



COOCH BEHAR PANCHANAN BARMA UNIVERSITY
PANCHANAN NAGAR, VIVEKANANDA STREET, COOCH BEHAR – 736101
SUB: GEOGRAPHY | UGNCCF | Under NEP 2020 |



**STRUCTURE & DETAILED SYLLABUS FOR
FOUR-YEAR UNDERGRADUATE PROGRAM
(UGNCCF) WITH MULTIPLE EXIT OPTIONS
IN GEOGRAPHY**

Under NEP 2020

Cooch Behar Panchanan Barma University

Cooch Behar, West Bengal



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STRUCTURE & DETAILED SYLLABUS

4 Year Undergraduate Programme (UG NCCF) with Multiple Exit Options in

GEOGRAPHY

Under NEP – 2020

SEMESTERS I & II

4–Year Undergraduate Degree in Geography Programme Code: (UG–CER–GEO)

Course Structure: Geography (Certificate)

Year	Sem.	Course	Paper Code	Title of Paper	Theory (Marks)	Practical (Marks)	Internal Assessment			Total Marks	Credit	Total Credit	Level
							Project/Seminar/ Assignment (Marks)	CE (Marks)	ATT. (Marks)				
1st	I	MAJOR-1	GEO-MAJ1T	Physical Geography (Theory)	50	–	10	10	5	100	4	6	100
			GEO-MAJ1-P	Basic Cartographic Techniques and Map Reading (Practical)	–	25					2		
		MDC-1	GEO-MDC1	Fundamentals of Physical Geography (Theory)	35	–	–	10	5	50	3	3	100
	II	MAJOR-2	GEO-MAJ2T	Fundamentals of Human Geography (Theory)	50	–	10	10	5	100	4	6	100
			GEO-MAJ2-P	Elementary Instrumental Observation and Map Reading (Practical)	–	25					2		

Index: T = Theory; P = Practical; CE = Continuous Evaluation.



Semester III, IV with Minor 3 and Minor 4

4 Year Under Graduate Degree (Honours) in

-----Geography (UG-DIP-GEO) -----

Course Structure: Geography (Diploma)

Year	Sem.	Course	Paper Code	Title of Paper	Theory (Marks)	Practical (Marks)	Internal Assessment			Total Marks	Credit	Total Credit	Level
							Project/ Seminar/ Assignment (Marks)	CE (Marks)	ATT. (Marks)				
2nd	III	MAJOR-3	GEO-MAJ 3T	Hydrology and Oceanography (Theory)	50	–	10	10	5	100	4	6	200
			GEO-MAJ 3P	Hydrographic and Geological mapping (Practical)	–	25					2		
		MAJOR 4	GEO-MAJ 4T	Soil Geography and Biogeography (Theory)	50	–	10	10	5	100	4	6	200
			GEO-MAJ 4P	Soil and Biogeography Techniques and Surveying and Levelling (basic) (Practical)	–	25					2		
		MINOR 3	GEO-MIN-3T	Physical Geography (Theory)	50	–	10	10	5	100	4	6	200
			GEO-MIN-3P	Scale and Map Projection (Practical)	–	25					4		
		MDC-2	GEO-MDC 2	Fundamentals of Human Geography (Theory)	35	–	–	10	5	50	3	3	200
	IV	MAJOR-5	GEO-MAJ 5T	Settlement and Population Geography (Theory)	50	–	10	10	5	100	4	6	200
			GEO-MAJ 5P	Settlement and Population Geography (Practical)	–	25					2		
		MAJOR-6	GEO-MAJ 6T	Economic and Industrial Geography (Theory)	50	–	10	10	5	100	4	6	200
			GEO-MAJ 6P	Economic and Industrial Geography (Practical)	–	25					2		
		MINOR 4	GEO-MIN-4T	Economic and Human Geography (Theory)	50	–	10	10	5	100	4	6	200
			GEO-MIN-4 P	Topographical Map and Weather Map (Practical)	–	25					2		



Semester: V and VI

4 Year Under Graduate Degree (Honours) in

-----Geography (UG- Degree-GEO) -----Course Structure: Geography (3-Year Degree)

Year	Sem.	Course	Paper Code	Title of Paper	Theory (Marks)	Practical (Marks)	Internal Assessment			Total Marks	Credit	Total Credit	Level
							Project/ Seminar/ Assignment (Marks)	CE (Marks)	ATT. (Marks)				
3RD	V	MAJOR-7	GEO-MAJ 7T	Geography of India and West Bengal	50	–	10	10	5	100	4	6	300
			GEO-MAJ 7P	Geography of India and Statistical Methods in Geography	–	25					2		
		MAJOR 8	GEO-MAJ 8T	Geographical Thought	50	–	10	10	5	100	4	6	300
			GEO-MAJ 8P	Statistical Methods in Geography (Inferential) and Identification of Rocks and Minerals	–	25					2		
		MAJOR 9	GEO-MAJ 9T	Regional Planning and Transport Geography	50	–	10	10	5	100	4	6	300
			GEO-MAJ 9P	Regional Planning and Transport Geography	–	25					2		
		MDC-3	GEO-MDC 3	Fundamentals of Economic Geography (Theory)	35	–	–	10	5	50	3	3	300
	VI	MAJOR-10	GEO-MAJ 10T	Development Geography and Regional Geography of North Bengal	50	–	10	10	5	100	4	6	300
			GEO-MAJ 10P	Map Projection and Inferential Statistics (Advanced)	–	25					2		
		MAJOR-11	GEO-MAJ 11T	Political Geography and Geography of Sustainability	50	–	10	10	5	100	4	6	300
			GEO-MAJ 11P	Advanced Surveying and Computer Application	–	25					2		
		MAJOR 12	GEO-MAJ 12T	Environmental Geography	50	–	10	10	5	100	4	6	300
			GEO-MAJ 12P	Field Report	–	25					2		



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Paper Code (UG-Geo) NEP

Programme Name	Year	Semester	Course	Title of Paper	Paper Code
4-Year Undergraduate Degree (Honours) in Geography	1st Year (Certificate)	1st Semester	Major 1	Physical Geography (Theory)	GEO-MAJ-1T
				Basic Cartographic Techniques and Map Reading (Practical)	GEO-MAJ-1P
			MDC 1	Fundamentals of Physical Geography (Theory)	GEO-MDC1
		2nd Semester	Major 2	Fundamentals of Human Geography (Theory)	GEO-MAJ-2T
				Elementary Instrumental Observation and Map Reading (Practical)	GEO-MAJ-2P
	2nd Year (Diploma)	3rd Semester	Major 3	Hydrology and Oceanography (Theory)	GEO-MAJ-3T
				Hydrographic and Geological mapping (Practical)	GEO-MAJ-3P
			Major 4	Soil Geography and Biogeography	GEO-MAJ-4T
				Soil and Biogeography Techniques and Surveying and Levelling (basic) (Practical)	GEO-MAJ-4P
			Minor 3	Physical Geography (Theory)	GEO-MIN-3T
				Scale and Map Projection (Practical)	GEO-MIN-3P
			MDC 2	Fundamentals of Human Geography (Theoretical)	GEO-MDC2
		4th Semester	Major 5	Settlement and Population Geography (Theory)	GEO-MAJ-5T
				Settlement and Population Geography (Practical)	GEO-MAJ-5P
			Major 6	Economic and Industrial Geography (Theory)	GEO-MAJ-6T
				Economic and Industrial Geography (Practical)	GEO-MAJ-6P
			Minor 4	Economic and Human Geography (Theory)	GEO-MIN-4T
				Topographical Map and Weather Map (Practical)	GEO-MIN-4P
			Major 7	Geography of India and West Bengal (Theory)	GEO-MAJ 7T
				Geography of India and Statistical Methods in Geography (Practical)	GEO-MAJ 7P



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Programme Name	Year	Semester	Course	Title of Paper	Paper Code
	3 rd Year (Degree)	5th Semester	Major 8	Geographical Thought (Theory)	GEO-MAJ 8T
				Statistical Methods in Geography (Inferential) and Identification of Rocks and Minerals (Practical)	GEO-MAJ 8P
			Major 9	Regional Planning and Transport Geography (Theory)	GEO-MAJ 9T
				Regional Planning and Transport Geography (Practical)	GEO-MAJ 9P
			MDC 3	Fundamentals of Economic Geography (Theory)	GEO-MDC3
		6th Semester	Major 10	Development Geography and Regional Geography of North Bengal (Theory)	GEO-MAJ 10T
				Map Projection and Inferential Statistics (Practical)	GEO-MAJ 10P
			Major 11	Political Geography and Geography of Sustainability (Theory)	GEO-MAJ 11T
				Advanced Surveying and Computer Application (Practical)	GEO-MAJ 11P
			Major 12	Environmental Geography (Theory)	GEO-MAJ 12T
				Field Report (Practical)	GEO-MAJ 12P



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SUB: GEOGRAPHY | UGNCCF | Under NEP 2020 |

SUBJECT: GEOGRAPHY (4 YEAR UG COURSE UNDER NCCF)

4 YEAR UNDER GRADUATE DEGREE (HONOURS / HONOURS WITH RESEARCH) IN GEOGRAPHY

Course Structure: Geography: Fourth Year, Semester VII, Session-2026-2027

Year	Sem.	Course	Paper Code	Title of Paper	End-Semester Examination		Internal Assessment			Total Marks	Credit	Total Credit	Level
					Theory (Marks)	Practical/ Dissertation	Project/ Seminar/ Assignment	CE	Attendance				
4th	VII	Major 13	GEO-MAJ-13T	Research Methodology and Ethics (Theoretical)	50	–	10	10	5	100	4	6	400
			GEO-MAJ-13P	Research Methodology and Ethics (Practical)	–	25					2		
		Major 14	GEO-MAJ-14T (ELEC 1A)	Cartography-1 (Theoretical)	50	–	10	10	5	100	4	6	400
			GEO-MAJ-14P (ELEC 1A)	Cartography-1 (Practical)	–	25					2		
		Major 14	GEO-MAJ-14T (ELEC 1B)	Fluvial Geomorphology-1 (Theoretical)	50	–	10	10	5	100	4	6	400
			GEO-MAJ-14P (ELEC 1B)	Fluvial Geomorphology-1 (Practical)	–	25					2		
		Major 14	GEO-MAJ-14T (ELEC 1C)	Population Geography-1 (Theoretical)	50	–	10	10	5	100	4	6	400
			GEO-MAJ-14P (ELEC 1C)	Population Geography-1 (Practical)	–	25					2		
		Major 14	GEO-MAJ-14T (ELEC 1D)	Urban Geography –1 (Theoretical)	50	–	10	10	5	100	4	6	400
			GEO-MAJ-14P (ELEC 1D)	Urban Geography –1 (Practical)	–	25					2		
		Major 15	GEO-MAJ-15T (SEMINAR)	Indian Knowledge System and Applied Geography (Theoretical Seminar)	50	–	10	10	5	100	4	6	400
			GEO-MAJ-15P (SEMINAR)	Indian Knowledge System and Applied Geography (Practical Seminar)	–	25					2		
		Major 16	GEO-MAJ-16 (D)	Dissertation-1: Progress Report (Honours with Research)	–	50+25=75	10	10	5	100	6	6	400
		Major 16	GEO-MAJ-16 (T)	Welfare and Gender Geography (Theoretical) – Honours without Research	50	–	10	10	5	100	4	6	400
			GEO-MAJ-16 (P)	Welfare and Gender Geography (Practical) – Honours without Research	–	25					2		

Note 1: Students shall select one elective theory-practical pair under Major Course 14. **Note 2:** Major Course 16 shall have two options of equal credit: students pursuing **Honours with Research** shall opt for the **Dissertation**, while students pursuing **Honours without Research** shall opt for the corresponding **General Paper**.

Index: T = Theory; P = Practical; D1 = Dissertation; CE = Continuous Evaluation



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SUB: GEOGRAPHY | UGNCCF | Under NEP 2020 |

SUBJECT: GEOGRAPHY (4 YEAR UG COURSE UNDER NCCF)

4 YEAR UNDER GRADUATE DEGREE (HONOURS / HONOURS WITH RESEARCH) IN GEOGRAPHY

Course Structure: Geography: Fourth Year, Semester VIII, Session-2026-2027

Year	Sem.	Course	Paper Code	Title of Paper	End-Semester Examination		Internal Assessment			Total Marks	Credit	Total Credit	Level
					Theory (Marks)	Practical/ Dissertation	Project/ Seminar/ Assignment	CE	Attendance				
4th	VIII	Major 17	GEO-MAJ-17T	Remote Sensing, GIS and GNSS (Theoretical)	50	–	10	10	5	100	4	6	400
			GEO-MAJ-17P	Remote Sensing, GIS and GNSS (Practical)	–	25					2		
		Major 18	GEO-MAJ-18T (ELEC 2A)	Cartography-2 (Theoretical)	50	–	10	10	5	100	4	6	400
			GEO-MAJ-18P (ELEC 2A)	Cartography-2 (Practical)	–	25					2		
		Major 18	GEO-MAJ-18T (ELEC 2B)	Fluvial Geomorphology-2 (Theoretical)	50	–	10	10	5	100	4	6	400
			GEO-MAJ-18P (ELEC 2B)	Fluvial Geomorphology-2 (Practical)	–	25					2		
		Major 18	GEO-MAJ-18T (ELEC 2C)	Population Geography-2 (Theoretical)	50	–	10	10	5	100	4	6	400
			GEO-MAJ-18P (ELEC 2C)	Population Geography-2 (Practical)	–	25					2		
		Major 18	GEO-MAJ-18T (ELEC 2D)	Urban Geography -2 (Theoretical)	50	–	10	10	5	100	4	6	400
			GEO-MAJ-18P (ELEC 2D)	Urban Geography -2 (Practical)	–	25					2		
		Major 19	GEO-MAJ-19 (D)	Dissertation-2: Final Submission (Honours with Research)	–	(50+25)	10	10	5	100	6	6	400
		Major 19	GEO-MAJ-19 (T)	Geography of Rural Development (Theoretical) – Honours without Research	50	–	10	10	5	100	4	6	400
			GEO-MAJ-19 (D2)	Geography of Rural Development (Practical) – Honours without Research	–	25					2		
		Minor 6	GEO-MIN 6 (T)	Geography of India and North Bengal (Theoretical)	50	–	10	10	5	100	4	6	300
			GEO-MIN 6 (P)	Geography of India and North Bengal Project Report (Practical)	–	25					2		

Note 1: Students shall select one elective theory-practical pair under Major Course 18. **Note 2:** Major Course 19 shall have two options of equal credit: students pursuing **Honours with Research** shall opt for the **Dissertation**, while students pursuing **Honours without Research** shall opt for the corresponding **General Paper**.

Index: T = Theory; P = Practical; D1 = Dissertation; CE = Continuous Evaluation



SUBJECT: GEOGRAPHY (4 YEAR UG COURSE UNDER NCCF)
PAPER CODE (UG-GEOGRAPHY), NEP/NCCF (2026-2027)

Fourth Year Course Structure: Semester–VII

Fourth Year Course Structure: Semester VII

Programme Name	Year	Semester	Course	Title of Paper	Programme Code	Paper Code
4-Year Undergraduate Degree (Honours/Honours with Research) in Geography	4th Year	VII Semester	Major 13	Research Methodology and Ethics (Theoretical)	UG-HWR-GEO / UG-HON-GEO	GEO-MAJ-13T
			Major 13	Research Methodology and Ethics (Practical)	UG-HWR-GEO / UG-HON-GEO	GEO-MAJ-13P
			Major 14	Cartography–1 (Theoretical)	UG-HWR-GEO / UG-HON-GEO	GEO-MAJ-14T (ELEC 1A)
			Major 14	Cartography–1 (Practical)	UG-HWR-GEO / UG-HON-GEO	GEO-MAJ-14P (ELEC 1A)
			Major 14	Fluvial Geomorphology–1 (Theoretical)	UG-HWR-GEO / UG-HON-GEO	GEO-MAJ-14T (ELEC 1B)
			Major 14	Fluvial Geomorphology–1 (Practical)	UG-HWR-GEO / UG-HON-GEO	GEO-MAJ-14P (ELEC 1B)
			Major 14	Population Geography–1 (Theoretical)	UG-HWR-GEO / UG-HON-GEO	GEO-MAJ-14T (ELEC 1C)
			Major 14	Population Geography–1 (Practical)	UG-HWR-GEO / UG-HON-GEO	GEO-MAJ-14P (ELEC 1C)
			Major 14	Urban Geography–1 (Theoretical)	UG-HWR-GEO / UG-HON-GEO	GEO-MAJ-14T (ELEC 1D)
			Major 14	Urban Geography–1 (Practical)	UG-HWR-GEO / UG-HON-GEO	GEO-MAJ-14P (ELEC 1D)
			Major 15	Indian Knowledge System and Applied Geography (Theoretical/Seminar)	UG-HWR-GEO / UG-HON-GEO	GEO-MAJ-15T (SEMINAR)
			Major 15	Indian Knowledge System and Applied Geography (Practical/Seminar)	UG-HWR-GEO / UG-HON-GEO	GEO-MAJ-15P (SEMINAR)
			Major 16	Dissertation–1: Progress Report (Honours with Research)	UG-HWR-GEO	GEO-MAJ-16 (D1)
			Major 16	Welfare and Gender Geography (Theoretical)—Honours without Research	UG-HON-GEO	GEO-MAJ-16 (T)
			Major 16	Welfare and Gender Geography (Practical)—Honours without Research	UG-HON-GEO	GEO-MAJ-16 (P)

Note 1: Students shall select one elective theory–practical pair under Major Course 14

Note 2: Major Course 16 shall have two options of equal credit: students pursuing **Honours with Research** shall opt for the **Dissertation**, while students pursuing **Honours without Research** shall opt for the corresponding **General Paper**.



Fourth Year Course Structure: Semester-VIII

Programme	Year	Semester	Course	Title of Paper	Programme Code	Paper Code
4-Year Undergraduate Degree (Honours/ Honours with Research) in Geography	4th Year	VIII Semester	Major 17	Remote Sensing, GIS and GNSS (Theoretical)	UG-HWR-GEO/ UG-HON-GEO	GEO-MAJ-17T
				Remote Sensing, GIS and GNSS (Practical)	UG-HWR-GEO/ UG-HON-GEO	GEO-MAJ-17P
			Major 18	Cartography-2 (Theoretical)	UG-HWR-GEO/ UG-HON-GEO	GEO-MAJ-18T (ELEC 2A)
				Cartography-2 (Practical)	UG-HWR-GEO/ UG-HON-GEO	GEO-MAJ-18P (ELEC 2A)
				Fluvial Geomorphology-1 (Theoretical)	UG-HWR-GEO/ UG-HON-GEO	GEO-MAJ-18T (ELEC 2B)
				Fluvial Geomorphology-1 (Practical)	UG-HWR-GEO/ UG-HON-GEO	GEO-MAJ-18P (ELEC 2B)
				Population Geography-1 (Theoretical)	UG-HWR-GEO/ UG-HON-GEO	GEO-MAJ-18T (ELEC 2C)
				Population Geography-1 (Practical)	UG-HWR-GEO/ UG-HON-GEO	GEO-MAJ-18P (ELEC 2C)
				Urban Geography -1 (Theoretical)	UG-HWR-GEO/ UG-HON-GEO	GEO-MAJ-18T (ELEC 2D)
				Urban Geography -1 (Practical)	UG-HWR-GEO/ UG-HON-GEO	GEO-MAJ-18P (ELEC 2D)
			Major 19	Dissertation-2: Final Submission (Honours with Research)	UG-HWR-GEO	GEO-MAJ-19 (D2)
				Geography of Rural Development (Theoretical) – Honours without Research	UG-HON-GEO	GEO-MAJ-19 (T)
				Geography of Rural Development (Theoretical) – Honours without Research	UG-HON-GEO	GEO-MAJ-19 (P)
			Minor-6	Geography of India and North Bengal (Theoretical)	UG-GEO-MIN	GEO-Min-4 (T)
			Minor 6	Geography of India and North Bengal [Project Report (Practical)]	UG-GEO-MIN	GEO-Min-6 (P)

Note 1: Students shall select one elective theory-practical pair under Major Course 18.

Note 2: Major Course 19 shall have two options of equal credit: students pursuing **Honours with Research** shall opt for the **Dissertation**, while students pursuing **Honours without Research** shall opt for the corresponding **General Paper**.



Course: Major 1

Semester-I

Paper Name: Physical Geography (Theoretical)

Programme Code: UG-CIR-GEO

Course Code: GEO-MAJ-1T

Full Marks-50

Time-2:30 hrs.

Programme Objectives:

The objectives of this course are to:

- Introduce the nature, scope and interdisciplinary foundations of Physical Geography.
- Explain the major ideas concerning the origin of continents and ocean basins.
- Develop understanding of plate tectonics, isostasy and sea-floor spreading.
- Familiarise students with geological time and the evolution of landforms and life.
- Introduce fundamental geomorphological processes and structurally controlled landforms.
- Explain major atmospheric processes, circulation systems, monsoon and climate change.

Programme Outcomes:

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

- Explain the scope and major branches of Physical Geography.
- Compare key theories of continental and ocean-basin evolution.
- Interpret the role of tectonics and isostatic adjustment in landscape development.
- Relate major geological periods to the evolution of landforms and life.
- Analyse drainage and landform development under different geological structures and climates.
- Explain temperature, pressure, winds, precipitation, monsoon mechanisms and climate change.

UNIT-I	Concept of Physical Geography	Marks: 15	Contact Hours: 20
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- 1.1. Definition, nature and scope of Physical Geography and its relationship with other disciplines.
- 1.2. Origin of continents and ocean basins: Convection Current Theory, Plate Tectonics, Isostasy and Sea-Floor Spreading.
- 1.3. Geological Time Scale and the evolution of landforms and life during different geological periods.

UNIT-II	Geomorphology	Marks: 15	Contact Hours: 20
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- 2.1. Fundamental concepts in Geomorphology.
- 2.2. Drainage development and evolution of landforms in horizontal, uniclinal, folded, faulted and domal structures.
- 2.3. Morphogenetic regions under different climatic regimes.

UNIT-III	Climatology	Marks: 20	Contact Hours: 20
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- 3.1. Winds and general circulation: Tri-cellular Model, Jet Stream, ENSO, El Niño, La Niña and Walker Circulation.
- 3.2. Precipitation: formation and types; theories of the origin of the monsoon and its features; climate change – concept, evidence, causes and consequences.

Note: The marks and contact hours for each unit are shown in the unit heading.

*** CE:** Written assignment/class test

Suggested Readings

1. Barry, R. G., & Chorley, R. J. (1998). Atmosphere, weather and climate. Routledge.
2. Bryant, H. R. (2001). Physical geography made simple. Rupa & Co.
3. Bunnett, R. B. (2003). Physical geography in diagrams (4th GCSE ed.). Pearson Education.



4. Garrison, T. (1998). Oceanography. Wadsworth.
5. Lake, P. (1979). Physical geography. Cambridge University Press.
6. Monkhouse, F. J. (1979). Physical geography. Methuen.
7. Singh, S. (2003). Physical geography. Prayag Pustak Bhawan.
8. Strahler, A. N., & Strahler, A. M. (1992). Modern physical geography. John Wiley & Sons.
9. Thornbury, W. D. (1954). Principles of geomorphology. John Wiley & Sons.
10. Wooldridge, S. W., & Morgan, R. S. (1959). The physical basis of geography: An outline of geomorphology. Longman.



Course: Major 1

Semester-I

Paper Name: Basic Cartographic Techniques and Map Reading (Practical)

Programme Code: UG-CIR-GEO

Course Code: GEO-MAJ-1P

Full Marks-25

Time-3:00 hrs.

Programme Objectives:

The objectives of this course are to:

- Introduce the basic principles and language of Cartography.
- Develop skills in scale conversion and graphical scale construction.
- Familiarise students with the Survey of India topographical map system.
- Train students to prepare relief profiles and identify drainage characteristics.
- Introduce elementary morphometric techniques from topographical maps.
- Develop integrated interpretation of physical and cultural features.

Programme Outcomes:

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

- Explain the meaning, importance and types of map scale.
- Convert scales and construct comparative, diagonal and vernier scales.
- Classify and interpret Survey of India topographical maps.
- Prepare representative, serial, superimposed, projected and composite profiles.
- Calculate selected morphometric indices from a topographical-map extract.
- Prepare a transect chart showing relationships between physical and cultural features.

UNIT-I	Scale	Marks: 10	Contact Hours: 20
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- 1.1. Scale:** meaning, importance and types; conversion of scale.
- 1.2.** Graphical construction of comparative, diagonal and vernier scales.

UNIT-II	Analysis and Interpretation of S.O.I. Maps	Marks: 15	Contact Hours: 40
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- 2.1.** Indian topographical map system: classification and types.
- 2.2.** Broad physiographic divisions based on break of slope, with a representative profile.
- 2.3.** Serial profiles; superimposed, projected and composite profiles.
- 2.4.** Identification of drainage patterns and drainage characteristics.
- 2.5. Morphometric techniques:** Relative Relief (Smith), Average Slope (Wentworth), Drainage Density (Horton).
- 2.6.** Identification of settlement patterns and calculation of settlement frequency.
- 2.7.** Transect chart showing the relationship between physical and cultural features.

Note: A 10 cm × 10 cm area shall be selected from the topographical sheet for morphometric analysis.

*CE: LNB

Suggested Readings

- Monkhouse, F. J., & Wilkinson, H. R. (1985). Maps and diagrams. Methuen.
- Raisz, E. (1962). General cartography. John Wiley & Sons.
- Robinson, A. H., et al. (2010). Elements of cartography (6th ed.). Wiley India.



4. Saha, P. K., & Basu, P. (2014). Advanced practical geography. Books and Allied.
5. Sarkar, A. (2015). Practical geography: A systematic approach. Orient BlackSwan.
6. Singh, L. R. (2006). Fundamentals of practical geography. Sharda Pustak Bhawan.
7. Singh, R. L., & Singh, R. P. B. (1993). Elements of practical geography. Kalyani Publishers.



Course: Major 2

Semester-II

Paper Name: Fundamentals of Human Geography (Theoretical)

Programme Code: UG-CIR-GEO

Course Code: GEO-MAJ-2T

Full Marks-50

Time-2:30 hrs

Programme Objectives:

The objectives of this course are to:

- Introduce the meaning, nature, scope and development of Human Geography.
- Explain major approaches to human-environment relationships.
- Examine human adaptation in contrasting climatic regions.
- Introduce major concepts and methods of Social Geography.
- Explain race and linguistic diversity with reference to the world and India.
- Develop understanding of culture, ethnicity, tribes and cultural diffusion.

Programme Outcomes:

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

- Explain the scope and principal approaches of Human Geography.
- Analyse forms of human adaptation in different climatic environments.
- Interpret the concepts of social space, social distance and social well-being.
- Explain major racial classifications and linguistic groups.
- Identify cultural traits, hearths, realms and processes of cultural diffusion.
- Describe the distribution and characteristics of selected tribal communities of India.

UNIT-I Introduction to Human Geography | Marks: 20 | Contact Hours: 20

1.1. Definition, nature and scope of Human Geography; relationship with other disciplines; approaches to Human Geography with special reference to the human-environment relationship and the humanistic approach.

1.2. Human adaptations in different climatic regions: Pygmy, Maasai, Bedouin, Kirghiz and Inuit (Eskimo).

UNIT-II Social Geography | Marks: 15 | Contact Hours: 20

2.1. Social processes, social space, social groups, social distance, social well-being and social area analysis (Shevky and Bell).

2.2. Concept of race; classification of the major races of the world, with special reference to India (Risley and B. S. Guha); major linguistic groups of the world.

UNIT-III Cultural Geography | Marks: 15 | Contact Hours: 20

3.1. Concept of culture; cultural traits, cultural hearths, cultural realms and cultural diffusion.

3.2. Concepts of ethnicity and tribe; distribution and characteristics of the Oraon, Gond, Santhal, Jarawa and Khasi communities.

Note: The marks and contact hours for each unit are shown in the unit heading.

* CE: Written assignment/class test based on the prescribed units, as per University norms.

Suggested Readings

- De Blij, H. J. Human geography: Culture, society and space. John Wiley & Sons.



2. Haggett, P. (2004). Geography: A modern synthesis. Harper & Row.
3. Husain, M. (2021). Human geography. Rawat Publications.
4. Hussain, M. (1994). Human geography. Rawat Publications.
5. Kaushik, S. D., & Sharma, A. K. (1996). Principles of human geography. Rastogi Publications.
6. Maurya, S. D. (2016). Cultural geography. Sharda Pustak Bhawan.
7. Maurya, S. D. (2018). Human geography. Pravalika Publications.
8. Norton, W. (1995). Human geography. Oxford University Press.
9. Patra, P., et al. (2020). Perspectives in human geography. Concept Publishing Company.
10. Rubenstein, J. M. (2012). Contemporary human geography. Prentice Hall of India.
11. Saxena, H. M. (2018). Economic geography (2nd ed.). Rawat Publications.
12. Singh, L. R. (2018). Fundamentals of human geography. Sharda Pustak Bhawan.



Course: Major 2

Semester-II

Paper Name: Elementary Instrumental Observation and Map Reading (Practical)

Programme Code: UG-CIR-GEO

Course Code: GEO-MAJ-2P

Full Marks-25

Time-3:00 hrs

Programme Objectives:

The objectives of this course are to:

- Introduce the functions and uses of basic meteorological instruments.
- Develop skills in observing and recording elementary weather data.
- Introduce instruments used in geomorphological and geological field measurement.
- Develop competence in measuring slope, height, depth, dip and strike.
- Familiarise students with the instruments used to measure river flow.
- Train students to represent and interpret climatic data graphically.

Programme Outcomes:

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

- Identify and explain the working principles of common meteorological instruments.
- Record temperature, pressure, rainfall and wind observations.
- Use a clinometer, Brunton compass and Abney level for elementary field measurements.
- Explain the use of a water-current meter, unit hydrograph and rotameter.
- Construct composite climographs, Taylor's climograph and Taylor's hythergraph.
- Interpret instrument observations and climatic graphs in geographical analysis.

UNIT-I Meteorological Instruments | Marks: 5 | Contact Hours: 20

1.1. Reading and use of the barometer; maximum-minimum thermometer; dry- and wet-bulb thermometer; rain gauge; and anemometer.

UNIT-II Geomorphological Instruments | Marks: 10 | Contact Hours: 20

- 2.1. Measurement of height and depth by clinometer.
- 2.2. Measurement of dip and strike of a bedding plane by Brunton compass.
- 2.3. Measurement of slope by Abney level.
- 2.4. Measurement and representation of river flow by water-current meter, unit hydrograph and rotameter.

UNIT-III Representation of Climatic Data | Marks: 10 | Contact Hours: 20

3.1. Construction and interpretation of a composite climograph, Taylor's climograph and Taylor's hythergraph.

* CE: LNB

Suggested Readings

1. Monkhouse, F. J., & Wilkinson, H. R. (1985). Maps and diagrams. Methuen.
2. Raisz, E. (1962). General cartography. John Wiley & Sons.
3. Saha, P. K., & Basu, P. (2014). Advanced practical geography. Books and Allied.
4. Sarkar, A. (2015). Practical geography: A systematic approach. Orient BlackSwan.
5. Sharma, J. P. (2001). Prayogik bhoogol. Rastogi Publications.
6. Singh, R. L., & Singh, R. P. B. (2012). Elements of practical geography. Kalyani Publishers.
7. Singh, L. R. (2006). Fundamentals of practical geography. Sharda Pustak Bhawan.
8. Singh, R. L., & Singh, R. P. B. (1993). Elements of practical geography. Kalyani Publisher



Course: MDC 1

Semester-I

Paper Name: Fundamentals of Physical Geography (Theory and Project)

Programme Code: UG-CIR-GEO

Course Code: GEO-MDC-1

Full Marks-35 + 15 (Project)

Time-2:00 hrs

Programme Objectives:

The objectives of this course are to:

- Introduce the internal structure and major materials of the Earth.
- Explain earthquakes, seismic zones, tsunamis and major relief features.
- Introduce exogenic processes and the landforms they produce.
- Develop understanding of hydrology, the water cycle and groundwater dynamics.
- Explain the biosphere, ecosystems, energy flow and biodiversity.
- Develop observation and project-reporting skills through a local landform study.

