दिल्ली विश्वविद्यालय
University of Delhi

परिषद शाखा - II, कमरा नं: 211, नया प्रशासनिक खंड, दिल्ली विश्वविद्यालय, दिल्ली-110007, दूरभाष: 011-27001156/54
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CNC-II/093/1/EC-1280/26/2
Dated: 20.07.2026

NOTIFICATION

Sub: Amendment to Ordinance V

(ECR 57-1-3/ dated 12.12.2025)

Following addition be made to Annexure-II-A to the Ordinance V (2-A) of the Ordinances of the University;

Add the following:

The syllabi of M.A. Geography for Semester-III/IV under Faculty of Social Sciences based on Postgraduate Curriculum Framework 2024 are notified herewith for the information of all concerned as per ***Annexure-1.***

REGISTRAR

13-07-2026

NEP 2020: Post Graduate Curricular Framework (PGCF) 2024

UNIVERSITY OF DELHI

POST GRADUATE PROGRAMS IN GEOGRAPHY

MASTER OF ARTS
(GEOGRAPHY)

TWO YEARS PG PROGRAM AFTER COMPLETION OF THREE-YEAR UG PROGRAM (3+2)
ONE YEAR PG PROGRAM AFTER COMPLETION OF FOUR-YEAR UG PROGRAM (4+1)

PROGRAMME STRUCTURE, COURSES AND SYLLABI
(Effective from Academic Year 2025-26)

Revised Syllabus is uploaded as provided by the Faculty of Social Science and approved by Academic Council on dd-mm-2025 and Executive Council on dd-mm-2025

13/07/2026.

विभागाध्यक्ष/Head
भूगोल विभाग/Deptt. of Geography
दिल्ली स्कूल ऑफ इकोनॉमिक्स
Delhi School of Economics
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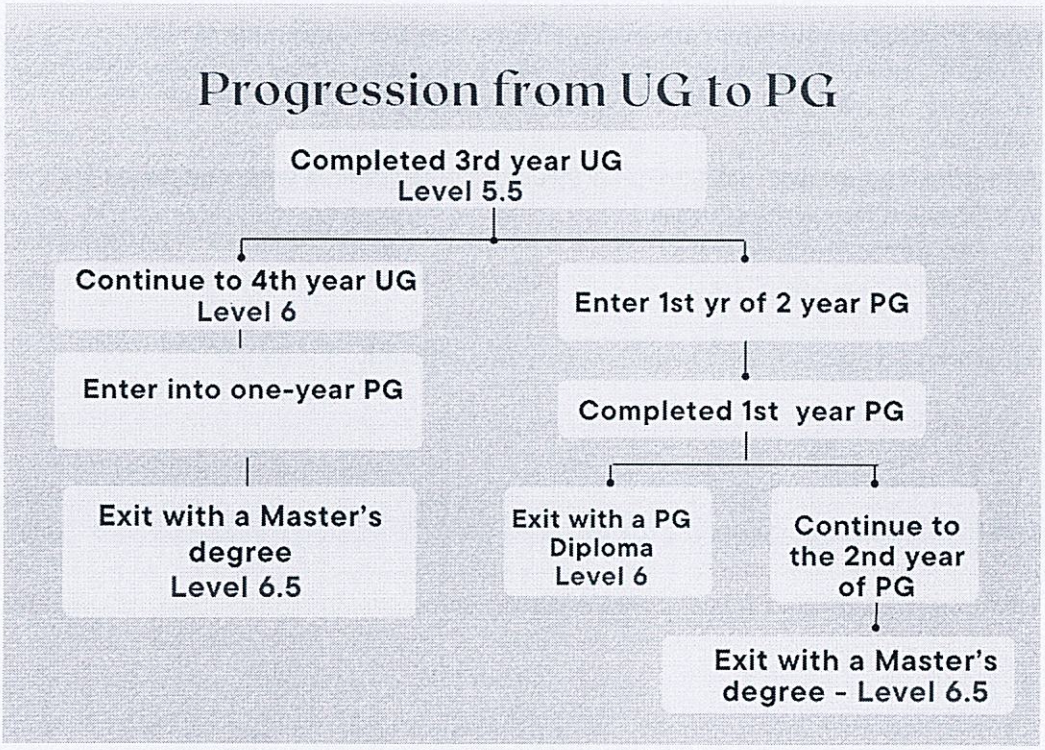
DEPARTMENT OF GEOGRAPHY
DELHI SCHOOL OF ECONOMICS
UNIVERSITY OF DELHI
POST GRADUATE CURRICULAR FRAMEWORK (PGCF) 2024
(Based on New Education Policy (NEP) 2020)
POST GRADUATE (PG) PROGRAMMES FRAMEWORK
AN INTRODUCTION

PROGRESSION FROM UNDER GRADUATE (UG) TO POST GRADUATE (PG) PROGRAMS



PROGRAMMES OF STUDY WITH EQUIVALENT QUALIFICATION LEVELS

First Year of Four Years UG Programme – Level 4.5
Second Year of Four Years UG Programme – Level 5.0
Third Year of Four Years UG Programme – Level 5.5
Fourth Year of Four Years UG Programme – Level 6.0

First year of Two Years PG Programme (after 3 Year UG) – Level 6.0
Second Year of Two Years PG Programme (after 3 Year UG) – Level 6.5
First year of One Year PG Programme (after 4 Year UG) – Level 6.5

First year of Two Years PG Programme (after 4 Year UG) – Level 6.5
Second year of Two Years PG Programme (after 4 Year UG) – Level 7.0

POST GRADUATE (PG) PROGRAMMES FRAMEWORK 2024

- Two years PG Programme after completion of Three-Year UG Programme (3+2)
- One year PG Programme after completion of Four-Year UG Programme (4+1)
  - Structure 1 (Level 6.5): PG Curricular Structure with only "Course Work"
  - Structure 2 (Level 6.5): PG Curricular Structure with "Course work and Research"
    A. "Dissertation Writing" track
    B. "Academic Projects" track
    C. "Entrepreneurship" track
  - Structure 3 (Level 6.5): PG Curricular Structure with only "Research"

DEPARTMENT OF GEOGRAPHY
DELHI SCHOOL OF ECONOMICS
UNIVERSITY OF DELHI
POST GRADUATE CURRICULAR FRAMEWORK (PGCF) 2024
(Based on New Education Policy (NEP) 2020)
POST GRADUATE (PG) PROGRAMMES FRAMEWORK
AN INTRODUCTION

TWO YEARS PG PROGRAMME AFTER COMPLETION OF THREE-YEAR UG PROGRAMME (3+2)

1st Year of PG curricular structure for Two-year PG Programmes (Level 6.0)

Semester	DSC	DSE	2 Credit course	Dissertation/ Academic Project/ Entrepreneurship	Total Credits
Semester I	DSC-1 DSC-2 DSC-3 (12 credits)	DSE-1 DSE-2 OR DSE-1 GE-1 (8 credits)	Skill-based course / workshop / Specialised laboratory / Hands on Learning (2 credits)	Nil	22
Semester II	DSC-4 DSC-5 DSC-6 (12 credits)	DSE-3 DSE-4 OR DSE-2 GE-2 (8 credits)	Skill-based course / workshop / Specialised laboratory / Hands on Learning (2 credits)	Nil	22

2nd Year of PG curricular structure for Two-year PG Programme (Level 6.5)

Semester	DSC	DSE	2 Credit course	Dissertation/ Academic Project/ Entrepreneurship	Total Credits
Semester III	DSC-7 DSC-8 (8 credits)	DSE-5 DSE-6 DSE-7 OR DSE-3 DSE-4 GE-3 (12 credits)	Skill-based course / workshop / Specialised laboratory / Internship/ Apprenticeship / Hands on Learning (2 credits)	Nil	22
Semester IV	DSC-9 DSC-10 (8 credits)	DSE-7 DSE-8 DSE-9 OR DSE-5 DSE-6 GE-4 (12 credits)	Skill-based course / workshop / Specialised laboratory / Internship/ Apprenticeship / Hands on Learning (2 credits)	Nil	22

DEPARTMENT OF GEOGRAPHY
DELHI SCHOOL OF ECONOMICS
UNIVERSITY OF DELHI
POST GRADUATE CURRICULAR FRAMEWORK (PGCF) 2024
(Based on New Education Policy (NEP) 2020)
POST GRADUATE (PG) PROGRAMMES FRAMEWORK
AN INTRODUCTION

ONE YEAR PG PROGRAMME AFTER COMPLETION OF FOUR-YEAR UG PROGRAMME (4+1)

Structure 1 (Level 6.5): PG Curricular Structure with only "Course Work"

Semester	DSC	DSE	2 Credit course	Dissertation/ Academic Project/ Entrepreneurship	Total Credits
Semester III	**DSC-7** **DSC-8** **(8 credits)**	**DSE-5** **DSE-6** **DSE-7** OR **DSE-3** **DSE-4** **GE-3** **(12 credits)**	Skill-based course / workshop / Specialised laboratory / Internship/ Apprenticeship / Hands on Learning **(2 credits)**	Nil	**22**
Semester IV	**DSC-9** **DSC-10** **(8 credits)**	**DSE-7** **DSE-8** **DSE-9** OR **DSE-5** **DSE-6** **GE-4** **(12 credits)**	Skill-based course / workshop / Specialised laboratory / Internship / Apprenticeship / Hands on Learning **(2 credits)**	Nil	**22**

The Structure 1 (Level 6.5) of the PG Curricular Structure with only "Course Work", is identical to the 2nd Year of PG curricular structure for Two-year PG Programme (Level 6.5).

DEPARTMENT OF GEOGRAPHY
DELHI SCHOOL OF ECONOMICS
UNIVERSITY OF DELHI
POST GRADUATE CURRICULAR FRAMEWORK (PGCF) 2024
(Based on New Education Policy (NEP) 2020)
POST GRADUATE (PG) PROGRAMMES FRAMEWORK
AN INTRODUCTION

ONE YEAR PG PROGRAMME AFTER COMPLETION OF FOUR-YEAR UG PROGRAMME (4+1)

Structure 2 (Level 6.5): PG Curricular Structure with "Course work and Research"

Semester	DSC	DSE	2 Credit course	Dissertation/ Academic Project/ Entrepreneurship	Total Credits
Semester III	**DSC- 7** **DSC -8** **(8 credits)**	**DSE-5** **DSE-6** OR **DSE-3,** **GE-3*** **(8 credits)**	Nil	See detailed outcomes below **(6 credits)**	**22**
Semester IV	**DSC-9** **DSC-10** **(8 credits)**	**DSE-7** **DSE-8** OR **DSE-4** **GE-4*** **(8 credits)**	Nil	See detailed outcomes below **(6 credits)**	**22**

The Structure 2 (Level 6.5) of the PG Curricular Structure with "Course work and Research" has following three tracks:

A. "Dissertation Writing" Track
B. "Academic Projects" Track
C. "Entrepreneurship" Track

Those who opt for 'Dissertation Writing' or 'Academic Projects' track, may study only the DSEs or select any GE of their choice, while those opting for 'Entrepreneurship' track, will select one GE related to Entrepreneurship in each of the Semesters III and IV.

The Dissertation / Project Report / Entrepreneurship Work should be an original work and not a repetition of work done earlier in the 4th Year of the UG programme, though it may be an extension of that work.

The expected outcomes of each of the three tracks are explained below.

A. "Dissertation Writing" – the outcomes expected are as follows:

Semester III

The following four outcomes must be achieved by the end of Semester III:

1) Research Problem identification
2) Review of literature
3) Research design formulation
4) Commencement of experimentation, fieldwork, or similar tasks

Semester IV

The following three outcomes must be achieved by the end of Semester IV:

1) Completion of experimentation / fieldwork
2) Submission of dissertation
3) Research output in the form of any one of the following –
   - Prototype or product development / patent
   - Any other scholastic work as recommended by the BRS and approved by the Research Council
   - Publication in a reputed Journals such as Scopus indexed journals or other similar quality journals
   - Book or book chapter in a publication by a reputed publisher

B. "Academic Projects" – the outcomes expected are as follows:

All academic projects should be application based research, and not an exploratory or descriptive research (except book translation or projects without a research component such as those in Master of Fine Arts)

Semester III

The following four outcomes must be achieved by the end of Semester III:

1) Research Problem identification
2) Review of literature
3) Research design formulation
4) Commencement of experimentation, fieldwork, or similar tasks

Semester IV

The following three outcomes must be achieved by the end of Semester IV:

1) Completion of the experimentation, fieldwork or similar task.
2) Submission of project report
3) Research output in the form of any one of the following –
   - Prototype or product development or patent
   - Any other scholastic work as recommended by the BRS and approved by the Research Council
   - Publication in a reputed Journals such as Scopus indexed journals or other similar quality journals
   - Draft policy formulation and submission to the concerned Ministry
   - Book or book chapter in a publication by a reputed publisher
   - Book translation (for Language departments)

C. "Entrepreneurship" – the outcomes expected are as follows:

Semester III

Week	Topic	Deliverable	Activities	Mentor Checkpoint
1-2	Idea Generation and Validation	Submission of at least three potential start-up ideas.	Conduct market research to validate the viability of each idea.	Review and feedback on the initial ideas.
3-4	Finalizing the Business Idea	Selection of the final business idea based on research and mentor feedback.	Develop a preliminary business model canvas.	Approval of the final business idea.
5-6	Market Research and Customer Discovery	Detailed market research report and customer discovery interviews.	Identify target market, customer segments, and key competitors.	Presentation of market research findings.
7-14	Prototype Development / Minimum Viable Product (MVP) and Business Model Refinement	Development of a prototype or MVP. Refined business model canvas including value proposition, customer segments, and revenue streams.	Design and build a basic version of the product or service. Test and iterate the business model based on prototype/MVP feedback.	Prototype/MVP review and feedback.
11-12	Financial and Legal Planning	Initial financial plan including cost structure, pricing strategy, and funding requirements.	Prepare a basic financial plan, including a budget and revenue forecast; review IPR potential	Financial plan and IPR review.
13-14	Pitch Preparation	Development of a pitch deck summarizing the business idea, market opportunity, prototype, and financials.	Create and refine a presentation for potential investors or stakeholders.	Practice pitch session with feedback.
15-16	Final Presentation and Review	Final pitch presentation to a panel of mentors, faculty, and possibly industry experts.	Deliver a polished pitch, receive feedback, and make final adjustments.	Final assessment and grading based on the pitch and overall progress throughout the semester.

Semester IV

Week	Topic	Deliverable	Activities	Mentor Checkpoint
1-2	Review and Refinement of Prototype / MVP	Review of the progress made in the 7th semester, including feedback from the final pitch.	Refine the business model, prototype, and financial plan based on mentor feedback and learnings from the 7th semester.	Review and approval of the refined business plan and prototype/MVP
3-12	Legal and Regulatory Compliance	Documentation of all legal requirements, including business registration, intellectual property rights, and compliance with industry-specific regulations.	Complete the legal registration of the business and ensure all necessary licenses and permits are obtained	Legal compliance review and feedback.
5-8	Operational Planning	Detailed operational plan, including supply chain management, production schedules, and quality assurance processes.	Finalize partnerships with suppliers, set up production or service delivery processes, and establish quality control measures.	Review and approval of the operational plan.
5-10	Marketing and Sales Strategy	Comprehensive marketing and sales plan, including market entry strategy, branding, and pricing.	Develop and test marketing campaigns, refine branding and messaging, and establish sales channels.	Marketing and sales strategy review and feedback.
9-14	Financial Planning and Fundraising	Finalized financial plan, including cash flow projections, break-even analysis, and funding requirements.	Prepare for fundraising by identifying potential investors, preparing financial documents, and practicing pitches.	Financial plan review and practice pitch sessions.
9-14	Risk Management and Contingency Planning	Risk management plan detailing potential risks and corresponding mitigation strategies.	Identify key risks (e.g., market, operational, financial) and develop	Risk management plan review and feedback.

Week	Topic	Deliverable	Activities	Mentor Checkpoint
			contingency plans.	
13-14	Final Preparations for Launch	Final preparations for market launch, including any final adjustments to the product/service, operational processes, and marketing efforts.	Conduct a soft launch or beta testing phase to gather final feedback, finalize logistics, and ensure readiness for full market entry.	Review and approval of launch readiness.
15-16	Final Presentation and Review	Comprehensive final presentation summarizing the entire project, including business model, operations, financials, marketing, and launch plan.	Deliver the final pitch to a panel of mentors, faculty, and industry experts, followed by the official market launch.	Final evaluation and feedback, with an emphasis on the feasibility of the launch and overall project success.

Note: Additional outcomes of Entrepreneurship may be added / revised by the concerned Faculty / Department Committee to suit the Master's level Programme.

DEPARTMENT OF GEOGRAPHY
DELHI SCHOOL OF ECONOMICS
UNIVERSITY OF DELHI
POST GRADUATE CURRICULAR FRAMEWORK (PGCF) 2024
(Based on New Education Policy (NEP) 2020)
POST GRADUATE (PG) PROGRAMMES FRAMEWORK
AN INTRODUCTION

ONE YEAR PG PROGRAMME AFTER COMPLETION OF FOUR-YEAR UG PROGRAMME (4+1)

Structure 3 (Level 6.5): PG Curricular Structure with only "Research"

Semester	DSC	DSE (related to identified research field)	Research Methods/ Tools/ Writing (2 courses)	One intensive problem-based research	Total Credits
Semester III	**1 DSC** (course related to the area identified for research) **(4 Credits)**	**1 DSE** (course related or allied to the area identified for research) **(4 Credits)**	(a) **Advanced Research Methodology** of the core discipline + (b) **Tools for Research** **(2+2 = 4 credits)**	Outcomes are listed below the table **(10 credits)**	**22**
Semester IV	-	**1 DSE** (course related or allied to the area identified for research) **(4 Credits)**	**Techniques of research writing** **(2 credits)**	Outcomes are listed below the table **(16 credits)**	**22**

The outcomes expected are as follows:

Semester III

The following four outcomes must be achieved by the end of Semester III:
1) Research problem identification
2) Review of literature
3) Research design formulation
4) Phase I – Initial phase of research experimentation, completion of pilot project etc.

Semester IV

The following three outcomes must be achieved by the end of Semester IV:
1) Phase II – Final phase of experimentation / fieldwork
2) Dissertation / project report submission
3) Research output in the form of any one of the following –
   a) Developed a patent or prototype of a product which meets the Technology Readiness Level 3/4 (TRL-3 or TRL-4) as defined by CSIR

b) Publication in Scopus indexed journals [#]
c) Publication of a book by a reputed publisher [#] (National/International) as recommended by the BRS and approved by the Research Council.

[#] Authors have to be the student and his/her supervisor(s). Additional authors has to be approved by the Chairperson, Research Council. This permission is mandatory prior to commencement of Phase II of the research.

DEPARTMENT OF GEOGRAPHY
DELHI SCHOOL OF ECONOMICS
UNIVERSITY OF DELHI
NEP 2020: POST GRADUATE CURRICULAR FRAMEWORK (PGCF) 2024
POST GRADUATE PROGRAMS IN GEOGRAPHY

TABLE 3: TWO YEARS PG PROGRAM AFTER COMPLETION OF THREE-YEAR UG PROGRAM (3+2) / ONE YEAR PG PROGRAM AFTER COMPLETION OF FOUR-YEAR UG PROGRAM (4+1)

MA IN GEOGRAPHY – PART 2 (LEVEL 6.5) – SEMESTER III – LIST OF COURSES

UPC	COURSE CODE	COURSE NAME	CREDITS			
			L	T	P	Total
DISCIPLINE SPECIFIC CORE (DSC) COURSES						
	GEOG-C301	Post Positivist and Contemporary Geographies	3	1	0	4
	GEOG-C302	Land, Ocean and Atmosphere Interaction	3	1	0	4
DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSES						
	GEOG-E301	Cities of Global South	3	1	0	4
	GEOG-E302	Climate Change and Adaptations	3	1	0	4
	GEOG-E303	Contemporary Conflicts and Geographies of Peace	3	1	0	4
	GEOG-E304	Cultural Geography Studio (Practical)	2	0	2	4
	GEOG-E305	Development Theory and Regional Policy	3	1	0	4
	GEOG-E306	Digital Geographies	3	1	0	4
	GEOG-E307	Digital Image Processing (Practical)	2	0	2	4
	GEOG-E308	Geographies of Life-force and Environment	3	1	0	4
	GEOG-E309	Geographies of Sexuality	3	1	0	4
	GEOG-E310	Geoheritage, Geoparks and Geotourism	3	1	0	4
	GEOG-E311	Landslide Risk Analysis	3	1	0	4
	GEOG-E312	Mountain Meteorology	3	1	0	4
	GEOG-E313	Natural Resources Management	3	1	0	4
	GEOG-E314	Palaeo-Climatic Changes and Methods of Reconstruction	3	1	0	4
	GEOG-E315	Regional Development in India	3	1	0	4
GENERAL ELECTIVE (GE) COURSES#						
	GEOG-E316	Natural Hazards and Disaster Management	3	0	1	4
SKILL BASED (SB) COURSES						
	GEOG-S301	Spatial Data Management	1	0	1	2
RESEARCH METHODS (RM) COURSES						
	GEOG-S302	Advanced Research Methodology	1	0	1	2
	GEOG-S303	Tools for Research	1	0	1	2
DISSERTATION / ACADEMIC PROJECT / ENTREPRENEURSHIP						
	GEOG-S304	Dissertation / Academic Project / Entrepreneurship	0	0	6	6
	GEOG-S305	Dissertation / Academic Project / Entrepreneurship	0	0	10	10

2 year PG Program Students, and 1 year PG Program students in **Module Coursework**, will complete 22 Credits, comprising 6 Courses – 2 DSC, 3 DSE (or 2 DSE and 1 GE*), and 1 SB (2 credits).

1 year PG Program students in **Module Coursework and Research**, will complete 22 Credits, comprising 5 Courses – 2 DSC, 2 DSE (or 1 DSE and 1 GE*); and one Dissertation/AP/E (6 credits).

1 year PG Program students in **Module Research**, will complete 22 Credits, comprising 4 Courses – 1 DSC (4 credits), 1 DSE (4 credits), 2 RM (4 credits), and one Dissertation/AP/E (10 credits).

DEPARTMENT OF GEOGRAPHY
DELHI SCHOOL OF ECONOMICS
UNIVERSITY OF DELHI
NEP 2020: POST GRADUATE CURRICULAR FRAMEWORK (PGCF) 2024
POST GRADUATE PROGRAMS IN GEOGRAPHY

TABLE 4: **AFTER COMPLETION OF THREE-YEAR UG PROGRAM (3+2) / AFTER COMPLETION OF FOUR-YEAR UG PROGRAM (4+1)**

MA IN GEOGRAPHY – PART 2 (LEVEL 6.5) – SEMESTER IV – LIST OF COURSES

UPC	COURSE CODE	COURSE NAME	CREDITS			
			L	T	P	Total
		DISCIPLINE SPECIFIC CORE (DSC) COURSES				
	GEOG-C401	New Economic Geographies	3	1	0	4
	GEOG-C402	Towards Viksit Bharat: Geographical Dimensions	3	1	0	4
		DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSES				
	GEOG-E401	Applied Climatology (Practical)	2	0	2	4
	GEOG-E402	Digital Cultures and Landscape	3	1	0	4
	GEOG-E403	Energy Geographies	3	1	0	4
	GEOG-E404	Gender, Space and Society in India	3	1	0	4
	GEOG-E405	Geochronology of Himalayan Glaciers	3	1	0	4
	GEOG-E406	Geographies of Social Justice in India	3	1	0	4
	GEOG-E407	Geography of Cryosphere	3	1	0	4
	GEOG-E408	Geography of Health	3	1	0	4
	GEOG-E409	Geography of Himalaya	3	1	0	4
	GEOG-E410	Machine Learning and Advance Geo Computation	3	1	0	4
	GEOG-E411	Regional Geography of India	3	1	0	4
	GEOG-E412	Sacred Landscape and Pilgrimage Geographies in India	3	1	0	4
	GEOG-E413	Terrain Modelling	3	1	0	4
	GEOG-E414	Trans Geographies	3	1	0	4
	GEOG-E415	Urban and Regional Planning	3	1	0	4
		GENERAL ELECTIVE (GE) COURSES#				
	GEOG-E416	Principles, Policies and Practices of EIA	3	0	1	4
		SKILL BASED (SB) COURSES				
	GEOG-S401	Instruments for Geographical Analysis	1	0	1	2
		RESEARCH METHODS (RM) COURSE				
	GEOG-S402	Techniques of Research Writing	1	0	1	2
		DISSERTATION / ACADEMIC PROJECT / ENTREPRENEURSHIP				
	GEOG-S403	Dissertation / Academic Project / Entrepreneurship	0	0	6	6
	GEOG-S404	Dissertation / Academic Project / Entrepreneurship	0	0	16	16

2 year PG Program Students, and 1 year PG Program students in **Module Coursework**, will complete 22 Credits, comprising 6 Courses – 2 DSC, 3 DSE (or 2 DSE and 1 GE*), and 1 SB (2 credits).

1 year PG Program students in **Module Coursework and Research**, will complete 22 Credits, comprising 5 Courses – 2 DSC, 2 DSE (or 1 DSE and 1 GE*); and one Dissertation/AP/E (6 credits).

1 year PG Program students in **Module Research**, will complete 22 Credits, comprising 3 Courses – 1 DSE (4 credits), 1 RM (2 credits), and one Dissertation/AP/E (16 credits).

DISCIPLINE SPECIFIC CORE (DSC) COURSE – GEOG-C301: POST POSITIVIST AND CONTEMPORARY GEOGRAPHIES

Course title & Code	Credits	Duration (Hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-C301: POST POSITIVIST AND CONTEMPORARY GEOGRAPHIES	4	3	1	0	BA/BSc in Geography	Nil

Learning Objectives:

The learning objectives of this course are:
1) to provide knowledge of disciplinary developments in Geography post 1970.
2) to enable students to contextualize the conceptual traditions within geography along with the major philosophical influences.
3) to promote an understanding of the fluidity, expansion and inclusivity of Modern Geographical Thought as against imperial underpinnings and latent eurocentricity.

Learning Outcomes:

Having completed this course, students will learn:
1) Developing a thorough knowledge of the growth, development, philosophical influences and relevance of geography from 1970 to the present time. This includes:
2) A Knowledge of emerging areas and new theorisations within the discipline
3) An appreciation of the discipline's dynamic and inclusive nature.

Course Outline:

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Brief Disciplinary History: Early origins, imperial influences and multi paradigmic nature, Four traditions; towards professionalization and institutionalisation; a contested discipline.

Readings for Unit 1

- Nayak, A. & Jeffery, A.S.,(2011) Geographical Thought: An Introduction to Ideas in Human Geography, 1st Edition, Pearson Prentice Hall. USA (Chapter 1: Geographies of empire: the imperial traditions)

- Johnston, R. J. "Paradigms and Revolutions or Evolution?: Observations on Human Geography since the Second World War." Progress in Human Geography 2, no. 2 (June 1978): 189–206. https://doi.org/10.1177/030913257800200201.
- Gregory, D., Johnston, R., Pratt, G., Watts, M. and Whatmore, S. eds. The Dictionary of Human Geography. John Wiley & Sons, 2011.

Unit 2: **(11 hours)**

Philosophical Influences and subfields of Modern Geography: Behaviouralism and Behavioural geographies, Realism, Marxism and development of radical geographies and feminist geographies, Structuralism, Post-structuralism and Postmodernism, development of post modern geographies

Readings for Unit 2

- Datta, A., Hopkins, P., Johnston, L., Olson, E. and Silva, J.M. eds. (2020). Routledge Handbook of Gender and Feminist Geographies. Routledge (Introductory Chapter: Establishing, placing, engaging and doing feminist geographies)
- Couper P. (2014) A student's introduction to Geographical Thought. Sage. UK (Chapter 7, Pages 131 - 144)
- Hubbard P. et al.(2002) Thinking Geographically. Reprint 2005. Continuum. London. U.K. (Ch 2, Section 2.4, Pages 41-43 & Ch 3, Section 3.5, Pages 84-93)

Unit 3: **(11 hours)**

Ontological turns, Fieldwork and New Theories in Geography: New ontologies of space and place; cultural turn, emotional turn, narrative turn; fieldwork and politics of representation; decolonizing geographical research, Grounded Theory, Minor Theory.

Readings for Unit 3

- Anderson, Kay, and Susan J. Smith. "Emotional geographies." Transactions of the Institute of British geographers 26, no. 1 (2001): 7-10.
- Goodson, Ivor F., and Scherto R. Gill. "The narrative turn in social research." Counterpoints 386 (2011): 17-33.
- Barusch, Amanda. "Refining the narrative turn: When does story-telling become research." In Referat wygłoszony na konferencji Gerontological Society of America, Listopad, vol. 16, p. 2012.

Unit 4: **(11 hours)**

Future of Geography: Drivers of global relevance, emerging subfields, difference, diversity and greater inclusivity in a globalising world.

Readings for Unit 4

- Simandan, D. "The future as an emergent problematic in geographical scholarship." Environment and Planning A: Economy and Space (2025): 0308518X251388768.

- Rose-Redwood, Reuben, CindyAnn Rose-Redwood, Elia Apostolopoulou, Tyler Blackman, Han Cheng, Anindita Datta, Sharon Dias et al. "Re-imagining the futures of geographical thought and praxis." *Dialogues in Human Geography* 14, no. 2 (2024): 177-191.

- Thrift, N. "The future of geography." *Geoforum* 33, no. 3 (2002): 291-298.

Tutorial Exercises **(15 hours)**

1. Locating oneself in a contested field- Tutorial exercise using the academic wheel of privilege
2. Tracing geographies histories contextually- southern perspectives: anti imperial struggles, establishment of new Chairs, institutionalization of Geography, Indian Geography
3. Whose Geography? On the futures of Geography- many worlds

Suggested Readings:

- Argent, N. "Behavioural Geography." In International Encyclopedia of Geography: People, the Earth, Environment and Technology: People, the Earth, Environment and Technology. John Wiley & Sons. (2017): 1-11.
- Minca, C. Postmodern Geographies. 1989. Edward Soja. In Hubbard, P., Kitchin R. & Valentine G (Eds) "Key Texts in Human Geography". Sage, 2008. pp.135-143
- Murphy, A. B. "Geography's crosscutting themes: Golden anniversary reflections on "the four traditions of geography".
- Pattison, W. D. (1964). The Four Traditions of Geography. Journal of Geography 63 (5), pp 211-216
- Soja, E. W. 2001. Postmodernism in Geography. International Encyclopaedia of the Social & Behavioural Sciences, 11860–11865.
- Women and Geography Study Group. *Feminist geographies: Explorations in diversity and difference*. Routledge, 2014.

DISCIPLINE SPECIFIC CORE (DSC) COURSE
GEOG-C302: LAND, OCEAN AND ATMOSPHERE INTERACTION

Course title & Code	Credits	Duration (Hrs per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical/ Practice		
GEOG-C302: LAND, OCEAN AND ATMOSPHERE INTERACTION	4	3	1	0	BA/ BSc in Geography	Basic Knowledge of Geography

Learning Objectives:

The learning objectives of this course are as follows:

- To understand the fundamental concepts and interdisciplinary nature of Earth system science and the interactions between its five major spheres.
- To comprehend the physical and biogeochemical linkages at the land-ocean interface and their role in global processes.
- To examine ocean-atmosphere coupling phenomena and boundary layer dynamics.
- To ascertain patterns and mechanisms of climate variability, including sea surface warming, teleconnections, and emerging modes of variability.

Learning Outcomes:

Having completed this course, students will learn:

- Analyze interactions between Earth's spheres using systems and geographic perspectives.
- Evaluate coupling processes at land-ocean and ocean-atmosphere interfaces, including boundary layer dynamics and biogeochemical cycles.
- Explain mechanisms and impacts of major climate variability modes and their teleconnections with the Indian monsoon.
- Assess inter-annual and decadal climate variability patterns, including emerging phenomena like Ningaloo Niño and subtropical dipoles.

Course Outline:

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Introduction to Earth System Science (Theory): Definition and scope of Earth System Science, Geographic perspective to Earth System Science, interaction between five spheres.

Readings

- Vallis, G.K., 2019. Essentials of Atmospheric and Oceanic Dynamics. Cambridge University Press.doi:10.1017/9781107588431
- Brian, J. S., Barbara, W.M. 2010. The Blue Planet: An Introduction to Earth System Science, 3rd Edition, Wiley.

Unit 2: **(11 hours)**

Land-Ocean Interaction (Theory): Shelf-sea-ocean linkages, Coupling Phenomenon, Land ocean interactions, processes, and issues.

Readings

- Maser, C., 2014. Interactions of Land, Ocean and Humans: A Global Perspective (1st ed.). CRC Press. https://doi.org/10.1201/b17529
- André Monaco, Patrick Prouzet (eds.) 2014. The land-sea interactions, Wiley Press.

Unit 3: **(11 hours)**

Ocean-Atmosphere Interaction (Theory): Significance of ocean-atmosphere interaction, coupling phenomenon, concept of boundary layers, ocean–atmosphere interaction near the tropics.

Readings

- Webster, P., 2020. Dynamics of The Tropical Atmosphere and Oceans, Dynamics of The Tropical Atmosphere and Oceans. Wiley. doi:10.1002/9781118648469
- Eric B Kraus, 2010. Atmosphere Ocean interactions, Oxford University Press

Unit 4: **(11 hours)**

Sea surface warming and Climate variability (Theory): Inter-annual variability and decadal variability, Tele-connections of India summer monsoon with southern oscillation, Indian Ocean Dipole and ENSO Modoki. Global impact of ENSO, IOD and ENSO Modoki, New faces of climate variability; Ningaloo Nino, California Nino, Sub tropical dipoles.

Readings

- Nakano, Y., Morita, O., 2025. Causal Analysis for Climate Study: Theory and Applications, Causal Analysis for Climate Study: Theory and Applications. CRC Press. doi:10.1201/9781003603429
- Behera, S.K., 2020. Tropical and Extratropical Air-Sea Interactions: Modes of Climate Variations, Tropical and Extratropical Air-Sea Interactions: Modes of Climate Variations. Elsevier. doi:10.1016/B978-0-12-818156-0.00016-2

Tutorial Exercises: **(15 hours)**

- Discussion on the interactions between Earth's five spheres using a systems approach and geographic perspective with real-world examples.
- Identification and analysis of land-ocean coupling processes at the shelf-sea-ocean interface using schematic diagrams and case studies.
- Discussion on ocean-atmosphere boundary layer dynamics in tropical regions with emphasis on coupling phenomena.
- Analysis of teleconnection patterns between Indian summer monsoon and ENSO, Indian Ocean Dipole, and ENSO Modoki.
- Review and comparison of emerging climate variability modes with traditional patterns, focusing on their global impacts and mechanisms.

Practical Record: Not Applicable

Suggested Readings:

- Rohli, R.V., 2024. Atmospheric and Oceanic Circulation. Springer Nature.
- Sahu N., Behera SK, Yamashiki Y., Takara K and Yamagata T. 2012. IOD and ENSO impacts on the extreme stream-flows of Citarum river in Indonesia, Climate Dynamics, DOI: 10.1007/s00382 011-1158-2. Volume 39, Issue 7-8, pp. 1673-1680.
- Sahu N., Behera SK, Ratnam JV, Silva RV, Parhi P, Duan W, Takara K, Singh RB and Yamagata T. 2014. El Nino Modoki connection to extremely-low streamflow of the Paranaiba River in Brazil, Climate Dynamics, March, 42,1509-1516, DOI 10.1007/s00382-013-2006-3
- Swadhin K. Behera and Toshio Yamagata, 2015. Indo-Pacific Climate variability and Predictability, World Scientific Press, Singapore.
- Nakamura, H., Isobe, A., Suga, T., 2016. "Hot spots" in the Climate System: New Developments in the Extratropical Ocean-Atmosphere Interaction Research. Springer Japan. doi:10.1007/978-4-431-56053-1
- Global Environmental Changes in South Asia., 2010. Global Environmental Changes in South Asia. Springer Netherlands. https://doi.org/10.1007/978-1-4020-9913-7
- S. Diop, J. Fabres, R. Pravettoni, J.-P. Barusseau, C.D., Ducrotoy, and J.-P., 2014. The Land/Ocean Interactions in the Coastal Zone of West and Central Africa, Estuaries of the World, Springer International Publishing Switzerland.
- Garatt, J.R. 1992. The Atmospheric Boundary Layer, Cambridge University Press.

- Swadhin Behera and Toshio Yamagata, 2011. Dynamics of the Indian and Pacific Oceans, Chapter 4, (eds.) Moffatt H.K., and Shuckburgh E., Environmental Hazards: The Fluid Dynamics and Geophysics of Extreme Events, vol.21, Lecture note series, IMS, NUS, Singapore.

Digital materials: Not Applicable

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE: GEOG-E301: CITIES OF GLOBAL SOUTH

Course Title & Code	Credits	Duration (hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-E301: CITIES OF GLOBAL SOUTH	4	3	1	0	BA/BSc in Geography	

Learning Objectives:

- To critically examine the diverse and complex processes shaping urbanization in the Global South.
- To engage with comparative and grounded analysis of urban issues beyond Eurocentric frameworks.
- To develop comparative, historically informed, and place-specific understandings of southern urbanism.

Learning Outcomes:

Having completed this course, students will learn:

- To develop an understanding of how colonial legacies, postcolonial state-building, global economic shifts, and local socio-spatial dynamics intersect to shape cities of Global South
- Evaluate urban issues within specific regional and local contexts in the Global South to assess the efficacy, inclusivity, and sustainability of planning and policy interventions.
- Apply theoretical frameworks and empirical knowledge to assess urban development, planning initiatives and policy interventions, particularly within the context of cities in the Global South

Course Outline:

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Conceptualizing Global Cities of the South: Defining the City; Theoretical Approaches and Key debates - global and local urbanisms, Southern urban theory and Postcolonial critiques of urban theory

Readings

- Robinson, J. (2016). Comparative Urbanism: New Geographies and Cultures of Theorizing the Urban. *International Journal of Urban and Regional Research*, *40*(1), 187–199.
- Roy, A. (2009). The 21st-Century Metropolis: New Geographies of Theory. *Regional Studies*, *43*(6), 819–830.
- Faranak Miraftab, & Neema Kudva. (2014). *Cities of the Global South Reader*. Routledge. (Chapter 1)

Unit 2: **(11 hours)**

Cities in the Global Economy: Urban restructuring under neoliberal globalization; Emerging Urban Economies – Informality and urban economic dualism in cities of global south; Social exclusion, inequality, and new forms of urban marginalization.

Readings for Unit 2

- Sassen, S. (2016). *Global Networks, Linked Cities*. Routledge. (Chapters **9, 11**)
- McFarlane, C. (2012). Rethinking Informality: Politics, Crisis, and the City. *Planning Theory & Practice*, *13*(1), 89–108.

Unit 3: **(11 hours)**

Politics and Governance in Cities of the South: Urban Governance and Local Politics; Community Development and Empowerment – right to the city and social justice.

Readings

- Parnell, S., & Oldfield, S. (Eds.). (2014). *The Routledge handbook on cities of the global south* (Vol. 2014). London: Routledge. (Part 4: chapters **22, 23,27**)
- Watson, V. (2014). Co-production and collaboration in planning – The difference. *Planning Theory & Practice*, *15*(1), 62–76.

Unit 4: **(11 hours)**

Futures of Urbanism in the Global South: Sustainable Urban Futures – climate resilience, adaptation and planning; Smart Cities and Technological Futures.

Readings

- Datta, A. (2018). Postcolonial urban futures: Imagining and governing India's smart urban age. *Environment and Planning D: Society and Space*, *37*(3), 393–410.
- Aurigi, A., & Odendaal, N. (2020). From "Smart in the Box" to "Smart in the City":

Rethinking the Socially Sustainable Smart City in Context. *Journal of Urban Technology*, 1–16.

Tutorial Exercises **(15 hours)**

- Group discussion on the conceptual evolution of from "Third World Cities" to "Global South Cities."
- Based on a case study the students will reflect on any city (e.g., Delhi) and how does it challenge classical urban theory?
- Based on news stories students will present on "Informality as Survival Strategy" of particular cases — eg. Dharavi (Mumbai), Kibera (Nairobi), or Rocinha (Rio)
- Group discussion on - How do "everyday politics" shape governance in your city?
- Class debate on Compare Smart City Missions (e.g., Delhi, Nairobi) through inclusivity and equity lens.

Practical Record: Not Applicable

Suggested Readings:

- Castells, Manuel (2009) The Information Age: Economy, Society and Culture (v. 1-3) The Rise of Network Society; The Power of Identity, End of Millennium. (Second edition) Oxford: Blackwell Publishing.
- Castells, Manuel, Gustavo Cardoso (2006) The Network Society: From Knowledge to Policy. Washington, DC, Center for Transatlantic Relations.
- Datta, A. And Shaban, A. (eds)(2017) Mega-Urbanisation in Global South: Fast Cities and New Urban Utopias of the Post-colonial State. Routledge: London and New York.
- Hall, P. (2001) Cities in Civilization : Culture, Innovation and Urban Order, Phoenix.
- Hall, P. (2002) Cities in Tomorrow: An Intellectual History of Urban Planning and Design in the Twentieth Century, 3rd Edition, Oxford: Blackwell.
- Nandy, A (2001) An Ambiguous Journey to the City: The Village and Other Odd Ruins of the Self in the Indian Imagination, New Delhi: OUP.
- Sassen, S (ed.) (2002) Global Network, Linked Cities, New York: Routledge.
- Scott, A.J. (2002) Global City-Regions: Trends, Theory, Policy, Oxford: OUP.
- Southhall, A. (1998) The City in Time and space, Cambridge: Cambridge University Press.
- Parnell, S. and Oldfield, S. (2014)The Routledge Handbook on Cities of Global. Routledge: London and New York.
- Chattopadhyay S. 2012. *Unlearning the City: Infrastructure in a New Optical Field* Minneapolis: Univ. Minn. Press
- Comaroff J, Comaroff JL. 2011. *Theory from the South: Or, How Euro-America Is Evolving Toward Africa* London: Routledge
- De Boeck F, Baloji S 2016. *Suturing the City: Living Together in Congo's Urban Worlds* London: Autograph

- de Sousa Santos B. 2014. *Epistemologies of the South: Justice Against Epistemicide* Boulder, CO: Paradigm

Digital materials: Not Applicable

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE: GEOG-E302: CLIMATE CHANGE AND ADAPTATIONS

Course Title & Code	Credits	Duration (hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-E302: CLIMATE CHANGE AND ADAPTATIONS	4	3	1	0	BA/BSc in Geography	NA

Learning Objectives:

The learning objectives of this course are as follows:

- Providing in depth knowledge of Climate Change.
- Assessment of Climate Change impacts on fragile ecosystems.
- Adaptation strategy and governance.

Learning Outcomes:

Having completed this course, students will learn:

- Understanding of various dimensions of Climate Change.
- Significance of adaptation strategies.
- Evaluation of role of Local and global organizations.

Course Outline:

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Science of Climate Change: Meaning, Concept and Linkages

Readings for Unit 1

1. Adger, W. N., (2006). Vulnerability, Global Environmental Change 16 (3), 268-281
2. Agrawala, S. and Fankhauser, S. (Eds.), (2008). Economic Aspects of Adaptation to Climate Change: Costs, Benefits and Policy Instruments. OECD, Paris

Unit 2: **(11 hours)**

Measuring Climate Change: Stress, exposure, risk and vulnerability related to climatic hazards and disasters.

Readings for Unit 2

1. Barros, Vicente R. (eds.), (2014). Climate Change 2014 – Impacts, Adaptation and Vulnerability: Global and Sectoral Aspects. Fifth Assessment Report of the Intergovernmental Panel on Climate Change (Part B; Regional Aspect). Cambridge University Press, New York.
2. Reid, Hannah. (2014). Climate change and human development. London, UK : Zed Books

Unit 3: **(11 hours)**

Empirical Assessment of Climate Change Adaptation: Assessment in fragile ecosystems; Mountain, Desert and Coastal.

Readings for Unit 3

1. Bergkamp, G., Orlando, B. and Burton, I. (2003). Change: Adaptation of Water Resources Management to Climate Change. IUCN, Gland.
2. **IPCC**, 2012: *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation.* A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change [Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, UK, and New York, NY, USA, 582 pp.

Unit 4: **(11 hours)**

Policy Framework for Climate Change Adaptation: Role of Indigenous Traditional Knowledge (ITK), International Climate Change Agreements and Local Governance.

Readings for Unit 4

1. IPCC, (2013). Climate Change 2013: The Physical Science Basis, the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1535 pp.
2. Mukherji Shormila, (2004). Fragile environment, Manak Publication Pvt. Ltd.

Tutorial Exercises **(15 hours)**

- Prepare a short note comparing different scientific approaches to understanding climate change.
- Identify and map one climatic hazard in India and outline its stress–exposure–risk–vulnerability chain.
- Write a brief assessment of climate change impacts on either a mountain, desert, or coastal ecosystem.
- Review a recent IPCC report section and summarize its key findings on adaptation.
- Examine one local example of Indigenous Traditional Knowledge (ITK) used for climate resilience.
- Prepare a flowchart explaining the link between SDGs and climate change adaptation.
- Compare two major international climate agreements and highlight their adaptation-related provisions.

Practical Record: Not Applicable

Suggested Readings:

- Brewster, E. N. (2010). Climate change adaptation: Steps for a vulnerable planet. New York: Nova Science.
- IPCC, (2013). Climate Change 2013: The Physical Science Basis, the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1535 pp.
- Mukherji Shormila, (2004). Fragile environment, Manak Publication Pvt. Ltd.
- NDMA, (2009). National Disaster Management Guidelines—Management of Landslides and Snow Avalanches. Publication of National Disaster Management Authority, Government of India. New Delhi
- Pandey, R, Jha S., (2011). Climate vulnerability index –measure of climate change vulnerability to communities: a case of rural Lower Himalayas, India, Mitigation and Adaptation Strategies Global Change, Published online December 2011
- Singh, Savindra, (2015). Paryavaran Bhoogol, Prayag Pushtak Bhavan Allahabad (Hindi).

Digital materials: Not Applicable

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE: GEOG-E303: CONTEMPORARY CONFLICTS AND GEOGRAPHIES OF PEACE

Course Title & Code	Credits	Duration (hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-E303: CONTEMPORARY CONFLICTS AND GEOGRAPHIES OF PEACE	4	3	1	0	BA/BSc in Geography	Basic Knowledge of Political Geography and Contemporary Events

Learning Objectives:

The learning objectives of this course are as follows:

- Understand the spatial dimensions of conflict and peace by engaging with critical theoretical and empirical frameworks within political and social geography.
- Analyze conflict-prone geographies at multiple scales by identifying key actors, institutions, structural drivers, and the socio-environmental impacts of conflict in India and the global context.
- Evaluate peacebuilding strategies and policy approaches through the lens of spatial justice, reconciliation practices, and pathways to sustainable and inclusive peace.

Learning Outcomes:

Having completed this course, students will learn:

- Interpret the spatial patterns and diversity of contemporary conflicts in India and globally.
- To analyze the geographic drivers and multi-level responses—institutional, grassroots, and policy-based—to conflict and peace.
- To apply spatial concepts and geospatial tools to map conflict zones and assess peacebuilding strategies.

Course Outline:

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Geographies of Conflict and Peace – Concepts and Frameworks: Typologies of conflict: geopolitical, territorial, identity-based, resource and environmental; theoretical approaches – critical geopolitics, political ecology, peace geography; spatial dimensions of violence and insecurity; Borderscapes and mapping of conflict zones.

Readings for Unit 1:

- Flint, C. (2021). Introduction to Geopolitics (3rd ed.). Routledge.
- Samaddar, R. (2004). Peace Studies: An Introduction to the Concept, Scope, and Themes. South Asia Forum for Human Rights
- Gregory, D. & Pred, A. (2007). Violent Geographies: Fear, Terror, and Political Violence. Routledge.

Unit 2: **(11 hours)**

Conflict and Peace in India – Regions, Resources, and Institutions: Regional patterns of conflict: Northeast, Kashmir, tribal belts, and urban spaces; communal, caste-based, and ethnic tensions; resource-driven conflicts and displacement; roles of Indian institutions – Election Commission, NHRC, NSA, and peace-building mechanisms

Readings for Unit 2:

- Muni, S. D. (2003). Conflicts in South Asia: Causes, Consequences, and Solutions. South Asian Publishers.
- Le Billon, P. (2005). Fuelling War: Natural Resources and Armed Conflicts. Routledge.
- Galtung, J. (1996). Peace by Peaceful Means: Peace and Conflict, Development and Civilization. Sage.

Unit 3: **(11 hours)**

Global Conflicts – Causes, Spaces, and Responses: Geopolitical and resource conflicts: Israel-Palestine, Ukraine, Rohingya, South China Sea, Horn of Africa; refugee flows, displacement corridors, and militarized borders; spatial impacts of war economies; roles of global institutions – UN, ICJ, ICRC, NATO, SAARC and peacekeeping missions.

Readings for Unit 3:

- Autesserre, S. (2021). The Frontlines of Peace: An Insider's Guide to Changing the World. Oxford University Press.

- Wallensteen, P. (2019). Understanding Conflict Resolution 5th ed.). Sage
- Kaldor, M. (2018). Global Security Cultures. Polity Press.

Unit 4: **(11 hours)**

Peacebuilding, Spatial Justice, and Emerging Threats: Post-conflict reconstruction, spatial justice, and territorial reconciliation; Peace parks, urban safe zones, memorial landscapes, and place-based healing; Grassroots, community, indigenous, gender, and educational dimensions of peacebuilding; Emerging conflict zones: climate-stressed regions, cyber and urban warfare spaces, contested borders; New hotspots: Arctic, Indo-Pacific, Sahel, sub-Himalayan India; Digital extremism, misinformation, AI-driven insecurity; early warning systems and risk mapping.

Readings for Unit 4:

- Megoran, N., McConnell, F., & Williams, P. (Eds.). (2014). Geographies of Peace. I.B. Tauris.
- Samaddar, R. (2004). Peace Studies: An Introduction to the Concept, Scope, and Themes. South Asia Forum for Human Rights
- Kaldor, M. (2013). *New and Old Wars: Organized Violence in a Global Era.*

Tutorial Exercises **(15 hours)**

- Select a conflict-prone region in India (Northeast, Kashmir, tribal belt, or an urban hotspot) and discuss its drivers, identity dynamics, and spatial patterns.
- Evaluate the role of one Indian institution (Election Commission, NHRC, NSA, or Peace Committees) in managing conflict and promoting peace.
- Compare any two global conflicts (Israel–Palestine, Ukraine, Rohingya, South China Sea) and assess their geopolitical causes and territorial claims.
- Map or describe refugee and displacement corridors from a major global conflict and examine how borders and humanitarian geographies shape movements.
- Choose a case of post-conflict reconstruction (e.g., Nepal, Sri Lanka, Rwanda) and examine how spatial justice and place-based healing are applied.
- Identify one emerging conflict threat (climate-stressed region, cyber warfare, misinformation, Indo-Pacific tensions). Explain its spatial implications and propose an early-warning approach.

Practical Record: Not Applicable

Suggested Readings:

- Agnew, J., 2003. Geopolitics: re-visioning world politics 2nd edn Routledge. New York.
- Baruah, S., 2020. In the Name of the Nation: India and its Northeast. Stanford University Press.
- Flint, C. and Dempsey, K.E. eds., 2023. Making geographies of peace and conflict. Taylor & Francis.
- Gelvin, J.L., 2014. The Israel-Palestine conflict: One hundred years of war. Cambridge university press.
- Krishna, S. ed., 2023. Routledge Readings on Security and Governance in Northeastern India: Resource Conflicts, Militarisation and Development Challenges. Taylor & Francis.
- Lederach, J.P., 1997. Sustainable reconciliation in divided societies. Washington, DC: USIP.
- Tuathail, Ó., 1996. Critical geopolitics: The politics of writing global space. University of Minnesota Press.

Digital materials: Not Applicable

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE: GEOG-E304: CULTURAL GEOGRAPHY STUDIO (PRACTICAL)

Course Title & Code	Credits	Duration (hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-E304: CULTURAL GEOGRAPHY STUDIO (PRACTICAL)	4	2	0	2	BA/BSc in Geography	NA

Learning Objectives:

The learning objectives of this course are as follows:

- To introduce advanced theoretical frameworks for analyzing urban spatial dynamics and infrastructural systems
- To develop methodological skills for investigating socio-political dimensions and lived experiences in urban spaces.
- To foster interdisciplinary approaches to urban cultural research through multimodal investigative techniques

Learning Outcomes:

Having completed this course, students will learn:

- Apply advanced theoretical concepts and methodological tools to analyze urban spatial configurations and transformations.
- Critically evaluate the relationships between urban infrastructures, social practices, and political processes.
- Produce focused research narratives that effectively communicate urban complexities

Course Outline:

THEORY **(30 hours)**

Unit 1 **(7.5 hours)**

Theoretical Foundations and Methodological Approaches: Frameworks for urban cultural research; methods in urban research; city as a method, ethnography and Participant Observation, positionality, ethics and collaborative knowledge

Readings for Unit 1

- Robinson, J. (2016). Thinking cities through elsewhere: Comparative tactics for a more global urban studies. *Progress in human geography*, *40*(1), 3-29.
- Lees, L. (2003). Urban geography:'New'urban geography and the ethnographic void. *Progress in Human Geography*, *27*(1), 107-113.
- Leszczynski, A. (2025). On method, and the present and future of "doing" urban geography. *Urban Geography*, 1-12.

Unit 2: **(7.5 hours)**

Infrastructures and Materialities: Formal and informal; material politics, urban resources and services; digital infrastructure, platform urbanism; Participatory mapping and infrastructure tracking

Readings for Unit 2

- Simone, A. M. (2004). "People as Infrastructure: Intersecting Fragments in Johannesburg." *Public Culture*, 16(3), 407-429.
- Burchardt, M. (2016). The infrastructures of diversity: Materiality and culture in urban space–an introduction. *New Diversities*, *17*(2), 1-13.
- Anand, N. (2017). *Hydraulic city: Water and the infrastructures of citizenship in Mumbai*. Duke University Press.

Unit 3: **(7.5 hours)**

Urban Socialities and Spatial Practices: Social infrastructures and public space dynamics: leisure, consumption, and cultural practices; embodied experiences, urban rhythms, temporal patterns; resistance in everyday spatial tactics; Sensory ethnography and rhythmanalysis

Readings for Unit 3

- Lancione, M. (2019). The politics of embodied urban precarity: Roma people and the fight for housing in Bucharest, Romania. *Geoforum*, *101*, 182-191.
- Latham, A., & Layton, J. (2019). Social infrastructure and the public life of cities: Studying urban sociality and public spaces. *Geography compass*, *13*(7), e12444.
- Middleton, J. (2018). The socialities of everyday urban walking and the 'right to the city'. *Urban studies*, *55*(2), 296-315.

Unit 4: **(7.5 hours)**

Urban Politics and Transformative Practices: right to the city and spatial justice, governance, power; digital activism, technological assemblages; urban imaginaries, alternative spatial practices; spatial ethnography, visual methods, tactical urbanism

Readings for Unit 4

- Fernandes, L. (2004). The politics of forgetting: Class politics, state power and the restructuring of urban space in India. *Urban studies*, *41*(12), 2415-2430
- Beveridge, R., & Koch, P. (2019). Urban everyday politics: Politicising practices and the transformation of the here and now. *Environment and Planning D: Society and Space*, *37*(1), 142-157.

- Palat Narayanan, N. (2025). Ontological locationalities: Moving beyond North–South binary and interrogating what gets studied. *Dialogues in Urban Research*, 27541258251329304.

Tutorial Exercises: Not Applicable

Practical Record: **(60 hours)**

Any Four to be conducted

- **Positionality Mapping and Reflexive Practice**
  Developing self-awareness of researcher's social location, power dynamics, and ethical considerations in urban fieldwork through collaborative reflection.
- **Participatory Infrastructure Mapping**
  Collaborative documentation of formal and informal urban infrastructures through transect walks, interviews, and digital mapping tools.
- **Urban Space Walks and Discussion**
  Pre-designed walking tours through Delhi urban spaces with focused observation on spatial arrangements, social interactions, and everyday infrastructures and materiality.
- **Sensory Ethnography and Rhythmanalysis**
  Multi-sensory observation of public spaces across different times, documenting urban rhythms through creative audio-visual and textual methods.
- **Everyday Spatial Tactics Documentation**
  Identifying and analyzing informal spatial practices, appropriations, and resistance in urban life through visual documentation and interviews.
- **Digital Activism and Platform Urbanism Analysis**
  Examining urban digital activism cases by mapping digital-physical assemblages and analyzing how platforms mediate spatial claims and voices.
- **Right to the City and Tactical Intervention Proposal**
  Group-based identification of spatial injustices and design of tactical urbanism interventions grounded in spatial justice theory and fieldwork.

Suggested Readings:

- Lefebvre, H. (1991). The Production of Space. Blackwell. (Key chapters: Introduction, Chapters 1-2)
- De Certeau, M. (1984). The Practice of Everyday Life. University of California Press. (Chapters 1-3 &7)
- Roy, A. (2009). "The 21st-Century Metropolis: New Geographies of Theory." Regional Studies, 43(6), 819-830.
- Harvey, D. (2012). Rebel Cities: From the Right to the City to the Urban Revolution. Verso. (Chapters 1-2 & 4)
- McFarlane, C. (2011). Learning the City: Knowledge and Translocal Assemblage. Wiley-Blackwell. (Chapters 1-3)
- Pink, S. (2015). Doing Sensory Ethnography (2nd ed.). Sage. (Chapters 1, 3, 6, 8)

Digital materials: Not Applicable

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE: GEOG-E305: DEVELOPMENT THEORY AND REGIONAL POLICY

Course Title & Code	Credits	Duration (hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-E305: DEVELOPMENT THEORY AND REGIONAL POLICY	4	3	1	0	BA/BSc in Geography	Basic Knowledge of Economics

Learning Objectives:

The learning objectives of this course are as follows:

- This course studies the conception of space in Anglo-American traditions of regional development theory.
- It lays the theoretical foundation for the various development concepts and models, which originated post 1950s.
- It also critically evaluates the numerous regional policies originating from the above theories.

Learning Outcomes:

Having completed this course, students will learn:

- The students will be aware of Anglo-American academic traditions, and overlapping disciplinary roots of the regional development theories.
- The students will know how the development theories evolved over four very dissimilar phases, with substantial variation in emphasis and character:
  a) Urban-Industrial Growth Pole Strategies (1950-70)
  b) Neo-Populist Regional Development Strategies (1970-90)
  c) Liberalization, Privatization and Globalization (1990-2010)
  d) Sustainable Human Development (2010 onwards)
- The students will learn about the regional policies emanating out of these development theories.

Course Outline:

THEORY **(45 hours)**

Unit 1 **(5 hours)**

Introduction: Origin and Context, Concept of Space and Region, Rationalization of Regional Planning and Spatial Policy.

Readings

- Gore C. 1984. *Regions in Question: Space, Development Theory and Regional Policy*, London, Methuen.

Unit 2: **(10 hours)**

Common Regional Policy Objectives: Regional Imbalance as a Policy Problem; Growth, Income Distribution and Spatial Inequality.

Readings

- Friedmann J. 1966. *Regional Development Policy: A Case Study of Venezuela*, Cambridge, Mass., MIT.
- Hirschman A. O. 1958. *The Strategy of Economic Development*, New Haven, Yale University Press.
- Myrdal G. 1957. *Economic Theory and Underdeveloped Regions*, London, Duckworth.

Unit 3: **(15 hours)**

Rival Regional Planning Strategies: Urban-Industrial Growth Pole Strategies; Polarization and the Development of Underdevelopment; Neo-Populist Regional Development Strategies; Territorial Regional Planning, State, Development and Regional Planning.

Readings

- Friedmann J. 1973. *Urbanization, Planning and National Development*, Sage Pub., London.
- Stohr W. B. and Taylor D. R. F. 1981. *Development from Above or Below? The Dialectics of Regional Planning in Developing Countries*, John Wiley, Chichester.
- Lo Fu-chen and Salih K. 1978. *Growth Pole Strategy and Regional Development Policy: Asian Experiences and Alternative Approaches*, Pergamon, Oxford.

Unit 4: **(15 hours)**

Globalization of Development Policy: Liberalization, Privatization and Globalization; Sustainable Human Development.

Readings

- Gore C., Köhler G., Reich U-P. and Ziesemer T. 1996. *Questioning Development: Essays on the Theory, Policies and Practice of Development Intervention*, Metropolis-Verlag, Marburg.
- Peet R. 1999. *Theories of Development*, Guilford Press, New York.
- Gore C. 2000. 'The Rise and Fall of the Washington Consensus as a Paradigm for Developing Countries', *World Development*, 28 (5), 789-804, Elsevier Science Ltd.

TUTORIALS **(15 hours)**

Tutorial Exercises

- How is the conceptualization of space in regional development different from other disciplines?
- Debate on efficiency and equity.
- Describe incidents of urban bias.
- Explain Problem in large city vis-à-vis Problems of large city
- How the concept of growth pole transformed into a regional theory?
- What are the reasons for failure of growth-pole strategies?
- What are the essential ingredients of a national development strategy?
- How did the development policy globalize?

- Critically evaluation normative vs. explanatory frameworks
- Critical evaluation of regional planning practices and strategies.

Practical Record: Not Applicable
Digital materials: Not Applicable

Suggested Readings:

- Friedmann J. 1966. *Regional Development Policy: A Case Study of Venezuela*, Cambridge, Mass., MIT.
- Friedmann J. 1973. *Urbanization, Planning and National Development*, Sage Pub., London.
- Gore C., Köhler G., Reich U-P. and Ziesemer T. 1996. *Questioning Development: Essays on the Theory, Policies and Practice of Development Intervention*, Metropolis-Verlag, Marburg.
- Hirschman A. O. 1958. *The Strategy of Economic Development*, New Haven, Yale University Press.
- Lo Fu-chen and Salih K. 1978. *Growth Pole Strategy and Regional Development Policy: Asian Experiences and Alternative Approaches*, Pergamon, Oxford.
- Myrdal G. 1957. *Economic Theory and Underdeveloped Regions*, London, Duckworth.
- Peet R. 1999. *Theories of Development*, Guilford Press, New York.
- *Stohr W. B. and Taylor D. R. F. 1981. Development from Above or Below? The Dialectics of Regional Planning in Developing Countries, John Wiley, Chichester.*

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE: GEOG-E306: DIGITAL GEOGRAPHIES

Course Title & Code	Credits	Duration (hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-E306: DIGITAL GEOGRAPHIES	4	3	1	0	BA/BSc in Geography	

Learning Objectives:

- To critically examine the intersections between geography, digital media, and communication technologies
- To analyze the role of digital media in constructing and mediating geographical imaginaries and how they evolve, and shape spatial perceptions, experiences, and practices.
- To evaluate the impacts of digital media on social, cultural, political, and economic geographies.

Learning Outcomes:

Having completed this course, students will learn:

- Critically assess the roles digital media play in expanding and diversifying geographical knowledge
- Examine how digital media platforms, narratives, and technologies challenge conventional spatial epistemologies and geographic imaginaries.
- Apply insights from digital geography to assess real-world contexts, addressing critical issues such as spatial justice, digital divides, place-making, and mediated experiences

Course Outline:

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Introduction to Digital Geographies: Conceptualizing Digital Media, Space, and Place; Cultural and technological approaches in digital geography;

Readings

- Adams, P. C. (2009). *Geographies of media and communication*. John Wiley & Sons. (Chapter 1)
- Leszczynski, A. (2014). Spatial media/tion. *Progress in Human Geography*, *39*(6), 729–751.
- Ash, J., Kitchin, R., & Leszczynski, A. (2018). Digital turn, digital geographies?. *Progress in Human Geography*, *42*(1), 25-43.

Unit 2: **(11 hours)**

Digital Infrastructures: Forms of digital media and practices; Geography of data centers and spatial clustering; Urban informatics and city infrastructure; Infrastructure Governance and Policy

Readings

- Plantin, J.-C., Lagoze, C., Edwards, P. N., & Sandvig, C. (2016). Infrastructure studies meet platform studies in the age of Google and Facebook. *New Media & Society*, *20*(1), 293–310.
- Graham, M., & Dutton, W. H. (Eds.). (2019). *Society and the internet: How networks of information and communication are changing our lives*. Oxford University Press. (Chapters **15, 19**)
- Travis, C., & Von Lünen, A. (Eds.). (2016). *The digital arts and humanities: neogeography, social media and big data integrations and applications*. Springer. (Chapter 11)

Unit 3: **(11 hours)**

Digital lives: Platformisation of economy and produser economy; digital and spatial narratives of everyday lives; digital activism and social mobilisations;

Readings

- Graham, M., & Dutton, W. H. (Eds.). (2019). *Society and the internet: How networks of information and communication are changing our lives*. Oxford University Press. (Part 1 Chapters **1,3**, **11, 13**)
- Travis, C., & Von Lünen, A. (Eds.). (2016). *The digital arts and humanities: neogeography, social media and big data integrations and applications*. Springer. (Chapter **4, 9,**)
- Morsello, B. (2017). The datafied society, studying culture through data. *Information, Communication & Society*, *20*(12), 1824–1826.

Unit 4: **(11 hours)**

Emerging Issues and Future Directions: Speculative digital geographies and their potential societal impacts; Critical Challenges and contemporary debates - Digital divides, spatial justice, and inclusive digital practices.

Readings

- Markham, A. (2020). The limits of the imaginary: Challenges to intervening in future

speculations of memory, data, and algorithms. *New Media & Society*, *23*(2), 146144482092932.

- Couldry, N., & Mejias, U. A. (2019). The costs of connection: How data is colonizing human life and appropriating it for capitalism. In *The costs of connection*. Stanford University Press.

Tutorial Exercises **(15 hours)**

- Students collaboratively create a digital concept map linking *space, place, and media* using Miro or Google Jamboard.
- Class Debate: "Are digital spaces real spaces?" — using readings from Adams (2009) and Ash et al. (2018).
- Students will conduct a case study analysis: Identify and map India's major data centers (e.g., Hyderabad, Mumbai, Noida) — analyze locational factors, governance, and energy use.
- Students will conduct digital ethnography and document their daily digital interactions for 48 hours and spatialize them on a map (using Google My Maps or ArcGIS StoryMap).
- Group discussion on "Futures of Digital Cities 2035" — emphasizing inclusivity and ecological sustainability.

Practical Record: Not Applicable

Suggested Readings:

- Ash, J., Kitchin, R., & Leszczynski, A. (2018). *Digital Geographies*. SAGE.
- Ash, J., Kitchin, R., & Leszczynski, A. (2024). *Researching Digital Life*. SAGE Publications Limited.
- Chung, W.H.K. and Keenan, T. (eds)(2006)New Media, Old Media: A History and Theory Reader. Routledge: London and New York.
- Graham, M. (2024, June 18). *Digital Economies at Global Margins*. MIT Press. https://mitpress.mit.edu/9780262535892/digital-economies-at-global-margins/
- Graham, M., & Dutton, W. H. (2019). *Society and the Internet : how networks of information and communication are changing our lives*. Oxford University Press.
- Jenkins, H. *Convergence Culture: Where Old and New Media Collide*. New York: New York University Press, 2006.
- Kitchin, R. (2021). *Data Lives*. Policy Press.
- Kitchin, R. (2024). *Critical Data Studies*. John Wiley & Sons.
- Travis, C. And von Lunen. A. (eds)(2016) The Digital Arts and Humanities. Neogeography, Social Media, Big Data Integrations and applications. Springer: Switzerland.
- Vale, M. (2024). *Geographies of the Platform Economy*. Springer Nature.

Digital materials: Not Applicable

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE: GEOG-E307: DIGITAL IMAGE PROCESSING (PRACTICAL)

Course Title & Code	Credits	Duration (hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-E307: DIGITAL IMAGE PROCESSING (PRACTICAL)	4	2	0	2	BA/BSc in Geography	Foundation in remote sensing

Learning Objectives:

- To make students acquainted with standard digital image processing techniques through hands-on practical exercises
- To enable students to extract land-use/land-cover and other valuable information from the digital remote sensing images for different geographical applications

Learning Outcomes:

Having completed this course, students will learn:

- Overview of Digital Image processing and image enhancement techniques for better interpretation
- Understanding of multi-resolution data fusion and visualisation
- Understanding of Image Classification and Change detection techniques

Course Outline:

THEORY **(30 hours)**

Unit 1 **(7.5 hours)**

Pre-processing: Digital image statistics, supply and storage of digital data, radiometric and geometric correction, image registration

Readings for Unit 1

- Jensen, J.R. 2015. Introductory Digital Image Processing: A Remote Sensing Perspective, 4th Edition, Pearson.
- Gupta, R.P. 2018. Remote Sensing Geology, 3rd Edition, Springer.

Unit 2 **(7.5 hours)**

Image enhancement: Colour Composite, contrast stretching, filtering, transformation, indices, image fusion

Readings for Unit 2

- Jensen, J.R. 2015. Introductory Digital Image Processing: A Remote Sensing Perspective, 4th Edition, Pearson.
- Gupta, R.P. 2018. Remote Sensing Geology, 3rd Edition, Springer.

Unit 3 **(7.5 hours)**

Classification: Supervised and unsupervised classification; accuracy assessment

Readings for Unit 3

- Jensen, J.R. 2015. Introductory Digital Image Processing: A Remote Sensing Perspective, 4th Edition, Pearson.
- Mather, P. M. and Koch, M. 2011. Computer Processing of Remotely Sensed Images: An Introduction, 4th Edition, Wiley-Blackwell.

Unit 4 **(7.5 hours)**

Change Detection: Image and post-classification change detection, change detection matrix

Readings for Unit 4

- Jensen, J.R. 2015. Introductory Digital Image Processing: A Remote Sensing Perspective, 4th Edition, Pearson.
- Mather, P. M. and Koch, M. 2011. Computer Processing of Remotely Sensed Images: An Introduction, 4th Edition, Wiley-Blackwell.

Practical Record: **(60 hours)**

- Computation of spatial statistics on 2-D matrices
- Image radiometric correction
- Image geometric corrections
- Contrast Stretching and filtering operations
- Image transformation, PCA and Indices
- Image fusion exercise
- Unsupervised and supervised classification
- Accuracy assessment of classification
- Digital change detection

Suggested Readings:

- Canty, M.J. 2014. Image Analysis, Classification and Change Detection in Remote Sensing, 3rd Edition, CRC Press.

- Gonzalez, R.C. and Woods, R.E. 2007. Digital Image Processing, 3rd Edition, Pearson.
- Gupta, R.P. 2018. Remote Sensing Geology, 3rd Edition, Springer.
- Jensen, J.R. 2006. Remote Sensing of the Environment: An Earth Resource Perspective, 2nd Edition, Pearson Education.
- Joseph, G. 2005. Fundamentals of Remote Sensing, Orient Blackswan.
- Lavender, S. and Lavender, A. 2015. Practical Handbook of Remote Sensing, CRC Press
- Liang, S. 2004. Quantitative Remote Sensing of Land Surfaces, Wiley.
- Mather, P. M. and Koch, M. 2011. Computer Processing of Remotely Sensed Images: An Introduction, 4th Edition, Wiley-Blackwell.
- Navulur, K. 2007. Multispectral Image Analysis using the Object-Oriented Paradigm, CRC Press.
- Sabins, F.F. 2007. Remote Sensing: Principles and Interpretation, 3rd Edition, Waveland Press.

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE: GEOG-E308: GEOGRAPHIES OF LIFE-FORCE AND ENVIRONMENT

Course Title & Code	Credits	Duration (hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-E308: GEOGRAPHIES OF LIFE-FORCE AND ENVIROMNENT	4	3	1	0	BA/BSc in Geography	NIL

Learning Objectives:

The learning objectives of this course are as follows:

- To understand the contribution of Indian knowledge systems to understanding human-environment relationship
- Student will learn how life-force energy mediates our existence in the universe
- The students will be exposed to Indian knowledge systems, techniques and methods of developing and integrating the self and environment.

Learning Outcomes:

Having completed this course, students will learn:

- The students will acquire Indian traditional knowledge to make sense of self, space and environment
- The students will be able to have deeper knowledge on well-being, environment and healthy life
- Use geographical concepts to understanding life-force

Course Outline:

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Introduction: Life-force- Prana, Ojas, Vitality, Consciousness; the Energy Body & the Universe; the Shiva-Shakti principle

Readings for Unit 1

1. Urban, H (2026) The Paths of the Serpent: Kuṇḍalinī as Subtle Energy, from Tantra to Neo-

Tantra, Numen Book Series.
2. Samuel, G. and Johnston, J., 2015. Religion and the Subtle Body in Asia and the West. New York and London: Routledge.

Unit 2: **(11 hours)**

Limits to Life-force & Vitality: Social Space, Public Space, Cyberspace and their effects on Life-force energy

Readings for Unit 2

1. Pile, S., 2013. The body and the city: psychoanalysis, space and subjectivity. Routledge.
2. Zhang, P., 2021. The energic economy of cyberchronotopia. Explorations in Media Ecology, 20(4), pp.479-496.

Unit 3: **(11 hours)**

Systems of Vitality: Yoga, Tantra, Tai Chi; Spatial Systems: Vaastu, Feng Shui

Readings for Unit 3

1. Woodyard, C., 2011. Exploring the therapeutic effects of yoga and its ability to increase quality of life. *International journal of yoga*, *4*(2), pp.49-54.
2. Kulshrestha, A, and Caplikaite, S. 2024. Tantra Philosophy and it's Yogic Approach for Self – Transformation : A Descriptive Study. http://dx.doi.org/10.2139/ssrn.4828586
3. Sinha, A., 1998. Design of settlements in the Vaastu Shastras. *Journal of Cultural Geography*, 17(2), pp.27-41.

Unit 4: **(11 hours)**

Spaces of Vitality: The Body: Breathe and associated Practices; Physical Environments; Cultural Environments; Globalisation and the Vitality economy

Readings for Unit 4

1. Urban H, B. 2022 Subtle Bodies: Cartographies of the Soul, from India to "the West" [Ciała subtelne. Kartografie duszy od Indii di po Zachód] *Hermaoin* 6.
2. Shrestha, S.K., Adhikari, S., Karky, J.R. and Timsina, S.K., 2024. Emerging Trends and Geographical Influences on Yoga: A Study of Yogic Practices. *AMC Journal*, 5(1), pp.53-68.
3. Thomas, T. and Jena, B. B., 2024. Intersections of New Age Spirituality and Urban Planning in India: Cultivating Well- Being and harmony in City Landscapes. In *Interstices of Space and Memory* (pp 266-271). Routledge.

Tutorial Exercises **(15 hours)**

- Difference between Physical Body & Energy Body

- Identifying linkages between Yogasanas, Tantra Principles and Universal Consciousness
- Differentiate between Shiva & Shakti Principle in Individual & Earth Environments
- Prepare a map of Vastu-purush (vaastu-grid) and identify energy points in a given space
- Case study of a settlement based on vaastu principle
- Energy walk on campus to identify life-force limiting and enhancing spaces (Gardens, Tea-stalls, Street side-walks, class-rooms)
- Effects of internet addiction on life-force and how to manage it
- Discussion on different type of pranayamas and effects on life-force energy
- Field visit to Lodhi garden/ Sundar Nursery/ Place of worship

Practical Record: Not Applicable

Suggested Readings:

- Abhinavgupta, 2013. Sri Tantraloka [Trans: Gautam Chaterjee], Indica Books, Varanasi
- Joo, Swami Lakshman, 2015. Vijnana Bhairava: The Practice of centering Awareness. Indica Books, Varanasi.
- Odier, D. 1997. Tantric Quest: An encounter with Absolute Love, Inner Traditions International, Vermont.
- Odier, D. 2001. Desire: The Tantric Path to Awakening, Inner Traditions International, Vermont.
- Woodroff, J. 2019. Introduction to Tantra Sastra. Jyoti Press, New Delhi.

Digital materials: Not Applicable

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE: GEOG-E309: GEOGRAPHIES OF SEXUALITIES

Course Title & Code	Credits	Duration (hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-E309: GEOGRAPHIES OF SEXUALITIES	4	3	1	0	BA/BSc in Geography	NA

Learning Objectives:

The learning objectives of this course are as follows:

- To understand geographers' contributions to sexuality studies
- To know the ways in which sexuality mediates the production of space and place
- To unpack the relationship between Body, Sexuality and Environment towards self-awakening

Learning Outcomes:

Having completed this course, students will learn:

- Understand concepts and terminologies in geographies of sexualities sub-discipline
- Reflect on sexuality as a key player in the production of space
- Become aware of contributions of Indian knowledge systems to global sexualities.

Course Outline:

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Introduction: Three decades of geographies of sexualities; Relationship between geography and sexuality, Key Concepts & Terminologies

Readings for Unit 1

1. Browne, K., 2006. Challenging queer geographies. *Antipode*, *38*(5), 885-893.
2. Oswin, N., 2008. Critical geographies and the uses of sexuality: Deconstructing queer space, *Progress in Human Geography*, 32(1), 89-103.
3. Menon, N., 2008. *Sexualities.* Sage, New Delhi.

Unit 2: **(11 hours)**

Heteronormativity and its Spatiality: Production of spaces; Practices and diversities

Readings for Unit 2

1. Dhanda, V., & Bhairannavar, K. 2025. Heteronormative geographies and other sexual practices in rural Haryana, India. *Culture, Health & Sexuality*, 27(3), pp. 285-98
2. Arun-Pina, C., 2021. Autoethnographic Re-drawings of floating homes: Narrating trans experiences of rental homes in Bangalore. *Emotion, Space and Society*, 40, pp. 807-28.
3. Srivastava, S., 2004. *Sexual Sites and Seminal attitudes: Sexualities, Masculinities and Cultures in South Asia*, Sage, New Delhi.

Unit 3: **(14 hours)**

Geographies of Socio-Sexual Space: Home, urban public space, cyber space, nation and globe

Readings for Unit 3

1. Banerjea, N., Boyce, P & Dasgupta, R., 2022. *Covid-19 Assemblages: Queer and Feminist Ethnographies from South Asia*, Taylor & Francis
2. Bhairannavar, K., 2024. Queer in Karnataka- Exploring Male Same-Sex Sexualities in the Non-Metropolitan. In: Chakraborty, K. & Chakraborty, A. (Eds). *The Queer and the Vernacular Languages in India*, Routledge. pp.48-63.
3. Srivastava, S., 2020. *Passionate modernity: Sexuality, class, and consumption in India*. Routledge India.

Unit 4: **(8 hours)**

Indian frameworks on Sexualities: Transmutation; Brahmacharya, Tantra, Yoga and Energy Chakra System

Readings for Unit 4

1. Lal, V., 2000. Nakedness, nonviolence, and Brahmacharya: Gandhi's experiments in celibate sexuality. *Journal of the History of Sexuality*, 9(1/2), pp.105-136.
2. Ghimire, M.K., Acharya, P. and Giri, M., 2025. The Secret of Goddess Worship and Symbol of Sex; Significance of Tantra, Shakti and Deities in Hindus of Kathmandu Valley. *Human Evolution*, 40, 143-166.
3. Woodyard, C., 2011. Exploring the therapeutic effects of yoga and its ability to increase quality of life. *International journal of yoga*, 4(2), pp.49-54.

Tutorial Exercises **(15 hours)**

- Relationship between Space and Sexuality: Discussion based on Readings.
- Movie Review of Natarang to understand society, space and sexuality relationship

- Movie Review of Mandi for Moral geographies of urban space
- Heritage walk to Connaught Place to understand production of urban space
- Discussion on Indian laws on protection of Women and Children against Sexual Harassment, exploitation and Trafficking.
- Discussion on Brahmacharya, Energy transmutation and Chakra system.

Practical Record: Not Applicable

Suggested Readings:

- Bell, D., & Valentine, G. (Eds.), 1995. Mapping Desire: Geographies of Sexualities, Psychology Press
- Binnie, J., & Valentine, G. 1999. Geographies of sexuality-a review of progress, Progress in human geography, 23(2), 175-187.
- Kole, S. K. 2007. Globalizing queer? AIDS, homophobia and the politics of sexual identity in India, *Globalization and Health,* 3(1), 8-15.
- Hubbard, P. 2013. *Cities and sexualities*, Routledge
- Rubin, G., 1975. The traffic in women: Notes on the "political economy" of sex. In Reiter R.R (Ed) *Toward an anthropology of Women* (pp. 157-210) Monthly Review Press, New York & London
- Odier, D., 2001. *Desire: The tantric path to awakening*. Inner Traditions Press, Vermont.
- Young, R.M., 2002. Sexuality and the Internet. *Science as Culture*, 11(2), 215-233

Digital materials: Not Applicable

DISCIPLINE SPECIFIC ELECTIVE COURSE (DSE) – GEOG-E310: GEOHERITAGE, GEOTOURISM AND GEOPARKS

Course title & Code	Credits	Duration (per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical/ Practice		
GEOG-E310: GEOHERITAGE, GEOTOURISM AND GEOPARKS	4	3	1	0	BA/ BSc in Geography	

Learning Objectives:

The learning objectives of this course are as follows:

- To develop foundational knowledge on the significance, scope, and relationship of geoheritage, geotourism, and geoparks along with geoconservation and sustainability.
- To enable students to identify, assess and document geoheritage resources using globally recognised methodologies while integrating community participation and responsible geotourism practices.
- To critically examine the institutional frameworks, policies and legal instruments regulating the geoheritage protection and geopark management at national and international levels through comparative case-based learning.

Learning Outcomes:

Having completed this course, students will learn:

- To identify, classify and evaluate geoheritage sites using assessment models with special reference to India, recognising threats and proposing viable conservation strategies.
- Designing and promoting techniques for developing geotourism initiatives, incorporating sustainable practices and local economic development, while learning geoconservation principles.
- Students will be able to demonstrate critical understanding of geopark governance structures, institutional and policy frameworks at national and global scales for effective sustainable planning.

Course Outline:

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Understanding Geoheritage, Geotourism and Geoparks:

Concept, Components, Scope and Significance of Geoheritage, Geotourism and Geoparks; Relationship between Geodiversity, Biodiversity; Cultural Geodiversity; Principles of Geoconservation.

Readings:

- Gray, M. (2013). Geodiversity: Valuing and Conserving Abiotic Nature (2nd ed.). Wiley-Blackwell, United Kingdom.
- Sadry, B. N. (2020). The Geotourism Industry in the 21st Century: The Origin, Principles, and Futuristic Approach. CRC Press, Taylor & Francis Group, USA.
- Singh, R. B., Wei, D., & Anand, S. (Eds.). (2020). Global Geographical Heritage, Geoparks and Geotourism: Geoconservation and Development. Springer, Singapore.

Unit 2: **(11 hours)**

Geoheritage Assessment and Practices:

Geoheritage and Geodiversity: Conceptualization, Characteristics, Types and Assessment Methods of Geological Heritage; IUGS Geoheritage Sites; Geoheritage sites in India; Geoethics; Case Studies.

Readings:

- Bobrowsky, P., Cronin, V. S., Capua, G. D., Kieffer, S. W., & Peppoloni, S. (2017). The Emerging Field of Geoethics. In Gundersen, L.C. (Ed.), Scientific Integrity and Ethics in the Geosciences (pp. 175–212). John Wiley & Sons.
- Brilha, J. (2016). Inventory and Quantitative Assessment of Geosites and Geodiversity Sites: A Review. Geoheritage, 8, 119–134.
- Reynard, E., & Brilha, J. (Eds.). (2025). Geoheritage: Assessment, Protection, and Management (2nd ed.). Elsevier.

Unit 3: **(11 hours)**

Geotourism Promotion and Development:

Geotourism: Concept, Role, Dimensions, Trends; Geoproduct & Geomarketing; Geotourism based Local Community and Economic Development; Sustainable Geotourism in India.

Readings:

- Newsome, D., & Dowling, R. K. (Eds.). (2010). Geotourism: The Tourism of Geology and Landscape. Goodfellow Publishers, Oxford.
- Rodrigues, J., Carvalho, C. N. D., Ramos, M., Ramos, R., Vinagre, A., & Vinagre, H. (2020). Geoproducts- Innovative development strategies in UNESCO Geoparks: Concept, implementation methodology, and case studies from Naturtejo Global Geopark, Portugal.

International Journal of Geoheritage and Parks, 9(1), 108–128.

- Sadry, B. N. (Ed.). (2021). The Geotoursim Industry in the 21st Century: The Origin, Principles and Futuristic Approach. CRC Press, Taylor & Francis Group, USA.

Unit 4: **(11 hours)**

Geoparks Development, Management, and Policy Frameworks:

Objectives, Characterization and Criteria for UNESCO Global Geoparks; Geopark Network; Management and Potential of Geoparks in India with Case Studies; Institutional Policy Framework and Legal Aspects.

Readings:

- Coelho, C., & Farsani, N. T. (Eds.). (2012). Geoparks and Geotourism: New Approaches to Sustainability for the 21st Century. Brown Walker Press, USA.
- Global Network of National Geoparks. (n.d.). Articles & Publication. Retrieved from http://www.globalgeopark.org/Articles/index.htm
- Gordon, J. E. (2019). Geoconservation principles and Protected Area Management. International Journal of Geoheritage and Parks, 7(4), 199–210.

Tutorial Exercises: **(15 hours)**

- Group discussion on interconnections between geoheritage, geodiversity, and geotourism.
- Presentations or documentary creations on potential Indian geoheritage sites.
- Team exercises in groups where students represent as local planner/ activist/ policymaker/ local community that is responding to a geoheritage site's threat.
- Identify and describe a geoheritage site based on its geological significance and potential for geotourism near your home district.
- Select one geoheritage assessment method from the readings and apply it to evaluate a geological site in your home district.
- Discuss any indigenous or traditional practices that contribute to the conservation of geological or natural heritage.
- Identify any existing policy (national, state, or local) that relates to geoheritage or geotourism and its effectiveness using a case study.

Practical Record: Not Applicable

Suggested Readings:

- Ameta, D. L. N. (2023). Prakritik Aapda Evam Paryavaran Prabandhan. Princeps Publishing. (Hindi)

- Errami, E., Brocx, M., & Semeniuk, V. (Eds.). (2015). *From geoheritage to geoparks: Case studies from Africa and beyond*. Springer Nature, Switzerland.
- Reddy, D. R. (Ed.). (2021). A monograph on *Potential geoparks of India*. Indian National Trust for Art and Cultural Heritage (INTACH).
- Shekhar, S., Kumar, P., Chauhan, G., & Thakkar, M. G. (2019). Conservation and Sustainable Development of Geoheritage, Geopark, and Geotourism: A Case Study of Cenozoic Successions of Western Kutch, India. Geoheritage, 11, 1475–1488.
- Tripathi, S. C., Pant, N. C., & Rajora, S. (Eds.). (2025). Geoconservation and Geotourism Potential of India. Springer Nature, Switzerland.
- Tripathi, S. C., Pant, N. C., & Rajora, S. (Eds.). (2025). Geoconservation and Geotourism Potential of India. Springer Nature, Switzerland.
- United Nations Educational, Scientific and Cultural Organization. (2026). *UNESCO Global Geoparks*.

Digital materials: Not Applicable .

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE: GEOG-E311: LANDSLIDE RISK ANALYSIS

Course Title & Code	Credits	Duration (hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-E311: LANDSLIDE RISK ANALYSIS	4	3	1	0	BA/BSc in Geography	-

Learning Objectives:

- To provide a holistic understanding of landslide risk analysis
- To enable students to efficiently address the issues related to landslide management

Learning Outcomes:

Having completed this course, students will learn:

- Understanding of landslide hazard and risk assessment methods
- Understanding and usage of geospatial technologies in landslide studies
- Overview of landslide risk reduction program and policies

Course Outline:

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Landslide: definition, types, causes, historical events; Geo-spatial technologies for Landslide hazard and risk assessment

Readings for Unit 1

- Dikau, R., Brunsden, D., Schrott, L. and Ibsen, M-L. (eds.),1996. Landslide Recognition: Identification, Movement and Causes, Wiley.
- Glade, T., Anderson, M. and Crozier, M.J. (eds.), 2005. *Landslide Hazard and Risk*, John Wiley.

Unit 2: **(11 hours)**

Landslide hazard assessment, tools and techniques: geomorphologic, statistical, non-parametric and advanced techniques

Readings for Unit 2

- Margottini, C., Canuti, P. and Sassa, K. (eds.), 2013. Landslide Science and Practice, Volume 1 to 7, Springer.
- van Westen, C.J. et al., 2012. Landslide Inventory, Hazard and Risk Assessment in India, in: B. Pradhan and M. Buchroithner (eds.), *Terrigenous Mass Movements*, Springer.

Unit 3: **(11 hours)**

Landslide risk assessment, tools and techniques: vulnerability, risk, geotechnical analysis, preparedness and coping capacity

Readings for Unit 3

- Lee, E.M. and Jones, D.K.C., 2004. Landslide Risk Assessment, Thomas Telford.
- Sassa, K. and Canuti, P. (eds.), 2009. *Landslides: Disaster Risk Reduction*, Springer.

Unit 4: **(11 hours)**

National and international programs on landslide risk reduction, role of NGOs and local communities, gender roles and agencies, prediction and early warning

Readings for Unit 4

- van Westen, C.J. et al., 2012. Landslide Inventory, Hazard and Risk Assessment in India, in: B. Pradhan and M. Buchroithner (eds.), *Terrigenous Mass Movements*, Springer.
- Anderson, M.G. and Holcombe, E. 2013. *Community-based Landslide Risk Reduction: Managing Disasters in Small Steps*, The World Bank.

Tutorial: **(15 hours)**

- Historic landslide events in India
- Tools and techniques for landslide hazard assessment
- Geo-spatial technologies for Landslide hazard assessment
- Tools and techniques for landslide risk assessment
- Landslide preparedness
- Assessment of National and International landslide programs
- Community-based landslide risk reduction

Practical Record: Not Applicable

Suggested Readings:

- Anderson, M.G. and Holcombe, E. 2013. Community-based Landslide Risk Reduction: Managing Disasters in Small Steps, The World Bank.
- Dikau, R., Brunsden, D., Schrott, L. and Ibsen, M-L. (eds.),1996. Landslide Recognition: Identification, Movement and Causes, Wiley.
- Lee, E.M. and Jones, D.K.C., 2004. Landslide Risk Assessment, Thomas Telford.
- Margottini, C., Canuti, P. and Sassa, K. (eds.), 2013. Landslide Science and Practice, Volume 1 to 7, Springer.
- Ramaswamy, S.M. and Singh, B. (eds.), 2017. Landslide Research: The DST's Initiatives, New India Publishing Agency.
- Sassa, K., Fukuoka, H., Wang, F. and Wang, G. (eds.), 2005. Landslides: Risk Analysis and Sustainable Disaster Management, Proceedings of the First General Assembly of the International Consortium on Landslides, Springer.
- van Westen, C.J. et al., 2012. Landslide Inventory, Hazard and Risk Assessment in India, in: B. Pradhan and M. Buchroithner (eds.), Terrigenous Mass Movements, Springer.
- Yamagishi, H. and Bhandary, N.P. (eds.), 2017. GIS Landslides, Springer.

Digital materials: Not Applicable

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE: GEOG-E312: MOUNTAIN METEOROLOGY

Course Title & Code	Credits	Duration (hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-312: MOUNTAIN METEOROLOGY	4	3	1	0	BA/BSc in Geography	Basic Knowledge of Physical Geography

Learning Objectives:

The learning objectives of this course are as follows:

- To provide an advanced understanding of the fundamentals of mountain meteorology, including topographic influences on atmospheric processes.
- To develop theoretical and analytical skills in understanding local and regional circulations, dynamic airflow over complex terrain, observational techniques, and forecasting challenges.
- To emphasize the unique meteorological characteristics of mountain region, including monsoon dynamics, western disturbances, extreme weather phenomena, and elevation-dependent climate processes.
- To enable students to assess meteorological hazards in mountain environments, their socio-economic impacts, and the role of climate variability.

Learning Outcomes:

Having completed this course, students will learn:

- Explain the definition, scope, and historical development of mountain meteorology; describe key processes such as orographic lifting, pressure/temperature/precipitation gradients, and rain-shadow effects.
- Analyze local and regional circulation systems, including diurnally driven winds, and the role of Indian Summer Monsoon and winter western disturbances.
- Evaluate techniques for meteorological observation and forecasting in complex terrain, while critically assessing challenges like data sparsity and the application of numerical models.
- Identify and assess meteorological hazards such as extreme orographic precipitation and cloudbursts and analyze climate variability impacts.

Course Outline:

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Introduction to mountain meteorology: Definition, scope, historical progress and significance of mountain meteorology. Instruments for measuring meteorological data. Pressure, temperature, and precipitation gradients. Orographic lifting, barrier effects, cloud formation, precipitation patterns, rain-shadow and leeward effects.

Readings for Unit 1

- Barry, R. G. (2008). Mountain Weather and Climate (3rd ed.). Cambridge: Cambridge University Press.
- Whiteman, C. D. (2000). Mountain meteorology: fundamentals and applications. Oxford University Press.

Unit 2: **(11 hours)**

Local and regional circulation systems in mountains: Mountain-valley wind systems such as anabatic and katabatic winds. Regional circulations: characteristics of Indian Summer Monsoon and western disturbances in winter.

Readings for Unit 2

- Chowdary, J. S., Parekh, A., & Gnanaseelan, C. (Eds.). (2021). Indian summer monsoon variability: El Niño-teleconnections and beyond. Elsevier.
- Dimri, A. P., & Chevuturi, A. (2016). Western Disturbances—An Indian Meteorological Perspective. Springer International Publishing
- Zardi, D., Whiteman, C.D. (2013). Diurnal Mountain Wind Systems. In: Chow, F., De Wekker, S., Snyder, B. (eds) Mountain Weather Research and Forecasting. Springer Atmospheric Sciences. Springer, Dordrecht

Unit 3: **(11 hours)**

Meteorological observation and forecasting: High-altitude ground-based observational networks, doppler radars, satellite based observations, and challenges of data sparsity in mountains. Reanalysis data and their strength and limitations. India Meteorological Department initiatives for Himalayan hill states.

Readings for Unit 3

- Chow, F. K., De Wekker, S. F., & Snyder, B. J. (Eds.). (2012). Mountain weather research and forecasting: recent progress and current challenges. Springer.
- Dimri, A. P., Bookhagen, B., Stoffel, M., & Yasunari, T. (Eds.). (2019). Himalayan Weather and Climate and their Impact on the Environment. Springer Nature.
- Whiteman, C. D. (2000). Mountain meteorology: fundamentals and applications. Oxford University Press.

Unit 4: **(11 hours)**

Meteorological hazards and impacts: Extreme orographic precipitation, cloudbursts, flash floods, landslides, and avalanche meteorology. Altered monsoon patterns, shifting western disturbances, elevation-dependent warming, and aerosol influences. Socio-economic impacts on livelihoods, hydropower, tourism, and agriculture.

Readings for Unit 4

- Dimri, A. P., Bookhagen, B., Stoffel, M., & Yasunari, T. (Eds.). (2019). Himalayan Weather and Climate and their Impact on the Environment. Springer Nature.
- Barry, R. G. (2008). Mountain Weather and Climate (3rd ed.). Cambridge: Cambridge University Press.
- Whiteman, C. D. (2000). Mountain meteorology: fundamentals and applications. Oxford University Press.

Tutorial Exercises **(15 hours)**

- Explain the historical evolution of mountain meteorology as a distinct sub-discipline.
- Describe the processes of orographic lifting, barrier effects, and rain-shadow formation.
- Describe the diurnal mountain-valley wind system and associated slope flows (anabatic/katabatic winds).
- Compare and contrast the meteorological roles of the Indian Summer Monsoon and winter Western Disturbances over the Himalaya.
- Discuss the major meteorological observational challenges in the Himalayan region.
- Evaluate the contributions of high-altitude automatic weather stations, Doppler radars, and satellite remote sensing platforms.
- Highlight India Meteorological Department initiatives for forecasting in hill states and suggest possible improvements.
- Analyse the meteorological triggers and socio-economic consequences of extreme orographic precipitation events and cloudbursts.
- Discuss evidence for elevation-dependent warming and changing monsoon/western disturbance patterns in the Himalaya.
- Evaluate their impacts on livelihoods, hydropower generation, tourism, and agriculture, and assess the role of aerosols and black carbon in amplifying these changes.

Practical Record: Not Applicable

Suggested Readings:

- Dash, S. K. (2013). Weather and climate in high altitudes with special reference to the Himalayas. Climate Change and its Ecological Implications for the Western Himalaya, 128-161.
- Gultepe, I. (2015). Mountain weather: Observation and modeling. Advances in Geophysics, 56, 229-312.
- Hik, D. S., & Williamson, S. N. (2019). Need for mountain weather stations climbs. Science, 366(6469), 1083-1083.
- Kumar, A., Verma, A., Bhambri, R., & Sain, K. (2021). Time series analysis of hydrometeorological data for the characterization of meltwater storage in glaciers of Garhwal Himalaya. In Basics of Computational Geophysics (pp. 373-388). Elsevier.
- Moore, G. W. K., & Semple, J. L. (2004). High Himalayan meteorology: Weather at the south col of Mount Everest. Geophysical Research Letters, 31(18).
- Mountain Research Initiative EDW Working Group (2015). Elevation-dependent warming in mountain regions of the world. Nature Clim Change 5, 424–430 .
- Pant, G. B., Kumar, P. P., Revadekar, J. V., & Singh, N. (2017). Weather systems over Himalaya: cloud and precipitation processes. In Climate Change in the Himalayas (pp. 63-79). Cham: Springer International Publishing.
- Pratap, B., Dobhal, D. P, Bhambri, R., and Mehta, M. (2013): Near-surface temperature lapse rate in Dokriani Glacier catchment, Garhwal Himalaya, India. Himalayan Geology, 34 (2), 183-186.
- Satyapragyan, S., Yadav, J. S., & Bhambri, R. (2026). Bias corrections of ERA5 and ERA5-land temperature using automatic weather station data in the Higher Central Himalaya: implications for hydro-meteorological and glaciological research. Journal of Hydrology: Regional Studies, 63, 103079.
- Shea, J. M., Wagnon, P., Immerzeel, W. W., Biron, R., Brun, F., & Pellicciotti, F. (2015). A comparative high-altitude meteorological analysis from three catchments in the Nepalese Himalaya. International journal of water resources development, 31(2), 174-200.
- Smith, R. B. (2019). 100 years of progress on mountain meteorology research. Meteorological Monographs, 59, 20-1.
- Yadav, J. S., Tiwari, S. K., Bhambri, R., Sain, K., Patidar, P., & Baiswar, A. (2024). Inter–Intraseasonality of Meteorological Drivers of Chorabari Glacier, Central Himalaya: Implications for Mass Fluctuations and Associated Hazards. Journal of Hydrometeorology, 25(10), 1541-1560.
- Yadav, J. S., Tiwari, S. K., Misra, A., Rai, S. K., & Yadav, R. K. (2021). High-altitude meteorology of Indian Himalayan Region: complexities, effects, and resolutions. Environmental Monitoring and Assessment, 193(10), 654.

Digital materials: Not Applicable

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE: GEOG-E313: NATURAL RESOURCE MANAGEMENT

Course Title & Code	Credits	Duration (hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-E313: NATURAL RESOURCES MANAGEMENT	4	3	1	0	BA/BSc in Geography	-

Learning Objectives:

The learning objectives of this course are as follows:

- Awareness about resource availability, accessibility, utilization, its use and misuse.
- Spatial distribution of natural resources.
- Resource management and governance.

Learning Outcomes:

Having completed this course, students will learn:

- At the end the course student should learn importance of natural resources.
- Conservation methods and awareness about community participation.
- Assessment of role of national and international efforts to mitigate resource problems.

Course Outline:

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Introduction: Introduction: Concept, approaches and appraisal to natural resource management.

Readings for Unit 1

- Pandey, B. W. (ed.) 2000. *Natural Resource Management*, Mittal Publication, New Delhi.
- Rees, J. 1990. *Natural Resources: Allocation, Economics and Policy*, Routledge, London.

Unit 2: **(11 hours)**

Natural Resources: Land, Water, Forest.

Readings for Unit 2

- Singh, Jagdish, 2006. *Sansadhan Bhoogol*, Radha Publications, New Delhi (Hindi).
- Taylor, Russel D., and Torquebiau, Emmanuel (Eds.). 2011. *Natural Resource Management and Local Development*, Springer, Netherland.

Unit 3: **(11 hours)**

Problems in Resource Management: Issues and constraints in resource management, Environmental, Political and Socio-Economic challenges.

Readings for Unit 3

- Thakur, B. 2003-2018. *Perspectives in Resource Management in Developing Countries*, Vol.1-13, Concept Publishing Company, New Delhi.
- Lockwood, M., Davidson, J., Curtis, A., Stratford, E., & Griffith, R. (2010). Governance principles for natural resource management. *Society and natural resources*, *23*(10), 986-1001.

Unit 4: **(11 hours)**

Governance: Policy, Planning and Institutional and Technical advancement in natural resource management; Integrated Resource Management; Case Studies.

Readings for Unit 4

- Berkes, F. (ed.), 1989. *Common Property Resources: Ecology and Community Based Sustainable Development,* Belhaven Press London.
- Mitchell B. 1988. *Geography and Resources Analysis*, 2nd edition, Longman, London.

Tutorial Exercises **(15 hours)**

- **Resource Mapping using RS–GIS:** Delineate and map land, forest, and water resources using satellite imagery.
- **Integrated Resource Case Study:** Analyze a Himalayan, coastal, or desert region for resource management challenges and strategies.
- **Policy Review Exercise:** Critically review a national policy related to land, water, or forest management.
- **Community Participation Survey:** Document local initiatives in participatory natural resource management.
- **Debate on Resource Conflicts:** Discuss ethical and socio-economic dilemmas in resource utilization and conservation.

Practical Record: Not Applicable

Suggested Readings:

- Mather, A.S. and Chapman, K. 1995. *Environmental Resources*, Longman, Harlow, England.
- McClay, K.R. 1995. *Resource Management Information System: Process & Practice*, Taylor Francis, London.
- Mitchell B. 1988. *Geography and Resources Analysis*, 2nd edition, Longman, London.
- Mitchell, B. 1997. *Resource and Environmental Management*, Longman, Harlow, England.
- Newson, M.D. 1991. *Land, Water and Development: River Basin Systems and Management*, Routledge, London.
- Owen, S. and Owens, P.L. 1991. *Environment, Resources and Conservation*, Cambridge University Press, New York.

Digital materials: Not Applicable

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE: GEOG-E314: PALAEOCLIMATIC CHANGES AND METHODS OF RECONSTRUCTION

Course Title & Code	Credits	Duration (hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-E314: PALAEO-CLIMATIC CHANGES AND METHODS OF RECONSTRUCTION	4	3	1	0	BA/BSc in Geography	Basic Knowledge of Geomorphology and Palaeo-climates

Learning Objectives:

The learning objectives of this course are as follows:

- The course intends to study the methods of Palaeo environmental and Palaeoclimatic reconstruction.
- To make the students learn the terrestrial and non-terrestrial reasons of long term climatic changes.
- It focuses on proxies that are used as measure of relative and absolute dating to reconstruct past events.
- The students will be exposed to reconstruction methods of Palaeo-glacial extent.

Learning Outcomes:

Having completed this course, students will learn:

- The students will be able to demonstrate the methods of palaeo-environmental and Palaeoclimatic reconstruction.
- The students will be able to elaborate the causes of long term climatic changes.
- The Students will be able to use relative and absolute dating methods to reconstruct Palaeogeography and Palaeoclimates in their future studies.

Course Outline:

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Introduction: Introduction to the Palaeoclimatic studies and their significance, the concept of climate change, variability and climatic anomalies. Terrestrial and non-terrestrial factors for long term climate

changes.

Readings for Unit 1

Haydn and Cook John (2011) Climate Change Denial Heads in the Sand, *Earth Scan publication,* London.
Huddart, David and Stott, Tim (2010) Earth Environments Past, Present and Future, Wiley, Oxford.
Washington
Lowe, J. John and Walker, Michael (2015) Reconstructing Quaternary Environments, Routledge, London.
Walker, Mike (2005) Quaternary dating Methods, John Wiley and Sons, Sussex.

Unit 2: **(11 hours)**

Geomorphological Evidence: Geomorphological evidence and the style and extent of Palaeoglacier movement, Reconstruction of former ice masses, reconstruction methods of palaeo Equalibirium Line Altitude (ELA), Palaeotemperature estimates from glacial geomorphological evidence, palaeo-environments of river terraces Pluvial lakes and lacustrine environments.

Readings for Unit 2

Benn, Douglas I. and Lehmkuhl, Frank (2000) Mass balance and equilibrium-line altitudes of glaciers in high-mountain environments, Quaternary International, Vol 65-66, 2000, pages 15-29, https://doi.org/10.1016/S1040-6182(99)00034-8
Lowe, J. John and Walker, Michael (2015) Reconstructing Quaternary Environments, Routledge, London.
Huddart, David and Stott, Tim (2010) Earth Environments Past, Present and Future, Wiley, Oxford.
Yang, W., Mackintosh, A.N., Cooper, EL. *et al.* Global estimates of glacier equilibrium-line altitude ratios for enhanced paleoclimate reconstructions. *Commun Earth Environ* **7**, 391 (2026). https://doi.org/10.1038/s43247-026-03391-5
Walker, Mike (2005) Quaternary dating Methods, John Wiley and Sons, Sussex.

Unit 3: **(11 hours)**

Lithological Evidence: Glacial sediment and its nature, Sediment sections, classification of tills, Analysis of glaciogenic sequences, Pluvial lake sediment sequences, Lake level changes and Quaternary palaeoclimates, Field Sampling for geochronology.

Readings for Unit 3

Douglas Benn, David J A Evans (2010) Glaciers and Glaciation, Routledge , London
Last, W.M. and Smol, J.P. (Eds). (2002): Tracking Environmental change using lake sediment vol I, Kluwer Academic Publishing, New York.
Reading, H.J. (Ed). (1996) Sedimentary Environments: Processes, Facies and Stratigraphy, Blackwell publishing, Wiley India Pvt Ltd, New Delhi
Stott, Tim and Huddart, David (2010) Earth Environments Past, Present and Future, Wiley-Blakwell, Oxford.

Unit 4: **(11 hours)**

Dating methods: Precision and accuracy in Quaternary dating, Absolute dating: Radiocarbon dating, Luminescence dating, Cosmogenic radio Nuclide (^{10}Be and ^{26}Al) dating. Sampling techniques in field and laboratory protocols, Relative dating: Dendrochronology, Lichenometry, Annual layers in glacier ice, boulder frequency.

Readings for Unit 4

Lowe, J. John and Walker, Michael (2015) Reconstructing Quaternary Environments, Routledge, London.
Walker, Mike (2005) Quaternary dating Methods, John Wiley and Sons, Sussex.
Liritzis, L; Singhvi, A. K.; Feathers, J. K; Wagner, G. A; Kadereit, A. and Zacharias, N. (2013) Luminescence Dating in Archaeology, Anthropology, and Geoarchaeology, Springer, London.

Tutorial Exercises **(15 hours)**

- How is the discipline of palaeoclimates relevant today?
- Evaluate the concept of climate change, variability in relation to the period of Rapid climate change. paleoclimatic about the major phases of Glaciation and deglaciation during the last Ice Age.
- Evaluate the strengths and weaknesses of the methods of palaeo Equilibrium line altitude.
- Explain the steps of selection of sites for glacial geochronology sampling to deduce the past events .
- Explain the important relative dating techniques used in palaeoclimates reconstructions.
- Compare the strength and limitation of luminescence and cosmogenic radio nuclide methods in reconstruction of glacial chronology.

Practical Record: Not Applicable

Suggested Readings:

- Fagan, Brian (2020) The Little Ice Age, how climate made history 1300-1850, Basic Books, New York.
- Hambrey, M. and Alean, A.J. (2004) Glaciers, Cambridge University Press, Cambridge.
- Hughes, P.D., Gibbard, P.L., A stratigraphical basis for the Last Glacial Maximum (LGM), Quaternary International (2014), http://dx.doi.org/10.1016/j.quaint.2014.06.006
- Michael J. Hambrey, Poul Christoffersen, Neil F. Glasser and Bryn Hubbard, (Eds). (2007) Glacial Sedimentary Processes, International Association of Sedimentologists. ISBN: 978-1-405-18300-0
- Wallace, R.W (2013) Glacial Epoch and Warm Polar Climates, Read Books Ltd.

Digital materials: Not Applicable

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE: GEOG-E315: REGIONAL DEVELOPMENT IN INDIA

Course Title & Code	Credits	Duration (hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical/ Practice		
GEOG-E315: REGIONAL DEVELOPMENT IN INDIA	4	3	1	0	BA/BSc in Geography	Basic Knowledge of Geography

Learning Objectives

The learning objectives of this course are as follows:

- To introduce students to the fundamental concepts of regional development and key theories underpinning regional development.
- To enable students to critically examine the spatial patterns and temporal trends of regional disparities in India.
- To familiarize students with various regional development policies and programmes.
- To understand India's future regional development trends and challenges.

Learning Outcomes

Having completed this course, students will learn:

- Students will be able to explain the concepts and theories of regional development and how sustainable development is integral to regional planning.
- Students will be able to critically assess the evolution of regional development planning in India, including the roles of key institutions like the Planning Commission and NITI Aayog.
- Students will be able to understand the regional disparities, trends, and challenges of regional development in India.

Course Outline

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Introduction: Concepts and Theories of regional development, Sustainable Development and Regional planning

Readings

- Stamp, L.D. 1967. Asia: A General and Regional Geography. Methuen and Co. Ltd. London.
- Misra, R.P. (ed.) 1992. Regional Planning Concepts, Techniques, Policies and Case Studies, Concept Publishing Pvt. Ltd, Delhi
- Myrdal, G. 1957. Economic Theory and Under-developed Regions. Gerald Duckworth & Co.

Unit 2: **(11 hours)**

Regional Planning and Disparities in India: Institutions and Mechanisms in India (Planning Commission, and NITI Aayog), Regional Disparities: spatial patterns and temporal trends in India

Readings

- Bhattacharya, B. B., and S. Sakthivel. 2004. "Regional Growth and Disparity in India." Economic and Political Weekly 39 (10): 1071–77.
- Mitra, Ashok. 1961. Levels of Regional Development in India, Census of India 1, no. 04 Part 1, 4.
- Dreze, J. and Sen, A. 1996. Indian Development: Select Regional Perspectives, Oxford University Press.

Unit 3: **(11 hours)**

Regional Development Policies and Programmes: Planning strategies since independence, NITI Aayog and contemporary policy framework, Decentralized Planning (Area Development Approach, Integrated Watershed Development, Panchayati Raj Institutions), Aspirational Districts Programme, Industrial corridor policies (SEZ, DMIC, EDFC Etc.)

Readings

- NITI Policy Paper, 2023. Bharatiya Model of Inclusive Development, https://www.niti.gov.in/sites/default/files/2023-06/NITI_policy-paper_BMID_2023-May.pdf
- Strategy for New India @ 75, 2018, https://niti.gov.in/sites/default/files/2019-01/Strategy_for_New_India_0.pdf
- NITI Reports on Aspirational Districts Programme, https://niti.gov.in/aspirational-districts-programme

Unit 4: **(11 hours)**

Future Regional Development in India: Emerging trends and challenges, Green growth and Sustainable Regional Development, Role of GIS and big data in regional planning and development, Climate change and regional vulnerability, Follow-up Field Trip

Readings

- Johnston, R.J. et.al (ed.) (1990). Regional Geography: Current Development and Future Prospects. Routledge London and New York.
- World Bank. Inclusive Green Growth: The Pathway to Sustainable Development, 2012, https://doi.org/10.1596/978-0-8213-9551-6
- Rao, C. H. H. 2005. "Agriculture, Food Security, Poverty and Environment: Essays on Post-Reform India." Oxford University Press.

Tutorial Exercises **(15 hours)**

- Discussion about Growth Pole and Growth Center approach
- Discussion on role of NITI Aayog in Regional Development
- Human Development Indicators (HDI) and regional development
- Policies and Programmes of Regional Development in India
- Role of Science and Technology in Regional Development

Practical Record: *Not Applicable*

Suggested Readings:

- Singh, R.L. (ed.) 1971. India-A Regional Geography. National Geographical Society, India, Varanasi.
- Despande, C.D. 1992. India-A Regional Interpretation. ICSSR, Northern Book Centre, New Delhi.
- Nath, V. 2009. Regional Development and Planning in India, Concept Publishing Company.
- Chandana, R.C. प्रादेशिक नियोजन तथा विकास. Kalyani Publication
- Gandhi, M.K. 1909. Hind Swaraj
- Kar, S., and S. Sakthivel. 2007. "Reforms and Regional Inequality in India." Economic and Political Weekly 42 (47): 69–77.
- UNDP's Human Development Reports, NITI Aayog Reports
- Dasgupta, D., P. Maity, R. Mukherjee, S. Sarkar, and S. Chakroborty. 2000. "Growth and Interstate Disparities in India." Economic and Political Weekly 35 (27): 2413–22.
- Maurya, S.D. प्रादेशिक नियोजन एवं विकास. Pravalika Publication.

Digital Materials: *Not Applicable*

GENERAL ELECTIVE (GE) COURSE:
GEOG-E316: NATURAL HAZARDS AND DISASTER MANAGEMENT

Course title & Code	Credits	Duration (per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical/ Practice		
GEOG-E316: NATURAL HAZARDS AND DISASTER MANAGEMENT	4	3	1	0	BA/BSc in Geography	Basic Knowledge of Geography

Learning Objectives:

The learning objectives of this course are as follows:

- To develop conceptual clarity regarding hazards, disasters, vulnerability, risk and resilience.
- To analyze spatial patterns and causes of natural and anthropogenic disasters.
- To examine disaster risk reduction strategies, governance frameworks and policies.
- To enable students to develop analytical and applied skills in disaster assessment, risk evaluation, and disaster management planning.

Learning Outcomes:

Having completed this course, students will learn:

- Demonstrate a clear conceptual understanding of hazards, disasters, vulnerability, risk and resilience within a geographical framework.
- Analyze the spatial patterns, causes and impacts of natural and anthropogenic disasters using geographical perspectives and relevant data.
- Apply disaster risk reduction principles by evaluating preparedness, mitigation, response and recovery strategies in different environmental and socio-economic contexts.
- Interpret disaster management policies and institutional frameworks at national and international levels, and critically assess their effectiveness.
- Critically examine emerging disaster risks, particularly those related to climate change, urbanization and environmental change, and suggest resilience-building strategies.

Course Outline:

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Introduction (Theory): Concept of Hazards, Risk, Vulnerability and Disaster, Types of Hazards: Natural (Earthquakes, volcanoes, landslides, cloudburst, Floods, droughts, cyclones, heatwaves, forest fire, etc.), man-made, Disaster risk equation and theoretical models.

Readings

- Coppola, D.P. (2011) Introduction to International Disaster Management (Second Edition) https://doi.org/10.1016/C2009-0-64027-7
- Wisner, B., P. Blaikie, T. Cannon and I. Davis, 2004. At Risk: Natural Hazards, Peoples' Vulnerability and Disasters, Routledge (Second Edition).
- Smith, K., Fearnley, C.J., Dixon, D., Bird, D.K., & Kelman, I. (2023). Environmental Hazards: Assessing Risk and Reducing Disaster (7th ed.). Routledge. https://doi.org/10.4324/9781351261647

Unit 2: **(11 hours)**

Dimensions of Hazards (Theory): Regional Dimension of hazard: Occurrence and trends, methods of identifying hazard prone regions; Disaster hotspots in India and the world; Case studies.

Readings

- Keller, E.A., & DeVecchio, D.E. (2019). Natural Hazards: Earth's Processes as Hazards, Disasters, and Catastrophes (5th ed.). Routledge. https://doi.org/10.4324/9781315164298
- UNDRR publications on hazard and risk assessment.

Unit 3: **(11 hours)**

Disaster Impacts and Loss Assessment (Theory): Disaster Losses and Impact - Displacements, livelihood, economy and infrastructure, health; urban vulnerability and climate change implications of disasters.

Readings

- Coppola, D.P. (2011). Introduction to International Disaster Management (Second Edition) *https://doi.org/10.1016/C2009-0-64027-7*
- Alexander, D. (2018). Natural Disasters. Routledge. https://doi.org/10.4324/9781315859149
- World Health Organization (WHO). Disaster Health Impact Reports.

Unit 4: **(11 hours)**

Disaster Risk Reduction and Governance Frameworks (Theory): Disaster management cycle: preparedness, mitigation, response, recovery; Role of GIS, Remote Sensing and spatial technologies;

Institutional frameworks: Sendai Framework, Disaster Management Act (India), NDMA, SDMA, DDMA roles, NGOs and international agencies, community-based disaster risk management; Mitigation and Management- Plans and policies; engineering, economic, social, political and policy initiatives.

Readings

- Haddow, G.D., Bullock, J.A. & Coppola, D. (2024). Introduction to Emergency Management (8th Edition).
- Carter, W.N. (2008). Disaster Management: A Disaster Manager's Handbook.

Tutorial Exercises: **(15 hours)**

- Guided discussions on key concepts and theoretical issues in disaster management.
- Case study analysis of recent disasters at regional, national and global scales.
- Review and critical discussion of assigned readings and policy documents.
- Data interpretation and problem-based analytical exercises.
- Student presentations and academic discussions.
- Debates on disaster risk reduction strategies, governance and resilience-building approaches.

Practical Record: Not Applicable

Suggested Readings:

- Allan, S., Adam,B. and Carter,C., (eds.), (2000): Environmental Risks and the Media, Routledge,London.
- Ambala-Bertrand, J.M., (1993): Political Economy of Large Natural Disasters: With Special Reference to Developing Countries, Clarendon Press, Oxford.
- Government of India, 2005. Disaster Management Act, 2005, The Gazette of India, New Delhi.
- Bankoff, G., G. Frerks and D. Hilhorst (eds.) 2003. Mapping Vulnerability: Disasters, Development and People, Earthscan.
- Drabek, Thomas, 2010. The Human Side of Disaster, Taylor and Francis
- Kapur, Anu. et al. 2005. Disasters in India: Studies of Grim Reality, Rawat Publications, Jaipur and Delhi.
- Kapur, Anu, 2010. Vulnerable India: A Geographical Study of Disaster, Sage.
- Parasuraman, S. 2004. India Disasters Report: Towards a Policy Initiatives, Oxford University Press.
- Tripathi, Punam, 2018. Vulnerable Andaman and Nicobar Islands: A Study of Disasters and Response, Routledge.
- United Nations, 2004. Living with Risk: A Global Review of Disaster Reduction Initiatives.
- Alexander, D. (1993). Natural Disasters (1st ed.). Routledge. https://doi.org/10.4324/9781315859149
- National Centre for Disaster Management, 2001. Report of the High-Powered Committee

(HPC) on Disaster management, New Delhi, http://nidm.gov.in/PDF/pubs/HPC_Report.pdf.

Digital materials: Not Applicable

SKILL BASED (SB) COURSE:
GEOG-S301: SPATIAL DATA MANAGEMENT

Course title & Code	Credits	Duration (per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-S301: SPATIAL DATA MANAGEMENT	2	1	0	1	BA/BSc in Geography	

Learning Objectives:

The learning objectives of this course are as follows:

- The students will be opened to the elementary, preliminary and introductory stages of Spatial Data for map understanding, interpretation, creation and its application.

Learning Outcomes:

Having completed this course, students will learn:

- The students will be able to differentiate between spatial and non-spatial data, georeference area of interest, create and design informative maps using spatial and non-spatial data sets.

Course Outline:

Unit 1 - Theory **(15 hours)**

Problematizing Spatial Associations: Formulation of Research Problem, Review of Literature, and Preparation of Research Design.

Readings for Unit 1:

- Flick, U. (2020). Introducing Research Methodology: A beginner's guide to doing a research project (3rd ed.). SAGE Publications, New Delhi.
- Gomez, B., & Jones III, J. P. (Eds.). (2010). Research Methods in Geography: A Critical Introduction. John Wiley & Sons Ltd. Publication, Wiley-Blackwell.
- Telore, N. V., & Borude, S. A. (Eds.). (2023). Advances in Geographical Research. Jyotikiran Publication, Pune.

Unit 2 - Practical **(30 hours)**

Methods of Data Collection: Ethical Approval and Informed Consent, Sources of Data, Techniques of Spatial Data Collection. Processing Data: Editing, coding, and tabulation, Problem-use of computers in social research

Readings for Unit 2:

- Bryman, A. (2016). Social Research Methods (5th ed.). Oxford University Press, United Kingdom.
- Creswell, J. W. (2009). Research Design: Qualitative, Quantitative and Mixed Methods Approaches (3rd ed.). SAGE publications, USA.
- Lovell, S. A., Coen, S. E., & Rosenberg, M. W. (Eds.). (2023). The Routledge Handbook of Methodologies in Human Geography. Routledge, Taylor & Francis Group, United Kingdom.

Practical Exercises

Students will be trained in various data handling techniques during class tutorials, students will be assigned and assessed through presentations related to individual term papers.

Practical Record: Not Applicable

Suggested Readings:

- Gomez, B., & Jones III, J. P. (Eds.). (2010). Research Methods in Geography: A Critical Introduction. John Wiley & Sons Ltd. Publication, Wiley-Blackwell.
- Koli, L. N. (2025). रिसर्च मैथडोलॉजी (Research Methodology) (2nd ed.). Y. K. Publishers, New Delhi. (Hindi)
- Kothari, C. R. (2004). Research Methodology: Methods and Techniques. New Age International (P) Ltd., Publishers, New Delhi.
- Krishna, G., & Singh, N. (2020). Researching Geography: The Indian Context (2nd ed.). Routledge, India.
- Lovell, S. A., Coen, S. E., & Rosenberg, M. W. (Eds.). (2023). The Routledge Handbook of Methodologies in Human Geography. Routledge, Taylor & Francis Group, United Kingdom.
- Patton, M. Q. (2002). Qualitative Research and Evaluation Methods (4th ed.). SAGE Publications, London.
- Telore, N. V., & Borude, S. A. (Eds.). (2023). Advances in Geographical Research. Jyotikiran Publication, Pune.

Digital materials: Not Applicable

RESEARCH METHODS COURSE:
GEOG-S302: ADVANCED RESEARCH METHODOLOGY

Course title & Code	Credits	Duration (per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical/ Practice		
GEOG-S302: ADVANCED RESEARCH METHODOLOGY	2	1	0	1	BA/ BSc in Geography	Basic Knowledge of Research Methods and Techniques

Learning Objectives:

The learning objectives of this course are as follows:

- To develop a comprehensive in-depth understanding of the conceptual foundations, literature survey, methodological approaches, and ethical intricacies essential for geographical research.
- To equip students with the ability to design and construct a robust geographical research framework through problem identification and purposeful formulation of questions, aims, and objectives.
- To foster academic writing proficiency by mastering structured dissertation and report writing with proper citation and referencing.

Learning Outcomes:

Having completed this course, students will learn:

- To critically conceptualize research problems and construct methodologically aligned aim based objectives research design with intellectual clarity.
- To demonstrate ethical accountability in research practice by identifying and preventing plagiarism, manipulation, and academic misconduct.
- To efficiently gather, analyse, and visually presents data using field survey, database, and graphical interpretation for the dissertation and report writing.

Course Outline:

Unit 1 - Theory **(15 hours)**

Research Design:

Steps, Identification and Conceptualization of Research Problem; Framing Research questions; Aims and Objectives, Methods of data collection.

Readings:

- Bryman, A. (2016). Social Research Methods (5th ed.). Oxford University Press, United Kingdom.
- Creswell, J. W. (2009). Research Design: Qualitative, Quantitative and Mixed Methods Approaches (3rd ed.). SAGE publications, USA.
- Lovell, S. A., Coen, S. E., & Rosenberg, M. W. (Eds.). (2023). The Routledge Handbook of Methodologies in Human Geography. Routledge, Taylor & Francis Group, United Kingdom.

Unit 2 - Practical **(30 hours)**

Geographical Structure of Dissertation and Report Writing:

Preliminary section, Main body of Text, Conclusion, Referencing and Bibliography, Appendix; Databases: Indexing and Citation, Preparation of report writing on any case studies.

Readings:

- Godwill, E. A. (2015). Fundamentals of Research Methodology: A holistic guide for research completion, management, Validation and ethics. Nova Science Publishers, New York.
- Oliver, P. (2008). Writing Your Thesis (2nd ed.). SAGE Publications Ltd, London.
- Parsons, T., & Knight, P. G. (2015). How to do your dissertation in geography and related disciplines (3rd ed.). Routledge, Taylor & Francis Group, United Kingdom.

Practical Record: NA

Suggested Readings:

- Clifford, N., Cope, M., Gillespie, T., & French, S. (Eds.). (2023). Key Methods in Geography (4th ed.). SAGE Publications Ltd., London.
- Flick, U. (2020). Introducing Research Methodology: A beginner's guide to doing a research project (3rd ed.). SAGE Publications, New Delhi.
- Gomez, B., & Jones III, J. P. (Eds.). (2010). Research Methods in Geography: A Critical Introduction. John Wiley & Sons Ltd. Publication, Wiley-Blackwell.
- Koli, L. N. (2025). रिसर्च मैथडोलॉजी (Research Methodology) (2nd ed.). Y. K. Publishers, New

Delhi. (Hindi)

- Kothari, C. R. (2004). Research Methodology: Methods and Techniques. New Age International (P) Ltd., Publishers, New Delhi.
- Krishna, G., & Singh, N. (2020). Researching Geography: The Indian Context (2nd ed.). Routledge, India.
- Patton, M. Q. (2002). Qualitative Research and Evaluation Methods (4th ed.). SAGE Publications, London.
- Telore, N. V., & Borude, S. A. (Eds.). (2023). Advances in Geographical Research. Jyotikiran Publication, Pune.

Digital materials: Not Applicable

RESEARCH METHODS COURSE:
GEOG-S303: TOOLS FOR RESEARCH

Course title & Code	Credits	Duration (per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical/ Practice		
GEOG-S303: TOOLS FOR RESEARCH	2	1	0	1	BA/ BSc in Geography	Basic Knowledge of Research Methods and Techniques

Learning Objectives:

The learning objectives of this course are as follows:

- To introduce students to essential tools, techniques, databases, and digital resources used in geographical research.
- To equip students with practical skills in data collection, data processing, referencing, citation management, statistical interpretation, and spatial visualization.
- To develop the ability to apply appropriate research tools for preparing academic reports, dissertations, maps, charts, tables, and research-based presentations.

Learning Outcomes:

Having completed this course, students will learn:

- To identify and use suitable research tools for literature search, data collection, data organization, analysis, referencing, and geographical interpretation.
- To handle primary and secondary data using appropriate digital, statistical, graphical, and spatial tools for geographical research.
- To prepare research outputs such as tables, graphs, maps, references, bibliographies, and short analytical reports with academic accuracy and ethical responsibility.

Course Outline:

Unit 1 - Theory **(15 hours)**

Research Tools, Databases and Techniques:

Concept and importance of tools in geographical research; Tools for literature review and academic search; Use of journals, books, theses, reports, e-resources and online repositories; Tools for referencing and bibliography management; Maps, satellite images and open data portals; Basic tools for data collection, questionnaire preparation, tabulation, graphical representation, statistical analysis, GIS and remote sensing; Ethical use of digital tools, data and sources.

Readings:

- Clifford, N., Cope, M., Gillespie, T., & French, S. (Eds.). (2023). Key Methods in Geography (4th ed.). SAGE Publications Ltd., London.
- Gomez, B., & Jones III, J. P. (Eds.). (2010). Research Methods in Geography: A Critical Introduction. John Wiley & Sons Ltd. Publication, Wiley-Blackwell.
- Longley, P. A., Goodchild, M. F., Maguire, D. J., & Rhind, D. W. (2015). Geographic Information Science and Systems (4th ed.). Wiley, United Kingdom..

Unit 2 - Practical **(30 hours)**

Application of Tools for Geographical Research:

Practical Exercises:

- Search and compile academic literature on any selected geographical research theme.
- Prepare an annotated bibliography using books, journal articles and online academic sources.
- Collect secondary data from Census, government reports or statistical databases.
- Prepare a questionnaire or interview schedule for a selected field-based research problem.
- Prepare tables, graphs and diagrams from collected data.
- Calculate simple statistical measures such as percentage, mean, growth rate and correlation.
- Prepare a thematic map using GIS or any suitable mapping tool.
- Generate citations and bibliography in different referencing styles.

Readings:

- Bryman, A. (2016). Social Research Methods (5th ed.). Oxford University Press, United Kingdom.
- Flick, U. (2020). Introducing Research Methodology: A beginner's guide to doing a research project (3rd ed.). SAGE Publications, New Delhi.
- Parsons, T., & Knight, P. G. (2015). How to do your dissertation in geography and related disciplines (3rd ed.). Routledge, Taylor & Francis Group, United Kingdom.

Practical Record: NA

Suggested Readings:

- Koli, L. N. (2025). रिसर्च मैथडोलॉजी (Research Methodology) (2nd ed.). Y. K. Publishers, New Delhi. (Hindi)
- Kothari, C. R. (2004). Research Methodology: Methods and Techniques. New Age International (P) Ltd., Publishers, New Delhi.
- Krishna, G., & Singh, N. (2020). Researching Geography: The Indian Context (2nd ed.). Routledge, India.
- Patton, M. Q. (2002). Qualitative Research and Evaluation Methods (4th ed.). SAGE Publications, London.

Digital materials: Not Applicable

DISCIPLINE SPECIFIC CORE (DSC) COURSE – GEOG-C401: NEW ECONOMIC GEOGRAPHIES

Course title & Code	Credits	Duration (Hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-C401: NEW ECONOMIC GEOGRAPHIES	4	3	1	0	BA/BSc in Geography	

Learning Objectives:

The learning objectives of this course are as follows:

- The students will appreciate the significance of social, cultural and political factors as central to the functioning of economies; and that the economic processes needs to be analyzed in social, cultural and political contexts.
- The students will be exposed to contemporary themes in economic geography, which emerged in post 1970s; and be conscious of the numerous economic issues confronting the world economic system.
- The students will realize the relevance of economic geography for analyzing contemporary societies and economies.

Learning Outcomes:

Having completed this course, students will learn:

- The students will be able to appreciate that geography and space matter in economy.
- The students will be able to identify some key issues that economic geography engages with.
- The students will be able to comprehend and analyze the principal questions confronting the contemporary space-economy:
  a) What are 'economic' reasons for variations in spatial distribution of population and resources?
  b) How to solve the 'mystery' of economic growth?
  c) Has the role of 'distance' and 'proximity' declined?
  d) Has the World become 'flat'?

Course Outline:

THEORY **(45 hours)**

Unit 1: **(10 hours)**

Introduction: The Re-Discovery and Core Issues; Economic-Geographic Links; Stages of Economic

Growth; Evolution of Economic Systems; Three-Sector Hypothesis and Post-Industrial Society; Informal Economy and Social Accounting.

Readings

- Dicken P. 1990. *Global Shift: Mapping the Changing Contours of the World Economy*, Harper Collins Publishers, New York.
- Grossman G. 1984. *Economic Systems,* Prentice Hall, New Jersey.
- Prager Jean-Claus and Thisse Jacques-Francois, 2012. *Economic Geography and the Unequal Development of Regions*, Routledge, London.

Unit 2: **(10 hours)**

Information and Knowledge Economies in Spatial Systems: Information Revolution and Age, Economies of Human Attention; Knowledge Economies and Imagination Age; Creative Industries and Cultural Economies.

Readings

- Anderson William P. 2012. *Economic Geography*, Routledge, London.
- Coe N. M., Kelly P. F. and Yeung H. W. C. 2007. *Economic Geography: A Contemporary Introduction*, Blackwell, Oxford.
- Hanink D. M. 1997. *Principles and Applications of Economic Geography*, John Wiley, New York.

Unit 3: **(10 hours)**

Economies of Urban Systems: FIRE and ICE Economies, and Global Cities; Place-Making, Place-based and Place-led Development; Place Marketing and City Branding; City Image and Re-Imaging.

Readings

- Sassen Saskia, 2012. *Cities in a World Economy,* Sage.
- Fujita Masahisa, Krugman Paul and Venables Anthony, 2001. *The Spatial Economy: Cities, Regions and International Trade*, The MIT Press.
- MacKinnon D. and Cumbers A. 2007. *An Introduction to Economic Geography: Globalization, Uneven Development and Place*, Pearson/Prentice Hall, Harlow.

Unit 4: **(15 hours)**

Space-Economy of International Systems: Economic Groupings; Economic Gravitations; Economic Cooperation and Integration.

Readings

- Murray Warwick E. 2006. *Geographies of Globalization*. Routledge.
- Machlup Fritz, 1977. *A History of Thought on Economic Integration*, Columbia University Press, New York.
- Jovanovich M. 1998. *International Economic Integration: Limits and Prospects*, Routledge.

Tutorial Exercises **(15 hours)**

- Case-Study of events and items displaying links between geography and economy
- Case-Study of social accounting of informal workers
- Case-Study of information overload
- Case-Study of city-reimaging and place marketing

- Understanding the center of economic gravity of selected spatial units

Practical Record: Not Applicable

Suggested Readings:

- Anderson William P. 2012. *Economic Geography*, Routledge, London.
- Coe N. M., Kelly P. F. and Yeung H. W. C. 2007. *Economic Geography: A Contemporary Introduction*, Blackwell, Oxford.
- Dicken P. 1990. *Global Shift: Mapping the Changing Contours of the World Economy*, Harper Collins Publishers, New York.
- Fujita Masahisa, Krugman Paul and Venables Anthony, 2001. *The Spatial Economy: Cities, Regions and International Trade*, The MIT Press.
- Grossman G. 1984. *Economic Systems,* Prentice Hall, New Jersey.
- Hanink D. M. 1997. *Principles and Applications of Economic Geography*, John Wiley, New York.
- Jovanovich M. 1998. *International Economic Integration: Limits and Prospects*, Routledge.
- Knox Paul, Agnew John, McCarthy Linda, 2008. *The Geography of the World Economy*, OUP, USA.
- Lee R. and Wills J. (eds.), 1997. *Geography of Economics,* Arnold, New York.
- Machlup Fritz, 1977. *A History of Thought on Economic Integration*, Columbia University Press, New York.
- MacKinnon D. and Cumbers A. 2007. *An Introduction to Economic Geography: Globalization, Uneven Development and Place*, Pearson/Prentice Hall, Harlow.
- Murray Warwick E. 2006. *Geographies of Globalization*. Routledge.
- Sachar A. and Oberg S. (eds.) 1990. *The World Economy and the Spatial Organisation of Power,* E.S.F. Publication, Strasbourg.
- Sassen Saskia, 2012. *Cities in a World Economy,* Sage.
- Sheppard E. and Barnes T. J. 1984. *The Capitalist Space Economy: Geographical Analysis after Ricardo Marx and Strafa,* Unwin Hyman, London.

Digital materials: Not Applicable

DISCIPLINE SPECIFIC CORE (DSC) COURSE – GEOG-C402: TOWARDS VIKSIT BHARAT: GEOGRAPHICAL DIMENSIONS

Course title & Code	Credits	Duration (Hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-C402: TOWARDS VIKSIT BHARAT: GEOGRAPHICAL DIMENSIONS	4	3	1	0	BA/BSc in Geography	

Learning Objectives:

The learning objectives of this course are as follows:

- To develop comprehensive understanding of Viksit Bharat @2047's vision and frameworks while critically evaluating geographical influences on India's developmental trajectory.
- To analyze multidisciplinary linkages across environment, demography, infrastructure, and technology to assess how sectoral synergies drive inclusive growth.
- To integrate institutional frameworks, innovation ecosystems, and indigenous epistemologies to propose culturally grounded, evidence-based developmental strategies.

Learning Outcomes:

Having completed this course, students will learn:

- To examine geographical factors like resources, demography, and infrastructure while articulating perspectives on regional disparities.
- To explain interconnections between sustainability, human development, technology, and governance, demonstrating holistic understanding of national progress.
- To evaluate governance, innovation, and indigenous wisdom in advancing sustainability while proposing implementable, context-specific solutions.

Course Outline:

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Introduction:

Introduction to Viksit Bharat @2047 and Geographical Foundation: Concept, Goals, Pillars and Strategic Framework; Geographical Diversity and Heritage; Geographical Implications in National Development: Vitality and Vulnerability.

Readings:

- Aiyar, S., & Mody, A. (2011). The Demographic Dividend: Evidence from the Indian States. International Monetary Fund, Washington, D.C.
- Gupta, D. K., & Singh, S. (Eds.). (2025). Viksit Bharat 2047: New Hopes & Opportunities. Right Way Publication & Distribution, New Delhi.
- Rao, C. B. (2024). Viksit Bharat 2047: Infrastructure. Innovation. Inclusion. Notion Press Media Pvt. Limited, Chennai, India.

Unit 2: **(11 hours)**

Resources and Environmental Sustainability:

Natural Resources & Environment: Inventory, Degradation and Sustainability; Renewable Energy and Green Energy Development; Agricultural Development; Climate Action, Indigenous Knowledge Systems (IKS).

Readings:

- Brokensha, D., Warren, D. M., Slikkerveer, L. J., & Dechering, W. (Eds.). (1995). The cultural dimension of development: Indigenous knowledge systems. Intermediate Technology Publications, United Kingdom.
- Harris, J. M., & Roach, B. (2022). Environmental and Natural Resource Economics: A Contemporary Approach (5th ed.). Routledge, New York.
- Malakar, K. D., Kumar, M., Anand, S., & Kuzur, G. (Eds.). (2024). Climate Change and Socio-Ecological Transformation: Vulnerability and Sustainability. Springer Nature, Singapore.

Unit 3: **(11 hours)**

Changing Demography, Social & Economic Progress:

Demographic changes and challenges; Economic Dynamism: Sectoral Development; Human Development: Education, Healthcare and Skill Development; Social Inclusiveness: Quality of Life and Human Well-being; Indian Diaspora.

Readings:

- Bhaskar, P. B. (2025). Indian Diaspora: Immigrants' Experiences in Literature. Cambridge Scholars Publishing, United Kingdom.
- Chadda, I. (2023). Social Sector Development and Inclusive Growth in India. Emerald Publishing Limited, United Kingdom.
- Weber, L. (2010). Demographic Change and Economic Growth: Simulations on Growth Models. Springer Nature, Singapore.

Unit 4: **(11 hours)**

Infrastructure, Innovation, Technology Transformation and Future Prospects:

Rural-Urban Infrastructure and Transformation; Industrial Corridors and Industry 4.0; Research & Development and Innovation, Global Influence, Skilled Bharat, Atmanirbhar Bharat; Sustainable Future India.

Readings:

- Nagarjuna, B., Raghuramapatruni, R., & Shyam, V. M. S. (2024). Viksit Bharat 2047: Empowering India. Archers & Elevators Publishing House.
- Nayyar, A., & Kumar, A. (Eds.). (2020). A Roadmap to Industry 4.0: Smart Production, Sharp Business and Sustainable Development. Springer Nature, Switzerland.
- NITI Aayog (2023). Viksit Bharat @2047: Strategy for New India. Government of India.

Tutorial Exercises **(15 hours)**

- Prepare a geographical map of a region and analyze its spatial patterns and development indicators.
- Examine some case studies and compare their outcomes to identify key success factors and challenges.
- Collect demographic data and visualize trends using charts, graphs, or maps, then interpret the implications.
- Investigate local indigenous knowledge systems and discuss their relevance for sustainable regional development.
- Case based study on rural and urban infrastructure transformation and discuss its impact on regional growth and connectivity.
- Research digital India initiatives, Start-Up India programs, and the skilled workforce agenda, reflecting their role in national development.
- Assume roles in a governance simulation and propose policies or solutions for a development challenge.

- Document smart infrastructure and develop a policy or governance plan promoting inclusive, sustainable development.

Suggested Readings:

- Chatterjee, U., Biswas, A., Mukherjee, J., & Majumdar, S. (Eds.). (2022). Advances in Urbanism, Smart Cities, and Sustainability. CRC Press, Taylor and Francis Group.
- Department of Science and Technology. (2025). *Vision document: Emerging Science, Technology, and Innovation Conclave (ESTIC) 2025: Imagine. Innovate. Inspire. for Viksit Bharat 2047*. Government of India.
- Gupta, D. K., & Singh, S. (Eds.). (2025). Viksit Bharat 2047: New Hopes & Opportunities. Right Way Publication & Distribution, New Delhi.
- Hooda, S. K. (2022). Health sector, state and decentralised institutions in India. Taylor & Francis Group.
- Kapur, A. (2010). Vulnerable India: A geographical study of disasters. SAGE Publications, India.
- NITI Aayog. (2026). *Scenarios towards Viksit Bharat and Net Zero: An overview* (Vol. 1). Government of India.

Digital materials: Not Applicable

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE:
GEOG-E401: APPLIED CLIMATOLOGY (PRACTICAL)

Course title & Code	Credits	Duration (per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical/ Practice		
GEOG-E401: APPLIED CLIMATOLOGY (PRACTICAL)	4	2	0	2	BA/ BSc in Geography	Basic Knowledge of Geography

Learning Objectives:

The learning objectives of this course are as follows:

- To explain the fundamental concepts of climatology, including climate components, their interactions, and their impacts on society, health, and the environment.
- To analyze and interpret various types of climate data using appropriate statistical and computational techniques.
- To evaluate the principles, processes, and limitations of numerical weather prediction.
- To apply advanced techniques for practical weather prediction and forecasting.

Learning Outcomes:

Having completed this course, students will learn:

- Demonstrate proficiency in handling and analyzing climate data for understanding spatial and temporal climatic patterns.
- Assess and interpret the accuracy and limitations of different weather prediction models and techniques.
- Develop informed weather forecasts and climate interpretations using both theoretical knowledge and practical computational tools.

Course Outline:

THEORY **(30 hours)**

Unit 1 **(7.5 hours)**

Introduction (Theory): Introduction to Climatology, climate components and its impact, climate and society, weather and health.

Readings

- Smith, S., 2022. Climatology: Concepts and applications. Scirus Academic Press.
- Thompson, R. D. & Perry, A. H., 1997. Applied climatology: principles and practice. London: Routledge.

Unit 2: **(7.5 hours)**

Climate data and its use (Theory): Methods and techniques of data analysis, downscaling methods, bioclimatology.

Readings

- Kotamarthi, R. et al., 2021. Downscaling Techniques for High-Resolution Climate Projections: From Global Change to Local Impacts. Cambridge: Cambridge University Press.
- Auliciems, A., (eds) 1998. Human Bioclimatology. Advances in Bioclimatology. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-031-40567-9

Unit 3: (Practical) **(30 hours)**

Weather Predictability (Practical): Numerical weather prediction, processes, and limitations.

Readings

- Ki Park S., (eds.) 2023. Numerical Weather Prediction: East Asian Perspectives. Springer International Publishing.
- Palmer, T. and Hagedorn, R., (eds.) 2006. Predictability of Weather and Climate. Cambridge: Cambridge University Press.

Unit 4: (Practical) **(30 hours)**

Techniques in Weather Prediction (Practical): Empirical Orthogonal Function, Exceedance probability and relative operating characteristics (ROC), regression methods, use of general circulation models for weather prediction.

Readings

- Wilks, D. S., 2019. Statistical Methods in the Atmospheric Sciences, Fourth Edition (pp. 1–818). Elsevier. https://doi.org/10.1016/C2017-0-03921-6
- Neelin, J.D., 2010. Climate Change and Climate Modeling. Cambridge: Cambridge University Press.

Tutorial Exercises: Not Applicable

Practical Record:

Four practical exercises to be completed from each unit, and this will involve training students to develop hands-on skills relevant to climatology and weather prediction. In Unit 1, they will analyze climate components, study temperature, precipitation, and humidity variations, and evaluate their impacts on health and sustainability. Unit 2 involves collecting and analyzing climate data using downscaling and bioclimatic methods, generating localized projections, and assessing ecosystem and societal effects. In Unit 3, students will explore numerical weather prediction models, interpret outputs, and evaluate forecasts. Unit 4 focuses on applying statistical and dynamical techniques, including EOF, regression, and GCMs, to identify climate patterns and predict atmospheric behavior.

Suggested Readings:

- Mearns, Linda O. Forest, Chris E. Fowler, Hayley J. Lempert, Robert Wilby, Robert L. (eds.), 2025. Uncertainty in Climate Change Research, Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-85542-9
- Melesse, A. M., Abtew, W., & Senay, G., 2019. Extreme hydrology and climate variability: Monitoring, modelling, adaptation and mitigation (pp. 1–561). Elsevier. https://doi.org/10.1016/C2017-0-04193-9
- Swadhin Behera and Toshio Yamagata 2016. Indo-Pacific Climate Variability and Predictability, World Scientific, Singapore.
- Maraun, D., & Widmann, M., 2018. Statistical Downscaling and Bias Correction for Climate Research. Cambridge University Press. https://doi.org/10.1017/9781107588783
- John E Hobbs, 2016. Applied climatology: A study of Atmospheric Resources, Elsevier, London.
- Antonio Navarra , Valeria Simoncini , 2010. A Guide to Empirical Orthogonal Functions for Climate Data Analysis, Springer, Dordrecht, The Netherlands.
- Antonio Navarra, Eugenia Kalney, 2003, Atmospheric Modeling, Data Assimilation and Predictability, Cambridge University Press, London.
- Sahu, N., Robertson, A. W., Boer, R., Behera, S., DeWitt, D. G., Takara, K., … Singh, R. B., 2017. Probabilistic seasonal streamflow forecasts of the Citarum River, Indonesia, based on general circulation models. Stochastic Environmental Research and Risk Assessment, 31(7), 1747–1758. https://doi.org/10.1007/s00477-016-1297-4
- Lorenz, E. N., 1956. Empirical Orthogonal Functions and Statistical Weather Prediction. Statistical Forecasting Project Rep. 1, MIT Department of Meteorology, 49.

Digital materials: Not Applicable

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE: GEOG-E402: DIGITAL CULTURES AND LANDSCAPES

Course Title & Code	Credits	Duration (hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-E402: DIGITAL CULTURES AND LANDSCAPES	4	3	1	0	BA/BSc in Geography	

Learning Objectives:

- Understand key theoretical frameworks for analyzing digital cultures and landscapes.
- Critically engage with digital technologies and their societal implications.
- Explore the relationship between space, place, and digital infrastructures.

Learning Outcomes:

Having completed this course, students will learn:

- Apply key theoretical frameworks to critically analyze digital technologies and their implications.
- Examine the relationship between digital technologies and spatiality and the formation of digital communities.
- To understand the role of digital technologies in mediating contemporary crises, such as pandemics, climate change, and political unrest, and their capacity to shape collective futures

Course Outline:

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Introduction to Digital Cultures: Historical and conceptual perspectives of digital culture; Digitization of culture vs. culture of the digital;

Readings

- Couldry, N., & Hepp, A. (2018). *The mediated construction of reality*. John Wiley & Sons.

(Chapter 1)

- Jenkins, H. (2006). Convergence culture: Where old and new media collide. *New York University Press.* (Introduction)
- Miller, V. (2020). Understanding digital culture. (Introduction)

Unit 2: **(11 hours)**

Digital Spaces and Spatiality: Cyberspace and the virtual/real dichotomy; Geographies of digital media, Locative media and co-creative digital spatiality

Readings

- Zook, M. A., & Graham, M. (2007). Mapping DigiPlace: Geocoded Internet Data and the Representation of Place. *Environment and Planning B: Planning and Design*, *34*(3), 466–482.
- Leszczynski, A., & Crampton, J. (2016). Introduction: Spatial Big Data and everyday life. *Big Data & Society*, *3*(2), 205395171666136.
- Farman, J. (2020). *Mobile interface theory: Embodied space and locative media*. Routledge. (C)hapter 2, 6)

Unit 3: **(11 hours)**

Cybercultures and Virtual Communities: Online identity, performance, and self-presentation; Digital tribes, online forums, and fandoms; Memes, virality, and internet subcultures;

Readings

- Papacharissi, Z. (2016). Affective publics and structures of storytelling: Sentiment, events and mediality. *Information, communication & society*, *19*(3), 307-324.
- Baym, N. K. (2015). *Personal connections in the digital age*. John Wiley & Sons. (chapter **4, 5, 6**)

Unit 4: **(11 hours)**

Crisis, Technology, and Digital Futures: Misinformation and digital crises; Resilience, sustainability, and critical digital literacy; Speculative futures: AI, metaverse, digital afterlives.

Readings

- Crawford, K. (2021). *The atlas of AI: Power, politics, and the planetary costs of artificial intelligence*. Yale University Press. (Introduction)
- Kitchin, R. (2021). *Data lives: How data are made and shape our world*. Bristol University Press.(chapters 1, 27)

Tutorial Exercises **(15 hours)**

- Compare arguments from *Miller (2011)* and *Ash et al. (2018)* about what constitutes "digital culture." Each group defends one author's stance in a short debate.

- Each student chooses one location on Google Maps and examines how digital representation (photos, reviews, tags) reshapes its spatial meaning.
- Students bring one meme that represents a social or political issue and analyze it through semiotic frameworks (signifier, context, affect).
- Small groups imagine speculative digital futures—AI governance, metaverse citizenship, digital afterlives—and present
- Simulate a panel discussion on "AI, Ethics, and the Global South." Students represent various stakeholders (governments, corporations, activists, academics).

Practical Record: Not Applicable

Suggested Readings:

- Ash, J., Kitchin, R., & Leszczynski, A. (2018). *Digital Geographies*. SAGE.
- Jose Van Dijck. (2013). *The culture of connectivity: a critical history of social media*. Oxford University Press.
- Kitchin, R. (2021). *Data Lives*. Policy Press.
- Adams, P. C (2009) Geographies of Media and Communication: A Critical Introduction. London: Wiley-Blackwell.
- Adams, PC, Craine, J, Dittmer, J (eds) (2014) The Ashgate Research Companion to Media Geography. Aldershot: Ashgate Press.
- Sheller, M., & Urry, J. (2006). *Mobile Technologies of the City*. Routledge.
- Farman, J. (2020). *Mobile Interface Theory*. Routledge.
- Castells, M. (2010). *The Rise of the Network Society: The Information Age: Economy, Society, and Culture Volume I*. Wiley
- Linus Dahlander, Lars Frederiksen, & Rullani, F. (2011). *Online communities and open innovation : governance and symbolic value creation*. London Routledge.

Digital materials: Not Applicable

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE: GEOG-E403: ENERGY GEOGRAPHIES

Course Title & Code	Credits	Duration (hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-E403: ENERGY GEOGRAPHIES	4	3	1	0	BA/BSc in Geography	NIL

Learning Objectives:

The learning objectives of this course are as follows:

- To understand the geographical perspectives on Energy
- To understand the centrality of energy to human civilization
- To engage with key debates on major energy systems

Learning Outcomes:

Having completed this course, students will learn:

- Geographical study of Energy using key concepts in the discipline
- Knowledge of current debates in field of energy geographies

Course Outline:

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Introduction: Geographical perspectives on energy

Readings for Unit 1

- Calvert, K. 2016. From 'energy geography' to 'energy geographies': Perspectives on a fertile academic borderland. Progress in Human Geography, 40(1), 105-125.
- Huber, M. 2015. Theorizing energy geographies. Geography Compass, 9(6), 327-338.

Unit 2: **(08 hours)**

Historical development of energy; the global trends and patterns in energy

Readings for Unit 2

- Gordon, R. T. 1982. Inventions that changed the World, READER'S DIGEST (selected entries).
- British Petroleum (latest year) Statistical Review of World Energy Report

Unit 3: **(14 hours)**

Energy resources of the World: Coal, Oil, Natural Gas, Nuclear, and Renewable energy

Readings for Unit 3

- Freese, B. 2016. Coal: A Human History, Basic Books
- Watts, M. 2009. Crude politics: Life and death on the Nigerian oil fields. Niger delta economies of violence working papers, 25.
- Victor, D. G., Jaffe, A. M., & Hayes, M. H. (Eds.), 2006. Natural gas and geopolitics: From 1970 to 2040. Cambridge University Press.
- Alexis-Martin, B. and Davies, T., 2017. Towards nuclear geography: Zones, bodies, and communities. Geography Compass, 11(9), p.e12325.

Unit 4: **(11 hours)**

Contemporary Issues: Energy security, Geo-Politics of energy, Energy, environment and sustainable development

Readings for Unit 4

- Cherp, A. and Jewell, J. 2011. The three perspectives on energy security: intellectual history, disciplinary roots and the potential for integration. Current Opinion in Environmental Sustainability, 3(4), 202-212.
- Verrastro, F. A., Ladislaw, S. O., Frank, M., and Hyland, L. 2010. The geopolitics of energy: emerging trends, changing landscapes, uncertain times. A Report of the CSIS Energy and National Security Program October.

Tutorial Exercises **(15 hours)**

- Reading based discussions on
    - BP Statistical review of world energy
    - Theorizing energy geographies
    - Coal's Resurgence & the Global Low-Carbon Societies
    - Oil Assemblage
    - Global production networks and the extractive sector of Oil
    - Petro-State Thesis
    - Geo-politics of energy
    - Climate Change & Energy

Practical Record: Not Applicable

Suggested Readings:

- Karl, T.L., 1997. The paradox of plenty: Oil booms and petro-states (Vol. 26). Univ of California Press.
- Kennedy, E., 2014. From Petro-States to 'new realities': Perspectives on the Geographies of oil. Geography Compass, 8(4), pp.262-276.
- Scholten, D., 2023. Introduction: The geopolitics of the energy transition. In Handbook on the geopolitics of the energy transition (pp. 1-18). Edward Elgar Publishing.
- Yergin, D. 2020. The New Map: Energy, Climate and the Clash of Nations, Penguin Press UK.

Digital materials: Not Applicable

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE: GEOG-E404: GENDER, SPACE AND SOCIETY IN INDIA

Course Title & Code	Credits	Duration (hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-E404: GENDER, SPACE AND SOCIETY IN INDIA	4	3	1	0	BA/BSc in Geography	

Learning Objectives:

The learning objectives of this course are as follows:

- To enable students to understand the relevance of and developments in the subfield of geography of gender in India.
- To equip students with an understanding of regional variations in construction of gender through the frame of genderscapes.
- To provide an understanding of spaces of indigenous feminisms in the Indian context.

Learning Outcomes:

Having completed this course, students will learn:

- Understanding the emergence of the subfield of geography of gender as well its trajectory of growth in India.
- Understanding gendered implications of public and private spaces and spatial variations in construction of gender in India.
- Understanding the concept of a genderscape and appreciating regional genderscapes in India.

Course Outline:

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Geography of Gender: Concepts, Development of and theoretical approaches to the study of gender in geography; contextualizing growth and development of the sub field globally and in India.

Readings for Unit 1

- Peake, Linda. "Women in geography." *International Encyclopedia of Geography: People, the Earth, Environment and Technology. New York: Wiley. https://doi. org/10.1002/9781118786352. wbieg1173* (2017).
- Datta, Anindita, Peter Hopkins, Lynda Johnston, Elizabeth Olson, and Joseli Maria Silva, eds. *Routledge handbook of gender and feminist geographies*. London: Routledge, 2020 Chapter 1
- Garcia Ramon, Maria Dolors, and Janice Monk. "Gender and geography: World views and practices." *Belgeo. Revue belge de géographie* 3 (2007): 247-260.

Unit 2: **(11 hours)**

Spatial Patterns and Bases of Gender inequalities: Kandiyoti's Classic Patriarchy, son preference, social value; new reproductive technology, skewed sex ratios

Readings for Unit 2

- Saraswati, Raju, Peter J. Atkins, Naresh Kumar, and Janet G. Townsend. "Atlas of women and men in India." (1999).
- Mazumdar Vina and N Krishnaji (eds), 2001. Enduring Conundrum: India's Sex Ratio, Centre for Women's Development Studies, Rainbow Publishers, Delhi.
- Datta, Anindita. "Natural landscapes and regional constructs of gender: theorizing linkages in the Indian context." *Gender, Technology and Development* 15, no. 3 (2011): 345-362.

Unit 3: **(11 hours)**

Towards Genderscapes: Spatial variations in the construction of gender in India -Concept of Genderscape, Regional Genderscapes in India, Genderscapes of violence and well-being in India-gendered patterns of crime and violence, gender disparities in selected indicators of social wellbeing

Readings for Unit 3

- Rustagi, Preet. "Significance of gender-related development indicators: An analysis of Indian states." Indian Journal of Gender Studies 11, no. 3 (2004): 291-343.

Unit 4: **(11 hours)**

Indigenous Feminisms and feminist counterspaces: Theorizing indigenous feminisms, indigenous feminisms, power and agency in classic patriarchy; indigenous feminisms and feminist counterspaces.

Readings for Unit 4

- Datta, Anindita. "Reinterpreting resistance and agency: Excavating feminist counterspaces within indigenous feminisms." In Gender, Space and Agency in India, pp. 145-159. Routledge India, 2020.

Tutorial Exercises **(15 hours)**

Practical Record: Not Applicable

Suggested Readings:

- Agarwal Bina, 1994. A Field of One's Own: Gender and Land Rights in South Asia, Cambridge University Press.
- Geetha V. 2007. Patriarchy, Stree publications
- Gregory Derek et al., 2009. Dictionary of Human Geography, 5th Edition, Wiley
- Massey Doreen, 1994. Space, Place and Gender, University of Minnesota Press, Minneapolis.
- McDowell Linda, 1999. Gender, Identity and Place: Understanding Feminist Geographies, Blackwell Publishers, Oxford.
- McDowell, Linda and Sharp, Joanne, eds. 1997. Space/Gender/Knowledge: Feminist Readings. London: Arnold.
- Phadke Shilpa, Ranade Shilpa and Sameera Khan, 2011. Why Loiter: Women and Risk on Mumbai Streets, Penguin
- Spain Daphne, 1992. Gendered Spaces, University of North Carolina Press.
- Walby Sylvia, 1990. Theorizing Patriarchy, Wiley Blackwell publishers.

Digital materials: Not Applicable

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE: GEOG-E405: GEOCHRONOLOGY OF HIMALAYAN GLACIERS

Course Title & Code	Credits	Duration (hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-E405: GEOCHRONOLOGY OF HIMALAYAN GLACIERS	4	3	1	0	BA/BSc in Geography	Basic Knowledge of Geomorphology and Paleo-climates

Learning Objectives:

The learning objectives of this course are as follows:

- The course intends to understand the topographic and climatic drivers of glacier fluctuations in the Himalaya.
- The course aims to expose the students with the progress made in the glacial chronology in the Himalayan regions from Last Glacial maximum to the Little Ice Age.
- This will enable students to target the future areas of work in Glacial chronology of the region.

Learning Outcomes:

Having completed this course, students will learn:

- The students will be able to evaluate the glacial chronology of the Himalaya and can draw their asynchronous and synchronous pattern with Global Last Glacial Maximum.
- The students will be able to target the future areas of research in the domain. a.
- The course will generate capacity building as trained human resource in the domain who can work as per the objective of DST, Government of India regarding Himalayan cryosphere.

Course Outline:

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Introduction: Introduction to Himalayan orogeny, its role in controlling the Global Circulation Model and Monsoon, Altitudinal variation of land cover, temperature and precipitation, distribution and patterns of glacier response across valleys and their topographic and climatic drivers.

Readings for Unit 1

- Benn, D.I., Owen, L. a., 1998. The role of the Indian summer monsoon and the midlatitude

westerlies in Himalayan glaciation: review and speculative discussion, Journal of the Geological Society 155, 353–363. doi:10.1144/gsjgs.155.2.0353
- Ajai et al. (2011). Snow and Glacier of the Himalayas. Space Application Centre, Ahmedabad.
- Hijmans, R.J., Cameron, S.E., Parra, J.L., Jones, G., Jarvis, A., 2005. