45 hours of classes)	Credits(3+0=3)
I	Geography and Environment; • Types ofEnvironment,major elements of environment • Nature and Scope of Environmental Geography. Approach to study Environmental Geography: Earth System Science, Land Change (Systems) Science, Ecological Approach, Quaternary Geography, Environmental history • Meaning, Components and functions of ecosystem: trophic levels, energy flows, food chain and food web, ecological pyramids • Classification of ecosystem • Ecological concepts: level of organisation, native species, keystone species, population viability threshold, ecological resilience, disturbances, connectivity/fragmentation • Geo-biochemical cycles: (carbon, nitrogen, oxygen, phosphorous) • Meaning, levels of organisation and attributes of	15	1

	biodiversity • Basic Ecological Principles		
II	Environment and society; • Human ecology: Concept, adaptation/interaction and influence/impact of human on ecology and environment • Ecological change and environmental degradation: Global Warming, Urban Heat Island, Atmospheric Pollution, Water Pollution, Soil/Land Degradation • Climate change and environmental hazards • Management of Environment and resources: Principles of conservation • Sustainable development: Concept, Value of biodiversity for development • Environmental policies/programmes and international treaties: Global, national and local (Brundtland Commission, Kyoto Protocol, Agenda 21, Sustainable development goals, Paris Agreement)	15	1
III	Environmental Impacts; • Ecological footprints • Carbon footprints • Environmental issues in tropical ecosystem • Environmental issues in temperate ecosystem • Environmental issues in polar ecosystem • Environmental Degradation and Human Health • Concepts and Principles and importance of Environmental impact assessment • Methods and procedures of EIA	15	1

Suggested Books:

1. Castree, N. et. al. 2009 (edt.): A Companion to Environmental Geography, Blackwell Publishing Ltd, UK
2. Goudie, A. 2001: The nature of Environment, Blackwell, Oxford
3. Chapman J. L. and Reiss, M.J. 1993: Ecology: Principles and Applications, Cambridge University Press
4. Farmer, A. 1997: Managing Environmental Pollution, Routledge, London: 246p
5. Roberts, N 1994 (edt.): The changing Global Environment, Blackwell Pub. Co., London
6. Saxena, H.M. 1999: Environmental Geography, Rawat Publication
7. Mahapatra, A.C. et. al. 1999: Man and Environment, Star Publishing House, Shillong
8. Odum, E.P. et al. 2005: Fundamentals of Ecology, Cengage Learning of India
9. William, J. S. 2006: Ecological Census Techniques, Cambridge
10. Lagacherie, P et al. 2003: Digital soil mapping: an Introductory Perspective, Elsevier
11. Singh, R.L. and Singh, R.P.B. 1992: Elements of Practical Geography
12. Basu, R. and Bhaduri, s ed, 2007: Contemporary Issues and Techniques in Geography, Progressive Publishers, Kolkata

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY

Semester-II

(Option A)
Skill Enhancement Course (SEC)
Course title: Quantitative Techniques for spatial Analysis
Course code: GEOSEC102A-3
Total Credits: 3 (Theory 2 + Practical 1)

Course Objectives-

- To provide learners theoretical and practical based exposure on dynamics of the course.
- To draw attention to the connection between two interdisciplinary course Quantitative techniques and spatial analysis.
- To give basic quantitative methods or techniques of different objects and its scientific based analysis in the field of geography.

Course Outcomes:

- By the end of this course on quantitative techniques for spatial analysis, students will be able to:
- Understand the fundamentals of spatial analysis: Students will grasp the core concepts and principles of spatial analysis, including spatial data types, coordinate systems, and spatial relationships.
- Apply statistical methods to spatial data: Students will develop a strong foundation in applying statistical techniques to spatial data.

Course Content:

Units	Course Content	No. of Classes -45 (30 hours of classes of one hour + 30 hours of classes of two hour)	Credits (2+1=3)
Part-A (Theory)			
I	Understanding spatial analysis: • Use of Data in Geography: Geographical Data Matrix, Significance of Statistical Methods in Geography; Sources of Data, Scales of Measurement (Nominal, Ordinal, Interval, Ratio).	15	2
II	Spatial statistics: • Statistics and Statistical Data: Spatial and non-spatial; indices of inequality and disparity. • Determination of Spatial Mean and Median Centers of Settlements and Standard Distance, • Weighted Mean Centre of Population or any other attribute • Chi square test (Spatial analysis)	15	
Part-B (Practical)			

III	• Determination of Spatial Mean and Median Centers of Settlements and Standard Distance • Weighted Mean Centre of Population or any other attribute • Chi square test and Variogram • Construction of population growth model and the distance decay model • Construction of Age-Sex pyramid • Mapping Settlement Types and Pattern - Construct a data matrix of about (30 x 10) with each row representing an areal unit (districts or villages or towns) and about 10 columns of relevant attributes of the areal units. - Based on the above table, a frequency table, measures of central tendency and dispersion would be computed and interpreted for any two attributes. - Histograms and frequency curve would be prepared on the five variables.	15	1

Suggested books

1. Spatial Analysis: Statistics, Visualization, and Computational Methods" by Manfred M. Fischer and Arthur Getis
2. "Geographic Information Analysis" by David O'Sullivan and David J. Unwin
3. "Spatial Data Analysis: Theory and Practice" by Robert Haining
4. "Spatial Analysis: Modelling in a GIS Environment" by Paul A. Longley, Michael F. Goodchild, David J. Maguire, and David W. Rhind
5. "Spatial Statistics: Methodological Aspects and Some Applications" edited by N.K. Taneja
6. "Applied Spatial Data Analysis with R" by Roger S. Bivand, Edzer J. Pebesma, and Virgilio Gómez-Rubio
7. "Geocomputation: A Practical Primer" by Chris Brunsdon and Alex Singleton
8. "Introduction to Geostatistics: Applications in Hydrogeology" by P.K. Kitanidis
9. "Spatial Analysis in Epidemiology" by Mark S. Carrothers
10. "Quantitative Geography: Perspectives on Spatial Data Analysis" edited by A. Stewart Fotheringham and Peter A. Rogerson

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY
Semester-II

(Option B)
Skill Enhancement Course (SEC)
Course title: Basics of Remote Sensing and GIS
Course code: GEOSEC102B-3
Total Credits: 3 (Theory 2 + Practical 1)

Course Objective:

- The skill enhancement course on Basics of Remote Sensing and Geographic Information System has been designed specifically to equip its learners with both theoretical and practical Knowledge about the geographical spatial information technology to the students.
- The course has been designed to impart its learners with the basic knowledge and skills to aid them in securing a niche for themselves in the geospatial technology.
- It aims to develop understanding among the learners about applying geospatial technology in understanding geographical domain.

Course Outcome: After the completion of this course, learners will be able to:

- Working principles of Remote Sensing
- Know how Remote Sensing and GIS emergence and its advantages and limitations
- Understand types of Remote Sensing and data types in GIS
- Apply different processes of GIS, Geospatial analysis and application in planning and management
- Gain knowledge on sources of various Remote Sensing and GIS software and database
- Able to project and generate maps from different sources on various themes
- Relate emerging spatial technology in recent days as important domain in geography
- Able to use remote sensing and Geographic Information System as tool in understand geographical space for planning and management.

Course Content:

Units	Course Content	No of Classes-45 (30 hours of classes of one hour + 30 hours of classes of two hours)	Credits (2+1=3)
	Part-A (Theory)		
I	Fundamentals of Remote Sensing • Introduction of remote sensing: What is remote sensing, defining and observation of remote sensing, • History and development of remote sensing. • Principles of remote sensing: Wavemodel of Electromagnetic Radiation. • Type of remote sensing; Active and Passive and based on platform • Satellite orbit, swath and nadir, and image referencing system. • Concept of satellite image and resolution. • Different Space Research Organization: ESA, ISRO and NASA.	15	1

	• Principal of Global Navigation System • Advantage and limitation of remote sensing and Global Positioning System		
II	Fundamentals of Geographic Information System: • History and concept of GIS, components of GIS • Relation of GIS with allied disciplines • GIS as set of interrelated subsystems • Function and advantages of GIS • Basic idea on; Spatial data model, Attribute data management, Processes in GIS, and Geospatial analysis • Current trends and application of GIS in planning and management,	15	1
	Part-B (Practical)		
III	• Sources of open-source GIS software and database • Projection system in Remote Sensing and GIS: - Projected Coordinate System and World Graticule System- Projecting toposheet • What is shape file and attribute table - Drawing point, line and polygon features and labeling - Attribute table; creating new fields, calculating length and area • Generating choropleth and chorochromatic map; Population density/Rice production etc, b. Soil type/vegetation/lithology etc • Satellite imagery and its characteristics;Types of aerial and satellite imagery - Generating land use and land cover map from satellite imagery-Supervised and unsupervised method • Global Positioning System, ground verification, and its application.	15	1

Suggested Books:

1. Basudeb, B. (2008): Remote Sensing and GIS, Oxford University Press, New Delhi
2.Bolstad. P: GIS Fundamentals: A first text on Geographic Information Systems, XenEdu
2. Fazal, S. (2006) Remote Sensing Basics, Kalyani Publishing, New Delhi.
3. George, J. and Jeganathan. C.: Fundamentals of Remote Sensing, University Press,
4. Reddy.M.A:Text book of Remote Sensing and Geographic Information System, B.S.Publication, New Delhi.

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY
Semester-II

Value added course (VAC)

Course title: Environmental Studies

(Common for all streams & subjects)

Course code: GEOVAC102-4

Total Credits: 4 (Theory 3+ Practical 1)

Semester – III
Core course
Course title: Basics of Cartography
Course code: GEOMAJ201-4
Total Credits: 4 (Theory 3+ Practical 1)

Course Objective:

- This paper has been designed to the students of undergraduate course in geography to familiarize about basic science behind the map making and their use.
- It also aims to help acquire knowledge about the dimensions of cartography from its nature and scope to its development and techniques behind the map making.

Course Outcome:

- This paper will help to understand the nature and scope of cartography, development trend and its relevance in the field of geography.
- The learner will acquire knowledge about the basic concept relating to earth, its different methods of measurement etc.
- It also caters the knowledge relating to map projection, different principles and methods of derivation.
- It will deliver hand on training of the learner towards different methods and techniques of cartography.

Course Content:

Units	Course Content	No. of Classes-60 (45 hours of classes of one hour+ 30 hours of classes of two hours)	Credits (3+1=4)
	Part-A (Theory)		
I	• Nature and scope of Cartography, trend of development and present day relevance of Cartography in Geography, traditional and digital cartography. • The concept of shape, size, latitude and longitude, direction and distance of earth. • Coordinate systems: Polar and rectangular, Concept of geoid and spheroid • Concept of generating globe; Grids: angular and linear systems of measurement • Bearing: Magnetic and true, whole-circle and reduced • Principle of Enlargement and Reduction of Maps by Graphical and Instrumental Methods. • Importance, scope and purpose of Digital Planimeter, principles of working and application of the instrument	15	3
II	• Definition, need of Map Projection, Principles, Function and Classification of map projection, Choice of Map Projection; • Graphical Construction of Zenithal group of projection both polar and equatorial case, cylindrical group of projection, conical group of projection and conventional group of projection, their properties and uses.	15	
III	• Concept and Principles of Geodetic and Plane Surveying,	15	

	• Principles of triangulation • Principles and techniques of surveying by Plane Table (Radiation and Intersection Method), Prismatic Compass (Closed Traverse and Open Traverse), Dumpy Level (Profile) and Theodolite (Traversing).		
Part-B (Practical)			
IV	• Construction of graticules based on Mathematical derivation and calculation; - Zenithal group (polar cases): Gnomonic, Stereographic, Orthographic, and Equal-area - Cylindrical group: Cylindrical equal area and Mercator's projection - Conical Group: Simple Conical Projection, Conical Projection with two standard parallels. - Conventional Group: Sinusoidal, • Principles of Surveying; - Plane table surveying (Radiation & Intersection methods) - Prismatic Compass and Theodolite Surveying (Open and Closed Traverse) - (c) Dumpy Level (Profile) and Theodolite (Traversing and Profile);	15	1

Suggested Books:

1. Campbell, J., 1984: Introductory Cartography, Prentice Hall Inc., Englewood Cliff
2. Misra, R.P. and Ramesh, A., 1995: Fundamentals of Cartography, Concept Publishing Company, New Delhi
3. Robinson, A.H., et al: Elements of Cartography, John Wiley & Sons, New York
4. Raisz, E. : Principles of Cartography, McGraw Hills, London
5. Kenetkar, T.P. and Kulkarni, S.U.: Surveying and Levelling, Vol. I & II, VidyarthiGrithaPrakashan, Pune
6. Kellaway, G.P.: Map Projection, Methuen & Co., London
7. Steers, J.A., 1965: An Introduction to the Study of Map Projection, University of London, London
8. Bygott, J., An Introduction to Map work and Practical Geography 17
9. Talukder, S., 2008: Introduction to Map Projections, Eastern Book House, Guwahati.
10. Mahmood, A., 1999: Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi.
11. Hammond, R. and McCullagh, P. (1965): Quantitative Techniques in Geography, Clarendon Press, Oxford Sarkar, Ashis, Practical Geography: A Systematic Approach, Orient Longman Pvt. Ltd., Kolkata.
12. Elhance, D.N., 1972: Fundamentals of Statistics, KitabMahal, Allahabad
13. Monkhouse, F.J. & Wilkinson, H.R., 1989: Maps & Diagrams, B.I. Publications, New Delhi
14. Gregory, S., 1963: Statistical Methods and Geographers, Longman, London
15. Singh, R. & Singh, R.: Map Work & Practical Geography, Central Book Depot, Allahabad.
16. Sarkar, Ashis, Practical Geography: A Systematic Approach, Orient Longman Pvt. Ltd., Kolkata.

OUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY

Semester-III

Core course

Course title: Climatology and Oceanography

Course Code: GEOMAJ202-4

Total Credits: 4 (Theory 3+Practical 1)

Course Objective:

- This course aims to deliver its learners with both theoretical and practical knowledge on the fundamentals of climate and its importance in geographical enquiry.
- The course aims to develop an understanding of the dynamics of climate that govern earth's process and affect landscape.
- It seeks to develop new insights among students on the relevance of climatic variable
- stangenting on climate change.

Course Outcome: After the successful completion of this course, students will :

- Be familiar with key concepts in meteorology and climatology.
- Be familiar with the composition and structure of the atmosphere.
- Understand how and why the distribution of gases varies with height, latitude and time.
- Know how atmospheric pressure, density and water vapour pressure vary with altitude.
- Know the effects of the atmosphere on solar and terrestrial radiation, understand heat budget and the importance of horizontal transfers of energy as sensible and latent heat.
- Be aware of the spatial and temporal characteristics of moisture in the atmosphere, evaporation and precipitation.
- Know what determines atmospheric stability/instability.
- Know the basic laws of horizontal motion in the atmosphere.
- Be familiar with the basic concepts of the general circulation of the atmosphere.
- Learn how and why pressure patterns and wind velocity change with altitude.
- Become familiar with the morphological and physical aspect of the ocean.
- Identify the relation between climate and ocean.
- Acquire hand on skills to handle climate data, analysis and forecasting of weather.
- Identify climate variables and climate types and predict climate change.

Course Content:

Units	Course Content	No. of Classes-60 (45 hours of classes of one hour + 30 hours of classes of two hours)	Credits (3+1=4)
	Part-A (Theory)		
I	Fundamentals of Climate: • Climatology and Meteorology, Climate and weather, elements of weather • Composition of Atmosphere: Primary gases, Greenhouse	14	3

	gases, Reactive gases, Aerosols, • Variation with height, variation with latitudes, seasons and time • Structure of Atmosphere: Layering of atmosphere • Factors controlling Global energy budget: • Effect of solar radiation (solar output, distance from the sun, altitude of the sun, length of the day); • Surface receipt of solar radiation and it effects (energy transfer within the earth-atmosphere system, effect of the atmosphere, effect of cloud cover, effect of latitude, effect of land and sea, effect of elevation and aspect, variation of free-air temperature with heightTerrestrial infra-red radiation and the Greenhouse effect • Heat budget of the earth • Horizontal transport of heat and spatial pattern of the heat components • Factors controlling horizontal and vertical distribution of global • Air pressure: Measurement of air pressure, Pressure gradient, vertical variation in air pressure (low pressure system and high pressure system) • Surface Pressure condition and global pressure belt (non-rotating homogenous earth, rotating non-homogenous earth)		
II	Dynamics of climate: • Factors affecting wind motion: horizontal pressure-gradient, the coriolis force, geostrophic wind, gradient wind, frictional force, centrifugal action of wind • Earth's Surface Wind Systems, Departure from idealised circulation pattern, circulation pattern in vertical and horizontal planes • Mean upper-air pattern and upper wind condition • Atmospheric moisture: the hydrological cycle, measures of humidity • Evaporation: process and factors affecting rate of evaporation • Processes and forms of condensation • Cloud formation and type of clouds • Bergeron-Findeisen theory of precipitation • Types and forms of precipitation • Distribution of precipitation and factors controlling distribution • Air Masses: classification and characteristics • Front: Frontogenesis and frontolysis, types • m)Monsoon: origin and mechanism	16	

III	Ocean and Climate: • Morphology of Ocean bottom • Bottom topography of the Atlantic, Indian and pacific Oceans • Chemical Composition of the oceans • Temperature, salinity and density of oceans: source of heat, factors of horizontal variation, vertical distribution, annual variation • Ocean deposits • Coral reefs: condition of growth, types and distribution • Circulations: Warm and cold currents, waves, tides • Cyclones: Tropical and Temperate; anticyclone and extra-tropical cyclone • ENSO Events: Effects of El Nino and La Nina and Southern Oscillation	15	
	Part-B (Practical)		
IV	Climatic Data Analysis: • Source of weather/climate data • Weather elements on a map (pressure, wind, cloudiness, rainfall, atmospheric phenomena, sea condition) • Interpretation of Indian Weather map for Monsoon and non–monsoon seasons/months • Short-range forecast of weather • Preparation of weather reports of Indian subcontinent by analysing the weather satellite • images of at least three consecutive days (e.g. INSAT 3D, NOAAsatellite) • Point rainfall analysis: Calculation of average annual rainfall and variability of annual rainfall and preparation of rainfall distribution and variability maps • Evaporation estimation: use of evaporation pan and empirical equation using climatic data • Preparation of rainfall-temperature graphs; hythergraph, climograph, ergograph, water balance graph • Koppen, Thornhwaite, and Trewartha's classification of world climate (Classification Scheme and Mapping) • Analysis of Climate Change: Analysis of rainfall/temperature data of any station for 50 years using line graph (identify heat extremes) • Analysis and Interpretation of NASA's earth climate change map https://earthobservatory.nasa.gov/global-maps/MOD_LSTD_M • Analysis of climate change map of Google Earth Engine https://earthengine.google.com/timelapse/	15	1

Suggested Books:

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

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY

Semester – III

Minor Course

Course title: Fundamentals of Cartography

Course Code: GEOMIN201-4

Total Credits: 4 (Theory 3+Practical 1)

Course Objective:

- This paper has been designed to the students of undergraduate course in geography to familiarize about basic science behind the map making and their use.
- It also aims to help acquire knowledge about the dimensions of cartography from its nature and scope to its development and techniques behind the map making.