Programme Outcomes:

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

- Describe the internal structure of the Earth and classify major rock types.
- Explain the causes and effects of earthquakes and tsunamis.
- Identify major relief features and landforms produced by exogenic agents.
- Explain runoff, infiltration, evapotranspiration and groundwater movement.
- Interpret ecosystem structure, trophic levels, food webs, energy flow and biodiversity.
- Conduct a basic local landform observation and prepare a concise project report.

UNIT-I Geomorphology | Marks: 10 | Contact Hours: 10

- 1.1. Internal structure of the Earth; rocks – characteristics and types.
- 1.2. Earthquakes: types, causes and effects; major seismic zones and tsunamis.
- 1.3. Major relief features: plains, plateaus and mountains.
- 1.4. Exogenic agents and resultant fluvial, arid, glacial and coastal landforms.

UNIT-II Hydrology | Marks: 10 | Contact Hours: 10

- 2.1. Concept of hydrology: surface runoff, porosity and permeability, infiltration, evaporation and evapotranspiration.
- 2.2. Global hydrological cycle.
- 2.3. Groundwater movement and storage.

UNIT-III Biogeography | Marks: 15 | Contact Hours: 10

- 3.1. Biosphere: concept and components.
- 3.2. Ecosystem: concept, types and components.
- 3.3. Trophic levels, food chains and food webs; energy flow in ecosystems; biodiversity.

UNIT-IV Project | Marks: 15 | Contact Hours: 10

- 4.1. Visit a local area to study landforms and prepare a project report based on field observation. The report shall not exceed 30 pages and should include an introduction, objectives, brief description and findings.



Note: Unit IV is the internal project component. Attendance carries 5 marks; total marks for the course are 50.

*** CE: Assessment of the local landform project report, as per University norms.**

Suggested Readings

1. Bryant, H. R. (2001). Physical geography made simple. Rupa & Co.
2. Lake, P. (1979). Physical geography. Cambridge University Press.
3. Monkhouse, F. J. (1979). Physical geography. Methuen.
4. Singh, S. (2003). Physical geography. Prayag Pustak Bhawan.
5. Strahler, A. N., & Strahler, A. M. (1992). Modern physical geography. John Wiley & Sons.
6. Thornbury, W. D. (1954). Principles of geomorphology. John Wiley & Sons.
7. Wooldridge, S. W., & Morgan, R. S. (1959). The physical basis of geography: An outline of geomorphology



Course: Major 3

Semester-III

Paper Name: Hydrology and Oceanography (Theory)

Course Code: GEO-MAJ-3T

Full Marks-50

Time-2:30 hrs

Programme Objectives:

The objectives of this course are to:

- To understand hydrology's systems approach and the global hydrological cycle.
- To differentiate runoff types, factors, and measurement methods.
- To grasp evaporation, evapotranspiration, and their measurement.
- To learn about artificial rainmaking principles and water harvesting.
- To define oceanography, explore oceanic features, and understand movements and phenomena.
- To study ocean temperature, salinity, sea level change, and coral reefs.
- To classify marine resources and address ocean pollution issues.

Programme Outcome:

Upon completion of this course, students will be able to

- Demonstrate a comprehensive understanding of hydrology and oceanography principles.
- Apply various methods to measure runoff, evapotranspiration, and groundwater occurrence.
- Implement techniques for artificial rainmaking and water harvesting.
- Analyze oceanic features, movements, and phenomena.
- Assess marine resources and propose solutions to ocean pollution issues.

Unit I

Hydrology

Marks: 20

- 1.1. Hydrology: Definition, Nature and Scope (5)
- 1.2. System approach in hydrology and Global hydrological cycle (5)
- 1.3. Runoff: Types, controlling factors and Runoff cycle. (5)
- 1.4. Evaporation and Evapotranspiration: Concept, Factors, and Measurement. (5)
- 1.5. Groundwater: Occurrence and storage. Factors controlling groundwater recharge, discharge, and movement. (5)
- 1.6. Concept of Rain Water Harvesting. (5)

Unit II

Oceanography

Marks: 30

- 2.1. Oceanography: Definition, Nature and Scope. (5)
- 2.2. Oceanic Movements: Currents (Atlantic, Pacific and Indian Ocean). (5)
- 2.3. Ocean temperature and salinity: Distribution and determinants; T-S Diagram. (5)
- 2.4. Sea level change: Types, causes, and implications. (5)
- 2.5. Coral Reefs: Types and Theories of Origin; Coral Bleaching. (5)
- 2.6. Marine resources: Classification and sustainable utilization. (5)

30 marks

Note: Value in the parenthesis indicates contact hours per semester

CE= Class Test



Suggested Readings

1. Dingman, S. L. (2015). Physical hydrology (3rd ed.). Macmillan Publishing Co.
2. Garrison, T. (1998). Oceanography. Wordsworth Company.
3. Garrison, T., & Ellis, R. (2021). Oceanography: An invitation to marine science (10th ed.). Cengage Learning.
4. Karanth, K. R. (1988). Groundwater: Exploration, assessment and development. Tata McGraw Hill.
5. Kershaw, S. (2000). Oceanography: An Earth Science Perspective. Stanley Thornes.
6. Nicolas, R. (2020). Introducing Hydrogeology (2nd ed.). Dunedin Academic Press.
7. Pinet, P. R. (2019). Invitation to oceanography (8th ed.). Jones and Bartlett Learning.
8. Raghunath, H. M. (2006). Hydrology: Principles, analysis, design (3rd ed.). New Age International Publishers.
9. Ramaswamy, C. (1985). Review of floods in India during the past 75 years: A perspective. Indian National Science Academy.
10. Rao, K. L. (1982). India's water wealth (2nd ed.). Orient Longman.
11. Reddy, P. J. R. (2014). A textbook of hydrology. University of Science Press.
12. Singh, V. P. (1995). Environmental hydrology. Kuwar Academic Publications.
13. Subramanya, K. (2013). Engineering hydrology. McGraw Hill Education.
14. Sverdrup, K. A., & Armbrust, E. V. (2008). An introduction to the world's oceans (10th ed.). McGraw Hill.



Course: Major 3

Semester-III

Paper Name: Hydrographic and Geological Mapping (Practical)

Course Code: GEO-MAJ-3P

Full Marks-25

Time-2:30 hrs

Programme Objectives:

The objectives of this course are to:

- To interpret rating curves and hydrographs for streamflow analysis.
- To derive the phi index and W index for hydrological assessment.
- To analyze ombrothermic graphs and hyetographs.
- To interpret geological maps depicting structural features.

Programme Outcome:

Upon completion of this course, students will be able to

- Interpret rating curves and hydrographs effectively for streamflow analysis.
- Derive the phi index and W index for hydrological assessment accurately.
- Analyze ombrothermic graphs and hyetographs proficiently.
- Interpret the geological maps depicting structural features with competence.

Unit I:	Hydrographic mapping	Marks: 10
1.1.	Construction and interpretation of rating curves (10)	
1.2.	Construction and interpretation of hydrographs and unit hydrographs. (10)	
1.3.	Construction and interpretation of ombrothermic graph and hyetograph. (10)	

Unit II:	Geological mapping	Marks: 15
2.1.	Drawing of Geological sections and interpretation of geological maps with Horizontal, Uniclinal structure, folded, faulted structure and intrusions from Platt 1 and Platt -2 books (30)	15 Marks.

Note-2: Value in the parenthesis indicates contact hours per semester

CE= LNB

Suggested reading:

- Basu, P. (2021). Advanced Practical Geography — a Laboratory Manual (4th ed.). Books and Allied.
- Monkhouse, F. J., & Wilkinson, H. R. (1971). Maps and diagrams: Their compilation and construction (3rd ed.). Alphaneumera-Kolkata.
- Platt, J. I. (1951). Selected exercises upon geological maps. London: Murby (George Allen and Unwin).
- Platt, J. I. (1974). A series of elementary exercises upon geological maps. London: Murby.
- Raghunath, H. M. (2006). Hydrology: Principles, analysis, design (3rd ed.). New Age International Publishers.
- Sen, P. K. (1989). Geomorphological analysis of drainage basin: An introduction to morphometric and hydrological parameters. University of Burdwan.



Course: Major4

Semester-III

Paper Name: Soil Geography and Biogeography (Theoretical)

Course Code: GEO-MAJ-4T

Full Marks-50

Time-2:30 hrs

Programme Objectives:

The objectives of this course are to:

- To learn the fundamentals of soil science and biogeography.
- To understand the formation, properties, and classification of soil.
- To analyze soil erosion and degradation processes and management strategies.
- To explore concepts of ecosystem structure, energy flow, and biodiversity.
- To study different biomes and their ecological characteristics.
- To understand the importance of biodiversity conservation and its degradation factors.

Programme Outcome:

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

- Demonstrate proficiency in the fundamentals of soil science and biogeography.
- Analyze soil formation, properties, and classification accurately.
- Evaluate soil erosion and degradation processes and propose effective management strategies.
- Identify and describe the concepts of ecosystem structure, energy flow, and biodiversity.
- Describe the ecological characteristics of different biomes comprehensively.
- Implement measures to conserve biodiversity and address the factors contributing to its degradation effectively.

Unit I:	Soil Geography	Marks:25
1.1.	Soil Geography: Definition, Nature and Scope. (5)	
1.2.	Physical and Chemical Properties of Soil: Texture, structure, Colour and moisture; Soil Reaction (pH), organic matter. (5)	
1.3.	Origin and profile characteristics of Soil: Laterite, Podzol, and Chernozem soils. (5)	
1.4.	Principles of soil classification: Genetic (Dokuchaev, Marbut) and USDA. (5)	
1.5.	Concept of land capability and its classification. (5)	
1.6.	Soil erosion and degradation: Factors, processes and management measures. (5)	
Unit II:	Biogeography	25 Marks
2.1.	Biogeography: Definition, Nature and Scope. (5)	
2.2.	Concepts of Biosphere, Ecology, Biome, ecotone, community, Habitat, Species Structure, Ecological Niche, Homeostatic mechanism, Limiting Factor, and Dispersal of Plants. (5)	
2.3.	Ecosystem: Components, Trophic structure, Productivity and Energy flow in Ecosystem; Ecological Pyramids. (5)	
2.4.	Plant Succession: Types, Stages, Theories of Climax. (5)	
2.5.	Bio-geo-chemical cycles: Nitrogen, Oxygen and Carbon. (5)	
2.6.	Concept of Biodiversity: Definition, types, importance and its degradation and conservation. (5)	

Note: Value in the parenthesis indicates contact hours per semester



*CE= Seminar

Suggested reading

1. Buckman, H. R., & Brady, N. C. (1974). Nature and Properties of Soil. McMillan.
2. Bunting, A. (1965). Geography of Soil. Hutchinson.
3. Chapman, J. L., & Reiz, M. J. (1993). Ecology: Principles and Applications. Cambridge University Press
4. Chiras, D. D., & Reganold, J. P. (2009). Natural Resource Conservation: Management for a Sustainable Future (10th ed.). Pearson.
5. Cox, B., Moore, P. D., & Ladle, R. (2016). Biogeography: An Ecological and Evolutionary Approach (9th ed.). Wiley-Blackwell.
6. Daji, J. A., Kadam, J. R., & Patil, N. D. (1996). A Textbook of Soil Science. Media Promoters and Publishers.
7. Dash, M. C. (2001). Fundamentals of Ecology (2nd ed.). Tata McGraw-Hill.
8. De, N. K., & Ghosh, P. (1993). India: A Study in Soil Geography. Sribhumi Pub Co.
9. De, N. K., & Sarkar, M. K. (1994). MrittikaBhu-vidya. PaschimBangaRajyaPustakParshad.
10. Franzmeier, D. P., McFee, W. W., Graveel, J. G., & Kohnke, H. (2016). Soil Science Simplified (5th ed.). Waveland Press.
11. Gerrard, J. (2000). Fundamentals of Soils. Routledge.
12. Huggett, R. (1998). Fundamentals of Biogeography. Routledge.
13. Lomolino, M. V., Riddle, B. R., & Whittaker, R. J. (2016). Biogeography (5th ed.). Oxford University Press.
14. MacDonald, G. (2001). Biogeography: Introduction to Space, Time and Life. Wiley.
15. Morgan, R. P. C. (2005). Soil Erosion and Conservation (3rd ed.). Wiley-Blackwell.
16. Nebel, J. B. (1981). Environmental Science. Prentice Hall.
17. Odum, F. P. (1971). Fundamentals of Ecology. W.B. Sanders.
18. Santra, A. (2006). Handbook on Wild and Zoo Animals. International Book Distributing Co.
19. Sharma, P. D. (2011). Ecology and Environment. Rastogi Publications.
20. Shukla, R. S., & Chandel, P. S. (1930). Plant Ecology and Soil Science. S Chand.



Course: Major 4

Semester-III

**Paper Title: Soil and Biogeography Techniques and Surveying and Levelling
(Basic) (Practical)**

Course Code: GEO-MAJ-4P

Full Marks-25

Time-2:30 hrs

Programme Objectives:

The objectives of this course are to:

- To determine soil colour, pH, and NPK levels using a field kit.
- To identify soil type through ternary diagram textural plotting.
- To assess plant species diversity using the matrix method.
- To understand Field Surveying with a Prismatic Compass.
- To prepare longitudinal and cross-sectional profiles using a Dumpy Level.

Programme Outcome:

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

- Use field kits to determine soil colour, pH, and NPK levels accurately.
- Identify soil types effectively using ternary diagram textural plotting.
- Proficiently assess plant species diversity using the matrix method.
- Understand and competently apply Field Surveying techniques with a Prismatic Compass.
- Prepare longitudinal and cross-sectional profiles accurately using a Dumpy Level.

Unit I:	Soil and Biogeography Techniques	Marks: 10
1.1.	Determination of soil Colour, pH, and NPK using a field kit. (10)	
1.2.	Determination of soil type by ternary diagram textural plotting. (10)	
1.3.	Plant species diversity determination by matrix method. (10)	

Unit II:	Surveying and Levelling (basic)	Marks: 15
2.1.	Definition of basic terminologies related to Prismatic Compass Surveying and Field Survey with Prismatic Compass. (15)	
2.2.	Definition of basic terminologies related to levelling and Preparation of Longitudinal and cross-sectional profiles using Dumpy Level. (15)	

Note: Value in the parenthesis indicates contact hours per semester

* CE=LNB

Suggested reading

- Basak, N. N. (2017). Surveying & Levelling (2nd ed.) [Paperback]. McGraw Hill Education.
- Rao, P. V., & Akella, V. (2015). Textbook of Surveying [Paperback]. PHI Learning Private Limited.
- Soil Survey Investigations Report No. 51.
- Stohlgren, T.J. 2007. Measuring Plant Diversity: Lessons from the Field. Oxford University Press.
USDA: United States Department of Agriculture. 2014. Soil Survey and Laboratory Methods Manual,



5. Walters, M., Scholes, R.J. (Eds.) 2017. The GEO Handbook on Biodiversity Observation Networks, Springer International Publishing.
6. Weil, R.R. and Brady, N.C. 2022. The Nature and Properties of Soil, 15th ed, Pearson. Xiao, M. 2009. Soil Testing Laboratory Manual, Bent Tree Press.



Course: Major 5

Semester-IV

Paper Name: Settlement Geography and Population Geography (Theoretical)

Course Code: GEO-MAJ-5T

Full Marks-50

Time-2:30 hrs

Programme Objectives:

The objectives of this course are to:

- i. To define settlement geography and its scope, examining both rural and urban settlements.
- ii. To explore the evolution, patterns, and morphology of the settlements.
- iii. To analyze urban settlement concepts and models of urban morphology.
- iv. To classify towns according to various frameworks.
- v. To examine factors influencing population distribution to elucidate the Nature and scope of population geography.
- vi. To discuss theories of population growth and analyze population structure.
- vii. To address key issues in Population Geography.

Programme Outcome:

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

- i. Define settlement geography and its scope, with a focus on both rural and urban settlements.
- ii. Analyze the evolution, patterns, and morphology of settlements comprehensively.
- iii. Explore urban settlement concepts and models of urban morphology effectively.
- iv. Classify towns accurately using various frameworks.
- v. Examine factors influencing population distribution to elucidate the nature and scope of population geography.
- vi. Discuss theories of population growth and analyze population structure proficiently.
- vii. Address key issues in Population Geography competently.

Unit I: Settlement Geography.....25 Marks

- 1.1. Settlement Geography: Definition, Nature and Scope. (5)
- 1.2. Rural settlements: Site and situation, Types and patterns. (5)
- 1.3. Urban Settlements: Classification of Towns (C.D. Harris, Nelson, Lewis Mumford, Ashok Mitra). (5)
- 1.4. Morphology of Settlements: Rural and Urban (Burgess, Hoyt, and Harris & Ullman). (5)
- 1.5. Some Concepts: Primate city, Rank-size rule, Metropolis and Megalopolis, Conurbation, Satellite Town, Smart city, PURA. (5)
- 1.6. Problems of rural and urban settlements in India. (5)

Unit II: Population Geography-----25 Marks

- 2.1. Population Geography: Definition, Nature and Scope. (5)
- 2.2. Theories of Population Growth: Malthus and Marx, Demographic Transition Theory. (5)
- 2.3. Population structure and composition: Age- and sex-specific, occupational and ethnic. (5)



2.4. Fertility and Mortality: Determinants and Measures. (5)

2.5. Population Migration: Types, Determinants, Theories (Stouffer, Lee, Ravenstein, Zelinsky, Gravity model). (5)

2.6. Issues in Population Geography: Child labour, Unemployment, Ageing of Population, Human Trafficking, Population-Resource Region. (5)

Note: Value in the parenthesis indicates contact hours per semester

*** CE= Group Discussion (GD)**

Suggested reading

A) Settlement Geography

1. Banerjee Guha, S. (Ed.). (2004). Space, Society and Geography. Rawat Publication.
2. Carter, H. (1995). The Study of Urban Geography, 4th ed. Arnold.
3. Fern, R.L. (2002). Nature, God and Humanity. Cambridge University Press.
4. Fouberg, E.H., Murphy, A.B., de Blij, H.J. (2015). Human Geography: People, Place, and Culture, 11th ed. Wiley.
5. Ghosh, S. (1998). Introduction to Settlement Geography. Sangam Books Ltd.
6. Gottdiener, M., Budd, M. Lehtovuori, P. (2016). Key Concepts in Urban Studies, 2nd ed. Sage.
7. Gregory, D., Johnston, R., Pratt, G., Watts, M., Whatmore, S. (Eds). (2009). The Dictionary of Human Geography, 5th ed. Wiley.
8. Haggett, P. (1975). Geography: A Modern Synthesis. Harper and Row Publishers.
9. Hudson, F.S. (1970). Geography of Settlements. Macdonald and Evans Ltd.
10. Hussain, M. (2007). Models in Geography. Rawat Publication.
11. Mandal, R.B. (2001). Introduction to Rural Settlement, 2nd ed. Concept Publishing Company.
12. Singh, R.Y. (2000). Geography of Settlements. Rawat Publication.

B) Population Geography

1. Barrett, H.R. (1995). Population Geography. Oliver and Boyd.
2. Bhende, A.A., & Kanitkar, T. (2008). Principles of Population Studies. Himalaya Publications.
3. Chandna, R.C. (2022a). Geography of Population Part-1: Concepts, Determinants and World Patterns. Kalyani Publications.
4. Chandna, R.C. (2022b). Geography of Population Part-2: India – Population and Patterns. Kalyani Publications.
5. Clarke, J. (1972). Population Geography. Elsevier.
6. Hussain, M. (1994). Population Geography, Vol. 1 & 2. Anmol Publications.
7. Jones, H. (1990). Population Geography. SLE Pound.
8. Nag, P., & Debnath, G.C. (2021). Population Geography. Bharati Prakashan.
9. Newbold, K.B. (2017). Population Geography: Tools and Issues. Rowman and Littlefield.
10. Srivastava, O.S. (Ed) (1994). Demography and Population Studies. Vikas Pub.
11. Trewartha, G.T. (1969). A Geography of Population: World Patterns. John Wiley & Sons.
12. William, F.H. (1993). An Introduction to Population Geography. Cambridge University Press.
13. Wood, R. (1979). Population Analysis in Geography. Longman



Course: Major 5

Semester-IV

Paper Title: Settlement and Population Geography (Practical)

Course Code: GEO-MAJ-5P

Full Marks-25

Time-2:30 hrs

Programme Objectives:

The objectives of this course are to:

- Identify settlement types using Survey of India maps.
- Map accessibility using detour index from Survey of India maps.
- Conduct Nearest Neighbour Analysis using Survey of India maps.
- Represent the population density of West Bengal's districts using the Choropleth method.
- Learn how to use Dot and Sphere.
- Construct and interpret age-sex pyramids, distinguishing progressive and regressive patterns.

Programme Outcome:

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

- Identify settlement types accurately using Survey of India maps.
- Map accessibility utilizing the Detour index from Survey of India maps effectively.
- Conduct Nearest Neighbour Analysis proficiently with Survey of India maps.
- Represent the population density of Indian states and West Bengal districts using the Choropleth method competently.
- Utilize Dot and Sphere methods appropriately for population representation.
- Construct and interpret Age-Sex pyramids, accurately distinguishing between progressive and regressive patterns.

Unit I:	Practical of Settlement Geography	10 Marks
1.1.	Identification and interpretation of types of settlements according to "Site" from Survey of India 1:50k topographical maps. (10)	
1.2.	Nearest Neighbour analysis from Survey of India 1:50k topographical maps. (10)	
1.3.	Determination of Urban centres as per Indian Census criteria (1991).	
1.4.	Graphical Representation of Urban Centre Distribution According to Zipf's Rank-Size Rule (10)	

Unit II:	Practical of Population Geography	15 Marks
2.1.	Representation and interpretation of population density of Indian states and West Bengal districts using the choropleth method (Equal Step, Mean & Standard Deviation, and Nested Mean Method) and measurement of Accuracy. (10)	
2.2.	Dots and Spheres (representing rural and urban population). (5)	
2.3.	Construction and interpretation of Progressive and Regressive Age-Sex Pyramid. (7)	
2.4.	Population projection: Arithmetic and Exponential method. (8)	

Note: Value in the parenthesis indicates contact hours per semester



*CE= LNB

Suggested reading

1. Basu, P. (2021). Advanced Practical Geography — A Laboratory Manual (4th ed.). Books and Allied.
2. Census of India. (1991, 2001, 2011). Table H-3A: Census Houses by Predominant Material of the Roof (H2A).
3. Monkhouse, F.J., & Wilkinson, H.R. (1971). Maps and Diagrams, Their Compilation and Construction (3rd ed., 2017)
4. Sarkar, A. (2015). Practical Geography: A Systematic Approach. Orient Black Swan Pvt. Ltd.



Course: Major 6

Semester –IV

Paper Name: Economic and Industrial Geography (Theoretical)

Course Code: GEO-MAJ-6T

Full Marks-50

Time-2:30 hrs

Programme Objectives:

The objectives of this course are to:

- Gain an understanding of the different classifications and types of economic activities.
- Comprehend the theories and models used to explain the spatial distribution of industries.
- Analyze specific examples of industries in various countries and regions to understand their characteristics and significance

Programme Outcome:

Upon completion of this course, students will be able to

- Comprehensively understand the classifications and types of economic activities.
- Comprehend the theories and models that effectively explain the spatial distribution of industries.
- Analyze specific examples of industries in various countries and regions to understand their characteristics and significance proficiently.

Unit I: Economic Geography-----25 Marks

- 1.1. Economic Geography: Definition, Nature and Scope. (5)
- 1.2. Economy: Types and indicators. (5)
- 1.3. Classification of economic activities: Primary, Secondary, Tertiary, Quaternary, and Quinary. (5)
- 1.4. Locational theory of economic activities: Von Thünen. (5)
- 1.5. Classification of agricultural regions by Whittlesey. (5)
- 1.6. Key Concepts: Special Economic Zones (SEZ), Exclusive Economic Zones (EEZ), Export Processing Zones (EPZ), Free Trade Zones (FTZ). (5)

Unit II: Industrial Geography 25 Marks

- 2.1. Industrial Geography: Definition, Nature and Scope. (5)
- 2.2. Industrial Location Theory: Alfred Weber's Model, Profit Maximization Theory of August Losch; Geographic and Dynamic Location Theory of Allan Pred (1967); Types of Industries. (5)
- 2.3. Agro-based Industry: Cotton Textile (U.S.A, India), Paper Industry (Canada, India). (5)
- 2.4. Mineral-based Industry: Metal – Iron & Steel (Japan, India); Non-metal – Petrochemical (Middle-East Countries, India) (5)
- 2.5. Automobile Industry: (U.S.A., India). (5)
- 2.6. Industrial regionalization in India. (5)

Note: Value in the parenthesis indicates contact hours per semester

***CE = Project Report**

Students will visit any local industry, agricultural field, or MGNREGA/VB-G-RAM G project sites and note down their observations in their own words, either in English or their mother tongue, spanning 8-10 pages.



They will explain what they have learned or their understanding based on their observations. The teacher will mentor the entire process. **(This is an Internal Assessment (CE) Part (10). 10 marks**

Suggested reading

1. Anderson, W.P. (2012). Economic Geography. Routledge.
2. Aoyama, Y., Murphy, J.T., & Hanson, S. (2010). Key Concepts in Economic Geography. Sage.
3. Coe, N. M., Kelly, P.F., & Yeung, H.W. (2019). Economic Geography: A Contemporary Introduction, 3rd ed. Wiley-Blackwell.
4. Combes, P., Mayer, T., & Thisse, J.F. (2008). Economic Geography: The Integration of Regions and Nations. Princeton University Press.
5. Hamilton, I. (Ed.). (1992). Resources and Industry. Oxford University Press.
6. MacKinnon, D., & Cumbers, A. (2019). An Introduction to Economic Geography: Globalisation, Uneven Development and Place, 3rd ed. Routledge.
7. Willington, D.E. (2008). Economic Geography. Husband Press.
8. Wood, A., & Roberts, A. (2010). Economic Geography: Places, Networks and Flows. Routledge.



Course: Major 6

Semester-IV

Paper Title: Economic and Industrial Geography (Practical)

Course Code: GEO-MAJ-6P

Full Marks-25

Time-2:30 hrs

Programme Objectives:

The objectives of this course are to:

- Develop skills in creating and interpreting proportional Pie diagrams to visualize economic data.
- Understand how to construct and analyze ergographs to evaluate labour productivity patterns.
- Gain proficiency in using Nelson's functions to identify dominant and distinctive economic functions.
- Learn techniques for conducting time series analysis and interpreting industrial production trends.
- Understand the concept of Location Quotient and its application in identifying zones of industrial concentration.
- Acquire knowledge of Z-scores and their use in assessing industrial performance based on various criteria.

Programme Outcome:

Upon completion of this course, students will be able to

- Create and interpret proportional pie diagrams for economic data visualization.
- Analyze labour productivity patterns using ergographs.
- Identify economic functions using Nelson's functions.
- Conduct time series analysis of industrial production trends.
- Apply Location Quotient to identify industrial concentration zones.
- Assess industrial performance using Z-scores.

Unit I: Practical of Economic Geography.....15 Marks

- 1.1. Proportional Pie Diagrams (showing variation in occupational structure or areal coverage under different crops) (10)
- 1.2. Construction and interpretation of ergograph and Crop Calendar. (10)
- 1.3. Construction and interpretation of Nelson's Dominant and Distinctive Functions. (10) 1

Unit II: Practical of Industrial Geography 10 Marks

- 2.1. Time series analysis of industrial production of India using Semi-Average, Moving Average and Least Squares Methods. (10)
- 2.2. Zones of concentration represented by Location Quotient. (10)
- 2.3. Z-Score (single criterion and two criteria). (10)

Note: Value in the parenthesis indicates contact hours per semester

* CE= LNB

Suggested reading

1. Basu, P. (2021). Advanced Practical Geography — A Laboratory Manual (4th ed.). Books and Allied.
2. Census of India. (1991, 2001, 2011). Table H-3A: Census Houses by Predominant Material of the Roof (H2A).
3. Monkhouse, F.J., & Wilkinson, H.R. (1971). Maps and Diagrams, Their Compilation and Construction (3rd ed., 2017)
4. Sarkar, A. (2015). Practical Geography: A Systematic Approach. Orient Blackswan Pvt. Ltd



Course: Major 7

Semester-V

Paper Name: Geography of India and West Bengal (Theoretical)

Course Code: GEO-MAJ-7T

Full Marks-50

Time-2:30 hrs

Programme Objectives:

The objectives of this course are to:

- Understand India's diverse physiographic divisions, including the Himalayas and Peninsular Plateau, and associated climate, soil, and vegetation regions.
- Analyze the transformative impacts of the Green and White Revolutions on Indian agriculture alongside major industrial regions and agro-ecological zones.
- Evaluate India's mineral and power resources in the context of industrial policy and globalization, considering their implications for economic development.
- Investigate West Bengal's geographical characteristics, including physiography, climate, soil, vegetation, major industries, and SEZ development.
- Examine population dynamics, migration patterns, and tourism prospects in West Bengal.

Programme Outcome:

Upon completion of this course, students will be able to

- Understand India's diverse physiographic divisions and their implications.
- Analyze the impacts of the agricultural revolution and industrialization in India.
- Evaluate India's mineral and power resources for economic development.
- Investigate West Bengal's geographical characteristics and industrial development.
- Examine population dynamics and tourism prospects in West Bengal.

Unit I:	Geography of India	25 Marks
1.1.	Physiographic Divisions of India: Physiography of the Himalayas and Peninsular Plateau. (5)	
1.2.	Climate, Soil, and Vegetation regions. (5)	
1.3.	Green, White and Blue Revolution and their impacts. (5)	
1.4.	Agro-climatic and agro-ecological regions. (5)	
1.5.	Mineral (Iron ore and Copper) and power resources (Coal, Hydel power and Petroleum) of India; Industrial Policy. (5)	
1.6.	Geopolitical importance of India. (5)	

Unit II:	Geography of West Bengal.....25 Marks
2.1. West Bengal: Physiography, Climate, Soil, Vegetation. (5)	
2.2. Drainage system. (5)	
2.3. Major Industries. (5)	
2.4. Development of SEZs. (5)	
2.5. Population: Growth, distribution and migration. (5)	
2.6. Tourism: Problems and Prospects. (5)	

Note: Value in the parenthesis indicates contact hours per semester

*CE= MCQ Test



Suggested reading

1. Chand, M., & Puri, V.K. (2013). Regional Planning in India. Allied Publishers.
2. Chattopadhyay, A. (2020). Bharat O Paschimonger Bhugol [Geography of India and West Bengal] (Jan 2020 ed.). Nabodaya Publications.
3. Johnson, B.L.C. (Ed). (2001). Geographical Dictionary of India. Vision Books.
4. Khullar, D.R. (2011). India: A Comprehensive Geography. Kalyani Publishers.
5. Rudra, K. (2018). Rivers of the Ganga–Brahmaputra–Meghna Delta: A Fluvial Account of Bengal. Springer.
6. Sarkar, B.C. (2019). Bharoter Bhugol [Geography of India] (First Edition). Concept Publishing Company Pvt. Ltd.
7. Sharma, T.C. (2012). Economic Geography of India. Rawat Publications.
8. Singh, J. (2003). India: A Comprehensive & Systematic Geography. Gyanodaya Prakashan.
9. Singh, R.L. (1971). India: A Regional Geography. National Geographical Society of India.
10. Spate, O.H.K., & Learmonth, A.T.A. (1967). India and Pakistan: A General and Regional Geography. Methuen.
11. Tiwari, R.C. (2007). Geography of India. Prayag Pustak Bhawan.
12. Vaidyanadhan, R. (Ed). (Year). Rejuvenation of Surface Water Resources of India: Potential, Problems and Prospects. Geological Society of India Special Publication.
13. Valdiya, K.S. (2010). The Making of India: Geodynamic Evolution. Macmillan India.
14. Wadia, D.N. (1926). Geology of India. Macmillan and Co. Ltd.
15. West Bengal Pollution Control Board. (2021). State of Environment Report: West Bengal, Vol I and
II. GoWB.



Course: Major 7

Semester -V

Paper Title: Geography of India and Statistical Methods in Geography (Descriptive) (Practical)

Course Code: GEO-MAJ-7P

Full Marks-25

Time-2:30 hrs

Programme Objectives:

The objectives of this course are to:

- Interpret monthly temperature and rainfall graphs for different Indian regions.
- Calculate the mean centre of population for West Bengal across census years.
- Analyze regional disparity using Sopher's Index.
- Construct and interpret frequency distributions.
- Understand measures of central tendency such as the mean, median, and mode.
- Calculate and interpret quartiles, deciles, and percentiles.

Programme Outcome:

Upon completion of this course, students will be able to

- Interpret monthly temperature and rainfall graphs for various Indian regions effectively.
- Calculate the accurate mean centre of population for West Bengal across census years.
- Analyze regional disparities proficiently using Sopher's Index.
- Construct and interpret frequency distributions competently.
- Understand measures of central tendency, such as the mean, median, and mode, appropriately.
- Calculate and interpret quartiles, deciles, and percentiles with competence.

Unit I: Practical Geography of India.....13 Marks

- 1.1. Monthly temperature and rainfall graphs from different physiographic regions of India. (10)
- 1.2. Mean centre of population for any district of West Bengal over any three census years. (10)
- 1.3. Analysis of Regional Disparity after Sopher's Index. (10)

Unit II: Statistical Methods in Geography (Descriptive).....12 Marks

- 2.1. Frequency Distribution: Histogram, Frequency Polygon, Frequency Curve, Ogives. (10)
- 2.2. Measures of Central Tendencies: Mean, Median, Mode. (10)
- 2.3. Partition Values: Quartiles, Deciles and Percentiles. (10)

Note: Value in the parenthesis indicates contact hours per semester

***CE= LNB**

Suggested reading

1. Basu, P. (2021). Advanced Practical Geography — A Laboratory Manual (4th ed.). Books and Allied.
2. Census of India. (1991, 2001, 2011). Table H-3A: Census Houses by Predominant Material of the Roof (H2A).
3. Monkhouse, F.J., & Wilkinson, H.R. (1971). Maps and Diagrams, Their Compilation and Construction (3rd ed., 2017)
4. Sarkar, A. (2015). Practical Geography: A Systematic Approach. Orient Blackswan Pvt. Ltd



Course: Major 8

Semester-V

Paper Title: Geographical Thought (Theoretical)

Course Code: GEO-MAJ-8T

Full Marks-50

Time-2:30 hrs

Programme Objectives:

The objectives of this course are to:

- i. Explore ancient, medieval, and modern geography.
- ii. Analyze classical geographers and their contributions.
- iii. Investigate dualisms and dichotomies in geography.
- iv. Understand the impact of the quantitative revolution.
- v. Examine the systems approach in geography.
- vi. Discuss Radicalism, Positivism, and Behavioural approaches.
- vii. Compare absolute and relative space concepts. viii. Explore the man-environment relationship.

Programme Outcome:

Upon completion of this course, students will be able to

- i. Comprehensively explore the development of geography from ancient to modern times.
- ii. Analyze the contributions of classical geographers effectively.
- iii. Investigate dualisms and dichotomies present in geographical thought proficiently.
- iv. Understand the impact of the quantitative revolution on geography accurately.
- v. Examine the systems approach in geography competently.
- vi. Discuss Radicalism, Positivism, and Behavioural approaches in geographical thought with depth.
- vii. Compare and contrast the concepts of absolute and relative space appropriately.
- viii. Explore the dynamic relationship between humans and the environment comprehensively.

Unit I: Evolution of Geography.....25 Marks

- 1.1. Ancient Geography: Greek, Roman, Indian and Chinese contributions (8)
- 1.2. Medieval Geography: Arab Geographers (2)
- 1.3. Modern Age: i) Pre-classical: Age of Discovery, Varenus and Kant; (5) ii) Classical: Humboldt and Ritter (3) iii) Post-Classical: a) 19th Century: Ratzel, Richthofen, Vidal de la Blache, Hettner b) 20th century: Mackinder, Geddes, Davis, Sauer (8)
- 1.4. Recent Developments: Geo-informatics, Emotional Geography and Welfare Geography. (4) (25 Marks)

Unit II:..... Approaches to the Study of Geography.....25 Marks

- 2.1. Dualism and Dichotomy: Physical vs. Human, Regional vs. Systematic, Environmental Determinism vs. Possibilism (6)
- 2.2. Materialism, Rationalism, Radicalism, Positivism, Behaviouralism and Humanism (8)
- 2.3. Location & Space, Areal Differentiation (4)
- 2.4. Man-environment Relationship (2)



2.5. System Approach in Geography and Quantitative Revolution and its Impact (6)

2.6. Structuralism and Post-Modernism (4)

(25 Marks)

Note: Value in the parenthesis indicates contact hours per semester

*CE= Report Writing on the contribution of any Geographer/ Geographical approach

Suggested Reading

1. Adhikari, S. (2015). Fundamentals of Geographical Thought. Orient Blackswan.
2. Couper, P. (2015). A Student's Introduction to Geographical Thought: Theories, Philosophies, Methodologies. Sage.
3. Cresswell, T. (2013). Geographic Thought: A Critical Introduction. Wiley-Blackwell.
4. Dickinson, R.E. (2015). The Makers of Modern Geography. Routledge.
5. Dikshit, R.D. (2004). Geographical Thought: A Contextual History of Ideas. Prentice Hall India.
6. Holt-Jensen, A. (2018). Geography: History and Concepts: A Student's Guide (5th ed.). Sage.
7. Husain, M. (2015). Evolution of Geographical Thought (6th ed.). Rawat Publications.
8. Jeffrey, A., & Nayak, A. (2013). Geographical Thought: An Introduction to Ideas in Human Geography. Routledge.
9. Lahiri Dutta, K. (2010). Bhugol Chintar Bikash [Bengali], The World Press Pvt. Ltd, Kolkata:
10. Maiti, R., & Maiti, M. M. (2021). Development of Geographical Thought: Contextualization and Synthesis of Philosophies (2nd ed.). Nabodaya Publications.
11. Peet, P. (1998). Modern Geographical Thought. Wiley-Blackwell.



Course: Major 8

Semester-V

Paper Title: Statistical Methods in Geography (Inferential) and Megascopic Identification of Rocks and Minerals (Practical)

Course Code: GEO-MAJ-8P

Full Marks-25

Time-2:30 hrs

Programme Objectives:

The objectives of this course are to:

- Apply measures of dispersion and correlation coefficients for geographical data analysis.
- Perform simple Bivariate analysis techniques, including regression trend lines and residual mapping.
- Identify various minerals and rocks through megascopic analysis.

Programme Outcome:

Upon completion of this course, students will be able to

- Apply measures of Dispersion and Correlation Coefficients proficiently for geographical data analysis.
- Perform simple bivariate analysis techniques, including regression trend lines and residual mapping effectively.
- Identify various minerals and rocks accurately through macroscopic analysis.

Unit I: Statistical Methods in Geography (Inferential) 15 Marks

- 1.1. Measures of Dispersion: Range, Mean Deviation, Quartile Deviation, Standard Deviation, Coefficient of Variation and Variance. (12)
- 1.2. Rank Correlation (Spearman's Method) and Pearson's Product Moment Correlation Coefficient. (8)
- 1.3. Simple Bi-variate Analysis: Fitting of Regression Trend Line by Least Squares Method; Residual Mapping. (10)

Unit II: Megascopic Identification of Rocks and Minerals.....10 Marks

- 2.1. **Minerals:** Quartz, Feldspar, Mica (Biotite & Muscovite), Talc, Graphite, Calcite, Dolomite, Bauxite, Magnetite, Haematite, Chalcopryite, Calcite, Galena. (15)
- 2.2. **Rocks:** Basalt, Dolerite, Granite, Pegmatite, Laterite, Sandstone, Limestone, Conglomerate, Shale, Slate, Phyllite, Schist, Quartzite, Gneiss, Marble. (15)

Note: Value in the parenthesis indicates contact hours per semester

*CE= LNB

Suggested reading

- Acevedo, M.F. (2012). Data Analysis and Statistics for Geography, Environmental Science and Engineering. CRC Press.
- Basu, P. (2021). Advanced Practical Geography — a Laboratory Manual (4th ed.). Books and Allied.
- Das, D., & Hazra, J. (2023). Snatok Byaboharik Bhugol [Bengali Edition] [Paperback]. CHAYA PRAKASHANI.
- Das, N. (2017). Statistical Methods (Combined edition volume 1 & 2). McGraw Hill Education: Noida, India.



5. Fitzsimons, C., Frampton, S., & Fejer, E. (2007). Rocks & Minerals: Identification Guide (Identification Guides) [Paperback]. Flame Tree Publishing.
6. Harris, R., & Jarvis, C. (2011). Statistics for Geography and Environmental Science. Prentice Hall.
7. Hazra, Y., & Banik, G. C. (Publisher). (Year). Bhugol Rasitotter Prayog (Application of Statistics In Geography) CBCS Geography Syllabus [Paperback]. Nabodaya Publication.
8. Mahmood, A. (1999). Statistical Methods in Geographical Studies. Rajesh Publications.
9. McGrew Jr., J.C., Lembo Jr., A.J., & Monroe, C.B. (2014). An Introduction to Statistical Problem Solving in Geography (3rd ed.). Waveland Press.
10. Pal, S.K. (1998). Statistics for Geoscientists: Techniques and Applications. Concept Pub Co.
11. Rogerson, P.A. (2015). Statistical Methods for Geography: A Student's Guide (4th ed.). Sage.
12. Sarkar, A. (2015). Practical Geography: A Systematic Approach (3rd ed.). Orient Blackswan.



Course: Major 9

Semester-V

Paper Name: Regional Planning and Transport Geography (Theoretical)

Course Code: GEO-MAJ-9T

Full Marks-50

Time-2:30 hrs

Programme Objectives:

The objectives of this course are to:

- Introduce key concepts in regional planning, including region types, delineation methods, and planning hierarchy.
- Familiarize students with regional planning models and their application in addressing development challenges.
- Provide an understanding of transport geography, covering modes of transport, importance in regional development, and network analysis.
- Enable students to analyze transportation systems using indices and metrics to assess efficiency and connectivity.

Programme Outcomes:

Upon completion of this course, students will be able to

- Demonstrate comprehension of regional planning principles for effective analysis and decision-making.
- Apply regional planning models to address real-world development issues critically.
- Recognize the significance of transportation in regional development and spatial connectivity.
- Proficiently analyze transport networks to evaluate efficiency and propose optimization strategies.

Unit I:	Regional Planning	25 Marks
1.1.	Region: Definition, Types, and Characteristics of Natural, Formal, Functional and Planning Regions. (5)	
1.2.	Methods of delineation of region: Gravity model and composite Index Method. (5)	
1.3.	Hierarchy of Planning Regions (Macro, Meso, Micro, Nuclear. (5)	
1.4.	Schemes of Regionalization in India: Natural Region, Planning Region, Economic Region. (5)	
1.5.	Regional Planning: Definition, Basic Principles, Types of Planning. (5)	
1.6.	Model of Regional Planning: Circular Circulation Causation by Gunnar Myrdal and Growth Pole Theory by François Perroux. (5)	

Unit II:	Transport Geography	25 Marks
2.1.	Transport Geography: Definition, Nature and Scope. (5)	
2.2.	Modes of transport and their characteristics. (5)	
2.3.	Importance of Transportation and its Significance in Regional Development. (5)	
2.4.	Models of Transportation (Taaffe, Morrill and Gould Model; Vance Model; and The Rimmer model). (5)	
2.5.	Concept of Accessibility and Connectivity. (5)	
2.6.	Structural Analysis of Transport Network: 1. Alpha Index, 2. Beta Index, 3. Gamma Index, 4. Cyclomatic Number, 5. Aggregate Transportation Score (ATS). (5)	

Note: Value in the parenthesis indicates contact hours per semester



***CE= Traffic Survey and Report**

Suggested reading

A) Regional Planning

1. Chand, M., & Puri, V.K. (2000). Regional Planning in India. Allied Publishers Ltd.
2. Chandana, R.C. (2016). Regional Planning and Development (6th ed.). Kalyani Publishers.
3. Glasston, J. (2017). Contemporary Issues in Regional Planning. Routledge.
4. Hall, P., & Tewdwr-Jones, M. (2010). Urban and Regional Planning. Routledge.
5. Higgins, B., & Savoie, D.J. (2017). Regional Development: Theories and Their Application. Routledge.
6. Kulshetra, S.K. (2012). Urban and Regional Planning in India: A Handbook for Professional Practitioners. Sage.
7. Misra, R.P. (1992). Regional Planning: Concepts, Techniques, Policies and Case Studies. Concept Pub Co.
8. Ray, J. (2001). Introduction to Development & Regional Planning. Orient Blackswan.

B) Transport Geography

1. Bamford, C.G., & Robinson, H. (1978). Geography of Transport. Macdonald and Evans.
2. Basu Roy, P. (2015). A Handbook of Transport Geography. Reader Service. Kolkata.
3. Bhaduri, S. (1992). Transport and Regional Development. Concept Publishing Company.
4. Bhaduri, S. (1992). Transport and Regional Development. Concept Pub. Co.
5. Hoyle, B., & Knowles, R. (2000). Modern Transport Geography. John Wiley and Sons.
6. Hoyle, B.S. (1973). Transport and Development. Macmillan.
7. Hurst, E. (1974). Transport Geography-Comments and Readings. McGraw Hill.
8. Rodrigue, J.-P. (2020). The Geography of Transport Systems (5th ed.). Routledge.
9. Saxena, H. M. (2010). Transport Geography. Rawat Publications



Course: Major 9

Semester-V

Paper Title: Regional Planning and Transport Geography (Practical)

Course Code: GEO-MAJ-9P

Full Marks-25

Time-2:30 hrs

Programme Objectives:

The objectives of this course are to:

- Understand measures of inequalities such as the Lorenz Curve and Gini's Coefficient.
- Apply the Shortest Path Matrix, specifically the Shimbel Index, for transportation analysis.
- Analyze transportation networks using the Cyclomatic Number, Alpha, Beta, Gamma, Eta Indices, and Aggregate Transportation Score.
- Develop practical skills in conducting field research, including data collection, analysis, and presentation, to address socio-economic or environmental issues

Programme Outcome:

Upon completion of this course, students will be able to

- Understand measures of inequalities such as the Lorenz Curve and Gini's Coefficient proficiently.
- Apply the Shortest Path Matrix, particularly the Shimbel Index, effectively for transportation analysis.
- Analyze transportation networks using the Cyclomatic Number, Alpha, Beta, Gamma, Eta Indices, and Aggregate Transportation Score accurately.
- Develop practical skills in conducting field research, including data collection, analysis, and presentation, to address socio-economic or environmental issues competently.

Unit I:	Regional Planning	13 Marks
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- 1.1. Measures of Inequalities: Lorenz Curve and Gini's Co-efficient. (10)
- 1.2. Crop Combinations by J.C Weaver and K Doi, Social regionalization based on Mean and SD.(10)
- 1.3. Standard Distance Measure of population. (10)

Unit II:	Transport Geography.....12 Marks
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- 2.1. Breakpoint Analysis and Detour Index. (10)
- 2.2. Shortest Path Matrix (Shimbel Index). (10)
- 2.2. Cyclomatic Number Alpha, Beta, Gamma, Eta Index and Aggregate Transportation Score. (10)

Note: Value in the parenthesis indicates contact hours per semester

*CE= LNB

Suggested Reading

1. Basu, P. (2021). Advanced Practical Geography — a Laboratory Manual (4th ed.). Books and Allied.
2. Das, D., & Hazra, J. (2023). Snotok Byaboharik Bhugol [Bengali Edition] [Paperback]. CHAYA PRAKASHANI.
3. Das, N. (2017). Statistical Methods (Combined edition volume 1 & 2). McGraw Hill Education: Noida, India.



4. Hazra, Y., & Banik, G. C. (Publisher). (Year). Bhugol Rasitotter Prayog (Application of Statistics In Geography) CBCS Geography Syllabus [Paperback]. Nabodaya Publication.
5. Mahmood, A. (1999). Statistical Methods in Geographical Studies. Rajesh Publications.
6. Pal, S.K. (1998). Statistics for Geoscientists: Techniques and Applications. Concept Pub Co.
7. Rogerson, P.A. (2015). Statistical Methods for Geography: A Student's Guide (4th ed.). Sage.
8. Sarkar, A. (2015). Practical Geography: A Systematic Approach (3rd ed.). Orient Blackswan.



Course: Major 10

Semester -VI

**Paper Title: Development Geography and Regional Geography of North Bengal
(Theoretical)**

Course Code: GEO-MAJ-10T

Full Marks-50

Time-2:30 hrs

Programme Objectives:

The objectives of this course are to:

- i. Define and grasp the scope of Development Geography.
- ii. Identify and analyze indicators of economic, social, and environmental development.
- iii. Understand human development concepts and measurements.
- iv. Explore issues like rural development and urban planning for sustainable development.
- v. Understand the physiography, drainage patterns and vegetation types of North Bengal.
- vi. Explore biodiversity and conservation efforts, as well as ethnic cultures and heritage.
- vii. Evaluate tourism status, challenges, prospects, and major environmental issues.

Programme Outcome:

Upon completion of this course, students will be able to

- i. Define and comprehend the scope of Development Geography effectively.
- ii. Identify and analyze indicators of economic, social, and environmental development accurately.
- iii. Understand human development concepts and measurements proficiently.
- iv. Explore issues like rural development and urban planning for sustainable development competently.
- v. Understand the physiography, drainage patterns, and vegetation types of North Bengal comprehensively.
- vi. Explore biodiversity and conservation efforts, as well as ethnic cultures and heritage adeptly.
- viii. Evaluate tourism status, challenges, prospects, and major environmental issues competently.

Unit I: Development Geography.....25 Marks

- 1.1. Development Geography: Definition, Nature and Scope. (5)
- 1.2. Key indicators of Development: Economic, social and environmental. (5)
- 1.3. Human Development: Concept and Measurements. (5)
- 1.4. Issues in Development Geography: Rural development, Urban planning. (5)
- 1.5. Need and measures of balanced development in India. (5)
- 1.6. Concept of Sustainable development. (5)

Unit II: Regional Geography of North Bengal 25 Marks

- 2.1. Physiography. (5)
- 2.2. Drainage and Vegetation. (5)
- 2.3. Biodiversity of North Bengal. (5)



- 2.4. People, Culture and Heritage: Rajbanshi, Rava, Toto, Oraon, Drukpa. (5)
2.5. Tourism: Major Tourist Spots, Present status, Problems and Prospects. (5)
2.6. Major issues in North Bengal: Flood, Flash flood, Landslide, Hailstorm, Human-Wildlife conflict. (5)

Note: Value in the parenthesis indicates contact hours per semester

*CE= Focus Group Discussion (FGD)

Suggested reading

1. Bagchi, A. (2013). India's uneven development: Geography, history, and politics. Oxford University Press.
2. Brenner, N., & Lazarus, M. (2010). Uneven development: Global geography of inequality (2nd ed.). Oxford University Press.
3. Chakraborty, N. (Year of Publication). Regional Planning & Development (Anchalik Porikalpona O Unnayan) CBCS Syllabus [Paperback, Bengali]. Nabodaya Publication.
4. Chattopadhyay, A. (2020). Bharat O Paschim Bonger Bhugol [Geography of India and West Bengal] (Jan 2020 ed.). Nabodaya Publications.
5. Desai, A. R. (2010). Planning for balanced development. Concept Publishing Company.
6. Escobar, A. (1995). The concept of development. Verso.
7. Gould, P. (1986). The geography of development (3rd ed.). Prentice Hall.
8. Hodder, R. (2000). Development geography. Routledge.
9. Mishra, S., & Hanif, Md. (2023). North Bengal: Geographical and historical perspectives. Mittal Publications.
10. Pink, S. (2013). Emotional geographies (2nd ed.). Routledge.
11. Simon, D., & Kobayashi, A. (2017). Geographies of development: An introduction to development studies (4th ed.). Routledge.
12. United Nations Development Programme (UNDP). (Various years). Human development report. Retrieved from <https://hdr.undp.org/>
13. United Nations Development Programme (UNDP). (Various years). Human development report. Retrieved from <https://hdr.undp.org/>
14. World Bank. (2023). World development indicators [Database]. Retrieved from <https://data.worldbank.org/>
15. Dasgupta, S.P. (1998). The geography of North Bengal. Books & Allied Publishers
16. Blanford, E.A. (1879). North Bengal: Drainage, vegetation and climate. Calcutta Central Press.
17. Mukherjee, T.K. (2005). People, culture and heritage of North Bengal. Mittal Publications.
18. Singh, A.K. (2012). Tourism potential of North Bengal. Concept Publishing Company.
19. Das, M.C. (2017). Natural disasters in North Bengal: Floods, flash floods, landslides and hailstorms. Academic Publishers.



Course: Major 10

Semester-VI

Paper Title: Map Projection and Inferential Statistics (advanced) (Practical)

Course Code: GEO-MAJ-10P

Full Marks-25

Time-2:30 hrs

Programme Objectives:

The objectives of this course are to:

- Understand the fundamentals, terminology, and purpose of map projections.
- Explore classification methods for map projections.
- Learn mathematical/graphical construction and properties of specific projections.
- Grasp the roles and definitions of null and alternative hypotheses.
- Differentiate between parametric and non-parametric tests and their applications.
- Learn about Type I and Type II errors in hypothesis testing.
- Apply statistical tests like Student's t-test, Chi-Squared, and One-way ANOVA for data analysis.

Programme Outcome:

Upon completion of this course, students will be able to

- Understand map projection fundamentals, terminology, and purpose effectively.
- Explore classification methods for map projections proficiently.
- Learn mathematical/graphical construction and properties of specific projections accurately.
- Grasp the roles and definitions of null and alternative hypotheses competently.
- Differentiate between parametric and nonparametric tests and their appropriate applications.
- Understand Type I and Type II errors in hypothesis testing comprehensively.
- Apply statistical tests such as Student's t-test, Chi-Squared, and One-way ANOVA proficiently for data analysis.

Unit I: Map Projections.....13 Marks

- 1.1. Map projection: Definition, key terminologies, classification (10)
- 1.2. Mathematical/graphical construction, properties and uses of i) Polar Zenithal Orthographic and Equal Area, Simple Conical Projection with one Standard Parallel, Bonne's Projection, Polyconic Projection, Simple Conical Projection of two Standard Parallels, Interrupted Sinusoidal, Cylindrical Equal Area, Mercator's Projection. (20)
- 13 Marks**

Unit II: Inferential Statistics (Advanced).....12 Marks

- 2.1. Basic concept of hypothesis: Null and alternative; Parametric and Non-parametric; Type-I and Type-II Errors. (10)
- 2.2. Application of some Statistical Tests: Student's T-test, Chi-Squared test, One- and Two-way ANOVA. (20)

Note: Value in the parenthesis indicates contact hours per semester

***CE= LNB**



Suggested reading

1. Acevedo, M.F. (2012). Data Analysis and Statistics for Geography, Environmental Science and Engineering. CRC Press.
2. Basu, P. (2021). Advanced Practical Geography — a Laboratory Manual (4th ed.). Books and Allied.
3. Das, D., & Hazra, J. (2023). Snotok Byaboharik Bhugol [Bengali Edition] [Paperback]. CHAYA PRAKASHANI
4. Das, N. (2017). Statistical Methods (Combined edition volume 1 & 2). McGraw Hill Education: Noida, India.
5. Hazra, Y., & Banik, G. C. (Publisher). (Year). Bhugol Rasitotter Prayog (Application of Statistics In Geography) CBCS Geography Syllabus [Paperback]. Nabodaya Publication.
6. Mahmood, A. (1999). Statistical Methods in Geographical Studies. Rajesh Publications.
7. Pal, S.K. (1998). Statistics for Geoscientists: Techniques and Applications. Concept Pub Co.
8. Sarkar, A. (2015). Practical Geography: A Systematic Approach. Orient Blackswan Pvt. Ltd.



Course: Major 11

Semester-VI

Paper Title: Political Geography and Geography of Sustainability (Theoretical)

Course Code: GEO-MAJ-11T

Full Marks-50

Time-2:30 hrs

Programme Objectives:

The objectives of this course are to:

- Understand the concepts, Nature, and Scope of Political Geography.
- Examine the attributes of the state, including frontiers, boundaries, and sovereignty.
- Analyze global strategic views such as the Heartland and Rimland theories.
- Define sustainability and its principles, emphasizing its importance.
- Explore the Sustainable Development Goals (SDGs) and Millennium Development Goals (MDGs).
- Investigate sustainable agriculture, urban sustainability, and tourism, including their meanings, implementations, and future strategies.

Programme Outcome:

Upon completion of this course, students will be able to

- Understand the concepts, nature, and scope of political geography effectively.
- Examine the attributes of the state, including frontiers, boundaries, and sovereignty accurately.
- Analyze global strategic views such as the Heartland and Rimland theories proficiently.
- Define sustainability and its principles, emphasizing their importance.
- Explore the Sustainable Development Goals (SDGs) and the Millennium Development Goals (MDGs) in depth.
- Investigate sustainable agriculture, urban sustainability, and tourism, including their definitions, implementation, and future strategies, adeptly.

Unit I:	Political Geography	25 Marks
1.1. Political Geography: Concepts, Nature and Scope. (5)		
1.2. Concept of Nation, State and Nation-State. (5)		
1.3. Global strategic views: Heartland and Rimland theories. (5)		
1.4. Boundaries and frontiers: the importance of a Buffer State. (5)		
1.5. World Political Blocks: UN, NATO, SEATO, BRICS, SAARC, ASEAN (5)		
1.6. Major Geopolitical Issues: Climate Change, Rich-Poor Gap, Health Issues (5)		
Unit II:	Geography of Sustainability	25 Marks
2.1. Sustainability: Meaning, Principles and Importance. (5)		
2.2. Sustainable Development Goals (SDGs) and Millennium Development Goals (MDGs). (5)		
2.3. Sustainable Agriculture: Concept and strategies. (5)		
2.4. Urban Sustainability: Concept and strategies. (5)		
2.5. Sustainable Tourism: Concept and Strategies. (5)		
2.6. Environmental Sustainability: Concept and strategies. (5)		



Note: Value in the parenthesis indicates contact hours per semester

***CE= Group Discussion (GD)**

Suggested Reading

1. Buttel, F. H., & McMichael, P. (Eds.). (2015). New Directions in the Sociology of Global Development, Volume 11, Research in Rural Sociology and Development. Emerald Group Publishing Limited.
2. Castree, N., Adams, W. M., Barry, J., Brockington, D., Büscher, B., Corbera, E., ... & Fischer, A. (2018). Changing the intellectual climate. *Nature Climate Change*, 8(9), 763–768.
3. Dobson, A. (2003). *Citizenship and the Environment*. Oxford University Press.
4. Goodall, C. (Ed.). (2002). *Ethics and the Environment: An Introduction*. Cambridge University Press.
5. Goudie, A. (2018). *The Human Impact on the Natural Environment: Past, Present, and Future* (8th ed.). Wiley-Blackwell.
6. Holden, E. (2017). *Environment and Sustainability: A Political Introduction*. Routledge.
7. Leiserowitz, A., Maibach, E., Roser-Renouf, C., Feinberg, G., & Rosenthal, S. (Eds.). (2019). *Climate Change in the American Mind: Data, Tools, and Trends*. Routledge.
8. Meadows, D. H., Meadows, D. L., Randers, J., & Behrens III, W. W. (2004). *Limits to Growth: The 30-Year Update*. Chelsea Green Publishing.
9. Robbins, P. (2017). *Political Ecology: A Critical Introduction* (3rd ed.). Wiley.
10. Spaargaren, G., Lamers, M., & Weenink, D. (Eds.). (2005). *Sustainable Consumption: The Implications of Changing Infrastructures of Provision*. Edward Elgar Publishing.



Course: Major 11

Semester -VI

Paper Title: Advanced Surveying and Computer Application (Practical)

Course Code: GEO-MAJ-11P

Full Marks-25

Time-2:30 hrs

Programme Objectives:

The objectives of this course are to:

- Learn how to use a Dumpy Level to create a contour plan.
- Understand the methods for determining the height and distance of objects using a Transit Theodolite.
- Learn the radiation, intersection, and traversing techniques in plane table survey.
- Gain knowledge of recording points using GPS technology.
- Learn MS-Excel skills for processing Demographic, Weather, Climatic, and Socio-economic data, creating thematic diagrams like Bar, Pie, and Line graphs, and performing basic calculations and interpretations.
- Develop skills in creating PowerPoint slides for presenting geographical data and information.

Programme Outcome:

Upon completion of this course, students will be able to

- Utilize a Dumpy Level proficiently to create contour plans accurately.
- Understand how to effectively determine the height and distance of objects using a Transit Theodolite.
- Apply Radiation, Intersection, and Traversing techniques in plane table survey competently.
- Gain knowledge of recording points using GPS technology accurately.
- Apply MS Excel skills to process demographic, weather, climatic, and socio-economic data proficiently, including creating thematic diagrams (e.g., bar, pie, and line graphs) and performing basic calculations and interpretations.
- Develop skills in creating PowerPoint slides for presenting geographical data and information effectively.

Unit I:	Advanced Surveying	15 Marks
1.1. Preparation of Contour Plan by Dumpy Level. (7)		
1.2. Determination of Height and Distance of an object (Base accessible and Inaccessible) with a Transit Theodolite (Same instrument height and different Instrument height). (8)		
1.3. Plane Table Survey: Radiation, Intersection and Traversing method. (10)		
1.4. Global Positioning System (GPS): Only recording of Points. (5)		s

Unit II:	Computer Application	10 Marks
2.1. Computer Application in Geography: Demographic data, Weather and Climatic data and Socio-economic data processing and Thematic Diagrams using Basic Calculations and interpretation (Bar, pie, and line graphs, Regression) by MS-Excel. (10)		
2.2. Preparation of PowerPoint slides. (10)		
2.3. Preparation of posters (computer- or manual-based). (10)		

Note: Value in the parenthesis indicates contact hours per semester

***CE= LNB**



Suggested reading

1. Basak, N. N. (2017). Surveying & Levelling (2nd ed.) [Paperback]. McGraw Hill Education.
2. Das, D., & Hazra, J. (2023). Snotok Byaboharik Bhugol [Bengali Edition] [Paperback]. CHAYA PRAKASHANI.
3. Kanetkar, T. P. (2015). Surveying and Levelling Part I. Pune Vidyarthi Griha Prakashan.
4. Rao, P. V., & Akella, V. (2015). Textbook of Surveying [Paperback]. PHI Learning Private Limited.
5. Sarkar, A. (2015). Practical Geography: A Systematic Approach. Orient Blackswan Pvt. Ltd.



Course: Major 12

Semester-VI

Paper Title: Environmental Geography (Theoretical)

Course Code: GEO-MAJ-12T

Full Marks-50

Time-2:30hrs

Programme Objectives:

The objectives of this course are to:

- i. Understand environmental geography and its significance.
- ii. Identify environmental components: physical and socio-cultural
- iii. Explore human adaptation in different biomes
- iv. Analyze global and Indian environmental programs
- v. Define hazards, disasters, risk, vulnerability, and susceptibility
- vi. Examine various types of disasters in India and their management
- vii. Discuss response and mitigation measures
- viii. Emphasize capacity building for disaster management.

Programme Outcome:

Upon completion of this course, students will be able to

- i. Comprehensively understand environmental geography and its significance.
- ii. Identify environmental components, including physical and socio-cultural aspects, accurately.
- iii. Explore human adaptation in different biomes proficiently.
- iv. Analyze global and Indian environmental programs effectively.
- v. Define hazards, disasters, risk, vulnerability, and susceptibility accurately.
- vi. Examine various types of disasters in India and their management competently.
- vii. Discuss response and mitigation measures comprehensively.
- viii. Emphasize disaster management capacity building effectively.

Unit I:	Environmental Geography	25 Marks
1.1. Environmental Geography: Definition, Nature and Scope. (5)		
1.2. Components of the Environment: Physical and Socio-cultural. (5)		
1.3. Environmental programmes in the World: Kyoto Protocol, Rio Summit, Montreal Protocol, Chipko and Narmada Bachao Movement. (5)		
1.4. Wetland: Definition, Wetland Services, Wetland Degradation and Management, Ramsar Sites (5)		
1.5. Environmental programmes in India: Swachh Bharat Mission, Mission Nirmal Bangla, and Ganga Action Plan. (5)		
1.6. Environmental Pollution: Water, Soil, Air. (5)		

Unit II:	Environmental Issues in Geography	25 Marks
2.1. Definition and Concepts: Hazards, Disasters; Risk, Vulnerability, Susceptibility. (5)		
2.2. Disasters in India: Factors, Vulnerability, Consequences, and Management: Drought. (5)		
2.3. Disasters in India: Factors, Vulnerability, Consequences, and Management: Tropical Cyclone. (5)		
2.4. Disasters in India: Factors, Vulnerability, Consequences, and Management: Riverbank erosion. (5)		



2.5. Disasters in India: Factors, Vulnerability, Consequences, and Management: Manmade disasters. (5)

2.6. Response and Mitigation to Disasters. (5)

*CE= Tree Plantation / Environmental Awareness Programme.

Note: Value in the parenthesis indicates contact hours per semester

Suggested reading

A) Environmental Geography

1. Cunningham, W. P., & Cunningham, M. A. (2004). Principles of Environmental Science: Inquiry and Applications. Tata McGraw-Hill.
2. Goudie, A. (2001). The Nature of the Environment. Blackwell.
3. Jones, G., & Hollier, G. (1997). Resources, Society, and Environmental Management. Paul Chapman.
4. Klee, G. (1991). Conservation of Natural Resources. Prentice Hall.
5. Mather, A. S., & Chapman, K. (1995). Environmental Resources. John Wiley and Sons.
6. Miller, G. T. (2004). Environmental Science: Working with the Earth. Thomson Brooks Cole.
7. Mitchell, B. (1997). Resource and Environmental Management. Longman Harlow.
8. Owen, S., & Owen, P. L. (1991). Environment, Resources, and Conservation. Cambridge University Press.
9. Saxena, H. M. (2017). Environmental Geography (Third Edition). Rawat Publications.
10. Sharma, P. D. (2011). Ecology and Environment. Rastogi Publications.
11. Singh, R. B. (Ed.). (2009). Biogeography and Biodiversity. Rawat Publication.
12. Singh, S. (2023). Environmental Geography [English]. Pravalika Publications.
13. Shil, A.K. (2024). Manabiyo Bhugol (Human Geography) [Bengali Edition]. The Himalayan Books.

B) Environmental Issues in Geography

1. Basu, R., Bhaduri, S. (Eds) (2007). Contemporary Issues and Techniques in Geography. Progressive Pub.
2. Coch, N.K. (1994). Geohazards: Natural and Human. Pearson College.
3. Cutter, S.L. (2006). Hazards, Vulnerability and Environmental Justice. Routledge.
4. Government of India. (1997). Vulnerability Atlas of India (Revised ed.). Building Materials & Technology Promotion Council, Ministry of Urban Development.
5. Gupta, H.K. (2013). Disaster Management. University Press.
6. Hyndman, D., & Hyndman, D. (2016). Natural Hazards and Disasters (5th ed.). Cengage Learning.
7. Kapur, A. (2010). Vulnerable India: A Geographical Study of Disasters. Sage.
8. Keller, E.A., & DeVecchio, D.E. (2014). Natural Hazards: Earth's Processes as Hazards, Disasters, and Catastrophes (4th ed.). Routledge.
9. Paul, B.K. (2011). Environmental Hazards and Disasters: Contexts, Perspectives and Management. Wiley-Blackwell.
10. Pine, J.C. (2014). Hazards Analysis: Reducing the Impact of Disasters (2nd ed.). CRC Press.
11. Robbins, P., Hintz, J., & Moore, S.A. (2014). Environment and Society: A Critical Introduction (2nd ed.). Wiley.
12. Smith, K. (2013). Environmental Hazards: Assessing Risk and Reducing Disaster (6th ed.). Routledge.



Course: Major 12

Semester –VI

Paper Title: Field Report (Practical)

Course Code: GEO-MAJ-12P

Full Marks-25

Time-3:00 hrs

Programme Objectives:

The objectives of this course are to:

- i. To collect Primary Data through direct observation and fieldwork techniques.
- ii. To facilitate spatial analysis for mapping, GIS, and spatial modeling.
- iii. To assess environmental conditions and impacts on air, water, soil, and biodiversity.
- iv. To study human activities, behaviours, and interactions within specific geographic contexts.
- v. To analyze land use and land cover changes over time.
- vi. To document geographical phenomena such as natural hazards, geological formations, and weather patterns.
- vii. To validate Remote Sensing data through ground-truthing.
- viii. To inform policy decisions and planning initiatives at various levels.
- ix. To serve educational purposes for students and public outreach.

Programme Outcome:

Upon completion of this course, students will be able to

- i. Effectively collect primary data through direct observation and fieldwork techniques.
- ii. Conduct spatial analysis proficiently for mapping, GIS, and spatial modeling.
- iii. Accurately assess environmental conditions and their impacts on air, water, soil, and biodiversity.
- iv. Analyze human activities, behaviours, and interactions within specific geographic contexts competently.
- v. Evaluate land-use and land-cover changes over time effectively.
- vi. Document comprehensively the geographical phenomena of natural hazards, geological formations, and weather patterns.
- vii. Validate Remote Sensing data effectively through ground-truthing.
- viii. Provide valuable inputs for policy decisions and planning initiatives at various levels.
- ix. Serve students and the public effectively for educational purposes and public outreach.

Field Report

Prepare a field report within 50 pages (computer typed), including diagrams and photo pages, by conducting field visits in groups to address any one of the issues mentioned in the following. The selected topics should be divided into parts, with each part assigned to groups of 5-10 students. This should be clearly stated at the beginning of the report. The report should be duly signed by the concerned teacher (s) for evaluation by the external expert (s), followed by a Viva-Voce. It must include a description of the study area, specific objectives, relevant research questions, results, discussion, recommendations, policy implications, and APA-formatted references. The report should be based on primary and/or secondary data and typed on A4 pages, with spiral-bound/Hard-bound formatting on a transparent/clear cover. **(30)**



A) Physical and Environmental Issues i) Earthquake ii) Landslide iii) Thunderstorm/ hailstorm iv) Tropical Cyclone v) Flood vi) Riverbank / Coastal erosion vii) Forest Fire viii) Structural collapse ix) Environmental pollution x) Biohazard, etc	B) Social and Cultural Issues i) Tribal Development ii) Employment iii) Heritage and Folk Culture iv) Rural Development v) Urban problems vi) Health problems vii) Indigenous healthcare methods and practices viii) Quality of Life ix) Migration x) Problems of environmental refugees, etc
(Report (15) + Viva Voce (10) = 25Marks)	

Note: Value in the parenthesis indicates contact hours per semester

***CE= Preparation of Questionnaire/ Schedule and Secondary Data Collection**

Suggested reading

- Gomes, B., Jones III, J.P. (Eds) (2010). Research Methods in Geography: A Critical Introduction.
- Wiley-Blackwell.
- Lenon, B., Cleves, P. (2015). Geography Fieldwork and Skills. Harper-Collins.
- Montello, D.R, Sutton, P. (2012). An Introduction to Scientific Research Methods in Geography and Environmental Studies, 2nd ed. Sage.
- Murthy, K.L.N. (2004). Research Methodology in Geography: A Textbook. Concept Publishing Co.
- Northey, N., Draper, D., Knight, D.B. (2015). Making Sense in Geography and Environmental Sciences: A Student's Guide to Research and Writing, 6th ed. Oxford University Press.
- Parsons, T., Knight, P.G. (2015). How to Do Your Dissertation in Geography and Related Disciplines, 3rd ed. Routledge.
- Phillips, R., Johns, J. (2012). Fieldwork for Human Geography. Sage.
- Riordan, D. (2013). Technical Report Writing Today, 10th ed. Wadsworth Publishing.
- Roy, T., Mandal, B., Bandyopadhyay, C., Maity, M., & Bishal, P. (2020). Bhogolik Gobeshona Paddhati O Kshetra Samikha (Bengali). Kalyani Publishers.



Programme Objectives:

The objectives of this course are to:

- Understand the Earth's internal structure, rocks, and geomorphic processes.
- Analyze Continental Drift, Plate Tectonic Theory, and Weathering.
- Explore oceanography, atmospheric dynamics, and soil geography.
- Understand ecosystems, biodiversity, and conservation efforts.

Programme Outcome:

Upon completion of this course, students will be able to

- Demonstrate a comprehensive understanding of geological processes and landforms.
- Interpret oceanographic and atmospheric phenomena proficiently.
- Analyze soil characteristics and ecosystem dynamics effectively.
- Evaluate the importance of biodiversity and propose conservation strategies.

Unit I: Geotectonics and Geomorphology Marks 20

Geotectonics and Geomorphology

- 1.1. Internal structure of the Earth; Rocks: Characteristics, types, and rock cycle
- 1.2. Continental Drift and Plate Tectonic Theory
- 1.3. Geomorphic Processes and Resultant Landforms: Endogenetic (Fold & Fault) and Exogenetic (Fluvial, Sea Wave, Wind and Glaciers)
- 1.4. Weathering: meaning, types and controlling factors.

Unit II Hydrosphere & Climatology Marks 15

- 2.1. Ocean: Bottom Relief features (Indian, Atlantic and Pacific Ocean), Deposits and Currents (Indian, Atlantic and Pacific)
- 2.2. Composition and structure of the atmosphere, Insolation, Pressure and Pressure Belts,
- 2.3. Winds: Planetary, Periodic, and Local

Unit III Soil Geography & Biogeography Marks 15

- 3.1. Soil: Factors and Processes of Soil Formation; Physical Properties of Soil: Structure, Texture
- 3.2. Ecosystem: Concept, Types and components, Energy flow
- 3.3. Biodiversity: Importance and Conservation

Note: Value in the parenthesis indicates contact hours per semester

***CE= Class test**

Suggested Reading:

1. Barry, R.G. and Chorley, R.J. (1998). Atmosphere, Weather and Climate. Routledge, London.
2. Bera, B., Bhattacharya, S., & Sengupta, N. (2016). Jib Bhugol O Poribesh. Navodaya Publications.



3. Bryant, H. Richard (2001). Physical Geography Made Simple. Rupa and Co., New Delhi.
4. Buckman, H. R., & Brady, N. C. (1974). Nature and Properties of Soil. McMillan.
5. Bunnett, R.B. (2003). Physical Geography in Diagrams, Fourth GCSE edition, Pearson Education (Singapore) Pvt Ltd.
6. Bunting, A. (1965). Geography of Soil. Hutchinson.
7. Chapman, J. L., & Reiz, M. J. (1993). Ecology: Principles and Applications. Cambridge University Press
8. Chiras, D. D., & Reganold, J. P. (2009). Natural Resource Conservation: Management for a Sustainable Future (10th ed.). Pearson.
9. De, N. K., & Sarkar, M. K. (1994). Mrittika Bhu-vidya. Paschim Banga Rajya Pustak Parshad.
10. Garrison, T (1998). Oceanography. Wordsworth CP, Bedmont.
11. Gerrard, J. (2000). Fundamentals of Soils. Routledge.
12. Huggett, R. (1998). Fundamentals of Biogeography. Routledge.
13. MacDonald, G. (2001). Biogeography: Introduction to Space, Time and Life. Wiley.
14. Morgan, R. P. C. (2005). Soil Erosion and Conservation (3rd ed.). Wiley-Blackwell.
15. Odum, F. P. (1971). Fundamentals of Ecology. W.B. Sanders.
16. Santra, A. (2006). Handbook on Wild and Zoo Animals. International Book Distributing Co.
17. Singh, S. (2003). Physical Geography (English and Hindi Editions). Prayag Pustak Bhawan, Allahabad.
18. Strahler, A.N. and Strahler A.M. (1992). Modern Physical Geography, John Wiley and Sons, New York
19. Thornbury, W. D. (1954). Principles of Geomorphology. New York: John Wiley.
20. Wooldridge, S.W. and Morgan, R.S. (1959). The Physical Basis of Geography: An Outline of Geomorphology, Longman, London



Course: Minor 3

Semester-III

Paper Title: Scale and Map Projection (Practical)

Course Code: GEO-MIN-3P

Full Marks-25

Time-2:30 hrs

Programme Objectives:

The objectives of this course are to:

- i. To learn the function and use of Map scale
- ii. To learn the function and use of Map projection

Programme Outcome:

Upon completion of this course, students will be able to

- i. Effectively use map scales to measure and represent distances accurately.
- ii. Apply appropriate map projections to represent Earth's curved surface on flat maps accurately.

Unit I:.....Scale..... Marks 10

1.1. Concept of Scale and Scale Conversion, Graphical Construction of Linear Scale and Diagonal Scale. (30)

Unit II: Map Projection.....Marks 15

2.1. Concept of Map Projection: Polar Zenithal Gnomonic Projection, Simple Conical Projection with One Standard Parallel, and Cylindrical Equal Area Projection (Graphical Construction). (30)

Note: Value in the parenthesis indicates contact hours per semester

***CE= LNB**

Suggested Reading:

1. Das, D., & Hazra, J. (2023). Snotok Byaboharik Bhugol [Bengali Edition] [Paperback]. CHAYA PRAKASHANI.
2. Monkhouse, F.J. & Wilkinson, F.J. (1985). Maps and Diagrams. Methuen, London.
3. Sarkar, Ashis (2015): Practical Geography – A Systematic Approach, Orient Black Swan, New Delhi.
4. Sharma, J.P. (2001). Prayogik Bhoogol. Rastogi Pub, Meerut.
5. Singh, L. R. (2006). Fundamentals of Practical Geography. Sharda Pustak Bhawan, Allahabad.
6. Singh, R. L. & Singh, Rana PB (1993). Elements of Practical Geography (Hindi & English Editions), Kalyani Publishers, New Delhi.



Course: Minor 4

Semester-IV

Paper Title: Economic and Human Geography (Theory)

Course Code: GEO-MIN-4T

Full Marks-50

Time-2:30 hrs

Programme Objectives:

The objectives of this course are to:

- Understand the concept and classification of resources, including forest and mineral resources.
- Analyze economic activities and sectors, with a focus on the primary and secondary sectors.
- Explore human geography, including human adaptations and ethnic diversity.

Programme Outcome:

Upon completion of this course, students will be able to

- Demonstrate understanding of resource concepts and their conservation.
- Analyze economic activities and sectors proficiently.
- Interpret human adaptations and ethnic diversity accurately.

Unit I: Geography of Resources.....Marks 15

- 1.1. Concept of Resource: Definition, Characteristics, Classification of Resource. (7)
- 1.2. Forest Resources: Types, Depletion and Conservation. (7)
- 1.3. Mineral and Power resources: Uses and distribution of Coal, Petroleum and Iron ore, Conventional and Non-Conventional energy resources; Depletion and Conservation of resources. (6)

Unit II: Economic Geography.....Marks 15

- 2.1. Classification of economic activities: Primary, Secondary, Tertiary, Quaternary, and Quinary. (7)
- 2.2. Primary activities: Definition and Types of Agriculture. (7)
- 2.3. Secondary activities: Definition and Types of Manufacturing Industries. (6)

Unit III: Human Geography.....20 Marks

- 3.1. Human Geography: Definition, Nature, and Scope; Approaches to Human Geography with special reference to Man-Environment relationship. (6)
- 3.2. Human Adaptations in different climatic regions: Pygmy, Masai, Bedouin, Kirghiz, Eskimo. (7)
- 3.3. Concept of Ethnicity and Tribe, Distribution and Characteristics of Major Tribes of India: Oraon, Gond, Santhal, Jarawa, Khasi. (7)

Note: Value in the parenthesis indicates contact hours per semester.

***CE= MCQ Test 10 Marks**

Suggested Reading:

1. De Blij, H.J. Human Geography: Culture, Society and Space. John Wiley, New York.
2. Husain, Majid (2021): Human Geography, Rawat Publications, New Delhi.
3. Kaushik, S.D.& Sharma, A.K. (1996): Principles of Human Geography, Rastogi Pub. Meerut.
4. Maurya, S.D. (2018): Human Geography, Pravalika Publications, Allahabad.
5. Norton, W. (1995). Human Geography. Oxford University Press, New York.
6. Patra, Punyatoya, et al. (2020): Perspectives in Human Geography, Concept Publishing Company, Ltd., New Delhi.



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7. Saxena, H.M. (2018): Economic Geography, 2nd Edition, Rawat Publications, New Delhi.
8. Singh, L...R. (2018): Fundamentals of Human Geography, Sharda Pustak Bhawan, Allahabad.



Course: Minor 4

Semester-IV

Paper Title: Topographical Map and Weather Map (Practical)

Course Code: GEO-MIN-4P

Full Marks-25

Time-2:30 hrs

Programme Objectives:

- Interpret topographical maps for Physiography, Drainage, Settlement, and Transportation.
- Apply morphometric techniques for analyzing land features.
- Learn about weather instruments and how to represent climatic data with climographs and Hythergraphs.

Programme Outcome:

Upon completion of this course, students will be able to

- Interpret topographical maps thoroughly and accurately, identifying various geographic features.
- Apply morphometric techniques confidently to analyze and assess land features.
- Utilize weather instruments effectively and represent climatic data accurately using climographs and Hythergraphs.

Unit I:	Topographical Map	15 Marks
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- 1.1. General Interpretation of Topographical Map: Broad Physiographic Divisions & Relief features, Drainage Pattern, Settlements, Transport & Communication and Transect Chart. (15)
- 1.2. Morphometric Techniques: Relative Relief (Smith), Average Slope (Wentworth) and Drainage Density (Horton) (15)

Unit II	Weather Map.....10 Marks
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- 2.1. Weather instruments: Maximum and minimum Thermometer, Hygrometer and Rain gauge. (15)
- 2.2. Representation of climatic data: Climograph (According to Taylor) and Hythergraph (According to Taylor) (15)

Note: Value in the parenthesis indicates contact hours per semester

*CE= LNB

Suggested Reading

1. Das, D., & Hazra, J. (2023). Snotok Byaboharik Bhugol [Bengali Edition] [Paperback]. CHAYA PRAKASHANI.
2. Monkhouse, F.J. & Wilkinson, F.J. (1985). Maps and Diagrams. Methuen, London.
3. Sarkar, Ashis (2015): Practical Geography – A Systematic Approach, Orient Black Swan, New Delhi.
4. Sharma, J.P. (2001). Prayogik Bhoogol. Rastogi Pub, Meerut.
5. Singh, L. R. (2006). Fundamentals of Practical Geography. Sharda Pustak Bhawan, Allahabad.
6. Singh, R. L. & Singh, Rana PB (1993). Elements of Practical Geography (Hindi & English Editions), Kalyani Publishers, New Delhi.



Course: MDC 2

Semester–III

Course Name: Fundamentals of Human Geography (Theoretical)

Course Code: GEO–MDC 2

Full Marks–35

Time–2:00 hrs

Programme Objectives:

The objectives of this course are to:

- To learn the Meaning, Concept, Nature, scope, and development of Human Geography.
- To understand the Culture and society of the World and India
- To learn about the Nature of Population and Human Settlements.

Programme Outcome:

Upon completion of this course, students will be able to

- Demonstrate understanding of Human Geography concepts.
- Analyze human adaptation and cultural diversity effectively.
- Evaluate societal progress using the Human Development Index.
- Understand cultural and societal structures proficiently.
- Interpret population dynamics and migration accurately.
- Analyze human settlement patterns competently.

Unit I: Introduction to Human Geography.....10 Marks

- 1.1. Human Geography: Definition, Scope, Elements. (2)
- 1.2. Human Adaptation to Environment with Special Reference to Eskimo, Kirghiz, Bushman, Masai, Gond, Jaroa and Santal (4)
- 1.3. Concept of Ethnicity and Tribe, Distribution and Characteristics of Major Tribes of India: Oraon, Gond, Santhal, Jarawa, Khasi. (4)

Unit II: Cultural and Social Geography..... 10 Marks

- 2.1. Concept of Culture, Cultural Hearths. (3)
- 2.2. Race: Definition and classification of major races of the World and India. (4)
- 2.3. Concept of Society and Community, Social Groups. (3)

Unit III: Human Population and Settlements.....15 Marks

- 1.1. Population: Growth, Fertility, Mortality, Regional Distribution of Population Density in India. (3)
- 1.2. Population Movement: Definition of Migration and related terminologies, Types, Causes and Consequences of Migration. (3)
- 1.3. Human Settlements: Origin, Types and Patterns of Human Settlements, Characteristics of Rural and Urban Settlements, Functional Classification of Urban Settlements after Ashok Mitra. (4)

***CE= Class Test**

Note: Value in the parenthesis indicates contact hours per semester

Suggested Reading:

1. De Blij, H.J. Human Geography: Culture, Society and Space. John Wiley, New York.
2. Husain, Majid (2021): *Human Geography*, Rawat Publications, New Delhi.
3. Kaushik, S.D.& Sharma, A.K. (1996): *Principles of Human Geography*, Rastogi Pub. Meerut.



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4. Maurya, S.D. (2016): *Cultural Geography*, Sardha Pustak Bhawan, Allahabad.
5. Maurya, S.D. (2018): *Human Geography*, Pravalika Publications, Allahabad.
6. Patra, Punyatoya, et al. (2020): *Perspectives in Human Geography*, Concept Publishing Company, Ltd., New Delhi.
7. Shil, A.K. (2024). *Manobiyo Bhugol (Human Geography) [Bengali Edition]*. The Himalayan Books.
8. Singh, L.R. (2005). *Fundamentals of Human Geography*, Sharda Pustak Bhawan, Allahabad.



Course: MDC 3

Semester-V

Paper Name: Fundamentals of Economic Geography (Theory)

Course Code: GEO-MDC 3

Full Marks-35

Time-2:00 hrs

Programme Objectives:

The objectives of this course are to:

- Gain an understanding of the different classifications and types of economic activities.
- Comprehend the theories and models used to explain the spatial distribution of industries.
- Analyze specific examples of industries in various countries and regions to understand their characteristics and significance.

Programme Outcome:

Upon completion of this course, students will be able to

- Identify various classifications and types of economic activities effectively.
- Apply theories and models to explain the spatial distribution of industries proficiently.
- Analyze specific examples of industries in various countries and regions accurately.

Unit I: Introduction to Economic Geography.....10 Marks

- 1.1. Economic Geography: Definition, Scope and Elements. (3)
- 1.2. Classification of economic activities: Primary, Secondary, Tertiary, Quaternary, and Quinary. (3)
- 1.3. Location of economic activities: Von Thünen. (4)

Unit II: Economic Activities.....10 Marks

- 2.1. Primary activities: Agriculture, Forestry, Fishing, and Mining. (3)
- 2.2. Secondary activities: Classification of manufacturing industries, Special Economic Zones and Technology Parks. (4)
- 2.3. Tertiary activities: Transport, Trade and Services. (3)

Unit III: Industrial Geography.....15 Marks

- 3.1. Nature and Scope of Industrial Geography. (2)
- 3.2. Industrial Location Theory: Alfred Weber's Model and Profit Maximization Theory of August Losch. (3)
- 3.3. Agro-based Industry: Cotton Textile (India), Paper Industry (Canada, India) (3)
- 3.4. Mineral-based Industry - Metal - Iron & Steel (India); Non-metal - Petrochemical (India) (2)

Note: Value in the parenthesis indicates contact hours per semester

***CE= Project**

Students will visit any local industry, agricultural field, or MGNREGA project sites and note down their observations in their own words, either in English or their mother tongue, spanning 5-6 pages. They will explain what they have learned or their understanding based on their observations. The teacher will mentor the entire process. **(This is an Internal Assessment (CE) Part (10). 10 marks**



Note: Value in the parenthesis indicates contact hours per semester

Suggested Reading:

1. Anderson, W.P. (2012). Economic Geography. Routledge.
2. Aoyama, Y., Murphy, J.T., & Hanson, S. (2010). Key Concepts in Economic Geography. Sage.
3. Chattopadhyay, A. (2020). Bharat O Paschim Bonger Bhugol [Geography of India and West Bengal] (Jan 2020 ed.). Nabodaya Publications
4. Economic Geography: A Contemporary Introduction, 3rd ed. Wiley-Blackwell.
5. Combes, P., Mayer, T., & Thisse, J.F. (2008). Economic Geography: The Integration of Regions and Nations. Princeton University Press.
6. Hamilton, I. (Ed.). (1992). Resources and Industry. Oxford University Press.
7. MacKinnon, D., & Cumbers, A. (2019). An Introduction to Economic Geography: Globalization, Uneven Development and Place, 3rd ed. Routledge.
8. Willington, D.E. (2008). Economic Geography. Husband Press.



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GEOGRAPHY SEMESTER VII & VIII

SESSION: 2026–2027

Under NEP 2020

Cooch Behar Panchanan Barma University
Cooch Behar, West Bengal



Course: Major 13

Semester-VII

Paper Name: Research Methodology and Ethics (Theoretical)

Programme Code: UG-HWR-GEO/ UG-HON-GEO

Course Code: GEO-MAJ-13T

Full Marks-50

Time-2:30 hrs.

Programme Objectives:

The objectives of this course are to:

- i. To introduce the meaning, scope and significance of research in Geography.
- ii. To explain major types and stages of geographical research.
- iii. To develop skills in framing research problems, objectives, questions and hypotheses.
- iv. To familiarise students with fieldwork, data collection and sampling methods.
- v. To introduce research reporting, citation and referencing styles.
- vi. To promote research ethics, plagiarism prevention and responsible use of AI tools.

Programme Outcome:

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

- i. Explain the basic concepts and types of geographical research.
- ii. Identify research problems and gaps.
- iii. Formulate objectives, research questions and hypotheses.
- iv. Apply basic fieldwork, sampling and data-collection techniques.
- v. Prepare research reports with proper citations and references.
- vi. Follow ethical practices in research, publication and use of AI tools

Unit- I..... Research Methodology: (Marks 25)

1.1 Research in Geography: Meaning, scope and significance. (6)

1.2 Types of research: Descriptive, analytical, qualitative, quantitative, basic and applied research (6).

1.3 Research Steps: Abstract, Selection of the title and study area, Literature review, Problems of the study area, objectives, research methodology, identification of research gap, Sampling technique and formulation of research design, and hypothesis/ research questions. (6)

1.4 Fieldwork in Geographical studies: Role and significance, Tools and techniques. (6)

1.5 Data collection and research reporting: Sources of data, sampling, citations, references, & Bibliography in APA 7 and MLA. (6).

Unit- II Research Ethics: (25 Marks)

2.1 Ethics in Research: Meaning, importance and basic principles of research ethics (6)

2.2 Ethical modalities: Academic honesty, intellectual honesty, research integrity, moral responsibility (6)

2.3 Ethical issues in field-based geographical research: Informed consent, confidentiality, anonymity, voluntary participation (6)

2.4 Publication ethics: Authorship, contributorship, acknowledgement, conflict of interest, duplicate publication, overlapping (6)

2.5 Plagiarism prevention and publication integrity: Types of plagiarism, UGC guidelines and ethical use of AI tools (6)

Note: The value in the parentheses indicates contact hours per semester

* **CE:** Recording of student's conversation with one respondent of 10-15 minutes on a selected issue and submission of the decoded/transcribed version within 5 pages.



Course: Major 13

Semester-VII

Paper Name: Research Methodology and Ethics (Practical)

Programme Code: UG-HWR-GEO/ UG-HON-GEO

Course Code: GEO-MAJ-13P

Full Marks-25

Time-3:00hrs

Programme Objectives

The objectives of this course are to:

- To familiarize students with standard academic citation and referencing styles such as APA 7th edition, MLA, Chicago and Harvard.
- To develop students' ability to convert numbered in-text citations into proper academic citation formats.
- To train students to prepare and correct reference lists according to the prescribed citation style.
- To introduce students to the basic structure and components of a research proposal.
- To develop students' skills in preparing a brief research proposal with proper objectives, research questions or hypotheses, methodology, possible outcomes, limitations and ethical considerations.

Programme Outcome

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

- Apply major citation styles and prepare accurate in-text citations and reference lists.
- Convert numbered citations into the citation style specified by the examiner.
- Prepare a brief research proposal on an assigned topic.
- Formulate a research title, introduction, study area, research problem, objectives and research questions or hypotheses.
- Incorporate methodology, possible outcomes, limitations and ethical considerations in research proposal writing.

UNIT-I	Citation Styles and Reference Correction	Marks: 10
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Students will be given a paragraph containing numbered in-text citations. They will insert citations in the specific academic referencing style as instructed by the examiner, such as APA 7th edition or MLA styles. Students will also prepare and correct the reference list according to the selected citation style (20).

UNIT-II	Preparation of a Research Proposal	Marks: 15
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An arbitrary research topic will be set for the examination. Based on the topic, students will prepare a brief research proposal by applying the basic principles of research methodology and research ethics (30).

The proposal should include the following components: (Do not write the name or Roll No. of the students)

- Title of the research
- Introduction
- Study area
- Statement of the research problems
- Objectives of the study, preferably 2-3 objectives
- Methodology or proposed methods of data collection and analysis
- Research questions or hypotheses, preferably 2-3
- Possible outcomes of the study
- Conclusion and recommendations



- x. Limitations of the study
- xi. Ethical considerations
- xii. References

Note: The value in the parentheses indicates contact hours per semester

* CE: Mock interview drill and field-note writing exercise.

Evaluation Scheme:

- i. Introduction, study area and research problems: 3 marks
- ii. Objectives and research questions/hypotheses :3 marks
- iii. Methodology and possible outcomes :3 marks
- iv. Conclusion, Limitations and ethical considerations :3 marks
- v. References, organization and overall presentation :3 marks

Suggested Readings

1. Chorley, R. J., & Haggett, P. (1973). *Models in geography*. London, England: Methuen.
2. Committee on Publication Ethics. (2017). *COPE core practices*. London, England: Committee on Publication Ethics.
3. Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Thousand Oaks, CA: SAGE Publications.
4. Diener, E., & Crandall, R. (1978). *Ethics in social and behavioral research*. Chicago, IL: University of Chicago Press.
5. Ebdon, D. (1991). *Statistics in geography*. Oxford, England: Blackwell Publishers.
6. Flowerdew, R., & Martin, D. (Eds.). (2005). *Methods in human geography: A guide for students doing a research project* (2nd ed.). Harlow, England: Pearson Education.
7. Gomez, B., & Jones, J. P., III. (2010). *Research methods in geography: A critical introduction*. Chichester, England: Wiley-Blackwell.
8. Indian Council of Medical Research. (2017). *National ethical guidelines for biomedical and health research involving human participants*. New Delhi, India: Indian Council of Medical Research.
9. Israel, M., & Hay, I. (2006). *Research ethics for social scientists: Between ethical conduct and regulatory compliance*. London, England: SAGE Publications.
10. Kothari, C. R., & Garg, G. (2019). *Research methodology: Methods and techniques* (4th ed.). New Delhi, India: New Age International Publishers.
11. Kumar, R. (2019). *Research methodology: A step-by-step guide for beginners* (5th ed.). London, England: SAGE Publications.
12. Mahmood, A. (1998). *Quantitative methods in geography*. New Delhi, India: Rajesh Publications.
13. Monkhouse, F. J. (1971). *Maps and diagrams*. London, England: Methuen.
14. Oliver, P. (2010). *The student's guide to research ethics* (2nd ed.). Maidenhead, England: Open University Press.
15. Pal, S. K. (1998). *Statistics for geoscientists: Techniques and applications*. New Delhi, India: Concept Publishing Company.
16. Resnik, D. B. (1998). *The ethics of science: An introduction*. London, England: Routledge.
17. Shamoo, A. E., & Resnik, D. B. (2015). *Responsible conduct of research* (3rd ed.). New York, NY: Oxford University Press.
18. University Grants Commission. (2018). *University Grants Commission (Promotion of Academic Integrity and Prevention of Plagiarism in Higher Educational Institutions) Regulations, 2018*. New Delhi, India: University Grants Commission.



Course: Major 14

Semester-VII

Paper Name: Cartography-1 (Theoretical)

Programme Code: UG-HWR-GEO/ UG-HON-GEO

Course Code: GEO-MAJ-14T (ELEC 1A)

Full Marks-50

Time-2:30 hrs.

Programme Objectives

The course aims to:

- Introduce the meaning, scope and development of cartography.
- Explain map elements, classification and cartographic representation.
- Develop an understanding of coordinates, bearings, datums and the mathematical basis of maps.
- Familiarise students with the principles and uses of selected map projections.
- Introduce basic land-surveying instruments and techniques.
- Develop skills in interpreting maps for geographical analysis.

Programme Outcomes

After completing this course, students will be able to:

- Explain the scope and historical development of cartography.
- Identify map elements, types and functions.
- Apply suitable symbols and thematic mapping techniques.
- Explain coordinates, bearings, datums and projection principles.
- Compare the properties and uses of selected map projections.
- Describe basic surveying methods and interpret cartographic information.

UNIT- I: Foundations and History of Cartography: 25 Marks

- 1.1. Meaning and Scope of Cartography:** Meaning, nature, scope and relevance of cartography; relationship with Geography, Geodesy and Mathematics. (6)
- 1.2. Development of Cartography:** Greek, Roman and Arab contributions; colonial surveys, Survey of India and digital cartography. (6)
- 1.3. Map Elements and Classification:** Meaning and functions of maps; title, scale, direction, coordinates, legend and source; classification by scale, purpose and content. (6)
- 1.4. Topographical, Cadastral and Thematic Maps:** Characteristics and uses of topographical, cadastral and thematic maps. (6)
- 1.5. Cartographic Representation and cartograms:** Point, line and area symbols; qualitative and quantitative representation; basic principles of choropleth, isopleth, proportional-circle and flow maps; concept and uses of cartograms. (6)

UNIT-II.. Mathematical Cartography and Surveying: 25 Marks

- 2.1 Mathematical Basis of Maps:** Latitude and longitude; parallels and meridians; great circles, rhumb lines, geoid, spheroid and generating globe. (6)
- 2.2 Fundamentals of Map Projection:** Meaning, purpose and classification of projections; scale factor, standard lines and constant of cone. (6)
- 2.3 Selected Map Projections:** Principles, basic derivations, properties and uses of Gnomonic, Stereographic, Equidistant, Simple Conical with Two Standard Parallels, Cylindrical Equal-Area (One standard parallel) and Mercator projections, without graphical construction. (6)
- 2.4 Bearing and Datum:** Meaning and types of bearing; concept of datum and elementary understanding of WGS 84.(6)



2.5 **Fundamentals of Land Surveying:** Principles and uses of Sextant; elementary concepts of triangulation and measurement of height and distance along Vertical plane. **(6)**

Note: The value in the parentheses indicates contact hours per semester

*CE: Handling and interpretation of cartographic data from topographical sheets, Survey of India maps, satellite images, Bhuvan and other open geospatial sources.



Course: Major 14

Semester-VII

Paper Name: Cartography-1 (Practical)

Programme Code: UG-HWR-GEO/ UG-HON-GEO

Course Code: GEO-MAJ-14P (ELEC 1A)

Full Marks-25

Time-3:00 hrs.

Programme Objectives

The objectives of this practical course are to:

- Develop skills in preparing choropleth and chorochromatic maps using appropriate data-classification methods.
- Understand the properties, construction procedures and applications of selected zenithal, conical, cylindrical, interrupted and semi-perspective projections.
- Acquire practical knowledge of slope measurement, area determination, levelling and contour preparation.
- Develop the ability to calculate height and distance through transit-theodolite surveying.
- Introduce students to GPS/GNSS-based collection, recording and plotting of geographical coordinates and waypoints.

Programme Outcomes

After completing this practical course, students will be able to:

- Prepare thematic maps using equal-step, equal-area, nested-mean, quartile-deviation and mean-standard-deviation methods.
- Construct and interpret selected map projections using mathematical calculations and graphical procedures.
- Measure the slope with a clinometer and determine the area using graph paper and a planimeter.
- Prepare contour plans from dumpy-level observations and calculate height and distance from theodolite data.
- Collect, record and plot latitude, longitude, altitude, accuracy and waypoint data using GPS/GNSS or mobile-GPS devices.

Unit – I	Thematic Mapping and Map Projection:	13 Marks
1.1	Thematic Mapping: Preparation of choropleth maps using (Equal Step, Mean & Standard Deviation, and Nested Mean Method and measurement of Accuracy and Chorochromatic maps. (6)	
1.2	Zenithal Projections: Properties, mathematical construction and drawing of Polar Zenithal Gnomonic, Stereographic and Equidistant projections (6)	
1.3	Conical Projections: Properties, mathematical construction and drawing of Simple Conical projection with two standard parallels. (6)	
1.4	Cylindrical and Interrupted Projections: Properties, mathematical construction and drawing of Mercator and Interrupted Sinusoidal projections. (6)	

Unit-II	Surveying:	12 Marks
2.1.	Clinometer Survey: Measurement and calculation of slope by clinometer with preparation of field notes. (6)	
2.2.	Area Measurement: Determination of area by graphical and planimetric methods. (6)	
2.3.	Dumpy Level Survey: Preparation of a contour plan along a traverse or three radiating lines. (6)	



- 2.4. **Transit Theodolite:** Determination of height and distance by triangulation in the same vertical plane. (6)

Note: The value in the parentheses indicates contact hours per semester

*CE: Laboratory Notebook (LNB)

Suggested Readings

1. Basak, N .N) .2017 .(Surveying & Levelling)2nd ed] (.Paperback .[McGraw Hill Education.
2. Das, D .C., & Roy, P) .2024 .(An analytical study of map projections.Kolkata, India: Nabodaya Publications.
3. Das, D., & Hazra, J) .2023 .(Snatok Byaboharik Bhugol]Bengali Edition] [Paperback .[CHAYA PRAKASHANI.
4. Dent, B.D., Torguson, J.S., & Holder, T. W. 2008. (Cartography: Thematic Map Design)6th ed .(. McGraw-Hill.
5. Kanetkar, T.P. 2015.(Surveying and Levelling Part I . Pune Vidyarthi Griha Prakashan.
6. Kanetkar, T .P., & Kulkarni, S .V) .2006 .(Surveying and Levelling, Vols .I-II.Vidyarthi Griha Prakashan.
7. Misra, R.P., & Ramesh, A. 1989.(Fundamentals of Cartography.Concept Publishing Company.
8. Monkhouse, F .J., & Wilkinson, H .R) .1980 .(Maps and Diagrams .B .I .Publications.
9. Punmia, B.C., Jain, A.K., & Jain, A .K. 2016.(Surveying, Vols. I-II.Laxmi Publications.
10. Raisz, E. 1948.(General Cartography.McGraw-Hill.
11. Rao, P.V., & Akella, V. 2015. (Textbook of Surveying) Paperback.[PHI Learning Private Limited.
12. Robinson, A .H., Morrison, J.L., Muehrcke, P.C., Kimerling, A .J., & Guptill, S. C. 1995. (Elements of Cartography)6th ed .(.Wiley.
13. Roy, P. 1988.(An Analytical Study of Map Projections.Pan Publishing Company.
14. Sarkar, A) .2015 .(Practical Geography :A Systematic Approach)3rd ed .(.Orient BlackSwan.
15. Sarkar, A. 2015.(Practical Geography: A Systematic Approach.Orient Blackswan Pvt.Ltd.
16. Singh, R .L., & Singh, R. P. B. (1992).(Elements of Practical Geography.Kalyani Publishers.



Course: Major 14

Semester: VII

Paper Name: Fluvial Geomorphology–1[Elective](Theoretical)

Programme Code: UG–HWR–GEO/ UG–HON–GEO

Course Code: GEO–MAJ–14T (ELEC–1B)

Full Marks: 50

Time: 2:30 hrs.

Programme Objectives

The objectives of this course are to:

- Introduce the scope, principles and dynamics of fluvial geomorphology.
- Explain river systems, dynamic equilibrium and channel adjustment.
- Examine fluvial processes, channel patterns and associated landforms.
- Develop an understanding of drainage–basin hydrology and morphometry.
- Explain integrated watershed management and river–related hazards.
- Assess human impacts on rivers, sediment budgets and urban streams.

Course Outcomes:

After completing this course, students will be able to:

- Explain the principles and systemic nature of river processes.
- Analyse drainage–basin properties, hydrographs and flood frequency.
- Identify channel patterns and major fluvial landforms.
- Explain river responses to tectonic, climatic, sea–level and land–use changes.
- Suggest measures for watershed management, riverbank erosion and badland control.
- Evaluate the impacts of urbanization, deforestation, dams and reservoirs on rivers.

Unit–I Foundational Concepts & Principles in Fluvial Geomorphology: 25 Marks

- 1.1. Introduction to fluvial geomorphology:** Scope and content of Fluvial Geomorphology, Processes, Forms, and Dynamics. (6)
- 1.2. Principles of the river system:** Fundamental principles of fluvial geomorphology, Systemic understanding of River channel systems and the concept of dynamic equilibrium in river systems. (6)
- 1.3. Fluvial processes & landforms:** Erosional & Depositional processes and Landforms. (6)
- 1.4. Fluvial morphodynamics:** Adjustment of channel forms to tectonic, climatic, sea level and land use changes. (6)
- 1.5. Change of rivers:** Concept of dynamic equilibrium in river systems, Knick points, waterfalls, and channel response to base–level fall or rise. (6)

Unit–II Watershed Hydrology and Channel Morphodynamics: (25 Marks)

- 2.1. Channel Patterns (Morphology):** Straight, meandering, braided, and anastomosing channels. (6)
- 2.2. The Drainage Basin Framework:** Catchment hydrology, drainage networks, and stream ordering systems, hydrographs, flood frequency analysis. (6)
- 2.3. Properties of drainage basin:** Linear, areal and altitudinal properties of drainage basin, Principles and significance of integrated watershed management. (6)
- 2.4. Fluvial landforms:** Terraces, Mid–channel bars, alluvial fans, badlands, deltas and accretion topography. (6)



- 2.5. **Human Impacts on Rivers:** Urbanization, deforestation, and the urban stream syndrome, impacts of dams and reservoirs on downstream sediment budgets. (6)

Note: The value in the parentheses indicates contact hours per semester

* **CE:** Handling, measurement and interpretation of drainage–basin, river–channel, hydrograph, topographical, DEM and satellite data.

Suggested Readings:

1. **Bridge, J. S. (2003).** Rivers and Floodplains: Forms, Processes, and Sedimentary Record. Wiley–Blackwell.
2. **Brierley, G. J., & Fryirs, K. A. (2005).** River Styles: A Geomorphic Approach to Catchment Management. Wiley–Blackwell.
3. **Burbank, D. W., & Anderson, R. S. (2011).** Tectonic Geomorphology. Wiley–Blackwell.
4. **Charlton, R. (2007).** Fundamentals of Fluvial Geomorphology. Routledge. (Highly accessible, excellent for introduction to channel patterns).
5. **Chow, V. T., Maidment, D. R., & Mays, L. W. (1988).** Applied Hydrology. McGraw–Hill. (The definitive guide for hydrographs and flood frequency analysis).
6. **Gregory, K. J., & Walling, D. E. (1973).** Drainage Basin Form and Process: A Geomorphological Approach. Edward Arnold.
7. **Heathcote, I. W. (2009).** Integrated Watershed Management: Principles and Practices. Wiley. (Crucial for sub –
8. **Kale, V. S. (Ed.). (2014).** Landscapes and Landforms of India. Springer. (Provides critical insights into the Ganga–Brahmaputra systems, deltas, and badlands).
9. **Knighton, D. (1998).** Fluvial Forms and Processes: A New Perspective. Routledge. (The gold standard for undergraduate fluvial mechanics).
10. **Kondolf, G. M., & Piégay, H. (Eds.). (2016).** Tools in Fluvial Geomorphology. Wiley–Blackwell. (The absolute best reference for practical laboratory and field assessment tools).
11. **Leopold, L. B., Wolman, M. G., & Miller, J. P. (1964).** Fluvial Processes in Geomorphology. Dover Publications.
(The timeless classic that pioneered quantitative fluvial geomorphology).
12. **Robert, A. (2003).** Fluvial Processes: An Introduction to Fluid Dynamics and Hydraulics of Open Channels. Routledge.
13. **Rosgen, D. L. (1996).** Applied River Morphology. Wildland Hydrology Books. (Famous for river classification and bank erosion management).
14. **Schumm, S. A. (1977).** The Fluvial System. John Wiley & Sons. (Essential for understanding dynamic equilibrium and system thresholds).
15. **Schumm, S. A., Dumont, J. F., & Holbrook, J. M. (2000).** Active Tectonics and Alluvial Rivers. Cambridge University Press. (Perfect for sub –unit 1.4).
16. **Singh, S. (2017).** Geomorphology. Pravalika Publications. (Extensively used across Indian universities for core landform terminology).
17. **Subramanian, K. (2013).** Engineering Hydrology. McGraw–Hill Education. (Highly relevant for quantitative catchment hydrology and Indian contexts).
18. **Thorne, C. R., Hey, R. D., & Newson, M. D. (1997).** Applied Fluvial Geomorphology for River Engineering and Management. John Wiley & Sons.



19. **Valdiya, K. S. (2015).** The Making of India: Geodynamic Evolution. Springer. (Excellent context for tectonic adjustments of major Himalayan and Peninsular rivers).
20. **Wohl, E. (2014).** A World of Rivers: Environmental Change on Large Rivers. University of Chicago Press. (In – depth look at human impacts and river degeneration).



Course: Major 14

Semester: VII

Paper Name: Fluvial Geomorphology–1 [Elective] (Practical)

Programme Code: UG-HWR-GEO/ UG-HON-GEO

Course Code: GEO-MAJ-14P (ELEC-1B)

Full Marks: 25

Time – 3:00 hrs

Programme Objectives

The objectives of this course are to:

- i. Develop skills in drainage–density, drainage–frequency and stream–order analysis.
- ii. Introduce the measurement of channel sinuosity and identification of drainage patterns.
- iii. Develop skills in hydrograph preparation and interpretation.
- iv. Train students to plot and interpret river longitudinal and cross–sectional profiles.
- v. Enable watershed and stream network delineation from topographic maps and DEMs.

Course Outcomes:

After completing this course, students will be able to:

- i. Prepare drainage–density and drainage–frequency maps.
- ii. Apply Horton’s and Strahler’s stream–ordering methods.
- iii. Calculate channel sinuosity and identify drainage patterns.
- iv. Construct hydrographs and interpret river profiles.
- v. Delineate watersheds and stream networks using topographical maps and DEMs.

Unit-I	Relief & Drainage Basin Morphometry:	13 Marks
1.1.	Construction of Drainage Density map (R.E. Horton) & Drainage Frequency map on a delineated drainage basin with specific area (10cm x 10cm).	(5)
1.2.	Application of Strahler & Horton’s stream ordering methods.	(5)
1.3.	Measurement of channel sinuosity index (S.I.) to classify meandering, straight, or braided channels.	(2)
1.4.	Identification of various types of drainage patterns on the given topographical maps.	(3)
Unit- II:	Channel Cross-Section and Flow Hydraulics:	12 Marks
2.1.	Calculate the Annual Hydrograph from water discharge data.	(4)
2.2.	Plotting and interpretation of river Long & cross–sectional profiles from the given toposheet.	(4)
2.3.	Delineation of watersheds and stream networks from topographical maps.	(3)
2.4.	Delineation of watersheds and stream networks from Digital Elevation Model (DEM)	(4)

Note: The value in the parentheses indicates contact hours per semester

***CE: LNB**

Suggested Readings:

1. Charlton, R. (2008). *Fundamentals of Fluvial Geomorphology*. Routledge.
2. Gregory, K. J. & Walling, D. E. (1973). *Drainage Basin Form and Process: A Geomorphological Approach*. Edward Arnold.
3. Horton, R. E. (1945). “Erosional Development of Streams and Their Drainage Basins.” *Geological Society of America Bulletin*, 56, 275–370.
4. Jensen, J. R. (2015). *Introductory Digital Image Processing: A Remote Sensing Perspective* (4th ed.). Pearson.
5. Knighton, D. (1998). *Fluvial Forms and Processes: A New Perspective*. Routledge.
6. Leopold, L. B., Wolman, M. G. & Miller, J. P. (1964). *Fluvial Processes in Geomorphology*. W. H. Freeman.
7. Raghunath, H. M. (2015). *Hydrology: Principles, Analysis and Design* (3rd ed.). New Age International.



8. Schumm, S. A. (1956). "The Evolution of Drainage Systems and Slopes in Badlands at Perth Amboy, New Jersey." Geological Society of America Bulletin, 67, 597–646.
9. Strahler, A. N. (1957). "Quantitative Analysis of Watershed Geomorphology." Transactions, American Geophysical Union, 38(6), 913–920.
10. Wilson, J. P. & Gallant, J. C. (Eds.). (2000). [Terrain Analysis: Principles and Applications](#), Wiley.



Course: Major 14

Semester- VII

Paper Name: Population Geography-1 [Elective] (Theoretical)

Programme Code: UG-HWR-GEO/ UG-HON-GEO

Course Code: GEO-MAJ-14T (ELEC-1C)

Full Marks-50

Time-2:30 hrs.

Programme Objectives

The programme aims to:

- Introduce the meaning, scope and basic concepts of Population Geography.
- Familiarise students with major sources of population data in India.
- Explain population distribution, density, growth and composition.
- Develop an understanding of fertility, mortality and migration processes.
- Introduce major classical and contemporary population theories.
- Examine population-resource relationships and emerging population issues in India.

Course Outcomes

After completing this course, students will be able to:

- Explain the nature and scope of Population Geography and its relationship with demography.
- Evaluate the major sources, merits and limitations of population data.
- Interpret population distribution, density, growth and composition.
- Explain fertility, mortality and migration using basic demographic measures.
- Describe major migration and contemporary population theories.
- Analyse population ageing, declining fertility, distress migration, brain drain and migrant-worker issues in India.

Unit-I	Basic Concepts, Data and Population Distribution:	25 Marks
1.1.	Population Geography: Meaning, Nature, Scope and relation with Demography. (6)	
1.2.	Sources of population data in India: Census, Civil Registration System, Sample Registration System (SRS) and NFHS; Their merits and limitations (6)	
1.3.	Population distribution and density: Physical, Economic and Social factors; Broad patterns in India. (6)	
1.4.	Population Growth: Positive, Negative and Zero growth; Natural and Actual growth; Doubling time; World and Indian trends. (6)	
1.5.	Population composition: Literacy Composition; Population Pyramid. (6)	

Unit-II	Population Processes, Theories and Issues:	25 Marks
2.1.	Fertility: meaning, simple measures and major determinants. (6)	
2.2.	Mortality: meaning, simple measures, infant mortality and life expectancy. (6)	
2.3.	Migration: meaning, types, causes and consequences; Basic Idea of New Economics of Labour Migration [NELM] (Stark and Bloom) and Migration Systems Theory (Mabogunje). (6)	
2.4.	Contemporary Theories of Population: Second Demographic Transition Theory, Neo-Malthusian perspectives and Low-Fertility Trap Hypothesis. (6)	



2.5. Population and Migration Issues in India: Population ageing, declining fertility, distress migration, brain drain and migrant-worker problems. (6)

Note: The value in the parentheses indicates contact hours per semester

*CE: Handling, coding and interpretation of population data from Census, DCHB, SRS, NFHS and other demographic data sources.

Suggested Readings

1. Barrett, H. R. (1995). Population Geography. Oliver and Boyd.
2. Beaujeu-Garnier, J. (1966). Geography of Population. Longman.
3. Bhende, A., & Kanitkar, T. (2000). Principles of Population Studies. Himalaya Publishing House.
4. Bogue, D. J. (1969). Principles of Demography. John Wiley & Sons.
5. Census of India. (2011). Primary Census Abstract and related publications. Government of India.
6. Chandna, R. C. (2012). Geography of Population: Concepts, Determinants and Patterns. Kalyani Publishers.
7. Clarke, J. I. (1965). Population Geography. Pergamon Press.
8. Hassan, M. I. (2005). Population Geography. Rawat Publications.
9. Jones, H. R. (2000). Population Geography (3rd ed.). Paul Chapman.
10. Newbold, K. B. (2009). Population Geography: Tools and Issues. Rowman & Littlefield.
11. Pacione, M. (1986). Population Geography: Progress and Prospect. Taylor and Francis.
12. Peters, G. L., & Larkin, R. P. (1979). Population Geography: Problems, Concepts and Prospects. Kendall/Hunt Publishing.
13. Registrar General of India. (2020). Sample Registration System Statistical Report. Government of India.
14. Trewartha, G. T. (1969). A Geography of Population: World Patterns. John Wiley & Sons.
15. Weeks, J. R. (2023). Population: An Introduction to Concepts and Issues (13th ed.). Cengage Learning.
16. Wilson, M. G. A. (1968). Population Geography. Nelson.
17. International Institute for Population Sciences. (2021). National Family Health Survey-5, 2019-21: India Report. IIPS and Ministry of Health and Family Welfare.
18. Government of India. (2000). National Population Policy 2000. Ministry of Health and Family Welfare.



Course: Major 14

Semester – VII

Paper Name: Population Geography-1 [Elective] (Practical)

Programme Code: UG-HWR-GEO/ UG-HON-GEO

Course Code: GEO-MAJ-14P (ELEC-1C)

Full Marks-25

Time-3:00 hrs

Programme Objectives

The programme aims to:

- Develop skills in calculating basic demographic measures.
- Train students to prepare and interpret age-sex pyramids.
- Introduce choropleth, dot, proportional-circle and sphere mapping techniques.
- Develop skills in analyzing population distributions, potential, and mean centres.
- Train students in preparing migration-flow maps.
- Introduce the calculation and interpretation of HDI and GDI.

Programme Outcomes

After completing the practical paper, students will be able to:

- Calculate population growth, decadal variation, birth rate, death rate and natural increase.
- Prepare and interpret age-sex pyramids.
- Represent demographic data using choropleth, dot, and proportional symbol maps.
- Calculate population potential and mean centre of population.
- Prepare and interpret migration-flow maps.
- Calculate and interpret HDI and GDI using prescribed methods.

Unit-I Demographic Measures and Population Representation: 12 Marks

- 1.1 Basic Demographic Measures:** Calculation of growth rate, decadal variation, birth rate, death rate and natural increase. (4)
- 1.2 Age-Sex Composition:** Preparation and interpretation of an age-sex pyramid. (4)
- 1.3 Choropleth Mapping:** Preparation of a choropleth map of population density, literacy or other demographic data. (4)
- 1.4 Population Distribution Mapping:** Preparation of dot and proportional circle/spheres on maps. (4)

Unit- II Spatial Population Analysis and Development Indices: 13 Marks

Spatial Population Analysis and Development Indices:13 Marks

- 2.1 Spatial Population Measures:** Calculation of population potential and mean centre of population. (4)
- 2.2 Migration-Flow Mapping:** Preparation of migration flow map. (4)
- 2.3 Human Development Index:** Calculation of HDI using UNDP 2014 methods. (4)
- 2.4 Gender Development Indices:** Calculation of GDI (4)

Note: The value in the parentheses indicates contact hours per semester

*CE: LNB



Suggested Readings

1. Bhende, A., & Kanitkar, T. (2000). Principles of Population Studies. Himalaya Publishing House.
2. Chandna, R. C., & Sidhu, M. S. (1980). An Introduction to Population Geography. Kalyani Publishers.
3. Craig, J. (1972). Population potential and population density. *Area*, 4(1), 10–12.
4. Craig, J. (1987). Population potential and some related measures. *Area*, 19(2), 141–146.
5. Gaye, A., Klugman, J., Kovacevic, M., Twigg, S., & Zambrano, E. (2010). Measuring key disparities in human development: The Gender Inequality Index. *Human Development Research Paper*, 46.
6. Mahmood, A. (n.d.). Statistical Methods in Geographical Studies. Rajesh Publications.
7. Pal, S. K. (1998). Statistics for Geoscientists. Tata McGraw-Hill, New Delhi.
8. Sarkar, A. (2013). Quantitative Geography: Techniques and Presentations. Orient BlackSwan.
9. Singh, R. L., & Dutt, P. K. (n.d.). Elements of Practical Geography. Kalyani Publishers.
10. Monkhouse, F. J., & Wilkinson, H. R. (n.d.). Maps and Diagrams. Methuen.
11. Government of India. (n.d.). Census of India, District Census Handbook, and Sample Registration System Reports.
12. International Institute for Population Sciences. (n.d.). National Family Health Survey Reports.
13. UNDP. (2021). Technical notes on calculating human development indices. United Nations Development Programme.



Course: Major 14

Semester-VII

Paper Name: Urban Geography- 1 (Theoretical)

Programme Code: UG-HWR-GEO/ UG-HON-GEO

Course Code: GEO-MAJ-14T (ELEC 1D)

Full Marks-50

Time-2:30 hrs.

Programme Objectives

The objectives of this course are to:

- i. To introduce the meaning, nature and scope of urban geography.
- ii. To explain the origin, growth and classification of urban settlements.
- iii. To develop an understanding of urban morphology, CBD and urban processes.
- iv. To examine urbanization trends in the world and India.
- v. To analyse major urban problems and smart urban development initiatives. Programme Outcomes

Programme Outcomes

After completing this course, students will be able to:

- i. Explain the basic concepts and scope of urban geography.
- ii. Describe the origin, growth and classification of cities.
- iii. Interpret urban morphology and major urban processes.
- iv. Compare urbanization patterns in developed and developing countries and India.
- v. Evaluate urban issues, renewal programmes and smart city initiatives.

Unit-I.....Foundations, Growth and Morphology of Urban Settlements:25 Marks

Foundations, Growth and Morphology of Urban Settlements: 25 Marks

- 1.1. **Introduction to Urban Geography:** Definition, nature, scope and content of urban geography (6)
- 1.2. **Origin and Growth of Urban Settlements:** Origin and Growth of urban settlements in the world (6)
- 1.3. **Classification of Cities:** Based on Population, Location and Function (6)
- 1.4. **Urban Morphology and CBD:** Concept of urban morphology and central business district (6)
- 1.5. **Urban Processes:** Urbanisation, suburbanization, counter-urbanization, re-urbanization (6)

Unit-II Urbanization, Urban Systems and Urban Issues: 25 Marks

- 2.1 **Trends of Urbanization:** Urbanization trends in developed and developing countries (6)
- 2.2 **Urbanization in India:** Levels, trends, and spatial patterns of urbanization in India (6)
- 2.3 **Urban Renewal and Urban Sprawl:** Definition, Concept and Characteristics (6)
- 2.4 **Urban Issues in India:** Urban poverty, transportation problems, housing shortages, slums, and urban crime (6)
- 2.5 **Smart Urban Development:** Smart Cities Mission and related initiatives (6)

Note: The value in the parentheses indicates contact hours per semester

*CE: Handling, coding and interpretation of urban data from Census, DCHB, Town Directory, municipal records and master plans



Course: Major 14

Semester-VII

Paper Name: Urban Geography-1 (Practical)

Programme Code: UG-HWR-GEO/ UG-HON-GEO

Course Code: GEO-MAJ-14P (ELEC-1D)

Full Marks: 25

Time: 3:00hrs.

Programme Objectives

The objectives of this course are to:

- To measure regional and urban disparities using suitable indices.
- To delineate urban influence zones through the Gravity Model.
- To analyse urban functional structure and population categories graphically.
- To apply statistical methods to selected urban variables.
- To examine urban inequality, association and bid-rent patterns.

Programme Outcomes

After completing this practical course, students will be able to:

- Calculate and interpret Sopher's Disparity Index.
- Delineate urban influence zones and prepare ternary and proportional sphere diagrams.
- Apply Pearson's and Spearman's correlation techniques.
- Construct Lorenz curves and calculate the Gini coefficient.
- Use Chi-square and bid-rent models in urban geographical analysis.

Unit-I Urban Spatial Patterns and Functional Analysis: 13 Marks

- 1.1 Regional Disparity Analysis:** Measurement of regional disparity using Sopher's Disparity Index. (4)
- 1.2 Urban Influence Zone:** Delineation of the influence zone of a city using the Gravity Model. (4)
- 1.3 Urban Functional Structure:** Construction and interpretation of a ternary diagram. (4)
- 1.4 Urban Population Representation:** Preparation of proportional sphere diagrams for different categories of towns (4)

Unit- II Statistical and Land-Use Analysis in Urban Geography: 12 Marks

- 2.1 Urban Correlation Analysis:** Application of Pearson's correlation and Spearman's rank correlation to selected urban variables. (4)
- 2.2 Urban Inequality Analysis:** Construction of the Lorenz Curve and calculation of the Gini coefficient for urban income inequality. (4)
- 2.3 Urban Association Analysis:** Application of the Chi-square test to selected categorical urban variables. (4)
- 2.4 Bid-Rent and Land-Use Modelling:** Calculation of bid-rent curves, intersection points and theoretical land-use zones. (4)

Note: The value in the parentheses indicates contact hours per semester

*CE= LNB



Course: Major 15

Semester-VII

Paper Name: Indian Knowledge System and Applied Geography

[Seminar paper] (Theoretical)

Programme Code: UG-HWR-GEO/ UG-HON-GEO

Course Code: GEO-MAJ-15T (SEMINAR)

Full Marks-50

Time-2:30 hrs.

Course Objectives

The objectives of this field-based course are to:

- Introduce the geographical relevance of Indian Knowledge Systems.
- Explain indigenous contributions to science, environment and planning.
- Familiarise students with traditional resource management and hazard adaptation.
- Introduce the scope and approaches of Applied Geography.
- Examine geographical applications in environment, population, regional and urban planning.

Programme Outcomes

After completing the programme, students will be able to:

- Explain the geographical significance of Indian Knowledge Systems.
- Describe indigenous practices in astronomy, cartography and conservation.
- Interpret traditional knowledge of weather, resources and hazards.
- Explain the approaches of Applied Geography.
- Apply geographical knowledge to environmental, regional, urban and developmental issues.

UNIT-I..... Indian Knowledge System (IKS) in Geography: 25 Marks

- 1.1 Concept, Sources and Geographical Relevance of IKS:** Meaning, nature and major sources of the Indian Knowledge System; relevance of traditional knowledge to geographical thought. (6)
- 1.2 Indigenous Science, Astronomy and Cartography:** Contributions of Aryabhata, the concept of zero, use of the Pole Star, traditional surveying and map-making practices. (6)
- 1.3 Environmental Thought and Cultural Landscapes:** Vedic and Vedantic views of nature; environmental ethics, sacred landscapes and cultural ecology. (6)
- 1.4 Traditional Weather and Resource Management:** Contributions of Khana to weather forecasting; indigenous practices of water harvesting, soil conservation and resource management. (6)
- 1.5 Indigenous Conservation, Hazards and Settlement Planning:** Traditional protection of plants and wildlife, community conservation, adaptation to environmental hazards and ancient town-planning practices. (6)

UNIT II Applied Geography: 25 Marks

- 2.1 Foundations and Approaches of Applied Geography:** Meaning, scope and relationship between pure and applied geography; spatial, regional and participatory approaches. (6)
- 2.2 Applications of Physical Geography:** Terrain evaluation, floodplain zoning, watershed management and drought management. (5)
- 2.3 Environmental and Disaster Applications:** Environmental degradation, hazard vulnerability, disaster mitigation and elementary concepts of Environmental Impact Assessment. (6)
- 2.4 Population, Livelihood and Regional Development:** Applications in population change, migration, livelihood planning, regional disparity and tribal-area development. (6)



2.5 Urban, Transport and Geospatial Applications: Applications in population change, migration, livelihood planning, regional disparity and tribal-area development. (6)

Note: The value in the parentheses indicates contact hours per semester

*CE= Assignment

Suggested Readings

A. Indian Knowledge System in Geography

1. Agarwal, A., and Narain, S. (Eds.) (2008). Dying Wisdom: Rise, Fall and Potential of India's Traditional Water Harvesting Systems (5th ed.). Centre for Science and Environment, New Delhi.
2. Bose, D. M., Sen, S. N., and Subbarayappa, B. V. (Eds.) (2009). A Concise History of Science in India. Universities Press, Hyderabad.
3. Dutt, B. B. (1925). Town Planning in Ancient India. Calcutta and later reprint editions.
4. Gadgil, M., and Guha, R. (2012). This Fissured Land: An Ecological History of India (2nd ed.). Oxford University Press, New Delhi.
5. Gole, S. (1989). Indian Maps and Plans: From Earliest Times to the Advent of European Surveys. Manohar Publications, New Delhi.
6. Mahadevan, B., Bhat, V. R., and Nagendra, P. R. N. (2022). Introduction to Indian Knowledge System: Concepts and Applications. PHI Learning, New Delhi.
7. Ramakrishnan, P. S., Saxena, K. G., and Chandrashekara, U. M. (Eds.) (1998). Conserving the Sacred for Biodiversity Management. Oxford & IBH Publishing, New Delhi.
8. Rao, S. Balachandra (1999). Indian Astronomy: An Introduction. Universities Press, Hyderabad

B. Applied Geography

1. Chand, M., and Puri, V. K. Regional Planning in India. Allied Publishers, New Delhi.
2. Longley, P. A., Goodchild, M. F., Maguire, D. J., and Rhind, D. W. (2015). Geographic Information Science and Systems (4th ed.). Wiley.
3. Mandal, S., Maiti, R., Nones, M., and Beckedahl, H. R. (Eds.) (2022). Applied Geomorphology and Contemporary Issues. Springer, Cham.
4. Pacione, M. (Ed.) (1999). Applied Geography: Principles and Practice. Routledge, London.
5. Roy, P. B. (2015). A handbook of transport geography. Kolkata, India: Reader Service
6. Saxena, H. M. (2005). Transport Geography. Rawat Publications, Jaipur.
7. Singh, S. (2012). Environmental Geography. Prayag Pustak Bhawan, Allahabad.
8. Smith, K., Fearnley, C. J., Dixon, D., Bird, D. K., and Kelman, I. (2024). Environmental Hazards: Assessing Risk and Reducing Disaster (7th ed.). Routledge, London.



Course: Major 15

Semester-VII

Paper Name: Indian Knowledge System and Applied Geography

[Seminar paper] (Practical)

Programme Code: UG-HWR-GEO/ UG-HON-GEO

Course Code: GEO-MAJ-15P (SEMINAR)

Full Marks-25

Time-3:00hrs

Programme Objectives

The objectives of this field-based course are to:

- To develop understanding of the geographical relevance of the Indian Knowledge System and Applied Geography.
- To encourage the study of local culture, indigenous practices and traditional knowledge systems.
- To develop skills in selecting a geographical theme and formulating clear objectives.
- To train students in collecting, organizing and interpreting primary and secondary information.
- To develop academic report-writing, mapping and PowerPoint presentation skills.

Programme Outcomes

After completing the seminar, students will be able to:

- Explain the relationship between Indian Knowledge traditions and geographical studies.
- Identify the applied significance of local and indigenous practices.
- Conduct a small geographical study using suitable data and methods.
- Analyse geographical issues through maps, tables, photographs and diagrams.
- Prepare a concise seminar report and present the findings effectively within 20 PowerPoint slides.

Seminar Report and Presentation: 25 Marks

A. Seminar Report Content: 15 Marks

- Selection of Theme:** Selection of a simple geographical theme related to the Indian Knowledge System, local and traditional culture, or Applied Geography. Themes may include folk knowledge and cultural landscapes, traditional weather forecasting, indigenous agriculture, soil and water management, sacred groves, traditional plant use, community-based resource conservation, indigenous hazard adaptation, vernacular housing, traditional cartography, rural settlement planning, livelihood practices, heritage conservation, or the application of indigenous knowledge to contemporary environmental and geographical problems and related themes.
- Conceptual Background:** Brief explanation of IKS, its sources and geographical relevance.
- Study Area and Objectives:** Brief description of the study area and formulation of clear objectives.
- Data and Methodology:** Use of field observations, interviews, literature, maps, records and suitable geographical methods.
- Analysis and Interpretation:** Analysis of the selected practice, its present relevance, environmental significance and sustainability potential.
- Group Composition and Contribution:** The seminar paper shall be prepared by a group of **six to ten students**.
Each member's contribution must be clearly stated.
- Report Preparation:** The report shall be limited to **50 pages** and include the title, introduction, objectives, study area, database, methodology, analysis, findings, conclusion and references.



B. PowerPoint Presentation and Viva Voce: 10 Marks

- i. Each group shall present a maximum of **20 PowerPoint slides**. All members must present their assigned parts and participate in the viva voce.
- ii. The Internal and External Examiners shall evaluate the seminar, and their marks shall be averaged.

Note: The value in the parentheses indicates contact hours per semester

***CE: Preparation of Seminar report**

Component	Marks
Seminar Report	15
PowerPoint Presentation and Viva Voce	10
Total	25

Suggested Readings

1. Booth, W. C., Colomb, G. G., Williams, J. M., Bizup, J., and FitzGerald, W. T. (2016). The Craft of Research (4th ed.). University of Chicago Press, Chicago.
2. Creswell, J. W. (2014). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches (4th ed.). SAGE Publications, Thousand Oaks.
3. Flowerdew, R., and Martin, D. (Eds.) (2005). Methods in Human Geography: A Guide for Students Doing a Research Project (2nd ed.). Pearson Education, Harlow.
4. Gomez, B., and Jones, J. P., III (Eds.) (2010). Research Methods in Geography: A Critical Introduction. Wiley-Blackwell, Chichester.
5. Kumar, R. (2019). Research Methodology: A Step-by-Step Guide for Beginners (5th ed.). SAGE Publications, London.



Course: Major 16

Semester-VII

(FOR HONS WITH RESEARCH)

Paper Name: DISSERTATION: 1 (PROGRESS REPORT and SYNOPSIS PREPARATION)

Programme Code: UG-HWR-GEO

Course Code: GEO-MAJ-16 (D) Dissertation

Full Marks-75

Time-3:00hrs.

Programme Objectives

The programme aims to:

- To guide students in selecting and finalising a focused, feasible and geographically relevant research topic.
- To develop the ability to formulate a clear statement of the problem after a systematic review of literature.
- To train students to identify a research gap and translate it into objectives, research questions and/or testable hypotheses.
- To develop an appropriate research design, sampling framework, questionnaire/schedule and plan for primary and secondary data collection.
- To provide practical experience in pilot surveying, validation and revision of research tools, and preparation and defence of a research synopsis.

Programme Outcomes

After completing the programme, students will be able to:

- Select and justify a researchable geographical topic and study area.
- Critically review relevant literature and identify a clearly stated research gap.
- Frame coherent objectives, research questions and/or hypotheses aligned with the research problem.
- Prepare a feasible methodology, sampling design and validated questionnaire/schedule or equivalent research instrument.
- Prepare and defend a structured progress report and synopsis through a professional presentation and viva voce.

1. Nature of the Research

The proposed research shall be objective-specific, problem-oriented and geographically grounded. It may be based on one or more of the following forms:

- Testing a geographical theory, model, relationship or hypothesis.
- Comparing the geographical characteristics of two or more places, regions, communities or phenomena.
- Examining change over time through temporal/spatial or spatio-temporal analysis.
- Investigating a physical, environmental, social, economic, cultural, urban, rural, regional, health, population/demographic, tourism, resource, hazard or planning problem.
- Applying cartographic, statistical, remote sensing, GIS, geospatial, qualitative or mixed-method approaches to a geographical problem.



2. Required Components of the Progress Report:

Sl. No.	Component	Requirement	Time Frame
1	Title or Topic Selection	A concise and researchable title reflecting the geographical problem, principal variables or phenomena, and spatial context.	Week 1
2	Selection of the Study Area	Identification and justification of the study area, including its location, extent, accessibility, relevance and relationship to the proposed problem.	Week 2
3	Statement of the Problems	A clear explanation of the geographical issue, its context, significance and the specific problem to be investigated.	Week 3
4	Review of Literature	A critical and organized review of relevant books, journal articles, theses, reports, official documents, maps and credible databases.	Weeks 4–6
5	Identification of the Research Gap	A precise statement of what is insufficiently known, inadequately explained or not previously examined in the selected spatial or thematic context.	Week 7
6	Formulation of Objectives	Specific, measurable, achievable, relevant and logically sequenced objectives.	Week 8
7	Research Questions and/or Hypotheses	Research questions and/or testable hypotheses framed in direct alignment with the problem, research gap and objectives.	Week 9
8	Research Design and Methodology	Data requirements, sources, sampling design, variables or indicators, tools, field or laboratory procedures, statistical, cartographic and geospatial techniques, and proposed methods of interpretation.	Weeks 10–11
9	Questionnaire/Schedule or Research Instrument	Preparation of a structured questionnaire, interview schedule, observation sheet, checklist, laboratory protocol, image-classification scheme, or other appropriate research instrument.	Week 12
10	Pilot Survey and Sample Design	Conduct of a pilot survey involving at least 50 respondents, cases or observations, wherever applicable. The proposed full sample size shall be justified using Cochran's formula or another appropriate sampling method.	Week 13
11	Validation of the Research Instrument	Revision of the questionnaire or schedule following pilot testing, including face and content validation and reliability testing using statistical methods, wherever applicable.	Week 14
12	Preparation and Finalization of Synopsis	Preparation of a coherent synopsis covering the proposed chapter scheme, work plan, methodology, expected findings, and academic or societal relevance, followed by final revision and submission.	Weeks 15–16

3. Suggested Structure of the Progress Report / and Preparation of the Synopsis

1. Title page.
2. Certificate of the Supervisor.
3. Student declaration.
4. Table of contents.
5. Proposed title and background of the study.
6. Statement of the problem and significance of the study.
7. Review of literature and research gap.
8. Objectives, research questions and/or hypotheses.
9. Location and geographical profile of the study area.
10. Database and methodology, including sampling design and proposed analytical techniques.



11. Draft questionnaire/schedule or equivalent research instrument.
12. Pilot-survey and validation/revision of the instrument.
13. Proposed chapter scheme and time-bound work plan.
14. Expected outcomes, relevance and limitations.
15. References and appendices.

3.1. Suggested Length: The Progress Report/Synopsis should ordinarily be within 3,000 words, excluding tables, maps, figures, references and appendices.

3.2. Submission procedure: The Progress Report shall be submitted in the form prescribed by the Department before the notified date. A soft copy may also be required for departmental record and examination purposes.

3.3. PowerPoint Presentation: Each student shall present the Progress Report to the Expert Committee using a PowerPoint presentation with not **more than 50 slides**. The presentation should ordinarily cover–

- i. Title, theme and significance of the research.
- ii. Statement of the problem and selected study area.
- iii. Major literature survey and identification of a research gap.
- iv. Objectives, research questions and/or hypotheses.
- v. Proposed database, sample design and methodology.
- vi. Questionnaire/schedule or other research instrument.
- vii. Pilot-survey findings and instrument validation.
- viii. Proposed chapter scheme, work plan and expected outcomes.

Course Evaluation

The course shall be evaluated through continuous supervision during the semester and an end-semester presentation of the Progress Report. The student shall present the proposed research before the Expert Committee. The evaluation shall consider the relevance and feasibility of the proposed study, clarity of the research problem, quality of the literature review, identification of the research gap, coherence of objectives and research questions/hypotheses, suitability of the research design, preparation and validation of the research instrument, completion of the pilot survey and overall quality of the synopsis.

4. Marks Distribution: Semester VII

Sl. No.	Component	Marks
1	Internal Assessment conducted by the Supervisor/Department	10
2	Continuous Evaluation	10
3	Attendance as per University rules	5
4	End-Semester Examination: Progress Report, Presentation and Viva Voce	75
Total		100

4.1. End-Semester Evaluation Rubric: (75 Marks)

Sl. No.	Criterion	Marks
1	Quality, coherence and academic merit of the Progress Report and Synopsis, including evaluation of the printed synopsis submitted with the Progress Report	50
2	Quality, clarity and organisation of the PowerPoint presentation (maximum 30 slides)	15
3	Performance in the viva voce and defence of the proposed research	10



Sl. No.	Criterion	Marks
	Total	75

4.2. Progress Report and Synopsis: Suggested Rubric (40 Marks)

Sl. No.	Criterion	Marks
1.	Relevance and finalization of the title/topic; justification and delineation of the study area.	08
2.	Clarity and significance of the statement of the problem; coverage, organization and critical quality of the literature review; identification and articulation of the research gap.	15
3.	Alignment of objectives, research questions and/or hypotheses.	06
4.	Research design, data requirements, sampling and analytical methods; questionnaire/research instrument, pilot survey and validation.	15
5.	Organization of the synopsis, chapter scheme, work plan and references.	06
	Total	50

Expert Panel for Evaluation:

The end-semester examination in each semester shall be conducted by an Expert Committee comprising:

- i. the concerned Supervisor, who shall act as the Internal Examiner;
- ii. the Head of the Department of Geography of the concerned college or, in his/her absence, the seniormost teacher of the Department; and
- iii. one External Expert nominated by the University on the recommendation of the UGBOS of Geography.

All members of the Expert Committee shall jointly award the average marks. Each member of the Committee must possess a Ph.D. degree.

6. **Continuity of Topic.** The research topic approved in Semester VII shall ordinarily continue in Semester VIII. Any substantial change in the title, study area, objectives, or methodology shall require written

approval of the Supervisor and the Head/Coordinator of the Department.

*** CE= Library Work**

Suggested Readings:

1. Booth, W. C., Colomb, G. G., Williams, J. M., Bizup, J., and FitzGerald, W. T. (2016). *The Craft of Research* (4th ed.). University of Chicago Press, Chicago.
2. Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (4th ed.). SAGE Publications, Thousand Oaks.
3. Flowerdew, R., and Martin, D. (Eds.) (2005). *Methods in Human Geography: A Guide for Students Doing a Research Project* (2nd ed.). Pearson Education, Harlow.
4. Gomez, B., and Jones, J. P., III (Eds.) (2010). *Research Methods in Geography: A Critical Introduction*. Wiley-Blackwell, Chichester.
5. Kumar, R. (2019). *Research Methodology: A Step-by-Step Guide for Beginners* (5th ed.). SAGE Publications, London.



OR

Course: Major 16

Semester-VII

Paper Name: Welfare & Gender Geography (Theoretical) (FOR HONS WITHOUT RESEARCH)

Programme Code: UG-HON-GEO

Course Code: GEO-MAJ-16 (T)

Full Marks-50

Time-2:30 Hrs.

Programme Objectives

The objectives of this field-based course are to:

- To introduce the meaning, scope and relevance of welfare and gender geography.
- To explain the major indicators of welfare, quality of life and gender inequality.
- To examine poverty, deprivation and spatial disparities in welfare facilities.
- To develop an understanding of gendered spaces, women's work and development.
- To familiarise students with welfare planning, gender policies and women's empowerment.

Programme Outcomes

After completing the programme, students will be able to:

- Explain the fundamental concepts of welfare and gender geography.
- Interpret welfare, poverty and gender inequality indicators.
- Identify regional and rural-urban disparities in welfare and quality of life.
- Analyse gender roles, stereotypes and women's participation in economic activities.
- Evaluate major welfare policies and their role in gender equality and empowerment.

UNIT- I	Basic Concepts of Welfare Geography:	25 Marks
1.1.	Welfare Geography: Meaning, scope, relevance and approaches. (5)	
1.2.	Indicators of Welfare and Quality of Life: Health, education, housing, income, employment, poverty and quality of life. (5)	
1.3.	Spatial Patterns of Welfare Disparity: Regional imbalances in health and educational infrastructure; rural-urban welfare gap. (5)	
1.4.	Poverty and Deprivation: Mapping of poverty hotspots and Multidimensional Poverty Index (MPI). (5)	
1.5.	Welfare Planning and Policies in India: Welfare perspectives in the Five-Year Plans and the role of NITI Aayog. (5)	

UNIT-II	Gender Geography:	25 Marks
2.1.	Gender Geography: Meaning, scope and objectives, Concept of feminism. (5)	
2.2.	Gendered Spaces and Stereotypes: Public and private spaces, home and workplace; stereotypes related to personality, domestic behavior, occupation and physical appearance. (5)	
2.3.	Gender and Development: Women's participation in agriculture, industry and the informal sector; Sustainable Development Goal- 5. (5)	
2.4.	Indicators of Gender Inequality: Gender Development Index (GDI) and Gender Inequality Index (GII). (5)	



- 2.5. **Gender, Welfare and Empowerment:** PMMVY, PMSMA, Janani Suraksha Yojana and Beti Bachao Beti Padhao; women's empowerment and political participation. (5)

Note: The value in the parentheses indicates contact hours per semester

CE: Class Test

Suggested Readings

1. Chant, S., & Gutmann, M. C. (2000). Mainstreaming Men into Gender and Development. Oxfam.
2. Coates, B. E., Johnston, R. J., & Knox, P. L. (1977). Geography and Inequality. Oxford University Press.
3. Government of India. Reports and Guidelines on Women's Welfare, Health, Education, Poverty Alleviation and Empowerment Programmes.
4. International Institute for Population Sciences and ICF. (2021). National Family Health Survey (NFHS-5), 2019-21: India Report. IIPS.
5. Knox, P. L., & Pinch, S. (2010). Urban Social Geography: An Introduction. Pearson Education.
6. Massey, D. (1994). Space, Place and Gender. Polity Press.
7. McDowell, L. (1999). Gender, Identity and Place: Understanding Feminist Geographies. Polity Press.
8. Momsen, J. H. (2010). Gender and Development. Routledge
9. NITI Aayog. (2023). National Multidimensional Poverty Index: A Progress Review 2023. Government of India.
10. Office of the Registrar General and Census Commissioner, India. Census of India: Population, Sex Ratio, Literacy and Work Participation Tables. Government of India.
11. Pacione, M. (Ed.). (1986). Progress in Social Geography. Croom Helm.
12. Relevant articles from Gender, Place & Culture, Social Indicators Research, Applied Geography, World Development, Economic, and Political Weekly.
13. Smith, D. M. (1977). Human Geography: A Welfare Approach. Edward Arnold.
14. UN Women. Women and the Sustainable Development Goals, with Special Reference to SDG 5. United Nations.
15. United Nations Development Programme. Human Development Reports and Technical Notes on HDI, GDI, GII and MPI. UNDP.



Course: Major 16

Semester-VII

Paper Name: Welfare & Gender Geography (Practical)

(FOR HONS WITHOUT RESEARCH)

Programme Code: UG-HON-GEO

Course Code: GEO-MAJ-16P

Full Marks-25

Time-3:00 Hrs.

Programme Objectives

- To develop skills in representing age-sex composition through population pyramids.
- To introduce techniques for measuring welfare gaps and regional imbalances.
- To train students in calculating HDI using standard UNDP methods.
- To analyse male-female differences in population density, growth and work participation.
- To develop skills in computing Sopher's Index, Location Quotient, GDI and GII.

Programme Outcomes

After completing the practical paper, students will be able to:

- Prepare and interpret age-sex pyramids.
- Apply Z-scores and residual mapping to analyse welfare disparities.
- Calculate and interpret HDI using UNDP methods.
- Compare male and female population characteristics using statistical techniques.
- Compute and interpret Sopher's Index, Location Quotient, GDI and GI.

Unit-I Welfare Measurement and Regional Disparities 12 Marks

- 1.1. Preparation of an age-sex pyramid from the given data. (4)
- 1.2. Z-score showing the existing gap in indicators of welfare & quality of life. (4)
- 1.3. Residual mapping showing Regional imbalances in health, education infrastructure; Rural-Urban Welfare gap. (4)
- 1.4. Computation of Human Development Index (HDI): UNDP 2004 and 2014. (4)

Unit-II Gender Disparities and Development Indicators 13 Marks)

- 2.1. Comparison of Male & Female population density, Growth rate by Linear and Exponential (4)
- 2.2. Sopher's Disparity Index (4)
- 2.3. Representation of sex ratio and Work Participation by Location Quotient (4)
- 2.4. Gender Development Index (GDI), Gender Inequality Index (GII) (4)

Note: The value in the parentheses indicates contact hours per semester

CE: LNB

Suggested Readings

1. Chandna, R. C. (2014). Geography of Population: Concepts, Determinants and Patterns. Kalyani Publishers.
2. Hassan, M. I. (2020). Population Geography: A Systematic Exposition. Routledge.
3. Pacione, M. (1986). Population Geography: Progress and Prospect. Routledge.
4. Smith, D. M. (1977). Human Geography: A Welfare Approach. Edward Arnold.



5. Census of India. (2011). Census of India and District Census Handbooks. Office of the Registrar General and Census Commissioner, India.
6. IIPS and ICF. (2021). National Family Health Survey (NFHS-5), 2019-21: India Report. International Institute for Population Sciences.
7. United Nations Development Programme. (2004). Human Development Report 2004: Cultural Liberty in Today's Diverse World. UNDP.
8. United Nations Development Programme. (2014). Human Development Report 2014: Sustaining Human Progress—Reducing Vulnerabilities and Building Resilience. UNDP
9. United Nations Development Programme. Human Development Index: Technical Notes and Methodology. UNDP Human Development Reports.
10. Government of India. Sample Registration System Statistical Reports. Office of the Registrar General, India.

Websites

1. https://censusindia.gov.in/census.website/data/handbooks?utm_source=chatgpt.com "District Handbooks | Government of India"
2. https://www.nfhsiips.in/nfhsuser/nfhs5.php?utm_source=chatgpt.com "National Family Health Survey (NFHS-5) – 2019-21"
3. https://hdr.undp.org/reports-and-publications/2020-human-development-report/data-readers-guide?utm_source=chatgpt.com "Data Reader's Guide | Human Development Reports"
4. https://hdr.undp.org/sites/default/files/data/2020/hdr2020_technical_notes.pdf?utm_source=chatgpt.com "Technical notes"



Course: Major 17

Semester– VIII

Paper Name: Remote Sensing, GIS and GNSS (Theoretical)

Programme Code: UG–HWR–GEO/ UG–HON–GEO

Course Code: GEO–MAJ–17T

Full Marks: 50

Time: 2:30 hrs

Programme Objectives

The objectives of this course are to:

- Introduce the basic principles and components of remote sensing.
- Explain satellites, sensors, resolutions and aerial photography.
- Develop skills in satellite image interpretation and geographical applications.
- Introduce GIS concepts, data models, databases and spatial analysis.
- Familiarise students with GNSS, GPS, GLONASS and NavIC.

Programme Outcomes

After completing this course, students will be able to:

- Explain the principles of remote sensing and electromagnetic radiation.
- Compare platforms, sensors, resolutions and aerial photographs.
- Interpret satellite images for geographical studies.
- Explain GIS data models, attribute data and DEM applications.
- Apply basic buffer, overlay, network and GNSS concepts.

Unit-I..... Fundamentals and Applications of Remote Sensing:Marks 25

- Fundamentals of Remote Sensing:** Definition and principles of remote sensing; electromagnetic radiation, its characteristics and interaction with matter. [6]
- Remote Sensing Platforms, Satellites and Sensors:** Types of platforms; satellite orbits; active and passive sensors; characteristics of MSS, LISS, TM and OLI sensors. [6]
- Resolution of Remote Sensing Data:** Spatial, spectral, temporal and radiometric resolutions; significance and applications with reference to IRS and Landsat missions. [6]
- Aerial Photography and Photogrammetry:** Types and scale of aerial photographs; stereoscopy, stereoscopic parallax, relief displacement, digital photogrammetry. [6]
- Satellite Image Interpretation and Applications:** Principles and elements of visual image interpretation; applications of remote sensing in geographical studies. [6]

Unit-II..... Fundamentals and Applications of GIS and GNSS:.....Marks:25

- Fundamentals of GIS:** Definition, scope, components and functions of GIS. [6]
- GIS Data Models and Structures:** Spatial and non-spatial data; raster and vector data models; point, line and polygon features; Digital Elevation Model (DEM) and its applications. [6]
- Attribute Data and Database Concepts:** Attribute tables, data types, data editing, data manipulation, joining and linking of tables. [6]
- Spatial Analysis in GIS:** Principles and significance of buffer analysis, overlay analysis and network analysis.



[6]

5. **Fundamentals of GNSS:** Definition, scope and components of GNSS, GPS, GLONASS, and NavIC; applications of GNSS in geographical studies. [6]

Note: The value in the parentheses indicates contact hours per semester

***CE =Assignment**

Suggested readings

1. Bhatta, B. (2011). Global Navigation Satellite Systems: Insights into GPS, GLONASS, Galileo, Compass and Others. CRC Press.
2. Bhatta, B. (2020). Remote Sensing and GIS (3rd ed.). Oxford University Press.
3. Bolstad, P. (2016). GIS Fundamentals: A First Text on Geographic Information Systems (5th ed.). XanEdu Publishing.
4. Campbell, J. B., & Wynne, R. H. (2011). Introduction to Remote Sensing. The Guilford Press.
5. Hengel, T., & Reuter, H. I. (Eds.). (2008). Geomorphometry: Concepts, Software, Applications. Elsevier.
6. Jensen, J. R. (2006). Remote Sensing of the Environment: An Earth Resource Perspective. Prentice Hall
7. Joseph, G., & Jegannathan, C. (2018). Fundamentals of Remote Sensing (3rd ed.). Universities Press /
8. Orient Blackswan.
9. Lillesand, T. M., Kiefer, R. W., & Chipman, J. W. (2015). Remote Sensing and Image Interpretation
10. (7th ed.). Wiley.
11. Nag, P., & Kudrat, M. (1998). Digital Remote Sensing. Concept Publishing Company.
12. Rees, W. G. (2001). Physical Principles of Remote Sensing. Cambridge University Press.
13. Sabins, F. F. (2008). Remote Sensing: Principles and Interpretation. Waveland Press.
14. Sahu, K. C. (2007). Textbook of Remote Sensing and Geographical Information Systems. Atlantic Publishers.
15. Wilson, J. P., & Gallant, J. C. (Eds.). (2000). Terrain Analysis: Principles and Applications. Wiley.
16. Wolf, P. R., & Dewitt, B. A. (2000). Elements of Photogrammetry: With Applications in GIS. McGraw-Hill.



Course: Major 17

Semester–VIII

Paper Name: Remote Sensing, GIS and GNSS (Practical)

Programme Code: UG-HWR-GEO/ UG-HON-GEO

Course Code: GEO-MAJ-17P

Full Marks: 25

Time: 3:00 hrs

Programme Objectives

The programme aims to:

- i. To introduce students to the basic interface, tools, and data management functions of QGIS.
- ii. To develop practical skills in georeferencing, digitisation and thematic mapping.
- iii. To familiarise students with basic attribute and spatial analysis techniques.
- iv. To provide hands-on training in satellite-image processing, LULC classification and terrain mapping.
- v. To develop skills in GPS-based field-data collection and integration with QGIS.

Programme Outcomes

After completing the course, students will be able to:

- i. Manage spatial data and coordinate reference systems in QGIS.
- ii. Georeference maps and create point, line and polygon layers.
- iii. Prepare thematic maps and perform basic spatial analysis.
- iv. Generate FCC, LULC, spectral-index and DEM-based terrain maps.
- v. Collect GPS data and prepare location maps using QGIS.

Unit-I.....	Basic GIS Mapping using QGIS:	Marks: 12.5
1.1. QGIS Interface and Data Management:	QGIS interface, Plugins, layer management, and coordinate reference systems. (4)	
1.2. Georeferencing and Digitisation:	Georeferencing of a scanned map and creation of point, line and polygon layers. (3)	
1.3. Attribute Data and Basic Analysis:	Attribute-table joining, simple queries and buffer analysis. (3)	
1.4. Thematic Mapping:	Preparation of a choropleth map with title, legend, scale and north arrow. (5)	

Unit- II	Basic Remote-Sensing Applications using QGIS:	Marks: 12.5
2.1 Satellite Image Preparation:	Importing Landsat or Sentinel imagery and preparing a False Colour Composite (FCC). (4)	
2.2 LULC Mapping:	Supervised and Unsupervised classification and preparation of a Land Use and Land Cover map. (3)	
2.3 Basic Terrain and Spectral-Index Mapping:	Preparation of elevation, slope and drainage network maps from SRTM DEM and preparation of Index Map: NDVI, NDBI (4)	
2.4 GPS-Based Field Data Collection and Mapping:	Collection of waypoints, routes and tracks using a handheld GPS or mobile GPS application; importing GPS data into QGIS and preparing a location map. (4)	

Note: The value in the parentheses indicates contact hours per semester

*** Internal: LNB**

Note 2: Two hands-on exercises shall be assigned during the examination along with the necessary data and instructions. Each exercise shall carry 12.5 marks, comprising 10 marks for the practical work and output and marks for



written interpretation in the answer script. The work shall be assessed jointly by the internal and external examiners, and the marks awarded by both examiners shall be averaged. The final outputs generated by the students must be attached to their respective examination answer scripts, with the marks awarded separately by both examiners clearly indicated.

Suggested Readings

1. Biswas, S., & Roy, S. K. (2022). *QGIS manual for beginners*. Mr. Book Publication.
2. Gandhi, U. (2022). *Introduction to QGIS*. Spatial Thoughts Open Course Ware.
3. Islam, S. (2018). *Hands-on geospatial analysis with R and QGIS: A beginner's guide to manipulating, managing, and analyzing spatial data using R and QGIS 3.2.2*. Packt Publishing.
4. Menke, K. (2022). *Discover QGIS 3.x: A workbook for classroom or independent study* (2nd ed.). Locate Press.
5. QGIS Development Team. (n.d.). *A gentle introduction to GIS*. QGIS Documentation.
6. QGIS Development Team. (n.d.). *QGIS training manual*. QGIS Documentation.
7. Sarafova, E., Ivanov, I., & Cutts, A. (2026). *Learn QGIS: Techniques for efficient spatial analysis* (5th ed.). Packt Publishing.
8. Tarafder, S. K. (2021). *Learning GIS with QGIS software: Version 3.14 Pi—A complete practical-based book with theoretical explanation*. A. S. Publication.

Important YouTube Resources for QGIS

Bengali

1. [QGIS Practical Classes in Bengali—Geography Major and NEP](#)
2. [QGIS Tutorials in Bengali](#)
3. [QGIS Tutorial Bangla—Basic to Intermediate](#)
4. [QGIS Tutorial in Bangla—GIS Basics and Hands-on Training](#)
5. [QGIS Bangla Tutorials—Georeferencing, Digitisation and Mapping](#)

English

1. [Introduction to QGIS—Full Course by Spatial Thoughts](#)
2. [An Absolute Beginner's Guide to QGIS 3—GeoDelta Labs](#)
3. [QGIS for Beginners—Geospatial School](#)
4. [Official QGIS YouTube Channel](#)



Course: Major 18

Semester-VIII

Paper Name: Cartography-2 (Theoretical)

Programme Code: UG-HWR-GEO/ UG-HON-GEO

Course Code: GEO-MAJ-18T (ELEC 2A)

Full Marks: 50

Time: 2:30 hrs

Programme Objectives

The objectives of this course are to:

- explain the basic concepts of geodesy, reference surfaces, ellipsoids and geodetic datums;
- introduce major grid systems and coordinate systems used in cartographic and geospatial analysis;
- develop an understanding of the principles, properties and applications of selected map projections;
- provide basic knowledge of reciprocal levelling and mathematical calculations related to map projections;
- familiarise students with the fundamentals of remote sensing, GIS, digital mapping and Web GIS; and
- develop elementary skills in statistical computing and geospatial data analysis using appropriate software tools.

Programme Outcomes

After completing this course, students will be able to:

- distinguish among the geoid, spheroid and ellipsoid and explain the importance of geodetic datums;
- interpret UTM, UPS and other coordinate systems commonly used in mapping and spatial analysis;
- explain the principles, properties, limitations and uses of selected map projections;
- perform basic reciprocal-levelling and projection-related calculations of distance, azimuth and scale;
- analyse raster, vector and remotely sensed data using fundamental GIS and image-processing techniques; and
- apply digital-mapping and statistical tools to basic cartographic and geospatial analytical problems.

Unit-I	Geodesy, Coordinate Systems, Map Projections and Surveying:	25 Marks
	Geodesy, Coordinate Systems, Map Projections and Surveying:	25 Marks
1.1.	Geodesy and Reference Surfaces: Shape and Size of the Earth; Geoid, Spheroid and Ellipsoid; Everest and WGS 84 datums. (6)	
1.2.	Grids and Coordinate Systems: UTM, UPS; Polar, Rectangular and Spherical coordinates. (6)	
1.3.	Derivation of Map Projections: Principles, Derivation, properties, limitations and uses of Polyconic and Conical Equal-Area Projections with One Standard Parallel without drawing. (6)	
1.4.	Mathematical Computations in Selected Map Projections: Determination of Distance, Azimuth and scale variation of Polar Zenithal, Gnomonic, Stereographic and Equidistant; Simple Conical Projection with Two Standard Parallels; Cylindrical Equal-Area Projection with One Standard Parallel and Mercator's Projection. (6)	
1.5.	Reciprocal Levelling: Reciprocal Levelling — Principles, Elimination of Curvature, Refraction, and Collimation Errors and determination of the reduced level of a place. (6)	

Unit-II	RemoteSensing: EMR, spectral signatures, sensors and resolutions; visual interpretation .	25 Marks
2.1.	Digital Image Processing: Principles of image rectification, digital classification techniques, and accuracy assessment matrices. (6)	
2.2.	GIS Data Models and	
2.3.	Remote Sensing, GIS and Digital Cartographic Applications: 25 Marks Database: Meaning and components of GIS; raster and vector data models; spatial and attribute data; basic concepts of topology. (6)	
2.4.	Digital and Web Mapping: Open Street Map, mobile mapping and introduction to Web GIS. (6)	
2.5.	Statistical Software in Cartographic Analysis: Core Features and Applications of Microsoft Excel, SPSS in Thematic Mapping and Geospatial Analytics. (6)	



Note: The value in the parentheses indicates contact hours per semester.

*CE: Class Test

Suggested Readings

1. Bhatta, B. (2020). *Remote Sensing and GIS*. Oxford University Press.
2. Bivand, R. S., Pebesma, E., & Gómez-Rubio, V. (2013). *Applied Spatial Data Analysis with R*.
3. Springer.
4. Burrough, P. A., McDonnell, R. A., & Lloyd, C. D. (2015). *Principles of Geographical Information Systems*. Oxford University Press.
5. Das, D. C., & Roy, P. (2024). *An analytical study of map projections*. Kolkata, India: Nabodaya Publications.
6. Das, D., & Hazra, J. (2023). *Snatok Byaboharik Bhugol [Bengali Edition] [Paperback]*. Chhaya Prakashani.
7. Ghilani, C. D. (2017). *Elementary Surveying: An Introduction to Geomatics*. Pearson.
8. Gorelick, N., Hancher, M., Dixon, M., Ilyushchenko, S., Thau, D., & Moore, R. (2017). Google Earth Engine: Planetary-scale geospatial analysis for everyone. *Remote Sensing of Environment*, 202, 18–27.
9. Jensen, J. R. (2015). *Introductory Digital Image Processing: A Remote Sensing Perspective*.
10. Pearson.
11. Kanetkar, T. P., & Kulkarni, S. V. (2010). *Surveying and Levelling*. Vidyarthi Griha Prakashan.
12. Kraak, M. J., & Ormeling, F. (2021). *Cartography: Visualization of Geospatial Data*. CRC Press.
13. Lillesand, T. M., Kiefer, R. W., & Chipman, J. W. (2015). *Remote Sensing and Image Interpretation*. Wiley.
14. Longley, P. A., Goodchild, M. F., Maguire, D. J., & Rhind, D. W. (2015). *Geographic Information Science and Systems*. Wiley.
15. Maling, D. H. (1992). *Coordinate Systems and Map Projections*. Pergamon Press.
16. Richards, J. A. (2013). *Remote Sensing Digital Image Analysis*. Springer.
17. Robinson, A. H., Morrison, J. L., Muehrcke, P. C., Kimerling, A. J., & Guptill, S. C. (1995). *Elements of Cartography*. John Wiley & Sons.
18. Roy, P. (1988). *An Analytical Study of Map Projections*. Pan Publishing Company.
19. Snyder, J. P. (1987). *Map Projections: A Working Manual*. U.S. Geological Survey.
20. Vaníček, P., & Krakiwsky, E. J. (1986). *Geodesy: The Concepts*. Elsevier



Course: Major 18

Semester– VIII

Paper Name: Cartography: 2 (Practical)

Programme Code: UG–HWR–GEO/ UG–HON–GEO

Course Code: GEO–MAJ–18P (ELEC 2A)

Full Marks: 25

Time: 3.00 hrs.

Programme Objectives

The objectives of this field-based practical course are to:

- Develop skills in selecting a suitable local study area and cartographic theme.
- Prepare objectives, research questions, base maps, survey routes and fieldwork plans.
- Acquire primary and secondary spatial data through field survey, GPS/mobile mapping and official sources.
- Apply appropriate techniques for data classification, tabulation and thematic map preparation.
- Develop the ability to interpret spatial patterns and prepare a systematic cartographic field report.

Programme Outcomes

After completing this course, students will be able to:

- Design and conduct a small-scale field-based cartographic study.
- Collect, organise and integrate primary and secondary geographical data.
- Prepare thematic, land-use, settlement, route, drainage, contour, facility-distribution and GPS-based maps.
- Apply appropriate cartographic symbols, scale, direction, legend, title, colour and source information.
- Analyse geographical patterns and present findings through maps, photographs and a concise field report.

Field-Based Project: Cadastral Mapping and Study of Land Use Change: Full Marks:25

- Selection of Study Area:** Students shall select a small village, municipal ward, neighbourhood, tea garden settlement or urban-fringe area for which a cadastral map is available.
- Collection of Base Map:** A cadastral map of the selected area shall be obtained from an appropriate official source and used as the project's base map
- Group Formation:** A group of 6 to 10 students shall undertake the project. Different parts of the work may be assigned to individual students or pairs.
- Past Land Use Mapping:** Past land use and land cover information shall be identified from older Google Earth images, available maps, satellite images or official records.
- Present Land Use Survey:** Present land use and land cover shall be identified through field observation, manual verification, GPS or mobile-based location recording and photography.
- Land Use Classification:** Major land use categories, such as settlement, agriculture, water bodies, roads, vegetation, open land, commercial areas, and public facilities, shall be identified and classified.
- Preparation of Maps:** Separate maps of past and present land use shall be prepared on the cadastral base map using suitable symbols, colours, scale, north arrow, legend, title and source.
- Change Analysis:** Students shall compare past and present land use and identify major changes, such as settlement expansion, loss of agricultural land, changes in water bodies and growth of transport or commercial areas.



9. **Optional Perception Survey:** Students may conduct a short survey or interview with about **100–150 residents, landowners, or other stakeholders to understand perceived land-use changes, their causes, and their** socio-economic and environmental impacts. Participation shall be voluntary, and respondents' confidentiality and anonymity must be maintained. Findings may be presented through percentages, tables, graphs or brief thematic analysis.
10. **Project Report:** The report need not follow a strict chapter-wise format. However, it should be clear, well organised and presentable within 30 pages. It should include the objectives, methods, study-area profile, data sources, cadastral map, past and present land-use maps, change analysis, photographs, findings and conclusion. The report shall be prepared group-wise and must clearly mention the contribution of each student or pair of students.
11. **Project Evaluation:** The project shall be evaluated jointly by the internal and external examiners. The project report shall carry **15 marks**, and the viva voce shall carry **10 marks**. The viva voce may be conducted group-wise. The marks awarded by both examiners shall be averaged to determine the final marks.
12. **Report Submission and Viva Voce:** One copy of the spiral-bound report, not exceeding **100** pages, shall be submitted in a transparent cover during the examination, duly signed by the concerned teacher. Candidates who fail to submit the report shall not be evaluated. Students shall also appear for a viva voce during the examination.

Note: The value in parentheses indicates contact hours per semester.

***CE: Preparation of Project Report**

Evaluation Scheme

Component	Marks	Mode of Evaluation
Field Report	15	Evaluated by both External and Internal Examiners
Viva-voce	10	Conducted by both External and Internal Examiners
Total	25	Average of External and Internal marks

Suggested Readings

1. Bhatta, B. (2013). *Research Methods in Remote Sensing*. Springer, Dordrecht.
2. Bhatta, B. (2020). *Remote Sensing and GIS* (3rd ed.). Oxford University Press, New Delhi.
3. Kanetkar, T. P., & Kulkarni, S. V. (2010). *Surveying and Levelling*. Vidyarthi Griha Prakashan, Pune.
4. Kraak, M. J., & Ormeling, F. (2021). *Cartography: Visualization of Geospatial Data* (4th ed.). CRC Press.
6. Misra, R. P., & Ramesh, A. (1989). *Fundamentals of Cartography*. Concept Publishing Company, New Delhi.
7. Monkhouse, F. J., & Wilkinson, H. R. (1963). *Maps and Diagrams: Their Compilation and Construction*. Methuen, London.
9. Robinson, A. H., Morrison, J. L., Muehrcke, P. C., Kimerling, A. J., & Guptill, S. C. (1995). *Elements of Cartography*. John Wiley & Sons.
10. Singh, R. L., & Dutt, P. K. *Elements of Practical Geography*. Students' Friends, Allahabad.



Course: Major 18

Semester: VIII

Paper Name: Fluvial Geomorphology–2 [Elective] (Theoretical)

Programme Code: UG–HWR–GEO/ UG–HON–GEO

Couse Code: GEO–MAJ–18T (ELEC–2B)

Full Marks: 50

Time: 2:30 hrs.

Programme Objectives

The objectives of this course are to:

- Introduce the fundamentals of river hydraulics, sediment transport and channel migration.
- Explain watershed management and the evolution of major North Bengal rivers.
- Examine river terraces, meander development and riverbank erosion.
- Assess human impacts, including sand mining, urbanisation, dams, and embankments.
- Introduce river restoration, environmental flows and integrated river–basin management.

Programme Outcomes

After completing this course, students will be able to:

- Explain hydraulic geometry, stream power, shear stress and river competence.
- Analyse sediment movement, channel migration and river–terrace formation.
- Describe the drainage characteristics of the Teesta, Torsa, Mahananda and Jaldhaka rivers.
- Evaluate riverbank erosion and human–induced alterations of river systems.
- Suggest watershed–management, bioengineering and river–restoration measures.

Unit– I River Hydraulics & Principles in Applied Fluvial Geomorphology: 25 Marks

- 1.1. Fundamentals of River Hydraulics:** Hydraulic geometry, stream power, channel flow velocity, shear stress and river competence. (8)
- 1.2. Watershed management:** Core principles, structural management techniques, non–structural techniques and analytical & planning metrics. (5)
- 1.3. Sediment Transport, Erosion, and Migration Processes:** Fluvial erosion mechanics, sediment transport mechanics, and channel migration processes. (5)
- 1.4. River Terraces:** Classification, formation and Climatic vs. Tectonic controls on terrace genesis. (6)
- 1.5. Evolution of drainage patterns and geomorphic characteristics:** Teesta, Torsa, Mahananda and Jaldhaka Rivers. (6)

Unit– II Human-Induced Alterations and Its management: 25 Marks

- 2.1. Controls on Meander Evolution:** Factors, impact of discharge variability, sediment load type (suspended vs. bedload), and riparian vegetation on planform stability. (6)
- 2.2. Sand Mining and Alluvial Aggregate Extraction:** Various causes and their effects on river health and environment. (5)
- 2.3. Riverbank Erosion & Management:** Mechanism of bank failure and bioengineering solutions. (5)
- 2.4. Human–Induced Changes:** Urbanization, deforestation, urban stream syndrome, and the impacts of dams, reservoirs, barrages, and embankments on downstream fluvial regimes. (7)
- 2.5. River Restoration and Integrated Management:** Principles of river restoration, environmental flows (e–flows) and hydrological regime recovery, integrated river basin management (IRBM) and governance. (7)



Note: The value in the parentheses indicates contact hours per semester.

*CE: Class Test

Suggested Readings:

1. Bridge, J. S. (2003). *Rivers and floodplains: Forms, processes, and sedimentary record*. Blackwell Publishing.
2. Brierley, G. J., & Fryirs, K. A. (2005). *Geomorphology and river management: Applications of the River Styles Framework*. Blackwell Publishing.
3. Burbank, D. W., & Anderson, R. S. (2011). *Tectonic geomorphology* (2nd ed.). Wiley-Blackwell.
4. Charlton, R. (2008). *Fundamentals of fluvial geomorphology*. Routledge.
5. Chow, V. T., Maidment, D. R., & Mays, L. W. (1988). *Applied hydrology*. McGraw-Hill.
6. Gregory, K. J., & Walling, D. E. (1973). *Drainage basin form and process: A geomorphological approach*. Edward Arnold.
7. Heathcote, I. W. (2009). *Integrated watershed management: Principles and practice* (2nd ed.). Wiley-Blackwell.
8. Kale, V. S. (Ed.). (2014). *Landscapes and landforms of India*. Springer.
9. Knighton, D. (1998). *Fluvial forms and processes: A new perspective*. Arnold.
10. Kondolf, G. M., & Piégay, H. (Eds.). (2016). *Tools in fluvial geomorphology* (2nd ed.). Wiley-Blackwell.
11. Leopold, L. B., Wolman, M. G., & Miller, J. P. (1995). *Fluvial processes in geomorphology*. Dover Publications.
(Original work published 1964)
12. Robert, A. (2003). *River processes: An introduction to fluvial dynamics*. Arnold.
13. Rosgen, D. L. (1996). *Applied river morphology*. Wildland Hydrology.
14. Schumm, S. A. (1977). *The fluvial system*. John Wiley & Sons.
15. Schumm, S. A., Dumont, J. F., & Holbrook, J. M. (2000). *Active tectonics and alluvial rivers*. Cambridge University Press.
16. Singh, S. (2017). *Geomorphology*. Pravalika Publications.
17. Subramanya, K. (2013). *Engineering hydrology* (4th ed.). McGraw-Hill Education.
18. Thorne, C. R., Hey, R. D., & Newson, M. D. (Eds.). (1997). *Applied fluvial geomorphology for river engineering and management*. John Wiley & Sons.
19. Valdiya, K. S. (2016). *The making of India: Geodynamic evolution* (2nd ed.). Springer.
20. Wohl, E. (2014). *A world of rivers: Environmental change on ten of the world's great rivers*. University of Chicago Press.



Course: Major 18

Semester: VIII

Paper Name: Fluvial Geomorphology-2 [Elective] (Practical/Project)

Programme Code: UG-HWR-GEO/ UG-HON-GEO

Course Code: GEO-MAJ-18P (ELEC-2B)

Full Marks: 50

Time: 3:00 hrs.

Programme Objectives

The objectives of this course are to:

- i. Develop field-based understanding of fluvial geomorphology.
- ii. Build skills in river-reach and watershed selection.
- iii. Train students in physical, geospatial and perception surveys.
- iv. Develop the ability to collect primary and secondary data.
- v. Introduce methods for river change and erosion analysis.
- vi. Promote safe, ethical and collaborative field research.

Programme Outcomes

After completing this course, students will be able to:

- i. Select and delineate a suitable river-based study area.
- ii. Conduct systematic field observations and surveys.
- iii. Measure and interpret channel and bank characteristics.
- iv. Use GPS, maps, DEMs and satellite images for river analysis.
- v. Analyse river issues such as erosion, flooding and sedimentation.
- vi. Prepare and present a concise field project report with management recommendations.

Field-Based Project: Applied Fluvial Geomorphology and River Issues. Full Marks: 25

1. **Selection of Study Area:** Students shall select a suitable river reach, tributary, micro-watershed or riverbank-erosion zone for detailed field investigation.
2. **Selection of Theme:** The project may examine channel morphology, bank erosion, channel migration, sedimentation, sand mining, floodplain change, river degeneration, embankment impacts, urban-stream problems or river restoration.
3. **Group Formation:** The project shall be undertaken by groups of 6–10 students. Specific field and analytical tasks may be assigned to individual members.
4. **Research Design:** The students shall formulate simple objectives, research questions or hypotheses and prepare a field-observation schedule.
5. **Physical Field Survey:** Data may be collected on channel width, depth, cross-section, flow velocity, discharge, bank height and slope, sediment characteristics, erosion/deposition features, and riparian conditions.
6. **Geospatial Survey:** GPS observations, field photographs, topographical maps, DEMs and multi-date satellite images may be used to analyze watershed characteristics and riverbank shifting.
7. **Perception Survey:** As a supplementary component, about **100–150** affected residents or river users may be surveyed on river changes, erosion, flooding, sand mining, livelihood impacts, and management needs.



8. **Secondary Data:** The relevant information may be collected from government reports, hydrological records, topographical maps, satellite data and published studies.
9. **Ethics and Field Safety:** Participation in perception surveys shall be voluntary and confidential. Students must follow safety precautions near riverbanks, in deep water, and in unstable channel sections.
10. **Data Analysis and Report:** Data shall be presented through profiles, maps, tables, graphs, photographs and statistical measures. The group report should include objectives, methods, physical setting, field observations, perception findings, analysis, major issues, management suggestions and conclusions, along with each student's contribution.
11. **Project Evaluation:** The project shall be evaluated jointly by the internal and external examiners. The project report shall carry 15 marks, and the viva-voce shall carry 10 marks. The viva-voce may be conducted group-wise. The marks awarded by both examiners shall be averaged to determine the final marks.
12. **Report Submission and Viva-Voce:** One copy of the spiral-bound report, not exceeding **100 pages**, shall be submitted in a transparent cover during the examination, duly signed by the concerned teacher. Candidates who fail to submit the report will not be evaluated. The students shall also appear for a viva-voce during the examination.

Note: The physical and geomorphic investigation shall remain the principal component; the perception survey shall provide supporting evidence

*CE: Preparation of Project report

Evaluation Scheme

Component	Marks	Mode of Evaluation
Field Report	15	Evaluated by both External and Internal Examiners
Viva-voce	10	Conducted by both External and Internal Examiners
Total	25	Average of External and Internal marks

Suggested Readings:

1. Bridge, J. S. (2003). Rivers and Floodplains: Forms, Processes, and Sedimentary Record. Blackwell Publishing.
1. Brierley, G. J., & Fryirs, K. A. (2005). Geomorphology and River Management: Applications of the River Styles Framework. Blackwell Publishing.
2. Charlton, R. (2008). Fundamentals of Fluvial Geomorphology. Routledge.
3. Gregory, K. J. (Ed.). (2006). The Human Role in Changing River Channels. Elsevier.
4. Kale, V. S., & Gupta, A. (2001). Introduction to Geomorphology. Orient BlackSwan.
5. Knighton, D. (1998). Fluvial Forms and Processes: A New Perspective (2nd ed.). Routledge.
6. Leopold, L. B., Wolman, M. G., & Miller, J. P. (1964). Fluvial Processes in Geomorphology. W. H. Freeman.
7. Sear, D. A., Newson, M. D., & Thorne, C. R. (2003). Guidebook of Applied Fluvial Geomorphology (R&D Technical Report FD1914). Defra/Environment Agency.
8. Thorne, C. R., Hey, R. D., & Newson, M. D. (Eds.). (1997). Applied Fluvial Geomorphology for River Engineering and Management. Wiley.
9. Wohl, E. (2014). Rivers in the Landscape: Science and Management (2nd ed.). Wiley-Blackwell.



Course: Major 18

Semester-VIII

Paper Name: Population Geography-2 [Elective] (Theoretical)

Programme Code: UG-HWR-GEO/ UG-HON-GEO

Course Code: GEO-MAJ-18T (ELEC-2C)

Full Marks: 50

Time: 2.30 hrs.

Programme Objectives

The programme aims to:

- To examine the relationship between population pressure and access to basic services.
- To explain major issues of poverty, employment, gender inequality, health and nutrition.
- To understand the problems faced by adolescents, the elderly, and marginalized communities.
- To introduce population policy, family welfare programmes, and population-resource relationships.
- To develop knowledge of population-data quality, environmental stress and regional planning.

Programme Outcomes

After completing this course, students will be able to:

- assess population pressure on housing, water, sanitation, education and healthcare;
- identify major social, economic, gender and health inequalities;
- explain the needs and problems of vulnerable population groups;
- analyse population policy and pressure on resources and the environment; and
- evaluate population-data limitations and service gaps for regional planning.

Unit- I.....	Population and Social Development:	25 Marks
1.1	Population and Basic Services: Population pressure on housing, drinking water, sanitation, education and healthcare facilities.	(6)
1.2	Poverty and Employment: Poverty, unemployment, informal work and livelihood insecurity.	(6)
1.3	Gender Inequality: Gender differences in education, employment, health and access to resources.	(6)
1.4	Health and Nutrition: Malnutrition, maternal and child health	(6)
1.5	Vulnerable Population Groups: Problems of adolescents, elderly people and marginalized communities.	(6)

Unit- II	Population Policy, Resources and Planning:	25 Marks
2.1	Population Policy in India: National Population Policy (2000) and family-welfare programmes.	(6)
2.2	Population and Resources: Population pressure on land, food, water and energy resources.	(6)
2.3	Population and Environment: Carrying capacity, ecological stress and sustainable resource use.	(6)
2.4	Population-Data Quality: Age heaping, undercounting, sampling errors and data comparability.	(6)
2.5	Population and Regional Planning: Service gaps and regional inequality in planning.	(6)

Note: The value in the parentheses indicates contact hours per semester

*CE: Class test

Suggested Readings

- Bhende, A., & Kanitkar, T. (2000). *Principles of Population Studies*. Himalaya Publishing House.
- Castles, S., de Haas, H., & Miller, M. J. (2020). *The Age of Migration: International Population Movements in the Modern World* (6th ed.). Red Globe Press.
- Census of India. (2011). *Primary Census Abstract and related publications*. Government of India.



4. Chandna, R. C. (2012). *Geography of Population: Concepts, Determinants and Patterns*. Kalyani Publishers.
5. Dyson, T. (2010). *Population and Development: The Demographic Transition*. Zed Books.
6. Government of India. (2000). *National Population Policy 2000*. Ministry of Health and Family Welfare.
7. International Institute for Population Sciences & ICF. (2021). *National Family Health Survey – 5, 2019–21: India Report*. IIPS.
8. Lutz, W., Sanderson, W. C., & Scherbov, S. (2004). *The End of World Population Growth in the 21st Century*. Earthscan.
9. Newbold, K. B. (2009). *Population Geography: Tools and Issues*. Rowman & Littlefield.
10. Rowland, D. T. (2003). *Demographic Methods and Concepts*. Oxford University Press.
11. Sen, A. (1999). *Development as Freedom*. Oxford University Press.
12. Todaro, M. P., & Smith, S. C. (2020). *Economic Development* (13th ed.). Pearson.
13. UNDP. (2024). *Human Development Report 2023/2024*. United Nations Development Programme.
14. United Nations, Department of Economic and Social Affairs, Population Division. (2022). *World Population Prospects 2022*. United Nations.
15. Weeks, J. R. (2023). *Population: An Introduction to Concepts and Issues* (13th ed.). Cengage Learning.
16. World Health Organization. (2024). *World Health Statistics 2024*. WHO.



Course: Major 18

Semester –VIII

Paper Name: Population Geography–2 [Elective] (Practical)

Programme Code: UG–HWR–GEO/ UG–HON–GEO

CourseCode: GEO–MAJ–18P (ELEC–2D)

Full Marks: 25

Time: 3:00 hrs.

Programme Objectives

The programme aims to:

- i. develop practical skills in selecting a study area and population group;
- ii. train students in preparing simple objectives and survey schedules;
- iii. provide experience in collecting primary data from vulnerable groups;
- iv. develop skills in organizing, presenting and analysing field data;
- v. promote ethical practices during field surveys and interviews; and
- vi. train students in preparing and presenting a group-based project report.

Programme Outcomes

After completing the programme, students will be able to:

- i. select a suitable area and vulnerable population group for study;
- ii. prepare objectives, questionnaires and a simple sampling plan;
- iii. collect basic social, economic and demographic information;
- iv. present field data through tables, diagrams, graphs and maps;
- v. identify the major problems and welfare needs of the selected group; and
- vi. prepare and defend a clear and presentable field project.

Field-Based Project: Population and Vulnerable Group Profile: Full Marks: 25

1. **Selection of Study Area:** Students shall select a village, ward, neighbourhood, census town, tea-garden settlement, tribal settlement or urban-fringe area.
2. **Selection of Population Group:** The study may focus on adolescents, the elderly, women, migrants, workers, tribal communities, tea-garden communities, or another vulnerable or marginalized group.
3. **Group Formation:** The project shall be undertaken by a group of 6–10 students. Different components may be assigned to individual students or pairs.
4. **Research Design:** Students shall formulate simple objectives, research questions or hypotheses and prepare a household or respondent survey schedule.
5. **Sampling Plan:** An appropriate sampling method shall be adopted to select respondents from the identified population group.
6. **Respondent Survey:** Primary data shall be collected from approximately **300–400 respondents**.
7. **Respondents or households:** Through questionnaires, schedules, interviews and field observations.
8. **Information to Be Collected:** May include age, sex, education, occupation, income, family structure, housing, migration, health, access to basic services, social security, and major problems.
9. **Secondary Data:** Relevant information may be collected from the Census, District Census Handbook, SRS, NFHS, government reports, local administrative records and published studies.
10. **Ethical Guidelines:** Participation shall be voluntary and based on informed consent. Personal records and identifiable photographs shall not be collected without permission. Confidentiality and anonymity must be maintained.



11. **Data Presentation and Analysis:** Data may be presented through tables, percentages, graphs, diagrams, photographs and maps. Students shall identify the major demographic, social, economic and welfare-related problems of the selected group.
12. **Project Report:** The group-wise report shall be clear, well-organised, and presentable. It should include objectives, methodology, study area profile, respondent profile, data analysis, findings, suggestions, and conclusion. The contribution of each student or pair shall be clearly stated.
13. **Project Evaluation:** The project shall be evaluated jointly by the internal and external examiners. The report shall carry **15 marks** and the viva-voce **10 marks**. The viva-voce may be conducted groupwise. Marks awarded by the two examiners shall be averaged.
14. **Report Submission and Viva-Voce:** One copy of the spiral-bound report, not exceeding **100 pages**, shall be submitted in a transparent cover during the examination, duly signed by the concerned teacher. Candidates failing to submit the report shall not be evaluated. All the students shall appear for the viva-voce.

Note: The value in the parentheses indicates contact hours per semester

*CE: Preparation of Project report

Evaluation Scheme

Component	Marks	Mode of Evaluation
Field Report	15	Evaluated by both External and Internal Examiners
Viva-voce	10	Conducted by both External and Internal Examiners
Total	25	Average of External and Internal marks

Suggested Readings

1. Clifford, N., French, S., & Valentine, G. (2010). *Key Methods in Geography*. SAGE.
2. Creswell, J. W., & Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches* (5th ed.). SAGE.
3. Flowerdew, R., & Martin, D. (2005). *Methods in Human Geography: A Guide for Students Doing a Research Project*. Pearson.
4. Gomez, B., & Jones III, J. P. (2010). *Research Methods in Geography: A Critical Introduction*. Wiley-Blackwell.
5. Kitchin, R., & Tate, N. J. (2000). *Conducting Research in Human Geography: Theory, Methodology and Practice*. Pearson.
6. Kothari, C. R., & Garg, G. (2019). *Research Methodology: Methods and Techniques* (4th ed.). New Age International.
7. Kumar, R. (2019). *Research Methodology: A Step-by-Step Guide for Beginners* (5th ed.). SAGE.
8. Pal, S. K. (1998). *Statistics for Geoscientists*. Tata McGraw-Hill.
9. Sarkar, A. (2013). *Quantitative Geography: Techniques and Presentations*. Orient BlackSwan.
10. Young, P. V. (1988). *Scientific Social Surveys and Research*. Prentice Hall of India.



Course: Major 18

Semester-VIII

Paper Name: Urban Geography-2 Elective (Theoretical)

Programme Code: UG-HWR-GEO/ UG-HON-GEO

Course Code: GEO-MAJ-18T (ELEC 2D)

Full Marks: 50

Time: 2:30 hrs.

Programme Objectives

The programme aims to:

- i. To explain the meaning, scope and need of urban planning.
- ii. To examine major planning ideas and planned cities in India.
- iii. To introduce compact, transit-oriented, vertical and green planning approaches.
- iv. To analyse urban governance, livelihoods, inclusion and well-being.
- v. To understand urban environmental risks and resilient city planning.

Programme Outcomes

After completing the course, students will be able to:

- i. Explain the principles and importance of urban planning.
- ii. Assess major planning thoughts and Indian planned-city experiences.
- iii. Compare contemporary approaches to sustainable urban development.
- iv. Analyse gentrification, informal livelihoods and urban inequality.
- v. Evaluate urban risks and propose inclusive, resilient planning measures.

Unit-I Urban Planning, Sustainable Cities and Planning Approaches: 25 Marks

- 1.1 **Foundations of Urban Planning:** Meaning, scope and need of urban planning. (6)
- 1.2 **Planning Thoughts:** Contributions of Ebenezer Howard and Patrick Geddes and their contemporary relevance. (6)
- 1.3 **Planned Cities in India:** Planning principles and problems of Chandigarh, Rajarhat-New Town. (6)
- 1.4 **Compact and Transit-Oriented Planning:** Compact city and transit-oriented development. (6)
- 1.5 **Green and Vertical Urban Planning:** Vertical urban growth, green infrastructure and blue-green planning. (6)

Unit - II Urban Governance, Inclusion and Resilience: 25 Marks

- 2.1 **Urban Governance and Green Practices:** Urban governance and SDG 11: Sustainable Cities and Communities (6)
- 2.2 **Gentrification:** Definition, Characteristics, Stages, types, Causes and impacts. (6)
- 2.3 **Urban Livelihoods and Informal Economy:** Sustainable livelihood framework, informal employment and livelihood challenges in urban and peri-urban areas. (6)
- 2.4 **Urban Well-being and Inclusion:** Slum improvement, affordable housing, gender, safety and inclusive urban development. (6)
- 2.5 **Urban Resilience and Environmental Risk:** Urban floods, waterlogging, heat islands, air pollution and resilient city planning. (6)

Note: The value in the parentheses indicates contact hours per semester

*** CE: Class test**



Course: Major 18

Semester-VIII

Paper Name: Urban Geography-2 (Elective) (Practical)

Programme Code: UG-HWR-GEO/ UG-HON-GEO

Course Code: GEO-MAJ-18P (ELEC-2D)

Full Marks:25

Time: 3:00hrs.

Programme Objectives

The objectives of this field-based course are to:

- i. Introduce students to basic field methods in urban geography.
- ii. Develop an understanding of urban and peri-urban areas through a primary survey.
- iii. Train students in preparing a questionnaire, a sampling plan, and a field schedule.
- iv. Enable students to collect, tabulate, code and analyze urban data.
- v. Develop skills in preparing maps, diagrams, photo plates and field reports.
- vi. Create awareness about urban issues such as slums, housing, migration, civic amenities, sanitation, traffic, livelihood and quality of life.

Programme Outcomes

After completing this field-based course, students will be able to:

- i. Select a suitable urban or peri-urban study area and theme.
- ii. Prepare objectives, research questions and household schedule.
- iii. Collect primary and secondary data related to urban issues.
- iv. Tabulate, code and present data through tables, maps and diagrams.
- v. Analyse urban problems such as housing, slums, civic amenities, migration, livelihood and quality of life.
- vi. Prepare a concise field report with findings, conclusion and references.

Field Based Project: Urban Perspectives and Urban Issues: Full Marks: 25

1. **Selection of Study Area:** Students shall select a municipal ward or town and shall be placed in multiple groups formed thereof.
2. **Selection of Theme:** The project may focus on problems related to housing, slums, migration, occupation, urban livelihoods, civic amenities, water supply, sanitation, solid waste, traffic, urban poverty, quality of life, or environmental problems.
3. **Group Formation:** A group of 6 to 10 students shall undertake the project. Different components of the study may be assigned to individual students.
4. **Preparation of Survey Schedule:** The Students shall prepare simple objectives, hypotheses/research questions and a short survey schedule.
5. **Field Survey:** Primary data shall be collected from about **300-400 respondents** through a questionnaire/schedule
6. **Collection of Secondary Data:** Relevant information may be collected from Secondary sources.
7. **Ethical Guidelines:** Participation shall be voluntary. Personal information and identifiable photographs shall not be collected without consent. Confidentiality and anonymity must be maintained.
8. **Data Presentation and Analysis:** The collected data may be presented through tables, percentages, graphs, diagrams, maps and photographs. Students shall identify major urban problems.



9. **Project Report:** The report need not follow a strict chapter-wise format. However, it should be clear, well organized and presentable. It should include the objectives, methods, study area profile, respondent profile, data analysis, findings, suggestions and conclusion. The report shall be prepared group-wise and must clearly state each student's contribution.
10. **Project Evaluation:** The project shall be evaluated jointly by the internal and external examiners. The project report shall carry **15 marks**, and the viva-voce shall carry **10 marks**. The viva-voce may be conducted group-wise. The marks awarded by both examiners shall be averaged to determine the final marks.
11. **Report Submission and Viva Voce:** One copy of the spiral-bound report, not exceeding **100 pages**, shall be submitted in a transparent cover during the examination, duly signed by the concerned teacher. Candidates who fail to submit the report shall not be evaluated. Students shall also appear for a viva-voce during the examination.

CE: Preparation of Project report

Evaluation Scheme

Component	Marks	Mode of Evaluation
Field Report	15	Evaluated by both External and Internal Examiners
Viva-voce	10	Conducted by both External and Internal Examiners
Total	25	Average of External and Internal marks

Suggested Readings

1. Carter, H. (1995). *The study of urban geography* (4th ed.). London: Arnold.
2. Census of India. (2011). *District census handbooks and town directory*. New Delhi: Office of the Registrar General and Census Commissioner, India.
3. Kaplan, D. H., Holloway, S. R., & Wheeler, J. O. (2014). *Urban geography* (3rd ed.). Hoboken, NJ: Wiley.
4. Knox, P. L., & McCarthy, L. M. (2011). *Urbanization: An introduction to urban geography* (3rd ed.). Boston: Pearson.
5. Ministry of Housing and Urban Affairs. (n.d.). *AMRUT, Smart Cities Mission and DAY-NULM documents*. New Delhi: Government of India.
6. Pacione, M. (2009). *Urban geography: A global perspective* (3rd ed.). London: Routledge.
7. Ramachandran, R. (1989). *Urbanisation and urban systems in India*. New Delhi: Oxford University Press.
8. Singh, R. B. (Ed.). (2015). *Urban development, challenges, risks and resilience in Asian megacities*. New Delhi: Springer.



Course: Major 19

Semester– VIII

Paper Name: DISSERTATION: 2 Final Submission (for Hons. with research)

Programme Code: UG–HWR–GEO

Course Code: GEO–MAJ–19 (D2) Dissertation

Full Marks: 75

Time: 3:00hrs.

1. Programme Objectives:

The programme aims to:

- To enable students to execute an independent geographical research project under academic supervision.
- To develop competence in fieldwork, laboratory work, secondary–data analysis, cartography, statistics, remote sensing, GIS or other methods appropriate to the study.
- To train students in objective–wise analysis, interpretation and critical discussion of geographical data and evidence.
- To develop the ability to prepare a coherent scientific dissertation with appropriate maps, tables, figures, references and appendices.
- To develop professional competence in presenting and defending research findings before an expert committee.

2. Programme Outcomes:

After completing the programme, students will be able to:

- Collect, organise, validate and analyse primary and/or secondary geographical data ethically and systematically.
- Apply appropriate qualitative, quantitative, cartographic, laboratory, and geospatial techniques to meet the stated objectives.
- Interpret findings in relation to geographical concepts, previous studies and the identified research gap.
- Prepare an original, properly referenced and professionally formatted dissertation.
- Communicate and defend research methods, findings, limitations and recommendations through presentation and viva voce.

1. Execution of the Dissertation

- Each student shall undertake the dissertation individually under the supervision of a Departmental Faculty member or another approved Supervisor.
- The topic, study area, objectives and methodology shall normally be those approved in Semester VII, subject to justified modifications approved by the Supervisor and the Department.
- The dissertation may use primary, secondary, or mixed data. Field survey, laboratory analysis, remote sensing, GIS, statistical analysis, archival research, qualitative methods, or other appropriate techniques may be used, depending on the objectives.
- The student shall maintain a research diary or progress record and meet the Supervisor at intervals prescribed by the Department.
- All maps, tables, diagrams, photographs and statistical outputs shall be numbered, titled, sourced and discussed in the text.
- The analysis shall be organized by objective or chapter and shall logically lead to findings, conclusions, and recommendations.

2. Submission of the Final Dissertation

Each student shall prepare and submit the complete dissertation in triplicate as follows:



- One copy for the examinee.
- One copy for the Departmental Seminar Library.
- One copy for the concerned Supervisor.

The three copies shall be identical, properly bound and duly signed by the student and the Supervisor. The Department may additionally require a searchable PDF and the supporting data, questionnaire/schedule, photographs, maps or geospatial files in digital form.

*** CE= Library Work**

3. Required Structure of the Final Dissertation:

Sl. No.	Section	Required Contents	Time Frame
1	Preliminary Pages	Title page; Supervisor's certificate; student's declaration; acknowledgement; preface, if required; abstract; table of contents; lists of tables, figures, maps, photographs and abbreviations.	Week 1 and Week 16
2	Introduction and Conceptual Background	Background of the study; statement of the problems; significance and scope; objectives; research questions and/or hypotheses; conceptual or theoretical framework; limitations; and organisation of the dissertation.	Weeks 1–2
3	Review of Literature and Research Gap	Thematic and critical review of relevant books, journal articles, theses, reports and other credible sources; synthesis of previous findings; identification and precise statement of the research gap.	Weeks 2–4
4	Study Area	Location, extent, accessibility, and spatial relationships; relevant physical, environmental, demographic, socio-economic, and cultural characteristics; supporting maps; and justification for selecting the study area.	Weeks 4–5
5	Database and Research Methodology	Research design; primary and secondary data sources; sampling frame, sampling technique and sample size; research instruments; variables and indicators; field or laboratory procedures; statistical, cartographic, remote-sensing and GIS techniques; validation procedures; and ethical safeguards.	Weeks 5–6
6	Data Collection and Field Investigation	Administration of questionnaires or schedules; interviews, observations, measurements, laboratory work, GPS surveys, photography and collection of relevant secondary data, wherever applicable.	Weeks 6–9
7	Data Processing and Analysis	Editing, coding, classification and tabulation of data; preparation of databases; statistical calculations; processing of satellite images and GIS layers; preparation of tables, graphs, diagrams and thematic maps.	Weeks 9–11
8	Results and Discussion	Objective-wise presentation, analysis, interpretation and discussion of results through appropriate text, tables, graphs, diagrams, maps, photographs and geospatial outputs; explanation of spatial patterns, processes and relationships.	Weeks 11–13
9	Major Findings	Concise synthesis of the principal findings; comparison with previous studies; linkage with the objectives; and acceptance or rejection of hypotheses, wherever applicable.	Week 14
10	Conclusion and Recommendations	Conclusions derived from the findings and linked to the objectives; major problems and prospects; practical, planning or policy recommendations; limitations of the study; and scope for further research.	Week 14
11	References and Appendices	Consistently formatted references or bibliography; questionnaire or schedule; interview guide; observation checklist; consent form; supplementary tables; sample calculations; relevant documents and other supporting materials.	Week 15



Sl. No.	Section	Required Contents	Time Frame
12	Editing, Formatting and Final Submission	Checking chapter sequence, language, citations, tables, maps, figures, captions, numbering and plagiarism; incorporation of the Supervisor's suggestions; printing, binding and submission of the final dissertation.	Week 16

4. Formatting Specifications

Item	Specification
Paper size	A4
Typing	Computer typed
Font	Times New Roman
Body text	12 point
Chapter title	16 point, bold, uppercase or title case
Section heading	14 point, bold
Tabulation	10/12 point normal,
Line spacing	1.5 for main text; single spacing may be used in tables, captions, footnotes and references
Alignment	Justified main text
Margins	Left: 1.25 inches; top, right and bottom: 1 inch
Word limit	Maximum 10,000 words, excluding tables, maps, figures, references and appendices
Illustrations	Pages containing sketches, graphs, diagrams, maps and photographs should ordinarily not exceed 40 pages.
Referencing	A consistent academic referencing style, preferably APA-7, shall be used throughout
Pagination	Preliminary pages in Roman numerals and main text in Arabic numerals, where practicable

5. PowerPoint Presentation: Semester VIII

Each student shall present and defend the completed dissertation before the Expert Committee using a PowerPoint presentation containing not more than 50 slides. The presentation should ordinarily include:

- Title, background and statement of the problems.
- Research gap, objectives, research questions and/or hypotheses.
- Study area and database.
- Research design, sampling and methodology.
- Objective-wise analysis supported by clear tables, graphs, maps, images or photographs.
- Major findings and discussion.
- Conclusions, recommendations, limitations and future scope.
- Selected references and acknowledgement of data sources.

6. Course Evaluation

The course shall be evaluated based on the complete Dissertation, its research and academic quality, the student's PowerPoint presentation (**maximum 50 PPTs**), and the student's performance in the viva voce. The final work

shall demonstrate continuity with the approved Semester VII proposal while incorporating the modifications suggested by the Expert Committee and the Supervisor.

7. Marks Distribution: Semester VIII



COOCH BEHAR PANCHANAN BARMA UNIVERSITY
PANCHANAN NAGAR, VIVEKANANDA STREET, COOCH BEHAR – 736101
SUB: GEOGRAPHY | UGNCCF | Under NEP 2020 |

Sl. No.	Component	Marks
1	Internal Assessment conducted by the Supervisor/Department	10
2	Continuous Evaluation	10
3	Attendance as per University rules	5
4	End-Semester Examination: Final Dissertation, Presentation and Viva Voce	75
Total		100

7.1. End-Semester Evaluation Rubric (75 Marks)

Sl. No.	Criterion	Marks
1	Research and academic quality of the Final Dissertation	50
2	PowerPoint presentation (maximum 50 slides)	15
3	Viva-voce and defence of the completed research	10
Total		75

7.2 Final Dissertation: Suggested Rubric (50 Marks)

Sl. No.	Criterion	Marks
1	Relevance, originality and significance of the topic; clarity of the research problem, objectives, research questions and/or hypotheses, and conceptual basis.	8
2	Critical review of literature and identification of the research gap; justification of the study area and quality of the database.	8
3	Appropriateness and rigour of the research methodology, sampling design, data collection procedures and adherence to research ethics.	6
4	Quality of data analysis, interpretation, and objective-wise discussion; accuracy and quality of maps, tables, figures, photographs, and geospatial outputs.	14
5	Major findings, conclusions, recommendations and linkage with the objectives; organisation, academic writing, referencing, formatting and appendices.	9
6	Publication of at least one research paper based on the dissertation in a peer-reviewed or UGC-CARE-listed journal, either accepted or published, subject to the submission of valid documentary evidence.	5
Total		50

8. COMMON ACADEMIC AND RESEARCH GUIDELINES:

- Individual Work and Supervision:** The dissertation shall be an individual work completed under an approved Supervisor. Joint field visits or common datasets may be permitted, but the research problem, analysis, interpretation and report of each student must be demonstrably individual.
- Research Relevance:** The topic should have clear geographical content and preferably address a local, regional, environmental, societal, developmental, planning, or policy issue, including problems relevant to North Bengal, Cooch Behar, the Eastern Himalayan foothills, or another justified region.
- Originality and Duplicate Submission:** The work shall not have been submitted previously, in whole or in substantial part, for credit in this or any other course. Any use of previously collected data must be declared and academically justified.
- Research Ethics:** Primary data shall be collected with informed consent. Privacy, confidentiality and anonymity shall be maintained wherever required. Research involving vulnerable groups, sensitive



information, or institutional records shall comply with applicable ethical and administrative permissions.

5. **Plagiarism and Academic Integrity:** All ideas, data, maps, images and text derived from other sources shall be properly acknowledged. Fabrication, falsification, plagiarism, manipulation of results, or undisclosed use of another person's work shall invite action under University and applicable UGC regulations.
6. **Questionnaire and Data Quality:** The questionnaire/schedule or research instrument shall be linked to the objectives. It shall be pilot-tested and revised before final administration. Reliability or validity testing shall be undertaken wherever appropriate.
7. **Geographical Presentation:** Every map shall contain an appropriate title, legend, scale, north arrow, source, and coordinate/reference information where relevant. Tables, graphs, diagrams, photographs and satellite images shall be numbered, captioned, sourced and referred to in the text
8. **Data Analysis:** Techniques shall be selected based on the nature of the data and the objectives. The student shall explain assumptions, formulae, software and classification procedures sufficiently to make the analysis understandable and reproducible.
9. **Use of Software and Artificial Intelligence:** The use of GIS, remote-sensing, statistical, reference-management and other software shall be disclosed where relevant. Any permitted use of generative artificial-intelligence tools shall comply with University policy and shall not replace the student's own analysis, interpretation or writing.
10. **Supervisor's Certification:** The Supervisor shall certify that the Progress Report and Final Dissertation have been prepared under supervision and are suitable for submission, without thereby assuming responsibility for every opinion or error of the student.
11. **Submission and Examination:** The student shall submit the required copies by the date notified by the Department. Failure to submit or present the work without an accepted reason may render the student ineligible for evaluation in the concerned semester.
12. **Revision after Semester VII:** Suggestions made by the Semester VII Expert Committee shall be recorded and incorporated during Semester VIII wherever academically appropriate. The Supervisor shall monitor compliance with major recommendations.



OR

Course: Major 19

Semester-VIII

**Paper Name: Geography of Rural Development (Theoretical) (FOR HONS
WITHOUT RESEARCH)**

Programme Code: UG-HON-GEO

Course Code: GEO-MAJ-19 (T)

Full Marks-50

Time-2:30 Hrs.

Course Objectives

- i. Introduce the meaning, scope and approaches of rural development.
- ii. Explain regional disparities and the structure of the Indian rural economy.
- iii. Examine land reforms, Panchayati Raj and agricultural finance.
- iv. Familiarise students with major rural development programmes in India.
- v. Assess the role of ICTs, NGOs and participatory institutions in rural development.

Course Outcomes

After completing this course, students will be able to:

- i. Explain the concepts, components and approaches of rural development.
- ii. Analyse regional imbalances and features of the rural economy.
- iii. Evaluate the role of land reforms, Panchayati Raj and agricultural finance.
- iv. Describe major government programmes for rural development.
- v. Assess the contributions of ICTs and NGOs to sustainable rural development.

Unit-I..... Foundations, Approaches and Structure of Rural Development: (25 Marks)

- 1.1. **Rural Development:** Nature, Scope and Significance of Rural Development (5)
- 1.2. **Basic components and Approaches:** Basic Components of Rural Development, *Grama* in Vedas; Gandhian Model of Rural Development (6)
- 1.3. **Approaches in Rural Development:** Human resource development, Sustainable Rural Development, Participatory rural development. (6)
- 1.4. **Regional Imbalances in Rural Development:** Determinants, spatial disparities and measures for balanced rural development (6)
- 1.5. **Indian Rural Economy:** Cropping pattern, Agricultural Regions, Agro-based Industries, Handicrafts (6)

Unit-II Institutions, Policies and Programmes of Rural Development:.. (25 Marks)

- 2.1. **Land Reforms in Rural Development:** Land reforms in India and their impact on rural development. (6)
- 2.2. **Role of Panchayati Raj in Rural Development:** Role of Panchayati Raj Institutions for Rural Development in India. (6)
- 2.3. **Agricultural Finance in Rural Development:** Need for and Sources of Agricultural Finance; Kisan Credit Card; Role of NABARD in Rural Development (6).
- 2.4. **Government Programmes for Rural Development:** DAY-NRLM, DDU-GKY, MGNREGS (VB-G RAM-G), PMAY-G, PMGSY and NRHM: objectives and role in rural development. (6)



2.5. Role of ICTs and NGOs in Rural Development: Role of ICTs and NGOs for Rural Development with special reference to India. (6)

Note: The value in the parentheses indicates contact hours per semester

CE: Class Test

Suggested Readings

1. Anand, S. (2013). Dynamics of Rural Development. Research India Press, New Delhi.
2. Das, K. D. (2007). Dynamics of Rural Development. Deep & Deep Publications, New Delhi.
3. Desai, V. (2019). Rural Development in India (Latest ed.). Himalaya Publishing House, Mumbai.
4. Garg, A. (1992). Working and Impact of Integrated Rural Development Programme. Deep & Deep Publications, New Delhi.
5. Jha, U. M. (1995). Rural Development in India: Problems and Prospects. Anmol Publications, New Delhi.
6. Krishnamurthy, J. (2000). Rural Development: Problems and Prospects. Rawat Publications, Jaipur.
7. Madan, G. R. (2010). Indian Rural Problems. Radha Publications, New Delhi.
8. Mishra, S. K., & Puri, V. K. (2018). Economics of Development and Planning. Himalaya Publishing House, Mumbai.
9. Nath, V. (2010). Rural Development and Planning in India. Concept Publishing Company, New Delhi.
10. Nikkiran, S., & Ramesh, G. (2010). Research Methods in Rural Development. Deep & Deep Publications, New Delhi.
11. Sahu, B. K. (2003). Rural Development in India. Anmol Publications, New Delhi.
12. Singh, K. (2016). Rural Development: Principles, Policies and Management. Sage Publications India, New Delhi.
13. Singh, R. B. (1985). Geography of Rural Development. Inter India Publications, New Delhi.
14. Sinha, R. N. P. Geography and Rural Development. Manohar Publishers & Distributors, New Delhi.
15. Sinha, S. P., & Singh, S. (2007). Strategies for Sustainable Rural Development. Deep & Deep Publications, New Delhi.



Course: Major 19

Semester- VIII

Paper Name: Geography of Rural Development (Practical) (FOR HONS WITHOUT RESEARCH)

Programme Code: UG-HON-GEO

Course Code: GEO-MAJ-19 (P)

Full Marks: 25

Time: 3:00 hrs.

Programme Objectives

- To develop skills in preparing village land-use maps.
- To introduce techniques of rural accessibility analysis.
- To represent rural demographic and amenity data cartographically.
- To apply statistical indices in rural spatial analysis.
- To familiarise learners with major rural development schemes.

Programme Outcomes

After completing the practical paper, students will be able to:

- Prepare and interpret village land-use maps.
- Measure rural accessibility using network-based methods.
- Represent rural population and amenity data through maps and diagrams.
- Calculate and interpret Location Quotient, Rural Intensity Index and Z-score.
- Assess the eligibility and implementation of rural development schemes.

Unit - I.....

Rural Mapping and Spatial Analysis:

Marks: 15

- 1.1 Measurement of rural accessibility through the Shortest Path Matrix.
- 1.2 Representation of rural population density, literacy and amenities through a choropleth map.
- 1.3 Calculation and mapping of Location Quotient for work participation and social categories of population.
- 1.4 Calculation and interpretation of Rural Development Intensity Index and Z-score.

Unit-II

Rural Development Schemes and Beneficiary Assessment:

Marks: 10

- 2.1 Study of objectives, eligibility conditions, beneficiary selection and implementation procedures of major Central Government rural development schemes, including DAY-NRLM, DDU-GKY, MGNREGS/VB-G RAM-G, PMAY-G, PMGSY and NRHM. **(Descriptive)**

Note: The value in the parentheses indicates contact hours per semester

CE: LNB

Suggested Readings

A. Books

- Desai, V. (2012). Rural Development in India. Mumbai: Himalaya Publishing House.
- Singh, K. (2016). Rural Development: Principles, Policies and Management. New Delhi: SAGE Publications.
- Mishra, R. P., & Sundaram, K. V. (Eds.). Rural Area Development: Perspectives and Approaches. New Delhi: Sterling Publishers.
- Nag, P. (1992). Thematic Cartography and Remote Sensing. New Delhi: Concept Publishing Company.
- Sarkar, A. (2015). Practical Geography: A Systematic Approach. Hyderabad: Orient Black Swan.



6. Singh, R. L., & Singh, R. P. B. (Eds.). (1999). Elements of Practical Geography. New Delhi: Kalyani Publishers.
7. Office of the Registrar General and Census Commissioner, India. District Census Handbooks, Village Directory and Primary Census Abstract. Census of India.
8. Government of India. Guidelines, Annual Reports and Official Documents on Rural Development Schemes. Ministry of Rural Development; and maps and village-boundary data from the Survey of India Online Maps Portal

B. Websites

1. [Census of India](#)
2. [MGNREGA \(Mahatma Gandhi NREGA\)](#)
3. [Ministry of Panchayati Raj.](#)
4. [Ministry of Rural Development \(MoRD\)](#)
5. [myScheme – Government of India](#)
6. [National Health Mission \(NHM\)](#)
7. [Survey of India](#)



Course: MINOR 6

Semester-VIII

Paper Name: Geography of India and North Bengal (Theoretical)

Course Code: GEO-MIN-6T

Full Marks: 50

Time: 2:30 hrs.

Programme Objectives

1. To understand the major physical, climatic, agricultural, industrial and population characteristics of India.
2. To explain the physiography, drainage, vegetation and biodiversity of North Bengal.
3. To study the people, culture, heritage and tourism potential of North Bengal.
4. To analyse the major population-related issues of India and the environmental issues of North Bengal.
5. To develop regional geographical understanding for planning and sustainable development.

Programme Outcomes

After completing this paper, students will be able to:

1. Describe the physiographic, climatic, soil and vegetation regions of India.
2. Explain the distribution of major crops, industries and population in India.
3. Discuss the National Population Policy, 2000 and major population problems.
4. Identify the physical and cultural characteristics of North Bengal.
5. Analyse tourism prospects and major hazards in North Bengal, such as floods, landslides, and human-wildlife conflict.

UNIT-I	Geography of India	25 Marks
1.1.	Major Physiographic Divisions of India; Physiography of the Himalayas and the Peninsular Plateau. (6)	
1.2.	Climate, Soil, and Vegetation Regions (6).	
1.3.	Production of rice, wheat, cotton and tea in India (6).	
1.4.	Industrial development in India: Iron & steel, cotton textile and automobiles. (6)	
2	Population: Historical growth of population in India since 1901; Regional patterns of population distribution and density (6)	

Unit-II	Geography of North Bengal:	25 Marks
2.1.	Physiography, Drainage and Vegetation. (6)	
2.2.	Biodiversity of North Bengal. (6)	
2.3.	People, Culture and Heritage: Rajbanshi, Rava, Toto and Oraon. (6)	
2.4.	Tourism: Major Tourist Spots, Problems and Prospects. (6)	
2.5.	Major issues in North Bengal: Flood, Flash flood, Landslide and Hailstorm. (6)	

Note: The value in the parentheses indicates contact hours per semester

*CE= Class Seminar

Suggested Readings:

1. Anthropological Survey of India. (2008). *People of India: West Bengal*. Anthropological Survey of India.
2. Bagchi, A., & Bhattacharya, D. (Eds.). (2015). *Omnibus of North Bengal: The History and Culture of the Hills and the Plains*. B. R. Publishing Corporation.



3. Botanical Survey of India. (1997). *Flora of West Bengal* (Vol. 1). Botanical Survey of India.
4. Department of Tourism, Government of West Bengal. (2016). *West Bengal Tourism Policy*.
5. Government of West Bengal.
6. Khullar, D. R. (2011). *India: A Comprehensive Geography*. Kalyani Publishers.
7. Mishra, S., & Hanif, M. (Eds.). (2023). *North Bengal: Geographical and Historical Perspectives*.
8. Mittal Publications.
9. Sharma, T. C. (2013). *Economic Geography of India*. Rawat Publications.
10. Singh, R. L. (Ed.). (1971). *India: A Regional Geography*. National Geographical Society of India.
11. Singh, R. L., & Singh, J. P. (2018). *India: A geographical perspective*. Allahabad: Prayag Pustak Bhavan.
12. West Bengal Disaster Management and Civil Defence Department. (2022–2023). *District Disaster Management Plans of North Bengal Districts*. Government of West Bengal.
13. গোস্বামী, কমলেশ (সম্পা.)। (২০১৪)। *উত্তরবঙ্গ: ইতিহাস, পরিবেশ, পর্যটন*। রূপালী।
14. দাস, দুলাল ও হাজরা, যুধিষ্ঠির। *স্নাতক ব্যবহারিক ভূগোল*। ছায়া প্রকাশনী।
15. নাগ, চঞ্চল কুমার। (২০২২)। *ভূগোল গবেষণা ও ক্ষেত্রসমীক্ষা পদ্ধতি*। নদীয়া পাবলিশার্স। শীল, অজিত কুমার। *গবেষণা পদ্ধতি ও ভৌগোলিক ক্ষেত্রসমীক্ষা*। দ্য হিমালয়ান বুকস।
16. মাইতি ও মান্না। *ভূগোলে রাশিবিজ্ঞানের প্রয়োগ, গবেষণা পদ্ধতি ও ক্ষেত্রসমীক্ষা*। উদ্যালক পাবলিশিং হাউস।
17. মুখোপাধ্যায়, শ্রীমন্ত। *স্নাতক ব্যবহারিক ভূগোল (অখণ্ড)*। নবোদয় পাবলিকেশন।



Course: Minor 6

Semester –VIII Paper

Title: Field Report (Practical)

Course Code: GEO–MIN–6P

Full Marks: 25

Time: 3:00 hrs.

Programme Objectives

1. To introduce students to the basic geographical features of India and North Bengal.
2. To understand the physiography, climate, soil, vegetation, agriculture, industry and population of India.
3. To study the physical, cultural, tourism and environmental aspects of North Bengal.
4. To raise awareness of population problems, natural hazards, and human–wildlife conflict.
5. To develop basic field observation and regional understanding among students.

Programme Outcomes

After completing this course, students will be able to:

1. Describe the major physical and human features of India.
2. Explain the agricultural, industrial and population characteristics of India.
3. Identify the physiography, drainage, vegetation and biodiversity of North Bengal.
4. Discuss the people, culture, heritage and tourism of North Bengal.
5. Understand the major environmental issues of floods, landslides, and human–wildlife conflict.

Field Report:

Full Marks: 25

(30 Hours)

Students have to prepare a simple field report on any one topic from the **Geography of India** or the **Geography of North Bengal**. The topic may be selected from **community–based, socio–economic, environmental, tourism–related, or disaster–related issues**.

Suggested topics may include population growth, migration, ageing, slum problems, food security, agriculture, tea garden livelihoods, tourism, Rajbanshi community, Rava community, Toto community, Oraon community, Drukpa community, floods, flash floods, landslides, hailstorms, human–wildlife conflicts, and other local geographical problems.

The field report should be prepared after a field visit. Students may work in groups. Each group may have **6-10 students**. Each group's work should be clearly stated at the beginning of the report.

The report should be no more than **50 pages**, including maps, diagrams, tables, and photographs. It should be **typed** on **A4–size paper** and submitted in spiral–bound form with a clear cover.

The field report should include:

1. Title page
2. Certificate duly signed by the teacher.
3. Acknowledgement
4. Contents
5. Introduction
6. Problems of the study area.
7. Objectives
8. Study area
9. Methods of data collection
10. Data analysis with tables, maps and diagrams
11. Findings
12. Suggestions
13. Conclusion



14. References

15. Photographs

- i. The Students will collect information through observation, questionnaire, interview and photographs. They may also use books, census reports, maps, and government websites as secondary data sources.
- ii. The report must be signed by the concerned teacher before submission. (30)

Evaluation Scheme for Field Report

Component	Marks	Mode of Evaluation
Field Report	15	Evaluated by both External and Internal Examiners
Viva-voce	10	Conducted by both External and Internal Examiners
Total	25	Average of External and Internal marks

Note: The value in the parentheses indicates contact hours per semester

*CE= Preparation of Questionnaire/ Schedule for Primary Data Collection

Suggested readings

1. Gomes, B., Jones III, J.P. (Eds) (2010). Research Methods in Geography: A Critical Introduction. Wiley-Blackwell.
2. Lenon, B., Cleves, P. (2015). Geography Fieldwork and Skills. Harper-Collins.
3. Montello, D. R. & Sutton, P. (2012). An Introduction to Scientific Research Methods in Geography and Environmental Studies, 2nd ed. Sage.
4. Murthy, K.L.N. (2004). Research Methodology in Geography: A Textbook. Concept Publishing Co.
5. Northey, N., Draper, D., Knight, D.B. (2015). Making Sense in Geography and Environmental Sciences: A Student's Guide to Research and Writing, 6th ed. Oxford University Press.
6. Parsons, T., Knight, P.G. (2015). How to Do Your Dissertation in Geography and Related Disciplines, 3rd ed. Routledge.
7. Phillips, R., Johns, J. (2012). Fieldwork for Human Geography. Sage.
8. Riordan, D. (2013). Technical Report Writing Today, 10th ed. Wadsworth Publishing.
9. Roy, T., Mandal, B., Bandyopadhyay, C., Maity, M., & Bishal, P. (2020). Bhogolik Gobeshona Paddhati O Kshetra Samikha (Bengali). Kalyani Publishers.
10. গোস্বামী, কমলেশ (সম্পা.)। (২০১৪)। উত্তরবঙ্গ: ইতিহাস, পরিবেশ, পর্যটন। রূপালী।
11. দাস, দুলাল ও হাজরা, যুধিষ্ঠির। স্নাতক ব্যবহারিক ভূগোল। ছায়া প্রকাশনী।
12. নাগ, চঞ্চল কুমার। (২০২২)। ভূগোল গবেষণা ও ক্ষেত্রসমীক্ষা পদ্ধতি নদীয়া পাবলিশার্স। শীল, অজিত কুমার। গবেষণা পদ্ধতি ও ভৌগোলিক ক্ষেত্রসমীক্ষা দ্য হিমালয়ান বুকস।
13. মাইতি ও মান্না। ভূগোলে রাশিবিজ্ঞানের প্রয়োগ, গবেষণা পদ্ধতি ও ক্ষেত্রসমীক্ষা। উদালক পাবলিশিং হাউস।
14. মুখোপাধ্যায়, শ্রীমন্ত। স্নাতক ব্যবহারিক ভূগোল (অখণ্ড)। নবোদয় পাবলিকেশন।