Course Outcome:

- This paper will help to understand the nature and scope of cartography, development trend and its relevance in the field of geography.
- The learner will acquire knowledge about the basic concept relating to earth, its different methods of measurement etc.
- It also caters the knowledge relating to map projection, different principles and methods of derivation.
- It will deliver hand on training of the learner towards different methods and techniques of cartography

Course Content:

Units	Course Content	No. of Classes-60 (45 classes of one hour& 15 classes of two hour)	Credits (3+1=4)
Part-A (Theory)			
I	• Nature and scope of Cartography, trend of development and present day relevance of Cartography in Geography, traditional and digital cartography. • The concept of shape, size, latitude and longitude, direction and distance of earth. • Concept of Scale, its types and Application, Conversion of scale, Concept of least count in Vernier Scale. • Concept of map, map classification and types; • Importance of map in Geography • Map Scale and Types, • Thematic maps and their classification, • Base map and its preparation • Elements of map reading and Interpretation of toposheet • Principles of Map Design and layout. • Mapping techniques and generalization principles	15	3
II	• Definition, need of Map Projection, Principles, Function and Classification of map projection, Choice of Map Projection; • Graphical Construction of Zenithal group of projection both polar and equatorial case, cylindrical group of projection, conical group of projection and conventional group of projection, their properties and uses.	15	
III	• Concept and Principles of Geodetic and Plane Surveying, • Principles of triangulation • Principles and techniques of surveying by Plane Table (Radiation and Intersection Method), Prismatic Compass (Closed Traverse and Open Traverse), Dumpy Level (Profile) and Theodolite (Traversing).	15	
Part-B (Practical)			

IV	• Construction of graticules based on Mathematical derivation and calculation; - Zenithal group (polar cases): Gnomonic, Stereographic, Orthographic, and Equal-area - Cylindrical group: Cylindrical equal area and Mercator's projection - Conical Group: Simple Conical Projection, Conical Projection with two standard parallels. - Conventional Group: Sinusoidal • Principles of Surveying; - Plane table surveying (Radiation & Intersection methods) - Prismatic Compass (Open and Closed Traverse) - Dumpy Level (Profile) and Theodolite (Traversing)	15	1

SuggestedBooks:

1. Campbell, J., 1984: Introductory Cartography, Prentice Hall Inc., Englewood Cliff
2. Misra, R.P. and Ramesh, A., 1995: Fundamentals of Cartography, Concept Publishing
3. Company, New Delhi
4. Robinson, A.H., et al: Elements of Cartography, John Wiley & Sons, New York
5. Raisz, E. : Principles of Cartography, McGraw Hills, London
6. Kenetkar, T.P. and Kulkarni, S.U.: Surveying and Levelling, Vol. I & II, VidyarthiGrithaPrakashan, Pune
7. Kellaway, G.P.: Map Projection, Methuen & Co., London
8. Steers, J.A., 1965: An Introduction to the Study of Map Projection, University of London, London
9. Bygott, J., An Introduction to Map work and Practical Geography 17
10. Talukder, S., 2008: Introduction to Map Projections, Eastern Book House, Guwahati.
11. Mahmood, A., 1999: Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi.
12. Hammond, R. and McCullagh, P. (1965): Quantitative Techniques in Geography, Clarendon Press, Oxford Sarkar, Ashis, Practical Geography: A Systematic Approach, Orient Longman Pvt. Ltd., Kolkata.
13. Elhance, D.N., 1972: Fundamentals of Statistics, KitabMahal, Allahabad
14. Monkhouse, F.J. & Wilkinson, H.R., 1989: Maps & Diagrams, B.I. Publications, New Delhi
15. Gregory, S., 1963: Statistical Methods and Geographers, Longman, London
16. Singh, R. & Singh, R.: Map Work & Practical Geography, Central Book Depot, Allahabad.
17. Sarkar, Ashis, Practical Geography: A Systematic Approach, Orient Longman Pvt. Ltd., Kolkata.

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY

Semester-III

Interdisciplinary course (IDC)

Course title: Natural Hazards and Disaster Management

Course Code: GEOIDC201-3

Total Credits: 3 (Theory 3)

Course Outcome:

This interdisciplinary course focuses on understanding natural hazards, their causes, and their impact on human populations and the environment. It explores strategies and measures for disaster management and mitigation. The course integrates knowledge from various fields, including geography, geology, meteorology, environmental science, social sciences, and engineering. It aims to develop students' understanding of natural hazards, their assessment, and effective disaster management strategies.

Course Objectives: To introduce students to the concepts and theories related to natural hazards and disaster management.

- To develop an understanding of the causes and characteristics of various natural hazards.
- To familiarize students with the methods and techniques for hazard assessment and vulnerability analysis.
- To explore strategies and measures for disaster preparedness, response, and recovery.
- To foster interdisciplinary thinking and collaboration in addressing natural hazards and disaster management.

Course Content:

Units	Course Content	No. of Classes-45 (45 hours of classes)	Credits (3+0=3)
I	• Introduction to Natural Hazards and Disaster Management: Definitions, classifications, and global perspectives. • Geophysical Hazards: Earthquakes, volcanic eruptions, tsunamis, and landslides. • Meteorological Hazards: Tropical cyclones, thunderstorms, tornadoes, and droughts. • Hydrological Hazards: Floods, flash floods, and avalanches. • Assessment and Mapping of Natural Hazards: Hazard mapping, risk assessment, and vulnerability analysis.	15	1
II	• Technological Hazards: Industrial accidents, nuclear disasters, and transportation-related hazards. • Environmental Hazards: Climate change, deforestation, and desertification. • Social and Economic Impacts of Disasters: Human vulnerability, social resilience, and economic consequences.	15	1
III	• Disaster Preparedness and Mitigation: Early warning systems, emergency planning, and community resilience. • Disaster Response and Recovery: Relief operations, rehabilitation, and post-disaster reconstruction	15	1

Suggested Books:

1. "Introduction to Natural Disasters" by Patrick L. Abbott.
2. "Natural Hazards and Disasters" by Donald Hyndman and David Hyndman.
3. "Disasters and Public Health: Planning and Response" by Bruce W. Clements and Eric K. Noji.
4. "Natural Hazards: Earth's Processes as Hazards, Disasters, and Catastrophes" by Edward A. Keller and Duane E. DeVecchio.
5. "Introduction to Emergency Management" by George Haddow, Jane Bullock, and Damon P. Coppola.
6. "Living with Hazards, Dealing with Disasters: An Introduction to Emergency Management" by William L. Waugh Jr.
7. "Environmental Hazards: Assessing Risk and Reducing Disaster" by Keith Smith and David N. Petley.
8. "Community Resilience to Disasters: A Systematic Review of the Literature" by Anita Chandra et al. (National Academies Press, 2011).
9. "Social Vulnerability to Disasters" by Deborah S.K. Thomas.
10. "Disaster Risk Reduction: Cases from Urban Africa" edited by Jonathan P. Makuwira and Matthieu Kervyn.

Note: This syllabus is a general framework and can be adjusted as per the specific requirements and resources of the institution offering the course. It is recommended to select textbooks and additional readings based on the availability and relevance to the course content and learning objectives. Additionally, supplementing the readings with scientific journals, research papers, and case studies can enhance the students' understanding of the subject matter.

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY
Semester-III
Skill Enhancement Course (SEC)
Course title: Geography of Assam Tourism
Course Code: GEOSEC201-3
Total Credits: 3 (Theory 2 + Practical 1)

Course objectives:

This syllabus is to provide students with a comprehensive understanding of the tourism geography of Assam and the Bodoland Territorial Area (BTR). It aims to familiarize students with the diverse tourism potential of Assam, including its natural, cultural, historical, and religious attractions. The syllabus also aims to introduce students to the concepts and principles of tourism development, planning, and management, with a focus on sustainable practices. Furthermore, the objective is to develop students' practical skills in map preparation, data analysis, and fieldwork, enabling them to apply their knowledge in a real-world context. The syllabus aims to equip students with the necessary knowledge and skills to contribute effectively to the tourism industry in Assam and the BTR, while promoting sustainable and responsible tourism practices.

Course outcomes: Upon completing this syllabus, students will be able to:

- Understand the tourism potential of Assam and the BTR, including its natural, cultural, historical, and religious attractions.
- Identify and classify different forms of tourism, such as natural, cultural, medical, adventure, and pilgrimage tourism.
- Analyze the significance of tourism as an industry, considering its economic and socio-cultural impacts in Assam.
- Examine the historical development of tourism in Assam and evaluate the factors that have influenced its growth.
- Understand the various forms of tourism, such as inbound, outbound, national, and international tourism, and their characteristics.
- Comprehend the basic components of tourism, including accessibility, attractions, and accommodation, and analyze their interrelationships.
- Explore tourism policies and initiatives in Assam and their implications for tourism development.
- Recognize the environmental impact of tourism and understand its linkages to ecology and the environment in Assam and the BTR.
- Understand the concept, nature, types, and significance of tourism planning and management.
- Apply planning approaches for different forms of tourism, including ecotourism, adventure tourism, rural tourism, etc., in Assam and the BTR.
- Develop practical skills in map preparation, including physiographic divisions, drainage, transport connectivity, and tourist attractions in Assam and the BTR.
- Analyze and interpret tourism-related data, such as tourist arrivals and seasonal variations, using appropriate tools and techniques.
- Demonstrate fieldwork skills, including data collection, observation, and documentation, in the context of tourism geography.
- The course outcomes aim to enable students to comprehend the diverse aspects of tourism geography in Assam and the BTR, develop critical thinking skills, and apply their knowledge and practical skills to contribute to the sustainable development of the tourism industry in the region.

Course Content:

Units	Course Content	No. of Classes-45 (30classes of one hour& 15 classes	Credits (2+1=3)

		of two hour)	
Part-A (Theory)			
I	Introduction to Geography of Assam Tourism; • Definition, meaning, nature, scope, and types of tourism • Forms of tourism: Natural, cultural, medical, adventure, and pilgrimage tourism • Overview of Assam's tourism potential: Cultural heritage, wildlife sanctuaries, tea gardens, national parks, archaeological sites, religious centers, etc. • Tourism resources and attractions in Assam: Monuments, museums, world heritage sites, religious shrines, fairs, and festivals Tourism Development and Impacts in Assam; • Historical development of tourism in Assam • Significance of tourism as an industry: Economic and socio-cultural impacts in Assam • Tourism policies and initiatives in Assam • Sustainable tourism practices and challenges in Assam	15	2
II	Tourism Planning and Management in Assam and BTR • Concept, nature, types, and significance of tourism planning • Planning approaches for different forms of tourism: Ecotourism, adventure tourism, rural tourism • Tourism infrastructure and facilities: Accommodation, transportation, and attractions in BTR Environmental Considerations in Tourism; • Environmental impact of tourism: Ecological, cultural, and social perspectives • Sustainable tourism practices: Conservation, preservation, and responsible tourism • Role of ecotourism in promoting environmental conservation	15	
Part-B (Practical)			
III	Practical Exercises in Geography of Tourism • Map preparation: Physiographic divisions and drainage of Assam/Bodoland Territorial Region • Identification and documentation of historical and religious tourism resources in Assam • Preparation of a transport connectivity map (road, railway, and air) for major tourist destinations in Assam/India	15	1

	• Locational mapping of tourist attraction points: National parks and sanctuaries in Northeast India/Assam • Data analysis: Trend of tourist arrivals in India/Assam since 2000, seasonal variation in tourist arrivals in capital cities of Northeast Indian states using line graphs and cartograms		

Suggested books

1. "Tourism Geography: A New Synthesis" by Stephen Williams
2. "Tourism: Principles and Practice" by John Fletcher and Alan Fyall
3. "Geography of Tourism and Recreation: Environment, Place, and Space" by C. Michael Hall
4. "Tourism Geography: Critical Understandings of Place, Space, and Experience" edited by Stephen Williams and Alan A. Lew
5. "Geography of Tourism: Image, Impacts, and Issues" by Peter Mason
6. "Sustainable Tourism: A Geographical Perspective" by Martin Mowforth and Ian Munt
7. "Tourism and Climate Change: Impacts, Adaptation, and Mitigation" by Daniel Scott, C. Michael Hall, and Stefan Gössling
8. "Geography of Tourism in North East India" by A.K. Bhagabati
9. "Tourism in North East India: A Case Study of Assam" by Dharitri Sarma
10. "Geography of Assam: People, Culture, and Economy" by A.C. Bhagabati
11. "Tourism and Development in the Third World" by Richard Sharpley

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY

Semester-IV

Core Course

Course title: Evolution of Geographical Thought
Course Code: GEOMAJ203-4
Total Credits: 4 (Theory 4)

Course Objective:

- This course aims to deliver its learners about the epistemology of Geography.
- The course aims to develop among students about understanding of the philosophical considerations underpinning the geographical enquiry.
- It seeks to develop insight understanding among students about development of philosophical ideas and methodologies used by geographers over time.

Course Outcome: After the successful completion of this course, students will:

- Be familiar with geographical thinking in classical and mediaeval period.
- Understand the foundational ideas of scientific geography.
- Be able to know the evolution of geographical thinking and major geographical considerations in the modern world.
- Know the paradigms of geographical thinking since the time of Greek to contemporary period.
- Will understand the difference of classical, modern and postmodern thoughts in geography.

Course Content:

Units	Course Content	No. of Classes-60 (60 hours of classes)	Credits (4+0=4)
I	Foundation of Geography; • Geographic thoughts: Introduction and major school of thoughts • Pre-Modern - Early Origins of Geographical Thinking with reference to the Classical (Greek, Roman, Indian, Arab) • Medieval Geography and Renaissance: Arab and Chinese Geography; Impact of Voyages, Discoveries and Renaissance • Foundation of Scientific Geography: Rise of dualism; special geography vs general geography; Philosophies of Immanuel Kant • Contribution of Alexander Von Humboldt and Carl Ritter • Impact of Darwinism on Scientific Geography	15	1
II	Modern Geographical Thoughts • Evolution of Geographical Thinking and Disciplinary Trends in Germany • Development of Professional Geography in France • Modern British Geography • Professional Geography in former Soviet Union and Contemporary Russia • New Geography in the United States • Geography in Modern India	15	1

III	Philosophies in Geography: • Philosophy of Environmental Determinism and its present day relevance • Pioneers of possibilism and their philosophies • Neo-Determinism and changing perception on environmentalism • Paradigm in geography and paradigm shift • The Quantitative Revolution: major theoretical and methodological development • Positivism and logical positivism • Critical Revolution: Criticism to positivism; Humanistic Geography (Idealist, Hermeneutic and Phenomenological approach); Behavioural Geography; Time-Space Geography; Human Ecology; Welfare Geography; Radical Geography	15	1
IV	New Synthesis in Geography: • Empirical philosophies of regional geography • Geographical Knowledge under globalisation • Pure and Applied Geography • Scientific Methods in Geography: Theory and fact; Role of theory; Scientific theory; routes to scientific explanation (induction and deduction) • Postmodernism: modernism and postmodernism; Postmodern Geographic thought; Feminism in Geography; Deconstruction and Spatiality	15	1

Suggested Books:

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

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY
Semester – IV
Core Course

Course title: Human Geography
Course Code: GEOMAJ202-4
Total Credits: 4 (Theory 3 + Practical 1)

Course Objectives:

- To introduce students to the basic understanding of the fundamental concepts and theories of Human Geography.
- To expose students to the Schools of human geography, the Relationship between human activities & the natural environment and human adaptation to the environment, etc.
- To provide students with both theoretical and practical-based Comprehensive knowledge of human geography.

Course Outcomes:

- Students will have basic ideas about the fundamental theories and concepts of human geography.
- Students will get to know human-environment interactions and the ways in which human activities transform their natural environment.
- Students will understand the fundamental concepts of mankind/race and linguistics, the evolution of human societies, the origin of settlements etc.
- The practical part will provide an overview of the relationship between humans and the environment in different regions of the world.

Course Content:

Units	Course Content	No. of Classes-60 (45 hours of classes of one hour + 30 hours of classes of two hours)	Credits (3+1=4)
	Part-A (Theory)		
I	Nature and Approaches: • Nature and scope of human geography. • Approaches to Human Geography: Resource, locational, landscape, environment • Definition of race, Major division of mankind/race, Language: Definition and linguistic classification	15	1
II	Schools of human geography: • Environmental Determinism • Possibilism • Neo-determinism • Cultural or Social Determinism • Transformation of Environment by man: Causes of climate change, Acidification, Desertification, Deforestation, Environmental change due to: disposal of waste materials, and tourism	15	1

III	Settlement and Human adaptation to environment: • Origin of settlement, Classification of Rural Settlement, Patterns of Rural Settlement • Evolution of human societies: Hunting and food gathering, pastoral nomadism, • Subsistence farming and industrial society • Human adaptation to environment: Case studies of Pygmies, Inuits/ Eskimos, Kirghizs, San Bushmen	15	1
	Part-B (Practical I)		
IV	• Mapping of change in forest coverage in Assam • Sketch of acidification process • Demonstration of types and patterns of settlement in BTR • Preparation of sketch of Bushmen camp • Preparation of sketch and sections of Igloo • Preparation of sketch of a Kirgizs encampment	15	1

Suggested Books:

1. Human Geography: People, Place, and Culture" by Erin H. Fouberg, Alexander B. Murphy, and H.J. de Blij.
2. The Cultural Landscape: An Introduction to Human Geography" by James M. Rubenstein.
3. Introduction to Human Geography" by David Dorrell, Joseph Henderson, and Todd Lindley.
4. Geographies of Globalization" by Warwick E. Murray and John Overton.
5. Geographies of Development: An Introduction to Development Studies" by Robert B. Potter, Tony Binns, Jennifer A. Elliott, and David Smith.
6. Urban Geography: A Critical Introduction" by Andrew E. G. Jonas, Eugene McCann, and Mary Thomas.
7. Population Geography: Tools and Issues" by K. Bruce Newbold.
8. Economic Geography: A Contemporary Introduction" by Neil Coe, Philip Kelly, and Henry W. C. Yeung.
9. Social Geography: A Critical Introduction" by Vincent J. Del Casino Jr.
10. Political Geography: World-Economy, Nation-State and Locality" by Peter J. Taylor and Colin Flint.

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY
Semester – IV
Core Course

Course title: Regional Planning and Development
Course Code: GEOMAJ205-4
Total Credits: 4 (Theory 4)

Course Objective:

- This paper has been designed to provide knowledge about the conceptual aspects of regional planning and development, different theories relating to it etc.
- It aims to help learners acquire knowledge about the various planning strategies taken so far.

Course Outcome:

- This paper will help to acquire knowledge relating to different dimensions of regional planning and development, its relevance in the present day context.
- It will also cater the knowledge and skill relating to the measurements of different levels of development with the help of consideration of different indicators.

Course Content:

Units	Course Content	No. of Classes-60 (60 hours of classes)	Credits (4+0=4)
I	• Definition of Region, Evolution and Types of Regional planning (Formal and Functional), Need for Regional Planning; • Regionalism and Types of regional Planning. • Concept of Development, Sectoral and sectional Development and developmental indicators.	15	1
II	• Choice of a Region for Planning, Characteristics of an Ideal Planning Region; Delineation of Planning Region; Regionalization of India for Planning (Agro Ecological Zones) • Theories and Models for Regional Planning: Growth Pole Model of Perroux; Growth Centre Model in Indian Context; Myrdal, Hirschman, Rostow and Friedmann; Village Cluster.	15	1
III	• Regional Disparities, Global Pattern of Development, Inter-regional variations. • Changing Concept of Development, Concept of underdevelopment; Efficiency-Equity Debate • Regional Planning in India, Regional Approach to Planning in India's Five Year Plans Decentralization and Multi-Level Planning - State, District and Block level planning in India. • Planning regions of India: Case Studies of a River Valley Development Plan eg. Damodar Valley and National Capital Region Plan. • Area Based Approach to Development: Green Revolution, Drought Prone Area Programmes, PMGSY • Need for Rural Development, Gandhian Concept of Rural Development.	20	1

IV	• Measuring development: Indicators (Economic, Social and Environmental) • Measures of Disparity Calculation for Indicators of Development • Measures of level of development with the help of Z-Scores and PCA techniques. • Delineation of Industrially backward regions of India with choropleth mapping. • Regional mapping of developmental activities in India with special reference to Assam.	10	1

Suggested Book:

1. Blij H. J. De, 1971: *Geography: Regions and Concepts*, John Wiley and Sons.
2. ClavalP.l, 1998: *An Introduction to Regional Geography*, Blackwell Publishers, Oxford and
3. Massachusetts.
4. Friedmann J. and Alonso W. (1975): *Regional Policy - Readings in Theory and Applications*,
5. MIT Press, Massachusetts.
6. Gore C. G., 1984: *Regions in Question: Space, Development Theory and Regional Policy*,
7. Methuen, London.
8. Gore C. G., Köhler G., Reich U-P. andZiesemer T., 1996: *Questioning Development; Essays*
9. *on the Theory, Policies and Practice of Development Intervention*, Metropolis- Verlag,
10. Marburg.
11. 6. Haynes J., 2008: *Development Studies*, Polity Short Introduction Series.
12. Johnson E. A. J., 1970: *The Organization of Space in Developing Countries*, MIT Press,
13. Massachusetts.
14. Peet R., 1999: *Theories of Development*, The Guilford Press, New York.
15. World Bank 2001-05: *World Development Report,* Oxford University Press, New
16. Abler R., Adams J. S., and Gould P. R., 1971: *Spatial Organization: A Geographer's View of*
17. *the World*, Englewood Cliffs, Prentice-Hall.
18. Blij H. J. De, 1971: *Geography: Regions and Concepts*, John Wiley and Sons.
19. ClavalP.l, 1998: *An Introduction to Regional Geography*, Blackwell Publishers, Oxford and
20. Massachusetts.
21. Friedmann J. and Alonso W. (1975): *Regional Policy - Readings in Theory and Applications*,
22. MIT Press, Massachusetts.
23. Gore C. G., 1984: *Regions in Question: Space, Development Theory and Regional Policy*,
24. Methuen, London.
25. Krishnamurthy, J. 2000: *Rural Development - Problems and Prospects,* Rawat Publs., Jaipur
26. Lee D. A. and Chaudhri D. P. (eds.), 1983: *Rural Development and State*, Methuen, London.
27. Misra R. P. and Sundaram, K. V. (eds.), 1979: *Rural Area Development: Perspectives and*
28. *Approaches*, Sterling, New Delhi.
29. Misra, R. P. (ed.), 1985: *Rural Development: Capitalist and Socialist Paths*, Vol. 1, Concept,
30. New Delhi.
31. Palione M., 1984: *Rural Geography*, Harper and Row, London.
32. Ramachandran H. and Guimaraes J.P.C., 1991: *Integrated Rural Development in Asia- Leaning from Recent Experience,* Concept Publishing, New Delhi.

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY
Semester – IV
Minor Course
Course title: Human Geography
Course Code: GEOMIN202-4
Total Credits: 4 (Theory 3 + Practical 1)

Course Objectives:

- To introduce students to the basic understanding of the fundamental concepts and theories of Human Geography.
- To expose students to the schools of human geography, the Relationship between human activities & the natural environment and human adaptation to the environment, etc.
- To provide students with both theoretical and practical-based Comprehensive knowledge of human geography.

Course Outcomes:

- Students will have basic ideas about the fundamental theories and concepts of human geography.
- Students will get to know human-environment interactions and the ways in which human activities transform their natural environment.
- Students will understand the fundamental concepts of mankind/race and linguistics, the evolution of human societies, the origin of settlements etc.
- The practical part will provide an overview of the relationship between humans and the environment in different regions of the world.

Course Content:

Units	Course Content	No. of Classes-60 (45 hours of classes of one hour + 30 hours of classes of two hours)	Credits (3+1=4)
Part-A (Theory)			
I	Nature and Approaches: • Nature and scope of human geography. • Approaches to Human Geography: Resource, locational, landscape, environment • Definition of race, Major division of mankind/race and Language	15	1
II	Schools of human geography: • Environmental Determinism • Possibilism • Neo-determinism • Transformation of Environment by man: Causes of climate change, Acidification, Desertification, Deforestation, Environmental change due to: disposal of waste materials, and tourism	15	1

III	Settlement and Human adaptation to environment: • Origin of settlement, Classification of Rural Settlement, Patterns of Rural Settlement • Evolution of human societies: Hunting and food gathering, pastoral nomadism, • Human adaptation to environment: Case studies of Pygmies, Eskimos	15	1
Part-B (Practical I)			
IV	• Mapping of change in forest coverage in Assam • Sketch of acidification process • Demonstration of types and patterns of settlement in BTR • Preparation of sketch of Eskimos camp • Preparation of sketch and sections of Igloo • Preparation of sketch of a Pygmiesencampment	15	1

Suggested Books:

1. Human Geography: People, Place, and Culture" by Erin H. Fouberg, Alexander B. Murphy, and H.J. de Blij.
2. The Cultural Landscape: An Introduction to Human Geography" by James M. Rubenstein.
3. Introduction to Human Geography" by David Dorrell, Joseph Henderson, and Todd Lindley.
4. Geographies of Globalization" by Warwick E. Murray and John Overton.
5. Geographies of Development: An Introduction to Development Studies" by Robert B. Potter, Tony Binns, Jennifer A. Elliott, and David Smith.
6. Urban Geography: A Critical Introduction" by Andrew E. G. Jonas, Eugene McCann, and Mary Thomas.
7. Population Geography: Tools and Issues" by K. Bruce Newbold.
8. Economic Geography: A Contemporary Introduction" by Neil Coe, Philip Kelly, and Henry W. C. Yeung.
9. Social Geography: A Critical Introduction" by Vincent J. Del Casino Jr.
10. Political Geography: World-Economy, Nation-State and Locality" by Peter J. Taylor and Colin Flint.

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY
Semester-V
Core Course
Course title: World Regional Geography
Course code: GEOMAJ301-4
Total Credits: 4 (Theory 3+ Practical 1)

Course Description:

World Regional Geography provides an in-depth analysis of the world's regions, examining the physical, cultural, economic, and political characteristics that define them. The course aims to develop students' understanding of global diversity and interconnections.

Course Objectives:

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

- Understand the key physical and human geographical features of major world regions.
- Analyze the spatial distribution of physical and human phenomena.
- Explore the cultural, economic, and political processes shaping different regions.
- Evaluate the impacts of globalization and regionalization.
- Develop a critical perspective on global issues and their regional manifestations.

Course Outcomes:

Upon successful completion of this course, students will be able to:

- Identify and describe the major physical features of each world region, including climate, landforms, and ecosystems.
- Explain the cultural characteristics and diversity of different regions, including language, religion, and traditions.
- Analyze economic activities and development patterns across regions, including agriculture, industry, and services.
- Discuss political structures and issues, including borders, governance, and conflicts within and between regions.
- Assess the impacts of human-environment interactions, including environmental challenges and sustainability efforts.
- Critically evaluate case studies on regional issues such as urbanization, migration, and economic integration.

Course Outline:

Units	Course Content	No. of Classes-60 (45 hours of classes of one hour + 30 hours of classes of two hours)	Credits (3+1=4)
Part-A (Theory)			

I	• Definition and scope of regional geography • Importance of regions in understanding global patterns • Physical geography: Major landforms, climate zones, and ecosystems of Asia, Europe, North America, South America, Africa and Oceania	15	1
II	• Human geography: Population distribution, cultural diversity, and urbanization of Asia, Europe, North America, South America, Africa and Oceania	15	1
III	• Economic activities and regional development of Asia, Europe, North America, South America, Africa and Oceania • Political structures and contemporary issues of Asia, Europe, North America, South America, Africa and Oceania	15	1
Part-B (Practical)			
IV	• Mapping major river system of the World • Climatic regions of the World • Trend of population growth of the World by line/bar graph • Show the population density of the World,show the Agricultural regions of the World and Industrial regions of the World	15	1

Suggested Books:

1. "The World Today: Concepts and Regions in Geography" by H.J. de Blij and Peter O. Muller
2. "Globalization and Diversity: Geography of a Changing World" by Lester Rowntree, Martin Lewis, Marie Price, and William Wyckoff
3. "Contemporary World Regional Geography: Global Connections, Local Voices" by Michael Bradshaw, Joseph Dymond, George F. Carney, Mark C. Schug, and Mary M. Bradshaw

Additional Resources:

- Online databases and journals
- Geographic information systems (GIS) tools
- Documentaries and relevant films

FOUR YEARS UNDERGRADUATE COURSE IN GEOGRAPHY

Semester – V

Core Course

Course title: Geography of Asia

Course Code: GEOMAJ302-4

Total Credits: 4 (Theory 3+ Practical 1)

Course Objectives:

- To give an overview of Asia's Regional geography: Students will get a thorough understanding of Asia's various physical characteristics, Population and Economics characteristics.
- To develop critical thinking and analytical skills: Through the study of regional geography of Asia, students will develop critical thinking and analytical skills.
- To understand the challenges in Asia: Students will be able to understand and evaluate the environmental issues and challenges faced by Asian countries.

Course Outcomes: Students will be able to-

- Understand the diverse physical and human geography of Asia.
- Students will have a comprehensive understanding of the physical features, Population and Economics characteristics of Asia.

Course Content:

Units	Course Content	No. of Classes-60 (45 hours of classes of one hour + 15 hours of classes of two hours)	Credits (3+1=4)
Part-A (Theory)			
I	Physical Characteristics: • Locational significance of Asia • Physical characteristics of Asia: Physiographic, Drainage, Climate, Soil and Natural vegetation • Asia is a continent of contrast	15	1
II	Population Characteristics: • Population Characteristics of Asia: Population growth, Distribution and density, Age-Sex Composition, rural-urban composition, religious composition and linguistic composition	15	1
III	Economic Characteristics: • Agricultural characteristics of Asia • Industrial characteristics of Asia • Transport and communication system of Asia • Disparity in socio-economic development and problems of economic development of Asia	15	1
Part-B (Practical I)			

IV	Practical: • Mapping major river system of Asia • Climatic regions of Asia • Trend of population growth of Asia by line/bar graph • Show the population density of Asia, Show the Agricultural regions of Asia and Industrial regions of Asia	15	1

Suggested Books:

1. The Geography of East Asia" by James B. Gardner and Roberta Gardner.
2. The Geography of South Asia: People, Place, and Development" by Robert C. Bradnock.
3. Geography of India" by Husain Majid.
4. Southeast Asia: Past and Present" by D. R. SarDesai.
5. Central Asia: A New History from the Imperial Conquests to the Present" by Adeeb Khalid.
6. The Physical Geography of Southeast Asia" edited by Avijit Gupta.
7. China: A Geographical Perspective" by Gregory Veeck, Clifton W. Pannell, Christopher J. Smith, and Youqin Huang.
8. Geopolitics of the World System" by Saul Bernard Cohen.
9. The Routledge Handbook of Asian Regionalism" edited by Mark Beeson and Richard Stubbs.
10. Asia: A Concise History" by Arthur Cotterell.

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY

Semester – V

Core Course

Course title: Geography of India

Course Code: GEOMAJ303-4

Total Credits: 4 (Theory 3+ Practical 1)

Course Objective:

- This paper has been designed to the students from other disciplines with an interdisciplinary approach to familiarize about the geography of India.
- It aims to help learners acquire knowledge about the various geographical aspects of the country with a dual motive of preparing them for pursuing higher studies in geography and also to help them prepare for various competitive exams.

Course Outcome:

- Understand the location of India with reference to its neighboring countries and hence able to appreciate its strategic location from a geopolitical point of view, besides learning about the various administrative divisions of the country;
- Student will be familiar with the physiographic divisions and drainage systems of India, climatic regions.
- This paper will help the students to understand the soil diversity, evolution and its distribution along with an in-depth knowledge of the forests and biosphere reserves of India;
- It also helps the learners to understand about the diversity of population distribution in terms of race, religion, language; composition, density and growth throughout the country.
- Assess the agricultural diversity of India and will also be able to explore the contemporary issues of agricultural development in the country;
- It will also cater knowledge about the different operational factors relating to industrial setup throughout the country as well as various policies implemented so far.
- This paper also assists to hand on experience to analyse the population related data of the country as well as to map out different regional entities of the country.

Course Content:

Units	Course Content	No. of Classes-60 (30 hours of classes of one hour + 30 hours of classes of two hours)	Credits (3+1=4)
	Part-A (Theory)		
I	• Location and situational entity of India, Strategic location and its significance, • Physiographic divisions, relief and structure • Drainage system and watersheds • Climatic regions and natural vegetation • Soil types and their distributions • Population: distribution (race, religion, language, tribes), density and growth; composition (rural-urban, age-sex, occupational, and religious); population problems and policies of India	15	3
II	Agriculture: • Characteristics and cropping pattern, Crop combination	15	

III	and agricultural productivity, • Problems of Indian Agriculture • Agricultural modernization, its socio-economic and ecological implications. • Agricultural regionalization and Agro-climatic regions of India. • Significance of dry farming; • Livestock resources and white revolution; • Aqua-culture; Sericulture, Agriculture and poultry Industry: • Development of major industrial sectors in India, industrial backward regions of India and regionalization of Industries throughout the country. • Distribution and production pattern of major Industries (Iron and steel, cotton textile, petrochemicals, sugar, paper and cement industries), • Industrial policies and industrial trade, Multinationals and liberalisation; Special Economic Zones Transport: Roads and railways, air transport, water and pipe transport		
Part-B Practical			
IV	• Mapping of Physiographic, climatic regions and Agricultural regions of India, • Mapping of major drainage system of India • Trend of population growth, population density and religious composition of India • Preparation of Age-Sex pyramid of population data of India • Distribution pattern of major industries of India.	15	1

Suggested Books:

1. Deshpande C. D., 1992: India: A Regional Interpretation, ICSSR, New Delhi.
2. Johnson, B.L.C.,ed.2001. GeographicalDictionary of India. VisionBooks,NewDelhi.
3. Mandal R. B. (ed.), 1990: Patterns of Regional Geography – An International Perspective. Vol. 3 –IndianPerspective.
4. Sdyasuk Galina and P Sengupta (1967): Economic Regionalisation of India, Census of India
5. Sharma, T. C. 2003: India - Economic and Commercial Geography. Vikas Publ., New Delhi.
6. Singh R. L., 1971: India: A Regional Geography, National Geographical Society ofIndia.
7. Singh, Jagdish 2003: India - A Comprehensive & Systematic Geography, GyanodayaPrakashan,Gorakhpur.
8. Spate O. H. K. and Learmonth A. T. A., 1967: India and Pakistan: A General and Regional Geography,Methuen.
9. Tirtha, Ranjit 2002: Geography of India, RawatPubls., Jaipur & NewDelhi.
10. Pathak,C.R. 2003: Spatial Structure and Processes of Development India. Regional Science Assoc., Kolkata.
11. Tiwari,R.C.(2007): Geography of India. Prayag Pustak Bhawan, Allahabad.
12. Sharma,T.C. (2013). Economic Geography of India. Rawat Publication, Jaipur.
13. Bhagabati,A.K.,Bora,A.K.andKar,B.K.:GeographyofAssam,RajeshPublications,NewDelhi.
14. Taher, MandAhmed,P:GeographyofNorth-EastIndia,Mani Manik Prakash, Guwahati.

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY

Semester-V

Core Course

Course title: Quantitative Methods in Geography

Course code: GEOMAJ304-4

Total Credits: 4 (Theory 3 + Practical 1)

Course Objectives:

This paper aims to offer a basic introduction to some of the methods and philosophies that are used in geographical research. The approach here will be wide ranging, attempting to cover the many ways in which research can be undertaken in both physical geography as well as human geography. The specific aims of the course are to:

- consider the nature, acquisition, presentation and mapping of geographical data
- describe qualitative as well as quantitative approaches
- Consider descriptive and inductive statistics, as well as broader modelling themes and the interpretation of both quantitative and qualitative information in an operational geographical context, using real world data and simple computer packages.

Course Outcomes:

- A broad overview of the various philosophies and methodologies that have been used in both physical and human geography and how these have evolved over time
- Developed an understanding of the nature and limitations of data used in geographical analysis
- Acquired skills in the presentation and mapping of geographical data
- Gained experience in applying statistical and some other quantitative methods, as well as qualitative methods, in real geographical contexts and in interpreting the results

Course Content:

Units	Course Content	No. of Classes-60 (45 hours of classes of one hour + 30 hours of classes of two hours)	Credits (3+1=4)
Part-A: (Theory)			
I	Application of Statistical Techniques: • Descriptive statistics: Measures of Central Tendency: Mean, Median and Mode; • Measures of Dispersion: Quartile Deviation, Mean Deviation, Standard Deviation, Variance and Coefficient of Variation.	15	3
II III	Correlation & Associations of Geographic data • Correlation and Regression analysis (Karl Pearson and Spearman's Rank method), Regression line and Regression Residuals Quantitative Expression of Geographic Data:	30	

	• Use of Sampling Technique in Geography, Method of Sampling (Purposive, Random, Systematic and Stratified). • Probability and Normal Distribution of Geographic Data.		
Part-B (Practical)			
IV	Application of Statistical Techniques: • Descriptive statistics: Measures of Central Tendency: Mean, Median and Mode; Measures of Dispersion: Quartile Deviation, Mean Deviation, Standard Deviation, Variance and Coefficient of Variation. • Association and Correlation: Rank Correlation, Product Moment Correlation, and Simple Linear Regression.	8	1
	Computer Application in Statistics • Data Entry: Arrangement into ascending and descending order, Representation of Frequency Distribution: Histogram, Frequency Polygon, Curve, Ogive. • Calculation of Mean, Median, Mode, Standard Deviation using formula. • Bivariate Techniques: Scatter Diagram and Fitting of Trend lines, Moving Average.	7	

Suggested Books:

1. Berry B. J. L. and Marble D. F. (eds.): Spatial Analysis – A Reader in Geography.
2. Ebdon D., 1977: Statistics in Geography: A Practical Approach.
3. Hammond P. and McCullagh P. S., 1978: Quantitative Techniques in Geography: An Introduction, Oxford University Press.
4. King L. S., 1969: Statistical Analysis in Geography, Prentice-Hall.
5. Mahmood A., 1977: Statistical Methods in Geographical Studies, Concept.
6. Pal S. K., 1998: Statistics for Geoscientists, Tata McGraw Hill, New Delhi.
7. Sarkar, A. (2013) Quantitative geography: techniques and presentations. Orient Black Swan Private Ltd., New Delhi
8. Silk J., 1979: Statistical Concepts in Geography, Allen and Unwin, London.
9. Spiegel M. R.: Statistics, Schaum's Outline Series.
10. Yeates M., 1974: An Introduction to Quantitative Analysis in Human Geography, McGraw Hill, New York.
11. Shinha, Indira (2007) Sankhyikibhugol. Discovery Publishing House, New Delhi

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY

Semester – V

Minor Course

Course title: Geography of India

Course Code: GEOMIN301-4

Total Credits: 4 (Theory 3+ Practical 1)

Course Objective:

- This paper has been designed to the students of undergraduate course in geography to familiarize about the regional geography of India its.
- It aims to help acquire knowledge about the various geographical aspects of the country and its diversity, with a dual motive of preparing them for pursuing higher studies in geography and also to help them prepare for various competitive exams.

Course Outcome:

- Understand the location of India with reference to its neighboring countries and hence able to appreciate its strategic location from a geopolitical point of view, besides learning about the various administrative divisions of the country;
- Student will be familiar with the physiographic divisions and drainage systems of India, climatic regions.
- This paper will help the students to understand the soil diversity, evolution and its distribution along with an in-depth knowledge of the forests and biosphere reserves of India;
- It also helps the learners to understand about the diversity of population distribution in terms of race, religion, language; composition, density and growth throughout the country.
- It will provide detail knowledge about the biotic and abiotic resources of the country, its distribution and contribution in the upliftment of country.
- Assess the agricultural diversity of India and will also be able to explore the contemporary issues of agricultural development in the country;
- It will also cater knowledge about the different operational factors relating to industrial setup throughout the country as well as various policies implemented so far.
- The paper will cater knowledge and understanding about the geopolitical situation of the country and its position in the world.
- This paper also assists to hand on experience to analyse the population related data of the country as well as to map out different regional entities of the country.

Course Content:

Units	Course Content	No. of Classes-60 (45 hours of classes of one hour + 30 hours of classes of two hours)	Credits (3+1=4)
	Part-A (Theory)		
I	• Location and situational entity of India, Strategic location and its significance, • Physiographic divisions, relief and structure; its significance • Drainage system and watersheds • Climatic regions and natural vegetation • Soil types and their distributions • Major dams and hydropower projects	15	3

	• Population: distribution (race, religion, language, tribes), density and growth; composition (rural-urban, age-sex,occupational, and religious); population problems and policies of India • Land, surface and ground water, energy, minerals, biotic and marine resources, Forest, wild life resources and their conservation		
II	Agriculture: • Characteristics and cropping pattern, Crop combination and agricultural productivity, • Problems of Indian Agriculture • Irrigation, seeds, fertilizers, power; Institutional factors; land holdings, land tenure and land reforms • Agricultural modernization, its socio-economic and ecological implications. • Agricultural regionalization and Agro-climatic regions of India. Industry: • Development of major industrial sectors in India, industrial backward regions of India and regionalization of Industries throughout the country. • Distribution and production pattern of major Industries (Iron and steel, cotton textile and paper industries), • Industrial policies and industrial trade, Multinationals and liberalisation; Special Economic Zones Transport: Roads and railways, air transport, water and pipe transport	15	
III	• India's geopolitical and economic position in Asia and the world; • Its economic development policies and international relations, India'srole in world affairs • International boundary of India and related issues; Cross-border terrorism; • Geopolitics of South Asia and Indian Ocean realm	15	
	Part-B (Practical)		
IV	• Mapping of Physiographic, climatic regions and Agricultural regions of India, • Mapping of major drainage system of India • Trend of population growth, population density and religious composition of India • Preparation of Age-Sex pyramid of population data of India • Distribution pattern of major industries of India. • Mapping of road, railway network system of India	15	1

Suggested Books:

1. Deshpande C. D., 1992: India: A Regional Interpretation, ICSSR, New Delhi.
2. Johnson, B.L.C., ed.2001. GeographicalDictionary of India. VisionBooks,NewDelhi.
3. Mandal R. B. (ed.), 1990: Patterns of Regional Geography – An International Perspective. Vol. 3 –IndianPerspective.

4. Sdyasuk Galina and P Sengupta (1967): Economic Regionalisation of India, Census of India
5. Sharma, T. C. 2003: India - Economic and Commercial Geography. Vikas Publ., New Delhi.
6. Singh R. L., 1971: India: A Regional Geography, National Geographical Society of India.
7. Singh, Jagdish 2003: India - A Comprehensive & Systematic Geography, GyanodayaPrakashan,Gorakhpur.
8. Spate O. H. K. and Learmonth A. T. A., 1967: India and Pakistan: A General and Regional Geography,Methuen.
9. Tirtha, Ranjit 2002: Geography of India, RawatPubls., Jaipur & NewDelhi.
10. Pathak,C.R. 2003: Spatial Structure and Processes of Development India. Regional Science Assoc., Kolkata.
11. Tiwari,R.C.(2007): Geography of India. Prayag Pustak Bhawan, Allahabad.
12. Sharma,T.C. (2013). Economic Geography of India. Rawat Publication, Jaipur.
13. Bhagabati,A.K.,Bora,A.K.andKar,B.K.:GeographyofAssam,RajeshPublications, NewDelhi.
14. Taher, MandAhmed,P.:GeographyofNorthEastIndia,Mani Manik Prakash, Guwahati.

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY

Semester-VI

Core Course

Course title: Geomorphology

Course Code: GEOMAJ305-4

Total Credits: 4 (Theory 3+ Practical 1)

Course Outcome:

This course introduces students to the fundamental concepts and processes of geomorphology, the study of landforms and the processes that shape them. Students will gain an understanding of the dynamic nature of Earth's surface, including the forces and processes that shape landscapes, the evolution of landforms over time, and the interactions between humans and the environment. The course will emphasize both theoretical concepts and practical applications of geomorphology.

Course Objectives: By the end of this course, students will be able to:

- Understand the fundamental principles and theories of geomorphology.
- Identify and describe various landforms and their formation processes.
- Analyze the interactions between natural processes and human activities in shaping landscapes.
- Apply geomorphologic concepts and techniques to real-world case studies.
- Develop critical thinking and analytical skills in analyzing and interpreting landforms and landscape evolution.

Course Content:

Units	Course Content	No. of Classes- 60 (45 hours of classes of one hour + 30 hours of classes of two hours)	Credits (3+1=4)
	Part-A (Theory)		
I	Basics of Geomorphology • Geomorphology: Definition, Nature and Scope, Evolution of Geomorphological Thoughts • Theories of origin and Evolution of Earth (Nebular hypothesis, Big Bang theory) • Earth: Chemical Composition and Interior Structure of the Earth, Geological Time scale; Era, period and epoch.	15	3
II	Earth Movements • Tectonic processes: Types of Earth Movements, Types of Fold and Fault Landforms; Earthquakes & Volcanoes; • Plate tectonic theories –Continental drift, Seafloor Spreading & Plate tectonic – Subduction Zones and Mantle Convection	(20 class)	

	• Mountain building (Orogeny) Theories - L. Kober and Arthur Holmes.		
III	**Geomorphic Processes** • Basic Concepts and Principles • Earth's Surface Processes – Weathering, Erosion and Mass Movement; Cycle of Erosion (Davis and Penck). • Landform Definitions: hills, valleys, mountains, plains, plateaus, and basins; Classification and characterization of landforms based on origin, morphology, and spatial distribution. • Evolution of Landforms (Erosional and Depositional): Fluvial, Aeolian, Glacial, Karst and Coastal.	18 class	
Part-B (Practical)			
IV	• Relief representation through serial profiles, superimposed profiles, composite profiles and Projected profiles, • Demarcation of basin and representation of basin relief through profiles, interpretation, • Mapping of the major crustal plates of the earth, Rock types and Characteristics • Preparation of Relative Relief Map using Smith's Method from Topographical Maps • Drawing and analysis of Average Slope Map by Wentworth's Method	15 (two hours duration)	1

Suggested Books:

1. "Geomorphology" by Robert S. Anderson and Suzanne P. Anderson
2. "Geomorphology: The Mechanics and Chemistry of Landscapes" by Robert J. Twiss and Robert V. Galloway
3. "Introduction to Geomorphology" by Adrian Harvey
4. "Landforms: Evolution and Processes" by David S. G. Thomas
5. "Process Geomorphology" by Dale F. Ritter, R. Craig Kochel, and Jerry R. Miller
6. "The Changing Earth: Exploring Geology and Evolution" by James S. Monroe and Reed Wicander
7. "Physical Geography: The Basics" by Joseph Holden
8. "Geomorphology: A Systematic Analysis of Late Cenozoic Landforms" by Adrian M. Harvey

Reference Books for Geomorphology:

1. "Geomorphology: The Research Frontier and Beyond" edited by Andrew S. Goudie
2. "Quantitative Geomorphology: Concepts and Methods" by Keith Richards
3. "Geomorphic Analysis of River Systems: An Approach to Reading the Landscape" by Kirstie A. Fryirs and Gary J. Brierley
4. "Fluvial Forms and Processes: A New Perspective" by David Knighton
5. "Glaciers and Glaciation" by Douglas I. Benn and David J. A. Evans
6. "Aeolian Geomorphology: Wind-driven Geomorphic Landforms" by David S. G. Thomas
7. "Slope Systems: Analysis and Modeling" by Jean-Paul Valentin, Michel Ambroise, and Alain Guerin

8. "Tectonic Geomorphology" by Douglas W. Burbank and Robert S. Anderson

Note: These textbooks and reference books provide comprehensive coverage of the fundamental principles, theories, and processes in geomorphology. They are aligned with the requirements of the National Education Policy (NEP) 2020 and provide a solid foundation for undergraduate studies in geomorphology.

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY

Semester-VI

Core Course

Course Title: Economic Geography

Course Code: GEOMAJ306-4

Total Credits: 4 (Theory 4)

Course Objectives:

This course provides an introduction to the field of Economic Geography, exploring the spatial patterns and processes of economic activities around the world. It examines the interplay between geography and economics, analyzing how regions, resources, trade, and globalization shape economic development and inequality. The course also addresses contemporary issues such as urbanization, sustainable development, and the impact of technology on economic geography.

Course Outcomes: By the end of the course, students should be able to:

- Understand the fundamental concepts and theories in Economic Geography.
- Analyze the spatial organization of economic activities and their implications.
- Evaluate the role of globalization, trade, and regional integration in economic development.
- Examine the impact of urbanization and rural-urban interactions on economic geography.
- Assess the challenges and opportunities of sustainable development in a globalized world.
- Apply geographic techniques and tools to analyze real-world economic issues.

Course Content:

Units	Course Content	No. of Classes-60 (60 hours of classes)	Credits (4+0=4)
I	Introduction to Economic Geography; • Definition, scope, and significance of Economic Geography • Evolution of Economic Geography as a discipline • Key concepts and theories in Economic Geography • Spatial Patterns of Economic Activities	15	4
II	Location theory and industrial location; • Clusters, agglomerations, and regional development • Global patterns of economic development and inequality • Globalization and Economic Geography	15	
III	Globalization and its impact on economic activities; • Trade, multinational corporations, and global production networks • Regional integration and economic geography • Urbanization and Economic Geography	15	

IV	Resources, Environment, and Economic Geography: • Natural resources and their role on economic development • Environmental impacts on economic activities • Sustainable development and economic geography • Technological Change and Economic Geography, • Innovation, technology, and economic geography • Digitalization and the changing landscape of economic activities, Implications for employment and inequality.	15	

Suggested Books:

1. Economic Geography: A Contemporary Introduction by Neil Coe, Philip Kelly, and Henry W. C. Yeung
2. The New Oxford Handbook of Economic Geography edited by Gordon L. Clark, Maryann P. Feldman, Meric S. Gertler, and Dariusz Wojcik
3. Economic Geography: Places, Networks, and Flows by Danny MacKinnon and Andrew Cumbers
4. Global Economic Geography: A Marxist Critique by David Harvey
5. Economic Geography: The Integration of Regions and Nations by Pierre-Philippe Combes, Henry G. Overman, and Gianmarco I. P. Ottaviano.

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY

Semester-VI

Core Course

Course title: Remote Sensing and Geographic Information System

Course Code: GEOMAJ307-4

Total Credit: 4 (Theory 3+ Practical 1)

Course Objectives:

- This paper aims to offer introduction to some of the principles and techniques that are used in geographical research.
- The approach here will be wide ranging, attempting to cover the various techniques of data acquisition and their utilities in undertaking geographical research.
- Prepare the students in identifying, analyzing and solving geospatial problems.
- Train the students in developing practical and executable solutions to the challenges of growing field of Remote Sensing and GIS.
- Impart the students with strong base of knowledge that makes them suitable both for teaching as well as for research.

Course Outcomes:

- It will enhance and equipped with concepts, methodologies and applications of Remote Sensing and GIS technology in geographical aspects.
- Able to represent spatial data and analysis in GIS platform to solve various natural, environmental and societal problems and challenges.

Course Content:

Units	Course Content	No. of Classes-40 (30 hours of classes of one hour + 20 hours of classes of two hours)	Credits (3+1=4)
	Part-A (Theory)		
I	Fundamental of Remote Sensing: • Introduction of remote sensing: What is remote sensing, Defining remote sensing, Process of Remote Sensing, Advantages and limitations of remote sensing. • Source and concept of energy/EMR: Wave and particle models of Electromagnetic Radiation, Electromagnetic spectrum, Processes of EMR interaction with atmosphere, Target and second time with Atmosphere), Spectral reflectance curve and atmospheric window, Recording of energy by sensor. • Transmission, Reception, and Processing in Remote Sensing, Application and limitations of Remote Sensing.	15	1
II	Principles of Remote Sensing: • Types of remote sensing and sensor Characteristics:Remote sensing; Based on platform, energy	15	1

	source, imaging media, regions of electromagnetic spectrum, and number of bends. • Characteristics of Images, and satellite orbit. • Concept of Nadir, Swath, Sensor resolution, and image referencing system of Remote Sensing satellite • Photographic Imaging; Camera system, types and geometry of aerial image • Digital Imaging; Sensor, Imaging by scanning technique • Remote Sensing; Data Products and Sources • Global Navigation Satellite System: Functional segments, Working Principle, sources of GPS error and application		
III	Geographic Information System: • Geographical Information System (GIS): Concept, Definition, Components and Development. • Function and advantages of GIS • GIS Data Type: Spatial and Non-Spatial, Raster and Vector • Concept of Attribute data and DBMS (Database management system) functions and advantages, Data and Database models, SQL and Metadata concept • Data Layer Extraction and Spatial Analysis: Buffer, Proximity, Geospatial, Overlay operation, and surface analysis. • Satellite image data sources, its characteristics and application: Land Use/Land Cover mapping, Urban Sprawl Analysis, Forest Monitoring, Disaster Management, Agriculture, Geomorphology, Planning and Decision Making.	15	1
	Part-B Practical		
IV	Practical on Remote Sensing and GIS: • Geo-Referencing a Map/Toposheet, Drawing Base Map from Satellite Imagery/Toposheet, • Mapping point, line and polygon features; Isopleths, Choropleth and Chorochromatic mapping, Proportional mapping, • Visual Interpretation of Aerial photograph and Satellite Imagery and preparation of thematic maps based on appropriate classification scheme. • Digital Image Classification of Satellite Image: Land use/ Land Cover mapping (Supervised and Un- Supervised), Accuracy assessment. • Geomorphological mapping using DEM • Data Collection from GPS, ground verification and Mapping.	15	1

Suggested Books:

1. Bhatta B., 2018: Remote Sensing and GIS, Oxford
2. Campbell J. B., 2007: *Introduction to Remote Sensing*, Guildford Press.
3. Jensen J. R., 2004: Introductory Digital Image Processing: A Remote Sensing Perspective, Prentice Hall.
4. Joseph, G. 2005: *Fundamentals of Remote Sensing*, United Press India.
5. Lillesand T. M., Kiefer R. W. and Chipman J. W., 2004: *Remote Sensing and Image Interpretation*,Wiley. (Wiley Student Edition).
6. Nag P. and Kudra, M., 1998: *Digital Remote Sensing*, Concept, New Delhi.
7. Rees W. G., 2001: *Physical Principles of Remote Sensing*, Cambridge University Press.
8. Fazal S., 2008: Remote Sensing Basics, Kalyani Publishers
9. Singh R. B. and Murai S., 1998: *Space-informatics for Sustainable Development*, Oxford and IBH Pub.
10. Wolf P. R. and Dewitt B. A., 2000*: Elements of Photogrammetry*: With Applications in GIS,McGraw-Hill.
11. Sarkar, A. (2015): *Practical Geography: A Systematic Approach*. Orient Black Swan PrivateLtd., New Delhi.
12. Chauniyal, D.D. (2010): *Sudur Samvedanevam Bhogolik Suchana Pranali*, ShardaPustakBhawan, Allahabad.
13. Burrough, P.A. and McDonnel, R.A., 1998: *Principles of Geographical Information Systems*, Oxford University Press.

Semester – VI
Core Course
Course title: Soil & Biogeography
Course Code: GEOMAJ308-4
Total Credits: 4 (Theory 3+ Practical 1)

Course Outcome:

This course aims to provide students with a comprehensive understanding of the interplay between soil and biogeography. Students will explore the physical and chemical properties of soils, as well as their formation and classification. Additionally, they will study the relationship between soils and ecosystems, including the influence of soil on plant distribution and biodiversity. The course will also cover biogeographical concepts such as species distribution, ecological communities, and the impact of human activities on soil and biogeography. Through lectures, discussions, and practical exercises, students will develop analytical and critical thinking skills related to soil and biogeographical processes.

Course Objectives:

- To introduce students to the fundamental concepts and principles of soil science and biogeography.
- To enable students to understand the physical and chemical properties of soils and their role in supporting ecosystems.
- To familiarize students with the classification and formation of soils.
- To explore the relationship between soil and plant distribution, as well as biodiversity patterns.
- To examine the impact of human activities on soil and biogeography.
- To develop students' analytical and critical thinking skills through practical exercises and case studies.

Course Content:

Units	Course Content	No. of Classes-60 (45 hours of classes of one hour +30 hours of classes of two hours)	Credits (3+1=4)
Part-A (Theory)			
I	**Nature and Scope of Soil Geography** • Definition and scope of soil geography • Soil as life supporting system • Soil Formation factors: parent material, organic, climatic, topographic factors • Soil Development • Spatio-temporal aspects of soil formation and development • Soil profile (Soil horizon)	15	3
II	**Soil and Land Management** • Physical properties: Morphology, texture, structure, moisture, air and temperature	15	

	• Chemical properties: chemical components and reaction, Soil colour, pH value, Organic Matter, and NPK • Principles of soil classification: Genetic School and USDA • Soil erosion and degradation process • Soil conservation methods		
III	**Concepts of Biogeography** • Nature and approaches in biogeography • Concept and Components of Biosphere, vertical and horizontal limits of biosphere; • Concept of Ecology and Ecosystem Tropic Structure, Food Chain and food web, Types, productivity, bio-energy cycles, energy flow • Plant association and succession • Biochores: sub-division • Plant and animal association in varying habitats: biomes • Concept of biodiversity, its types and conservational issues, • Nature and distribution of biodiversity in N.E. India and Assam change	15	
Part-B(Practical Exercises)			
IV	• Methods/mechanism of soil survey: soil sampling method • Visual Classification of soil • Construction and interpretation of soil profile with the data derived from the field • (college campus/ river site/ foot hill, etc.) • Soil texture analysis • Testing pH of soil • Drawing and interpretation of soil map of India/North East India • World soil classification • Visual identification of taxonomical group of plants (herbarium) and forest cover • Plant Population frequency by quadrant method • Mapping of vegetation of India/north east India • Mapping biomes of the world	15	1

Suggested Books:

1. **"**Soil Science Simplified" by K. Raghavan
2. "Soil and Soil Fertility Management" by M. S. Sahrawat
3. "Soil Geography and Land Use Planning" by L. P. Singh
4. "Soil Erosion and Conservation" by P. S. Datta
5. "Introduction to Biogeography" by M. K. Ramesh Kumar
6. "Indian Soil and Land Use Atlas" by National Bureau of Soil Survey and Land Use Planning

7. "Soil Science: An Introduction" by Michael L. Jackson
8. "Biogeography: An Ecological and Evolutionary Approach" by C. Barry Cox, Peter D. Moore, and Richard Ladle
9. "Soils: Genesis and Geomorphology" by Randall J. Schaetzl and Sharon Anderson
10. "Applied Biogeography: Principles and Practice" by Ian F. Spellerberg and John W. D. Sawyer

Note: The recommended books are intended to provide additional references and in-depth knowledge on the topics covered in the course. Students are encouraged to consult the university library for additional readings and research articles relevant to soil science and biogeography.

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY

Semester-VI

Minor Course

Course title: Economic Geography

Course code: GEOMIN302-4

Total Credits: 4 (Theory 3+ Practical 1)

Course Objective:

- The minorcourse on Economic Geographyhas been designed specifically to equip its learners with theoretical Knowledge about the economic activities taking place among human society across the world.
- The course has been designed to impart its learners with the basic knowledgeto aid them in securing a niche for themselves in ongoing issues and relevant factors controlling various economic activities.
- It aims to develop understanding among the learners how indifferent distribution of resources influence human and economic activities over the space and can be understood through the lens of geographical concepts on economic activities, resource distribution, enacted policies and trading rules across the globe.

Course Outcome: After the completion of this course, learners will be able to:

- Understand meaning and scope of Economic geography with various concepts and approaches
- Classify economic activities and its significance towards economy of the country
- Concepts of resource, resource distribution across the world and its role towards global world trade.
- Factors governing economic activities of agriculture and industries.
- Roles of international institutions in global trade regulation and activities.
- Able to relate world economic situation emerging at different time period over the space.

Course Content:

Units	Course Content	No. of Classes-60 (45 hours of classes of one hour + 30 hours of classes of two hours)	Credits (3+1=4)
	Part-A (Theory)		
I	Introduction to Economic Geography; • Meaning and scope of economic geography, Approaches in economic geography: regional, systematic and sectoral. • Concept and classification of economic activity and its GDP share on national economy - Primary Activities: Subsistence and Commercial - agriculture, forestry, fishing and mining; - Secondary Activities: Manufacturing (Cotton Textile, Iron and Steel); - Tertiary Activities: Transport, Trade and Services; role of tertiary activity in economic development of a country.	15	3
II	Geography of Resource; • Concept of resources and its classification; Distribution of renewable and non-renewable resources inglobal	15	

	context: Forests, Hydro, Wind, Solar, Tidal, Nuclear, Coal, petroleum, Iron ore. • Conservation of resources, idea and concept of sustainability and resource management approaches. • International forums and resource sustainability.		
III	Geography of Economic Activity; • Agriculture: Cropping season, physical and socio-economic factors influencing agricultural practice; types of agriculture; major food and cash crops, their distribution and production (Rice, wheat, Sugarcane, Tea, Cotton) • Industry: Factors of industrial location, classification of industries, distribution and production of iron and steel, textile, petro-chemicals. • Economic characteristics of developed and developing countries • WTO and role in global trade • Challenges of global/regionaleconomy in contemporary world order	15	
Part-B (Practical)			
IV	• Cartographic representation of economic data of India/N.E. India in spatio-temporal context: pie-graph, line graph, bar graph and choropleth mapping • Trend analysis of production of food crops, cash crops, ores, petroleum, etc. of India/N.E. India using moving average method • Transport network analysis using connectivity indices (alpha, beta & gamma). • Traffic Flow Cartogram, crop combination analysis	15	1

Suggested Books:

1. Bishop, M.: Economics An A-Z guide, Profile books Ltd, London
2. Guha, J.L. and Chattoraj, P.R.: A New Approach to Economic Geography, The World Press Pvt. Ltd., Kolkata.
3. Leong, G.C. and Morgan, G.C.: Human and Economic Geography, Oxford University Press, New Delhi.
4. Roy, P. and Mukherjee, S.: Economic Geography – An Appraisal of Resources, Central Educational Enterprise, Kolkata.
5. Thoman, R.S. and Corbin, P.B.: The Geography of Economic Activity, McGraw Hill
6. Memoria, C.B.: Economic and Commercial Geography, Shivlal Agarwala and Company Educational Publishers, Agra-3

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY
Semester – VII

Core Course

Course title: Advance Climatology

Course Code: GEOMAJ401-4

Total Credits: 4 (Theory 4)

Course Objectives:

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

Course Outcomes:

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

Course content:

Units	Course Content	No. of Classes-60 (60 hours of classes)	Credits(4+0=4)
I	**Global Energy Budget** • Atmospheric Composition: Variation of with height, latitudes, seasons and time • Factors controlling Global energy budget: Effect of solar radiation, Surface receipt of solar radiation, Terrestrial infra-red radiation and the Greenhouse effect • Heat budget of the earth: Horizontal transport of heat and spatial pattern of the heat components • Factors controlling horizontal and vertical distribution of global temperature • Surface Pressure condition of rotating non-homogenous earth, Oscillation of pressure belt	15	1
II	**Atmospheric Moisture Budget** • Evaporation: process and factors affecting rate of evaporation, Moisture transport • Condensation: Adiabatic Temperature Changes, condensation level, air stability and instability • Cloud formation: condensation nuclei coalescence theories, solid precipitation, global cloud cover • Precipitation Characteristics: Types, Rainfall intensity, areal extent of rainstorm, frequency of rainstorm, drought • Development of Thunderstorms • Frontogenesis: Zones of wave development, frontal cyclones, non-frontal depressions	15	1

	• Mesoscale convective systems		
III	**Atmospheric Motion and Tropical Climate** • Vertical variation of pressure systems: Mean upper-air pattern and upper wind condition • Atmospheric motion: Divergence, vertical motion and vorticity • Global wind pattern: Departure from idealised circulation pattern, circulation pattern in vertical and horizontal planes • Local winds: Mountain and valley winds, land and sea breezes, winds due to topographic barriers • Tropical Disturbances: waves, cyclones, tropical cloud clusters • The Asian Monsoon • El Nino-Southern Oscillation Events • Climate Classification: Energy and Moisture Budget Classification, Genetic Classification	15	1
IV	**Climate and Weather Prediction** • Fundamentals of Global Climate Models and model simulations • Data sources for forecasting • Climate Change: Climate Forcings and Feedbacks • The climatic Records • Causes of Climate change • Model strategies for prediction of climate change • Impacts of Climate Change	15	1

Suggested Books:

1. Barry, R.G. and Chorley, R.J., 2003: Atmosphere, Weather and CLimate, Routledge, London and New York
2. Barry R. G. and Carleton A. M., 2001: Synoptic and Dynamic Climatoloxgy, Routledge,UK.
3. Critchfield H. J., 1987: General Climatology, Prentice-Hall of India,New Delhi
4. Lutgens F. K., Tarbuck E. J. and Tasa D., 2009: The Atmosphere: An Introduction toMeteorology, PrenticeHall, Englewood Cliffs, NewJersey.
5. Oliver J. E. and Hidore J. J., 2002: Climatology: An Atmospheric Science, PearsonEducation, NewDelhi.
6. Trewartha G.T. and Horne L.H.,1980: An Introduction to Climate, McGraw-Hill.
7. Lal, D.S., 2023: Climatology, Sharda Pustak Bhawan, Prayagraj.

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY
Semester – VII
Core Course

Course title: Applied Cartography & Quantitative Techniques
Course Code: GEOMAJ402-4
Total Credits: 4 (Theory 4)

Course objectives:

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

Course Outcomes:

- Understand Basic Cartographic Concepts
- Apply Map Enlargement and Reduction Techniques
- Read and Interpret Topographical Maps
- Master Surveying Techniques
- Design Effective Maps
- Utilize Uni-variate Statistical Techniques
- Conduct Bi-variate Statistical Analysis

Course Content:

Units	Course Content	No. of Classes-60 (60 hours of classes)	Credits(4+0=4)
I	**Fundamentals of Cartography** • Meaning of cartography, Types of Diagrams, Graphs, Distribution maps and cartograms • Concept of Bearing: Magnetic and true, whole-circle and reduced • Enlargement and Reduction: Principle of Map enlargement and reduction by Graphical and Instrumental Methods • Topographical maps: Index system, Grid reference, Map reading Component of topographical map- scale, direction, symbols, coordinates, direction, distance Identification of land forms	15	1
II	**Surveying and cartographic Techniques** • Ground Survey and Positioning: Principles of Surveying, Measurement Technology • Traditional and Automated Survey Methods • Spherical trigonometry: Concept and Use in Cartography • Digital Planimeter: Principles of working and application of the instrument • Cartographic Design: Objectives of map design, Scope of design, Perceptual Considerations, Graphic communication, Controls on map design, Design Planning • Colour theory and Models: Nature of colour, Colour	15	1

	dimensions, Nature of colour vision, color modeling systems and Computer electronic display colour • Selection and Generalization Principles • Symolization of map: Feature attributes at Points, Lines and Areas		
III	**Uni-variate statistical techniques** • Need and use of quantitative techniques in geography • Graphical representation of data • Measures of central tendency: properties, merits, demerits, and uses • Measure of dispersion: Range, interquartile range, and standard deviation	15	1
IV	**Bi-variate statistical techniques** • Testing of Hypothesis: Chi-Square Test • t – test, F – test, Z – test • Correlation: Pearson's product moment correlation coefficient, Spearman's rank correlation coefficient, and Kendal's tau • Regression: Linear Regression	15	1

Suggested Books:

1. Campbell, J. (1984). *Introductory Cartography*. Prentice Hall.
2. Cuff, J. D. and M. M. T. (1982). *Thematic Maps: Their Design and Production*. Methuen Young Books.
3. Dent, B. D., T. J. S. and H. T. W. (2008). *Cartography: Thematic Map Design* (6th ed.). McGraw Hill Higher Education.
4. Downie, N.M. and Heath, R.W. (1970). *Basic Statistics Methods*, Third Edition. Harper International Edition.
5. Gupta, K. K. and T. V. C. (1992). *Working with Maps*. Survey of India, DST.
6. Kellaway, G. P. (1946). *Map Projections*. Methuen & Company.
7. King, J. P. C. and C. A. M. (1968). *Quantitative Geography*. London: John Wiley.
8. Koutsoyiannis. (1973). *Theory of Econometrics*. London: Mcmillan.
9. Kraak, M. J. and O. F. (2003). *Cartography: Visualization of Geo-Spatial Data*. Prentice Hall.
10. Lawrence, G. R. P. (1964). *Cartographic Methods*. Oxford University Press.
11. Mahmood, A. (2021). *Statistical Methods in Geographical Studies.* Rajesh Publications: N Delhi.
12. Mishra, R. P. and R. A. (1989). *Fundamentals of Cartography*. Concept.
13. Mishra, R. P. and R. A. (1989). *Fundamentals of Cartography*. Concept.
14. Monkhouse, F. J. and W. H. R. (1989). *Maps and Diagrams*. B.I. Publication Pvt. Ltd.
15. Peter Haggett, Andrew D. Cliff, & A. F. (1977). *Vocation Methods Vol. I and II*. London: Edward Arnold.
16. Robinson, A. H. et. al. (1995). *Elements of Cartography* (6th ed.). John Wiley & Sons.
17. Rogerson, Peter A. (2001). *Statistical Methods for Geography*. Sage Publications.
18. Sarkar, A. (2015). *Practical Geography: A Systematic Approach*. Orient Blackswan Private Ltd.
19. Sharma, J. P. (2010). *Prayogic Bhugol*. Rastogi Publishers.
20. Shaw, G. and Wheeler, D. (1985). *Statistical Techniques in Geographical Analysis*. John Wiley & Sons.
21. Singh, L. R. and S. R. (1977). *Manchitra Tatha Prayogaatmak Bhugol*. Central Book, Depot.
22. Singh, R. L. and S. R. P. B. (1999). *Elements of Practical Geography*. Kalyani Publisher.
23. Slocum, T. A., M. R. B. and K. F. C. (2008). *Thematic Cartography and Geo-Visualization* (3rd ed.). Prentice Hall.
24. Steer, J. A. (1965). *An Introduction to the Study of Map Projection*. University of London.
25. Talukder, S. (2008). *Introduction to Map Projections*. Eastern Book House, India.
26. Tyner, J. A. (2010). *Principles of Map Design*. The Guilford Press.

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

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY

Semester – VII

Minor Course

Course title: Social, Cultural & Political Geography

Course Code: GEOMIN401-4

Total Credits: 4 (Theory 3+ Project 1)

Course Objectives:

- Understanding the basic concepts of social and political geography is the goal of this course, which attempts to introduce students to the major ideas and viewpoints in this field.
- It aims to improve analytical and critical thinking abilities: Through the study of both theoretical and practical based. The course seeks to improve students' analytical and critical thinking abilities. In order to assess intricate social and political processes and their spatial ramifications

Course Outcomes: Students will be able to;

- Analyze and understand the spatial aspects of social and political phenomena.
- Know the socio- cultural problems and issues of their surroundings regions.

Course Content:

Units	Course Content	No. of Classes-60 (45 hours of classes of one hour + 30 hours of classes of two hours)	Credits (3+1=4)
	Part-A (Theory)		
I	**Basics of Social Geography:** • Origin, Nature and Scope of Social Geography, • Concept of Social Space: First, Second and third Space, • Social Categories: Defining Caste, Class, Religion, Ethnicity and Gender and their Spatial Underpinnings; • Concepts of Social differentiation and integration and social change. • v. Social Geographies of Inclusion and Exclusion, Slums, Gated Communities, Communal Conflicts and Crime.	15	1
II	**Basics of Cultural Geography:** • Introduction, Nature and Scope of Cultural Geography, • Concept of Society, Culture, Race, Ethnicity and different facets of culture, • Historical perspective of Indian societies; racial, linguistic and ethnic diversity, • Major Tribes of India and their problems	15	1
III	**Basics of Political Geography:** • Definition and Scope of Political Geography, Geopolitics; • State, Nation and Nation State – Concept of Nation, State and Nation State, Attributes of State – Frontiers, Borders, Shape, Size, Territory and	15	1

	Sovereignty, Nation Building, Concepts of Lebensraum, Heartland and Rimland, Colonialism, desalinization and Neocolonialism • Political Geography of Resource Conflicts – Water Sharing Disputes, Disputes and Conflicts Related to Forest Rights and Minerals, issues of land locked states in Asia and Africa. • Politics of Displacement: Issues of relief, compensation and rehabilitation: with reference to Dams and Special Economic Zones		
Part-B (Project)			
IV	• A Project report on Socio-cultural Problems/Issue Pertainingto institutional surrounding regions.	15	1

Suggested Books:

1. Ahmed A., 1999: *Social Geography*, Rawat Publications.
2. Casino V. J. D., Jr., 2009) *Social Geography: A Critical Introduction*, Wiley Blackwell.
3. Panelli R., 2004: *Social Geographies: From Difference to Action*, Sage.
4. Rachel P., Burke M., Fuller D., Gough J., Macfarlane R. and Mowl G., 2001:
1. *Introducing Social Geographies,* Oxford University Press.
5. Sen, Jyotirmoy : A text book of Social and Cultural Geography
6. Taher, M 1994 : An Introduction to Social Geography, NEIGS
7. Ahmed, A : 1999 Social Geography, Rawat Publications Jaipur & New Delhi
8. Dikshit , R.D.1982 : Political Geography – A Contemporary Perspective, Tata
9. McGraw Hill Publishing Co.Ltd,NewDelhi
10. Carlson: Geography and World Politics
11. Taylor, P. J., 1989: Political Geography, Longman, London
12. Sukhuwal, B.J., 1979: Modern Political Geography of India, Sterling, New Delhi
13. De Blij, H.J. 1972: Systematic Political Geography, John Wiley, New York
14. Agnew J., 2002: Making Political Geography, Arnold.
15. Agnew J., Mitchell K. and Toal G., 2003: A Companion to Political Geography, Blackwell.
16. Cox K. R., Low M. and Robinson J., 2008: The Sage Handbook of Political Geography, Sage Publications.
17. Cox K., 2002: Political Geography: Territory, State and Society, Wiley-Blackwell
18. Gallaher C., et al, 2009: Key Concepts in Political Geography, Sage Publications.
19. Glassner M., 1993: Political Geography, Wiley.
20. Jones M., 2004: An Introduction to Political Geography: Space, Place and Politics, Routledg .
21. Mathur H M and M M Cernea (eds.) Development, Displacement and Resettlement – Focus on Asian Experience, Vikas, Delhi
22. Painter J. and Jeffrey A., 2009: Political Geography, Sage Publications.
23. Taylor P. and Flint C., 2000: Political Geography, Pearson Education.
24. Verma M K (2004): Development, Displacement and Resettlement, Rawat Publications, Delhi
25. Hodder Dick, Sarah J Llyod and Keith S McLachlan (1998), Land Locked States of Africa and Asia (vo.2), Frank Cass

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY

Semester – VII

Core Course

Course title: Research Methodology

Course Code: GEOREM401-4

Total Credits: 4 (Theory 4)

Course Objectives:

- To provide an understanding of the research process in Geography.
- To familiarize students with different research methodologies and techniques used in Geography.
- To develop critical thinking and analytical skills required for designing and conducting geographical research.
- To enhance students' ability to analyze and interpret research data.
- To cultivate ethical research practices and principles.

Course Outcome:

This course aims to introduce students to the fundamentals of research methodology in the field of Geography. It covers various research methods, techniques, and tools used in geographical research. The course emphasizes both theoretical and practical aspects of research, enabling students to develop skills required for conducting independent research projects in Geography.

Course Content:

Units	Course Content	No. of Classes-60 (60 hours of classes)	Credits (4+0=4)
I	• Introduction to Research Methodology: Meaning and importance of research methodology, Types of research in Geography • Research process: planning, designing, and execution,Role of research questions and objectives • Research Design: Formulating research problems and hypotheses, Experimental, descriptive, and exploratory research designs, Variables and measurements in research, Sampling techniques in Geography	16	1
II	• Data Collection Methods: Primary and secondary data sources, Questionnaire design and surveys, Interviews and focus groups, Observation methods and fieldwork • Spatial Data Collection Technique: Remote sensing and GIS in geographical research, Satellite imagery interpretation, GPS and geospatial data collection • Data Analysis and Interpretation: Quantitative and qualitative data analysis techniques, Statistical analysis in Geography, Geospatial data analysis using GIS software	16	1
III	• Writing Research Proposals: Components of a research proposal, Literature review and conceptual framework, Methodology section: data collection and analysis plan, Ethical considerations in research	16	1

	• Data Presentation and Visualization: Data visualization techniques: maps, charts, graphs, Geographical Information System (GIS) for data presentation, Interpretation of research findings • Academic Writing and Referencing: Writing research papers and reports, Academic writing style and structure, Citation and referencing styles (e.g., APA, MLA)		
IV	• Ethical Considerations in Research: Research ethics and integrity, Informed consent and confidentiality • Intellectual property rights and plagiarism	12	1

Suggested Books:

1. "Research Methodology in Geography" by K. R. Sharma
2. "Research Methods in Geography: A Critical Introduction" by Basil Gomez and John Paul Jones III
3. "Research Design in Geography: Concepts and Applications" by Basil Gomez and John Paul Jones III
4. "GIS Research Methods: Incorporating Spatial Perspectives" by Sheila L. Steinberg
5. "Qualitative Research Methods in Human Geography" by Iain Hay
6. "The Sage Handbook of Qualitative Geography" by Dydia DeLyser, Steve Herbert, Stuart Aitken, Mike Crang, and Linda McDowell
7. "Quantitative Methods in Geography: Making the Connections" by A. Stuart Goudie, Tony J. Parsons, and Stephen G. Wakefield
8. "Geographical Information Systems: Principles, Techniques, Management, and Applications" by Paul A. Longley, Michael F. Goodchild, David J. Maguire, and David W. Rhind
9. "Research Methods in Physical Geography" by Basil Gomez and John Paul Jones III
10. "Research Methods in Human Geography" by Robin Flowerdew and David M. Martin

11. Note: This is a sample syllabus and book list. It is recommended to adapt and modify the syllabus based on specific course requirements and available resources.

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY
Semester – VIII
Core Course
Course title: Geography of Northeast India
Course Code: GEOMAJ404-4
Total Credits: 4 (Theory 4)

Course Objectives:

- Provide an in-depth understanding of the physical, demographic, and socio-economic characteristics of North-East India and Assam.
- Analyze the geographical and socio-economic dynamics of the Bodoland Territorial Region (BTR).

Course Outcomes:

- Understand the locational significance, physiographic divisions, and climate of North-East India.
- Analyze the drainage systems, vegetation, and soil types in North-East India.
- Study population growth, density, and composition in North-East India, including religious and ethnic aspects.
- Examine agricultural practices, industrial development, and transport in North-East India.
- Identify socio-economic disparities and biodiversity resources in North-East India.
- Comprehend the geographical features, climate, and significance of the Brahmaputra in Assam.

Analyze the demographic and socio-economic dynamics of the Bodoland Territorial Region (BTR).

Course Content:

Units	Course Content	No. of Classes-60 (60 hours of classes)	Credits (4+0=4)
I	**North East India** • Locational significance of North East India • Physiographic divisions and climate of North East India • Drainage system, Vegetation and Soil types of North East India • Population growth, density, age-sex composition, • Composition: religious composition, ethnic composition	15	1
II	**Socio-economic traits of North East India** • Agricultural practices: Types of farming, major crops and distribution • Industrial development: Types of Industries, problems and prospects • Transport and communication, • Disparity in socio-economic development and problems • Resources and biodiversity	15	1
III	**Geography of Assam** • Locational significance of Assam • Physiographic divisions and climate of Assam • Significance of Brahmaputra • Soil of Assam • Population growth and spatial distribution	15	1

IV	**Dynamics of BTR** • Location and formation of BTR • Population growth, density, age-sex composition, caste composition, and religious composition • Literacy rate, educational attainment level • Dependency ratio, work participation • Forest cover, National Park, Biodiversity	15	1

Suggested Books:

1. Barad, Gomit K (2018). Geography of North East India. Pacific Books International.
2. Bhagabati, AK, Bora, AK & Kar, BK (2018). Geography of Assam. Rajesh Publications: New Delhi.
3. Bhakta, GP (1992). Geography of North-East India. Akashi Book Depot: Shillong.
4. Bhattacharyya, NN (2018). North East India, A Systematic Geography. Rajesh Publications: New Delhi.
5. Choudhury, RKD (2021). Demographic Scenario of the North East India. Concept Publishing Company Pvt. Ltd.
6. Devee, Geeta & Das, Puspanjalee (2018). North-East India: A Comprehensive Geography. EBH Publishers (India).
7. Saikia, Sailajananda; Nimasow, Gibji & Sora, Tage Rupa (2023). Unveiling the Mystique: Diversity in Geography of NE India. Notion Press.

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY
Semester – VIII
Minor Course
Course title: Fundamentals of Remote Sensing and GIS
Course Code: GEOMIN402-4
Total Credit: 4 (Theory 3+ Practical 1)

Course Objectives:

- This paper aims to offer introduction to some of the principles and techniques that are used in geographical research.
- The approach here will be wide ranging, attempting to cover the various techniques of data acquisition and their utilities in undertaking geographical research.
- Prepare the students in identifying, analyzing and solving geospatial problems.
- Train the students in developing practical and executable solutions to the challenges of growing field of Remote Sensing and GIS.
- Impart the students with strong base of knowledge that makes them suitable both for teaching as well as for research.

Course Outcomes:

- It will enhance and equipped with concepts, methodologies and applications of Remote Sensing and GIS technology in geographical aspects.
- Able to represent spatial data and analysis in GIS platform to solve various natural, environmental and societal problems and challenges.

Course Content:

Units	Course Content	No. of Classes-40 (30 hours of classes of one hour + 20 hours of classes of two hours)	Credits (3+1=4)
	Part-A (Theory)		
I	Fundamental of Remote Sensing: • Introduction of remote sensing: What is remote sensing, Defining remote sensing, Process of Remote Sensing, Advantages and limitations of remote sensing. • Source and concept of energy/EMR: Wave and particle models of Electromagnetic Radiation, Electromagnetic spectrum, Processes of EMR interaction, Spectral reflectance curve and atmospheric window • Transmission, Reception, and Processing in Remote Sensing, Application and limitations of Remote Sensing.	15	1
II	Principles of Remote Sensing: • Remote sensing; Based on platform, energy source, imaging media, regions of electromagnetic spectrum.	15	1

	• Characteristics of Images, and satellite orbit. • Concept of Nadir, Swath, Sensor resolution, and image referencing system of Remote Sensing satellite • Photographic Imagingand geometry of aerial image • Types of Digital Imaging techniques • Global Navigation Satellite System: Functional segments, Working Principle, sources of GPS error and application		
III	Geographic Information System: • Geographical Information System (GIS): Concept, Definition, Components and Development. • Function and advantages of GIS • GIS Data Type: Spatial and Non-Spatial, Raster and Vector • Concept of Attribute data and DBMS (Database management system) • Data Layer Extraction and Spatial Analysis • Application of Remote Sensing and Geographic information System	15	1
Part-B Practical			
IV	Practical on Remote Sensing and GIS: • Geo-Referencing a Map/Toposheet, Drawing Base Map from Satellite Imagery/Toposheet, • Mapping point, line and polygon features; Isopleths, Choropleth and Chorochromatic mapping, Proportional mapping, • Visual Interpretation of Aerial photograph and Satellite Imagery and preparation of thematic maps based on appropriate classification scheme. • Data Collection from GPS, ground verification and Mapping.	15	1

Suggested Books:

1. Bhatta B., 2018: Remote Sensing and GIS, Oxford
2. Campbell J. B., 2007: *Introduction to Remote Sensing*, Guildford Press.
3. Jensen J. R., 2004: Introductory Digital Image Processing: A Remote Sensing Perspective, Prentice Hall.
4. Joseph, G. 2005: *Fundamentals of Remote Sensing*, United Press India.
5. Lillesand T. M., Kiefer R. W. and Chipman J. W., 2004: *Remote Sensing and Image Interpretation*,Wiley. (Wiley Student Edition).
6. Nag P. and Kudra, M., 1998: *Digital Remote Sensing*, Concept, New Delhi.
7. Rees W. G., 2001: *Physical Principles of Remote Sensing*, Cambridge University Press.
8. Fazal S., 2008: Remote Sensing Basics, Kalyani Publishers
9. Singh R. B. and Murai S., 1998: *Space-informatics for Sustainable Development*, Oxford and IBH Pub.
10. Wolf P. R. and Dewitt B. A., 2000*: Elements of Photogrammetry*: With Applications in GIS,McGraw-Hill.
11. Sarkar, A. (2015): *Practical Geography: A Systematic Approach*. Orient Black Swan PrivateLtd., New Delhi.

12. Chauniyal, D.D. (2010): *Sudur Samvedanevam Bhogolik Suchana Pranali*, ShardaPustakBhawan, Allahabad.
13. Burrough, P.A. and McDonnel, R.A., 1998: *Principles of Geographical Information Systems*, Oxford University Press.

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY

Semester – VIII

Core Course

Course title: Advanced Geomorphology (Option A)

Course Code: GEOADL401-4

Total Credits: 4 (Theory 4)

Course Objectives:

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

Course Outcomes:

- Understand the development and fundamental concepts of advanced geomorphology.
- Analyze landform structures using morphology-based approaches.
- Assess the impact of climatic factors on landforms through climate-based methodologies.
- Comprehend key geomorphological theories and their historical context.
- Examine hillslope processes and their role in slope evolution and stability.
- Differentiate and classify various types of slopes and their development.
- Analyze the geomorphological features of specific regions, such as the Deccan Plateau and North East India.

Course Content:

Units	Course Content	No. of Classes-60 (60 hours of classes)	Credits (4+0=4)
I	**Advanced Concepts in Geomorphology** • **Fundamental Concepts and Development of Advanced Geomorphology** - Overview of geomorphological evolution in the late 20th century. - Key contributions and theoretical advancements. • **Major Contemporary Methodologies** - Morphology-based approaches: Analysis of landform structures. - Climate-based approaches: Impact of climatic factors on landforms. - Process-based approaches: Understanding geomorphological processes. - Geotechnical science-based approaches: Integrating geotechnical data in geomorphological studies. • **Time and Space in Geomorphology** - Nature of time: Geological time scales, episodic and continuous processes. - Sampling of time: Techniques for temporal data collection and interpretation. - Nature of space: Spatial distribution of geomorphological features.	15	1
II	**Landscape Evolution Theories** • **Development of Geomorphological Theories**	15	1

	- Historical context and evolution of key theories. - Significance and need for theoretical frameworks in geomorphology. • **Major Geomorphological Theories** - Uniformitarianism (James Hutton) & Catastrophism (Georges Cuvier) - Davisian Cycle of Erosion (W.M. Davis) - Dynamic Equilibrium (John T. Hack) - Steady State Landscape Theory (William Morris Davis) - Theories by W. Penck - Threshold Theory (Luna B. Leopold) - Dynamic equilibrium and related investigations (G.K. Gilbert) - Cyclic models (L.C. King) - Tectono-geomorphic models (M. Morisawa)		
III	**Hill Slope Evolution & Development** • **Hillslope Processes** - Soil creep and solifluction: Mechanisms and impacts. - Mass wasting: Types (landslides, rockfalls, debris flows) and their mechanisms. - Weathering-limited and transport-limited slopes: Characteristics and differentiation. • **Hillslope Forms and Evolution** - Slope development: Importance and methodologies. - Classification of slopes: Convex, concave, planar. - Soil properties affecting slope stability: Cohesion, internal friction, soil shear strength. - Failure criteria: Analyzing slope stability and potential failure.	15	1
IV	**Regional Geomorphology** • Definition and scope of regional geomorphology; Importance of regional studies in geomorphology; Overview of major geomorphological regions of the world • Geomorphology of Specific Regions: Deccan Plateau: Geological structure and landform characteristics; North East India: Geomorphological features and regional significance.	15	1

Suggested Books:

1. Ahmad, E. (1985). *Geomorphology*. Kalyani Publishers.
2. Bloom, A. L. (1978). *Geomorphology- A Systematic Analysis of Late Cenozoic Landforms*. Prentice Hall.
3. Chorley, R. (1972). *Spatial Analysis in Geomorphology*. Harper & Row.
4. Dayal, P. (1996). *A Textbook of Geomorphology* (2nd ed.). Shukla Book Depot.
5. Derbishire, E. (ed). (1976). *Geomorphology and Climate*. John Wiley and Sons Ltd.
6. Dixit, K. R. (ed). (1983). *Contribution to Indian Geomorphology*. Heritage.
7. Embelton, C. and T. J. (1982). *Processes in Geomorphology* (First Indian Edition). Arnold Heinemann.
8. Embelton, C. B. D. and J. D. K. C. (ed). (1978). *Geomorphology: Present Problems and Future Prospects*.Oxford University Press.
9. Engeln, O. D. Von. (1942). *Geomorphology*. McMillan.
10. Fairbridge, R. W. (ed). (1968). *Encyclopaedia of Geomorphology*. Reinhold.

11. Goudie, A. et. al (ed). (1981). *Geomorphological Techniques*. George Allen and Unwin.
12. Gregory, K. J. (1985). *The Nature of Physical Geography*. Edward Arnold.
13. Hart, M. G. (1986). *Geomorphology: Pure and Applied*. Allen & Unwin.
14. Holmes, A. (1968). *Principles of Physical Geology*. Nelson.
15. Jensen, J. R. (2011). *Remote Sensing of the Environment - An Earth Resource Perspective* (3rd ed.). Pearson.
16. Penck, W. (1924). *Morphological Analysis of Landforms*. McMillan.
17. Sharma, V. K. (1986). *Geomorphology: Earth Surface Processes and Forms*. Tata McGraw Hill.
18. Steer, J. A. (1958). *The Unstable Earth*. Methuen.
19. Strahler, A. N. (1969). *Physical Geography* (3rd ed.). Wiley.
20. Thornbury, W. D. (1969). *Principles of Geomorphology* (2nd ed.). Oliver and Boyd.
21. Wooldridge, S. W. & M. R. S. (1948). *The Physical Basis of Geography*. Longman.

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY
Semester – VIII
Core Course
Course title: Environmental Geomorphology (Option A)
Course Code: GEOADL402-4
Total Credits: 4 (Theory 4)

Course Objectives:

- Explore the components and scope of environmental geomorphology, focusing on resources and hazards.
- Analyze the impact of natural and anthropogenic activities on geomorphological processes and hazards.

Course Outcomes:

- Understand the role of geomorphology in assessing and managing natural resources such as soil and raw materials.
- Evaluate how geomorphology contributes to the exploration and utilization of other natural resources.
- Examine the consequences of human activities on geomorphological processes and landscapes.
- Classify and analyze environmental hazards, including geological, geomorphological, climatic, and oceanic hazards.
- Explore the causes, distribution, and impacts of geological and geomorphological hazards like earthquakes, landslides, and marine hazards.
- Investigate climate variability mechanisms and hazards such as storms, droughts, and floods.

Assess risk and vulnerability related to environmental hazards, including responses, preparedness, and environmental impact assessments.

Course Content:

Units	Course Content	No. of Classes-60 (60 hours of classes)	Credits (4+0=4)
I	**Fundamentals** • Environmental Geomorphology: components and scope • Aspects of geomorphological resources: soil, raw materials, resources and reserves • Contribution of geomorphology in search of other natural resources • Man's activities and their geomorphological consequences	15	1
II	**Geohazards** • Classification of Environmental Hazards • Causes and Distribution of Geological Hazards: Earthquakes, Volcanoes and Tsunamis • Geomorphological Hazards: Soil Erosion, Land Instability, Marine hazard, glacial and periglacial hazard	15	1
III	**Climatic Hazard** • Mechanism of Climate Variability: models of atmospheric circulation and change • Change in jet stream paths, The southern Oscillation, Astronomical Cycles	15	1

	• Large-scale storm as hazard, Localised storms • Drought and Flooding as a hazard • Fire and Oceanic Hazard		
IV	**Risk and Vulnerability** • Personal and Group responses to hazard: warning and evacuation, Preparedness, response during event, and additional impacts • Vulnerability and Geomorphological Risk • Geomorphology and Environmental Impact Assessment • Prediction and forecast	15	1

Suggested Books:

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

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY

Semester – VIII

Core Course

Course title: Practical I (Option A)

Course Code: GEOADL403-4

Total Credits: 4 (Practical4)

Course Objectives:

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

Course Outcomes:

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

Conduct flood frequency analysis, estimate flood hazards and inundation areas, and assess flood risks using environmental geomorphological techniques

Course Content:

Units	Course Content	No. of Classes-60 (60 hours of classes)	Credits (4+0=4)
I	**Application of Radar Remote Sensing** • Familiarizing SNAP tool • RADAR image preprocessing • Water body mapping • Soil mapping • Vegetation mapping	15	1
II	**Application of Multispectral image** • Familiarizing Google Earth Engine/QGIS • Land Cover classification • Urban sprawl mapping • Heat and thermal mapping • NDVI and NDWI	15	1
III	**Advance Geomorphology** • Digital elevation models (DEMs) and terrain analysis, Measurement of slopes, stream gradients, and other geomorphic parameters, **Generate Slope and Aspect Maps**; • Delineate watersheds and extract the drainage network; compute relief, curvature, and hypsometric curves • Grain size analysis of sediments	15	1

	• Interpretation of landforms and processes: Determine the dominant fluvial processes (erosion, transport, deposition) shaping the valley		
IV	**Environmental Geomorphology** • Mapping and Assessing landforms as geomorphological assets • Flood frequency analysis • Flood hazard estimation/inundation area • Flood risk assessment	15	1

Suggested books:

1. Field Techniques in Geomorphology" by H. A. Viles, A. Goudie, G. S. Robinson, and C. E. E. Jones
2. Geomorphological Techniques edited by Andrew Goudie**
3. Remote Sensing and GIS for Geomorphology" by Nicholas J. Clifford, Shaun G. L. Harrisson, and J. O. M. Eyre
4. Geomorphology: The Mechanics and Chemistry of Landscapes" by Robert S. Anderson and Suzanne P. Anderson
5. Quantitative Geomorphology of a Drainage Basin" by Arthur N. Strahler
6. Fluvial Forms and Processes: A New Perspective" by David Knighton
7. Aeolian Geomorphology: A New Introduction" by Ian Livingstone and Andrew Warren
8. Techniques for Desert Research" by Ronald U. Cooke and Andrew Warren
9. Sedimentology and Stratigraphy" by Gary Nichols
10. Principles of Geomorphology" by William D. Thornbury

Semester – VIII
Core Course
Course title: Fertility Studies (Option B)
Course Code: GEOADL401-4
Total Credits: 4 (Theory 4)

Course Objectives:

- Provide a comprehensive understanding of fertility concepts, theories, and measures, emphasizing their significance in population dynamics and demographic studies.
- Analyze global and regional trends in fertility, factors influencing fertility levels, and theoretical frameworks explaining fertility behavior.

Course Outcomes:

- Define and differentiate concepts such as fertility, fecundity, natural fertility, sterility, and contraception, and discuss their biological and social implications.
- Explain the importance of studying fertility in understanding population dynamics, including demographic transitions and population aging.
- Identify sources of fertility data and evaluate their reliability and applicability in demographic research.
- Analyze and compare fertility levels, trends, and differentials between developed and developing countries, highlighting factors contributing to these variations.
- Discuss the phenomenon of below-replacement level fertility in developed countries and its implications for population growth and aging.
- Evaluate the causes of high fertility in developing countries, considering socio-economic, cultural, and demographic factors.
- Describe and discuss various theories of fertility proposed by scholars such as Kinsley Davis, Judith Blake, John Bongaarts, Becker, Easterlin, and Caldwell, analyzing their frameworks and implications for fertility behavior.

Course Content:

Units	Course Content	No. of Classes-60 (60 hours of classes)	Credits (4+0=4)
I	**Concepts** • Concept of Fertility, Fecundity, Natural fertility, Sterility, Contraception • Fertility: Biological limits and Social Norms, Theoretical maximum • Importance of the study fertility in population dynamics • Sources of fertility data	15	1
II	**World Fertility Transition** • Levels, Trends and Differentials in fertility of Developed and Developing Countries • Factors affecting fertility • Below-replacement level fertility in developed countries and its implications • Causes of high fertility in developing countries • Spatio-temporal variation in fertility in India: findings from NFHSs	15	1

III	**Theories of Fertility** • Kignsley Davis and Judith Blake, and John Bongaart's determinants of fertility • Theory of Change and Response, Liebenstein's Theory, Becker's Theory, Easterlin's Framework of Fertility, Caldwell's Wealth Flow Theory	15	1
IV	**Measures of Fertility** • Basic measures of fertility: Crude birth rate, General fertility rate, General marital fertility rate, Age specific fertility rate, Age specific marital fertility rate, Total fertility rate, Total marital fertility rate • Standardization of crude birth rate, Sex age adjusted birth rate • Measures of Reproduction: Gross reproduction rate, Net reproduction rate	15	1

Suggested Books:

1. Bhende, A. A., & Kanitkar, T. (1978). *Principles of Population Studies*. Himalaya Publishing House.
2. Caldwell, J. C. (1990). What do we know about health transition: The cultural, social and behavioural determinants of health. In *The Proceedings of an International Workshop, Vol. 1 & 2*. Health Transition Centre, Australian National University.
3. Coontz, S. H. (1957). *Population Theories and their Economic Interpretation*. Routledge.
4. Kaa, D. J. van de. (1996). Anchored Narratives: The Story and Findings of Half a Century of Research into the Determinants of Fertility. *Population Studies*, *50*(3), 389–432. https://doi.org/10.1080/0032472031000149546
5. Mandelbaum, D. G. (1974). *Human Fertility in India: Social Components and Policy Perspectives*. University of California Press.
6. Mason, A. (Ed.). (2002). *Population Change and Economic Development in East Asia: Challenges Met, Opportunities Seized*. Stanford University Press.
7. Mishra, B. D. (1981). *An Introduction to the Study of Population*. South Asian Publishers, Pvt. Ltd.
8. Mosley, W. H., & Chen, L. C. (1984). Analytical Framework for the Study of Child Survival in Developing Countries. *Population and Development Review*, *10*, 25–45.
9. Omran, A. R. (2005). The epidemiologic transition: a theory of the epidemiology of population change. 1971. *The Milbank Quarterly*, *83*(4), 731–757. https://doi.org/10.1111/j.1468-0009.2005.00398.x
10. Park, K. (2021). *Text Book of Preventive and Social Medicine* (26th ed.). Banarsidas Bhanot Publishers.
11. Preston, S. ., Heuveline, P., & Guillot, M. (2000). *Demography: Measuring and Modeling Population Processes*. Wiley-Blackwell.
12. Ram, F., & Pathak, K. B. (1998). *Techniques of Demographic Analysis*. Himalaya Publishing House.
13. Siegel, J. S., & Swanson, D. A. (2004). *The Methods and Materials of Demography* (2nd ed., pp. 371–405, 407–428, 429–453). Elsevier Academic Press.
14. Spira, A., Leridon, H., & Gray, R. (Eds.). (1993). *Bomedical and Determinants of Reproduction*. Clarendon Press.
15. Srinivasan, K. (1998). *Basic Demographic Techniques and Applications* (pp. 59–85). Sage Publications.
16. United Nations. (1973). *Determinants and Consequences of Population Trends, Vol. 1* (pp. 96–104). UN.
17. United Nations. (1999). Below Replacement Fertility. In *Population Bullentin of the UN, Special Issue Nos. 40/41*. Department of Economic and Social Affairs, UN.
18. World Health Organization. (2015). International statistical classification of diseases and related health problems, 10th revision, Fifth edition. *World Health Organization*.

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY

Semester – VIII

Core Course

Course title: Mortality Studies (Option B)

Course Code: GEOADL402-4

Total Credits: 4 (Theory 4)

Course Objectives:

- Explore fundamental concepts and measures related to mortality, including death, infant mortality, child mortality, and maternal mortality, along with life table construction and data sources.
- Analyze mortality trends, differentials, and causes in global and regional contexts, focusing on India and Northeast India.

Course Outcomes:

- Define and differentiate concepts such as death, abortion, still births, live births, infant mortality, early and late neonatal death, and maternal mortality.
- Explain the significance of mortality measures like crude death rate, infant mortality rate, maternal mortality ratio, and life expectancy at birth in demographic analysis.
- Identify sources of mortality data and evaluate their reliability for demographic research and policy formulation.
- Analyze historical and contemporary trends in mortality levels and causes in developed and developing regions, emphasizing factors responsible for high mortality in the past in developing countries.
- Discuss causes of infant mortality, distinguishing between endogenous and exogenous factors, and evaluate trends and leading causes of death in India.
- Calculate and interpret mortality measures such as age-specific death rates, infant mortality rates, and construct abridged life tables to understand population health dynamics.
- Evaluate spatio-temporal variations in death rates and infant mortality rates in Northeast India, analyzing rural-urban and age-sex differentials and their implications for public health interventions.

Course Content:

Units	Course Content	No. of Classes-60 (60 hours of classes)	Credits (4+0=4)
I	**Concepts** • Concept of death, abortion, fetal deaths, still births, live birth, deaths • Concept of Infant Mortality, early and late neonatal death • Concept of Child Mortality, Maternal Mortality • Life table: Concept, types, assumptions, life expectancy at birth • Sources of mortality data	15	1
II	**Mortality Transition** • Levels and trends in mortality in developed and developing regions; • Factors responsible for high mortality in the past in developing countries	15	1

	• Causes of infant mortality (endogenous and exogenous) • Levels and trends of infant and child mortality in India; • Leading causes of death in India		
III	**Measures of mortality** • Crude death rate, Age specific death rate, Age sex specific death rate • Infant mortality rate, Standardization of crude death rate • Maternal mortality ratio, • Life table: Construction of abridged life table • Mosley Chen Framework	15	1
IV	**Mortality in India** • Spatio temporal variation in death rate in Northeast India • Rural-Urban and Age- Sex differentials in death rate in Northeast India • Spatio temporal variation in Infant Mortality Rate in Northeast India • Rural-Urban differentials in Infant Mortality Rate in Northeast India • Causes of deaths in India • Accessibility; Physiography and IMR	15	1

Suggested Books:

1. Bhende, A. A., & Kanitkar, T. (1978). *Principles of Population Studies*. Himalaya Publishing House.
2. Caldwell, J. C. (1990). What do we know about health transition: The cultural, social and behavioural determinants of health. In *The Proceedings of an International Workshop, Vol. 1 & 2*. Health Transition Centre, Australian National University.
3. Canning, D., Bloom, D. E., & Sevilla, J. (2003). *The Demographic Dividend: A New Perspective on the Economic Consequences of Population Change*. RAND.
4. Coontz, S. H. (1957). *Population Theories and their Economic Interpretation*. Routledge.
5. Mason, A. (Ed.). (2002). *Population Change and Economic Development in East Asia: Challenges Met, Opportunities Seized*. Stanford University Press.
6. Mishra, B. D. (1981). *An Introduction to the Study of Population*. South Asian Publishers, Pvt. Ltd.
7. Mosley, W. H., & Chen, L. C. (1984). Analytical Framework for the Study of Child Survival in Developing Countries. *Population and Development Review*, *10*, 25–45.
8. Murray, C. J. (1994). Quantifying the burden of disease: the technical basis for disability-adjusted life years. *Bulletin of the World Health Organization*, *72*(3), 429–445. http://www.ncbi.nlm.nih.gov/pubmed/8062401
9. Omran, A. R. (2005). The epidemiologic transition: a theory of the epidemiology of population change. 1971. *The Milbank Quarterly*, *83*(4), 731–757. https://doi.org/10.1111/j.1468-0009.2005.00398.x
10. Park, K. (2021). *Text Book of Preventive and Social Medicine* (26th ed.). Banarsidas Bhanot Publishers.
11. Pool, I., Wong, L. R., & Vilquin, E. (Eds.). (2006). *Age-Structural Transitions: Challenges for Development*. CIRCRED.
12. Preston, S., Heuveline, P., & Guillot, M. (2000). *Demography: Measuring and Modeling Population Processes*. Wiley-Blackwell.
13. Ram, F., & Pathak, K. B. (1998). *Techniques of Demographic Analysis*. Himalaya Publishing House.
14. Siegel, J. S., & Swanson, D. A. (2004). *The Methods and Materials of Demography* (2nd ed., pp. 371–405, 407–428, 429–453). Elsevier Academic Press.

15. Spira, A., Leridon, H., & Gray, R. (Eds.). (1993). *Bomedical and Determinants of Reproduction*. Clarendon Press.
16. Srinivasan, K. (1998). *Basic Demographic Techniques and Applications* (pp. 59–85). Sage Publications.
17. United Nations. (1973). *Determinants and Consequences of Population Trends, Vol. 1* (pp. 96–104). UN.
18. United Nations. (1999). Below Replacement Fertility. In *Population Bullentin of the UN, Special Issue Nos. 40/41*. Department of Economic and Social Affairs, UN.
19. World Health Organization. (2015). International statistical classification of diseases and related health problems, 10th revision, Fifth edition. *World Health Organization*.

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY

Semester – VIII

Core Course

Course title: Practical I (Option B)

Course Code: GEOADL403-4

Total Credits: 4 (Practical4)

Course Objectives:

- Equip students with practical skills in using statistical software packages (SPSS, R, and Stata) for data management, analysis, and visualization.
- Develop students' ability to conduct fieldwork, collect data on health, gender, and tribal issues, and analyze it using appropriate software tools.

Course Outcomes:

- Navigate and utilize the SPSS environment proficiently for tasks such as creating data frames, reading different file formats, and transforming data through recoding and computing variables.
- Apply SPSS to generate and interpret univariate, bivariate, and multivariate tables to summarize and analyze data effectively.
- Demonstrate proficiency in the R environment, including data input/output, basic statistical calculations (frequency distribution, mean, standard deviation, median), and creating basic graphs.
- Utilize Stata for data transformation tasks such as recoding and computing variables, and generate comprehensive tables to analyze geographic data.
- Conduct fieldwork to collect primary data on health, gender, and tribal issues in a selected study area under faculty guidance.
- Analyze collected data using SPSS, R, or Stata to draw insights and conclusions regarding health, gender, and tribal issues.
- Prepare a concise group field report summarizing findings from the fieldwork, including data analysis results and recommendations, within specified page limits, emphasizing clarity and coherence.

Course Content:

Units	Course Content	No. of Classes-60 (45 hours of classes of one hour + 30 hours of classes of two hours)	Credits (3+1=4)
I	**SPSS for Geographic data analysis** • Familiarization with SPSS environment • Creation of data frame • Reading Excel, CSV file • Data transformation: Recoding variable, Computing variable • Generating tables: Uni variate, Bi-variate and Multi-variate tables	15	1
II	**R & Stata for Geographic data analysis** • R Environment • Data input, import and export • Frequency distribution, mean, standard deviation, and	15	1

	median • Basic graphs • Stata Environment • Data transformation: Recoding variable, Computing variable • Generating tables: Uni variate, Bi-variate and Multi-variate tables		
III	**Field work** • The students, in consultation with assigned faculty, are required to collect data from a selected study area. The issues pertaining to Health, Gender and Tribal issues needs to be covered. The collected data should be analyzed in one of the data analysis software packages taught in the semester.	15	1
IV	**Field work** • Based on the collected data a group field reports covering the Health, Gender and Tribal issues needs to be prepared. A group report should be prepared within a page limit of 20, inclusive of everything.	15	1

Suggested Books:

1. Acock, Alan C (2014). A Gentle Introduction to Stata, 4th Edition. A Stata Press Publication
2. StataCorp LP, College Station, Texas.
3. Daniels, Lisa and Minot, Nicholas (2019). An Introduction to Statistics and Data Analysis Using Stata®, From Research Design to Final Report. Sage Publications.
4. Field, A. (2009). Discovering Statistics using SPSS, Third Edition. Sage Publications.
5. Gregory, S. (1978). *Statistical Methods and the Geographer*. London: Longman.
6. IBM. IBM SPSS Statistics 25 Core System User's Guide. IBM
7. IBM. IBM SPSS Statistics 25 Brief Guide. IBM
8. Johnston, R. J. (1973). *Multivariate Statistical Analysis in Geography*. London: Longman.
9. King, L. J. (1969). *Statistical Methods in Geographical Studies*. London.
10. King, J. P. C. and C. A. M. (1968). *Quantitative Geography*. London: John Wiley.
11. Mahmood, A. (1977). *Statistical Methods in Geographical Studies*. Delhi: Concept Publications.
12. McCullagh, H. R. and P. S. (1974). *Quantitative Techniques in Geography: An Introduction.* Oxford: Clarendan Press.
13. Paul, S. K. (1998). *Statistics for Geoscientists.* New Delhi: Tata McGraw Hill.
14. Robinson, G. M. (1998). *Methods and Techniques in Human Geography.* Chichester: John Wiley & Sons.
15. Stockemer, Daniel (2019).Quantitative Methods for the Social Sciences, A Practical Introduction with Examples in SPSS and Stata. Springer.
16. Yeats, M. (1974). *An Introduction to Quantitative Analysis in Human Geography*. New York: McGraw, Hill.
17. Unwin, D. (1981). *Introductory Spatial Analysis*. London: Methuen.

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY

Semester – VIII

Core Course

Course title: Social Geography (Option C)

Course Code: GEOADL401-4

Total Credits: 4 (Theory 4)

Course Objectives:

- To introduce students to the fundamental concepts, theories, and approaches in Social Geography, emphasizing the interaction between society and geographical space.
- To explore social issues, inequalities, and problems within the context of geographical variations and spatial dynamics.

Course Outcomes:

- Define and describe Social Geography, its scope, evolution, and development in India, highlighting key approaches and theoretical frameworks.
- Analyze the concepts of society, social groups, and communities, examining their classifications, characteristics, and spatial variations.
- Evaluate the dynamics of social space, social structure, and social processes, illustrating their impact on geographical patterns and interactions.
- Examine social diversity, plurality, and social justice within different geographical contexts, assessing their implications for societal well-being.
- Discuss the influence of environmental factors on society and vice versa, exploring the reciprocal relationship between environment and social dynamics.
- Investigate social inequalities, stratifications, and geographical variations in caste, religion, and language composition across India.
- Critically analyze social problems such as poverty, juvenile delinquency, dowry system, child labor, alcoholism, drug abuse, social animosity, flood impacts, and human trafficking, considering their spatial and temporal variations.

Course Content:

Units	Course Content	No. of Classes-60 (60 hours of classes)	Credits (4+0=4)
I	**Formulation of Social Geography** • Definition of Social Geography, • Content and Scope of Social Geography • Evolution of Social Geography, • Development of Social Geography in India • Approaches to Social Geography • Society: Definition, Characteristics, Elements, Types • Social Groups: Concepts, Classifications, Characteristics • Community: Concepts, Classifications, Characteristics, Elements	15	1
II	**Concepts and themes** • Social Space, Social Structure, Social Process, • Social Organisations, Social Diversity and Plurality, • Social distance, Social Justice	15	1

	• Geography of Social Well-being, Social Pathology and Social Action • Effect of Environment on Society and Vise versa		
III	**Social Inequality, Institutions and Controls** • Social Differentiations and Social Stratifications • Geographical variations in Caste, Religion, Language Composition • Marriage System, Family System, Kinship System and their spatial variation in India • Social Controls: Meaning, Customs and Sanctions, Social Norms and Values, Conformity and Deviance	15	1
IV	**Social Problems with special reference to India** • Concept of Social Problems and social disorganisation • Spatial variation in problems relating to poverty • Juvenile Delinquency and its spatio-temporal variation • Dowry System: Prevalence and measures • Child labour: causes and consequences • Alcoholism and Drugs abuse • Strategic location and social animosity • Flood and Human Trafficking	15	1

Suggested Books:

1. Ahmad, A. (1993). Social Structure and Regional Development: A Social Geography Perspective. Jaipur: Rawat Publications.
2. Ahmad, A. (1999). *Social Geography*. Jaipur and New Delhi: Rawat Publications.
3. Carter, J and Terner, J. (1989). *Social Geography: An Introduction to Contemporary Issues*. London: Edward Arnold.
4. Carter, John and Trevor, J. (1989). *Social Geography: An Introduction to Contemporary Issues*. London: Edward Arnold.
5. Eyles, J. (1983). *Social Geography in International Perspective*. Oxford: Basil Blackwell.
6. Eyles, J. (1997). *Social Geography*. New York: The Dictonary of Human Geography.
7. Gregory, D. and Urry, J. (1985). *Social Relation and Social Structure*. London: Macmillan.
8. Hannett, C. (1996a). *Social Geography: A Reader*. London: Arnold.
9. Hannett, C. (1996b). *Social Geography*. London: Arnold.
10. Harvey, D. (1972). *Social Justice and the City*. London: Arnold.
11. Jackson, P. and Smith, S. (1984). *Exploring Social Geography*. London: George Allen and Unirn (Publishers) Ltd.
12. Jackson, P. and, & Smith, S. (1984). *Exploring social Geography*. London: George Allen and Unirn (Publishers) Ltd.
13. Jones, E. and Eyles, J. (1977). *An Introduction to Social Geography*. Oxford and New York: Oxford University Press.
14. Jones, E. (1975a). *Reading in Social Geography*. Oxford: Oxford University Press.
15. Jones, E. (1975b). *Readings in Social Geography*. London: Oxford University Press.
16. Keyness, M. (1972). *Social Geography: New Trends in Geography*. London: Open University Press.
17. Milton, K. (1973). *Social Geography: New Trends in Geography*. London: Open University Press.
18. Momsen, J. H. and Townsend, G. (1987). *Geography of Gender in the Third World*. London, New York: Hutchinson, State University of New York Press.
19. Noble, A. G. and Dutta, A. K. (n.d.-a). *India: Cultural Pattern and Processes*. Colorado: West ViewPress.
20. Noble, A. G. and Dutta, A. K. (n.d.-b). *India: Cultural Pattern and Processes*. Colorado: West View

Press.
21. Pecion, M. (1987). *Social Geography: Process and Prospect*. London: Croom Helm.
22. Sharma, H. N. (2000). *Social Geography*. (J. Singh, Ed.). New Delhi: INSA.
23. Sharma, H. N. (2001). *Social Geography: Progress in Geography*. New Delhi: INSA.
24. Smith, D. M. (1977a). *Human Geography : A Welfare Approach*. London: Edward Arnold.
25. Smith, D. M. (1979). *Where the Grass is Greener: Living in an Unequal World*. Victoria: Penguin Books Australia Ltd.
26. Sopher, D. E. (1986). An Exploration Of India: Geographical Perspectives on Society and Culture. London: Longman.
27. Sopher, D. E. (1987). An Exploration Of India: Geographical Perspectives on Society and Culture. London: Longman.
28. Sriniwas, M. N. (1986). *India: Social Structure*. Delhi: Hindustan Publishing Corporation.
29. Taher, M. (1994). *Social Geography: Concept and Theories*. Guwahati: NEIGS.

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY

Semester – VIII

Core Course

Course title: Geography of Culture (Option C)

Course Code: GEOADL402-4

Total Credits: 4 (Theory 4)

- **Course Objectives:**
- To introduce students to the foundational concepts, theories, and approaches in Cultural Geography, focusing on the interaction between culture and geographical space.
- To explore the diversity of cultures, cultural change processes, and cultural landscapes across different geographical contexts.
-
- **Course Outcomes:**
- Define and discuss the nature, scope, and development of Cultural Geography, including its approaches and theoretical foundations.
- Explain the concepts of culture, cultural traits, functions, and components, highlighting their significance in Cultural Geography.
- Analyze the evolution of Indian culture, tracing historical and contemporary changes and their geographical manifestations.
- Evaluate themes such as cultural diffusion, assimilation, interaction, cultural regions, and cultural ecology, illustrating their role in shaping cultural landscapes.
- Examine cultural lag, cultural hearths, folk culture, and the principles of behaviouralism and cultural relativism in the context of Cultural Geography.
- Investigate the components of Cultural Geography including race, spatial diffusion, and distribution of cultural traits globally and within specific regions like North East India.

Discuss the relationship between livelihood patterns and culture, exploring livelihood adaptation strategies, economic activities, and their cultural adaptations, particularly in physiographically diverse regions such as North East India.

Course Content:

Units	Course Content	No. of Classes-60 (60 hours of classes)	Credits (4+0=4)
I	**Fundamentals of Cultural Geography** • Definition, Nature and scope of cultural geography, • Approaches of Cultural Geography • Development of Cultural Geography • Concepts of Culture, its Traits, Functions and Components of Culture • Evolution of Indian culture • Cultural changes	15	1
II	**Themes and Concepts in Cultural Geography** • Cultural Diffusion and Assimilation, Cultural Interaction • Cultural Area, Cultural Region, Cultural ecology, Cultural Landscape • Cultural Lag • Cultural Hearth • Folk Culture and geography • Behaviouralism and cultural relativism	15	1

III	**Components of Cultural Geography** • Race: classification, Spatial Diffusion and distribution • Types and Pattern of World Cultural regions: Language, Religion, Ethnicity • Cultures and cultural regions in North East India in particular reference to religion • Geography of ethnic groups and tribal groups • Diffusion of ethnic traits in world as well as India	15	1
IV	• Livelihood and Culture • Concept of livelihood, Livelihood Pentagon • Livelihood adaptation strategies • Patterns of livelihood: various economic activities & cultural adaptations • Livelihood Security and Cultural Security • Association of livelihood with physiography with special reference to North east India	15	1

Suggested Books:

1. Broek, J. C. and Webb, J. W. (1978). *A Geography of Mankind*. New York: McGraw Hill.
2. Duncan, J. and Ley, D. (1992). *Place/Culture/Representation*. London: Routledge
3. Gritzer, Charion, F. (1984). The Scope of Cultural Geography', Journal of Geography. *Journal of Geography*, *65*, 4–11.
4. Jackson, Richard.H. and Hudman, L. E. (1990). *Cultural Geography*. New York: West Publishing Company.
5. Noble, A. G. and Dutt, A. K. (1982). *India: Cultural Pattern and Processes*. Colorado: West View Press / Boulder.
6. O. G. and Rowntree, L. (1998). *The Human Mosaic: A Thematic Interpretation in Cultural*
a. *Geography*. London: University of Chicago Press.
7. Thomas, W. L. (1959). *Man's Role in Changing the Face of the Earth*. Chicago: University of Chicago Press.
8. Zelinsky, W. (1973). *The Cultural Geography of America*. Princeton: Princeton University Press.
9. Yi-Fu, T. (1996). Cosmos and Hearth: A Cosmopolite's Viewpoint, University of Minnesota
10. Press.
11. Relph, E. (2022).Place and Placelessness, SAGE Publications Ltd.
12. Timothy, S. O and Patricia L. P. (2008). The Cultural Geography Reader, Routledge 270
13. Madison Avenue, New York
14. Yi-Fu, T. (2001) Space and Place: The Perspective of Experience , University of Minnesota Press.
15. Doreen, M. (2005).For Space, SAGE Publications Ltd.
16. Michel, de C. (1988). The Practice of Everyday Life, University of California Press.
17. Soja, E. W. (1996). Thirdspace: Journeys to Los Angeles and Other Real-and-Imagined Places,
18. Wiley-Blackwell
19. Duncan, J. et al (2004). A Companion to Cultural Geography, Blackwell Publishing Ltd.
20. Pile, S. and Keith, M. (2013). Geographies of Resistance, Taylor and Francis

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY
Semester – VIII
Core Course
Course title: Practical I (Option C)
Course Code: GEOADL403-4
Total Credits: 4 (Practical4)

Course Objectives:

- Explore the methodologies and tools used in settlement geography, social indicators, social change, and development measurement.
- Analyze and apply various quantitative and qualitative indicators to assess settlement patterns, social well-being, social change, and development across different geographical contexts.

Course Outcomes:

- Utilize nearest neighbor analysis, network analysis, and distance decay to analyze settlement hierarchies, organization, and patterns.
- Develop and implement survey schedules to measure dimensions of social well-being using quantitative indicators such as income, employment, health, and qualitative indicators like life satisfaction and mental health.
- Calculate and interpret measures of fertility (CBR, GFR, ASFR, TFR) and mortality (CDR, ASDR, IMR, MMR) to understand demographic dynamics.
- Apply measures of social change (relative, absolute, spatio-temporal) to analyze selected indicators and map significant geographical features like sea routes and autonomous movements.
- Construct and interpret development indices such as PQLI, HDI, and GDI to assess regional and global development disparities.

Course Content:

Units	Course Content	No. of Classes-60 (60 hours of classes)	Credits (4+0=4)
I	**Settlement Geography** • Hierarchy • Organization and pattern • Nearest Neighbor Analysis • Network analysis • Distance Decay	15	1
II	• Indicators and Measurement • Developing questions, rating and ranking Scale by using Quantitative indicators (income, employment, health statistics, education levels) and Qualitative indicators (life satisfaction, sense of community, mental health) • Designing survey schedule to measure different dimensions of social well-being • Measures of fertility: CBR, GFR, ASFR, TFR • Measures of mortality: Crude Death Rate, Age Specific Death Rate (ASDR), IMR, MMR	15	1
III	**Measures of Social change** • Change: Relative, Absolute, Spatio-Temporal (selective indicators)	15	1

	• Mapping of major sea routes around: South China Sea, Suez Canal, Panama Canal • Mapping of strategically significant areas between India and its neighbours: India- Pakistan, India-Bangladesh, India-Sri Lanka, India-China • Mapping of Geography of Autonomous Movement in India		
IV	**Measures of Development** • Construction of Development Indices • Physical Quality of Life Index (PQLI), Human development index (HDI), Gender Development Index (GDI) • Dependency Ratio: Child dependency ratio, old age dependency ratio • Classification of labor • Disparity Index, Z-Score, PCA • Measures of Aging	15	1

Suggested Books:

1. Bhende, A. A., & Kanitkar, T. (1978). *Principles of Population Studies*. Himalaya Publishing House.
2. Caldwell, J. C. (1990). What do we know about health transition: The cultural, social and behavioural determinants of health. In *The Proceedings of an International Workshop, Vol. 1 & 2*. Health Transition Centre, Australian National University.
3. Mishra, B. D. (1981). *An Introduction to the Study of Population*. South Asian Publishers, Pvt. Ltd.
4. Park, K. (2021). *Text Book of Preventive and Social Medicine* (26th ed.). Banarsidas Bhanot Publishers.
5. Ram, F., & Pathak, K. B. (1998). *Techniques of Demographic Analysis*. Himalaya Publishing House.
6. Robinson, G. M. (1998). *Methods and Techniques in Human Geography.* Chichester: John Wiley & Sons.
7. Siegel, J. S., & Swanson, D. A. (2004). *The Methods and Materials of Demography* (2nd ed., pp. 371–405, 407–428, 429–453). Elsevier Academic Press.
8. Srinivasan, K. (1998). *Basic Demographic Techniques and Applications* (pp. 59–85). Sage Publications.
9. United Nations. (1973). *Determinants and Consequences of Population Trends, Vol. 1* (pp. 96–104). UN.
10. Yeats, M. (1974). *An Introduction to Quantitative Analysis in Human Geography*. New York: McGraw, Hill.
11. United Nations (2017). Handbook on Measuring International Migration through Population Censuses. Department of Economic and Social Affairs Statistics Division
12. United Nations (). Manual VI, Methods of Measuring Internal Migration. Department of Economic and Social Affairs, Population Studies No. 47

FOUR YEAR UNDERGRADUATE COURSE IN GEOGRAPHY

Semester-VIII

Course title: Dissertation in Geography

Course code: GEOREM402-12

Total Credits: 12

(Note: GEOREM402-12 is optional in lieu of papers GEOADL401-4, GEOADL402-4 and GEOADL403-4)

A.

I. Introduction and Overview

- Objective: To guide students in conducting independent, original research culminating in a written dissertation.
- Prerequisites: Completion of core courses relevant to the dissertation topic.

II. Credit Distribution

1. Proposal Development (2 Credits)

- Objective: Formulate a clear research question/hypothesis and develop a comprehensive research proposal.
- Deliverables: - Research proposal document (approx. 3,000 words), - Oral presentation of the proposal
- Assessment: - Written proposal: 70%
- Oral presentation: 30%

2. Literature Review (2 Credits)

- Objective: Conduct a thorough review of existing literature to contextualize the research.
- Deliverables: - Literature review chapter (approx. 5,000 words)
- Assessment: - Written literature review: 100%

3. Methodology (2 Credits)

- Objective: Design and articulate the research methodology including data collection and analysis methods.
- Deliverables: - Methodology chapter (approx. 3,000 words)
- Assessment: - Written methodology chapter: 100%

4. Data Collection and Analysis (3 Credits)

- Objective: Collect and analyze data in accordance with the proposed methodology.
- Deliverables: - Data collection report, - Data analysis report (combined approx. 4,000 words)
- Assessment: - Data collection and analysis report: 100%

5. Results and Discussion (2 Credits)

- Objective**: Present findings and discuss their implications in relation to the research question.
- Deliverables: - Results and discussion chapter (approx. 5,000 words)
- Assessment: - Written results and discussion chapter: 100%

6. Conclusion and Recommendations (1 Credit)

- Objective: Summarize key findings, articulate conclusions, and make recommendations for future research.
- Deliverables: - Conclusion and recommendations chapter (approx. 2,000 words)
- Assessment: - Written conclusion and recommendations chapter: 100%

B.Overall Assessment Criteria

- Originality and Contribution to Knowledge: 30%
- Literature Review and Contextual Understanding: 20%
- Methodological Rigor: 20%
- Quality of Data Analysis : 15%
- Clarity of Presentation and Writing: 15%

C. Timeline and Milestones

- Proposal Submission : [Insert Date]
- Literature Review Submission: [Insert Date]
- Methodology Submission: [Insert Date]
- Data Collection and Analysis Submission: [Insert Date]
- Results and Discussion Submission: [Insert Date]
- Conclusion and Recommendations Submission: [Insert Date]
- Final Dissertation Submission: [Insert Date]
- Oral Defense: [Insert Date]

D. Supervision and Support

- Supervisor Meetings: Regular meetings (bi-weekly/monthly) with assigned supervisor.
- Workshops and Seminars : Attendance at research methodology workshops and seminars.
- Peer Review Sessions: Participation in peer review sessions for constructive feedback.
- Resources and References
- Library Resources: Access to university library and online databases.
- Writing and Research Guides: Recommended guides and manuals for academic writing and research.
- Policies and Ethics
- Academic Integrity: Adherence to university policies on plagiarism and academic misconduct.
- Ethical Approval: Requirement for ethical approval for research involving human subjects.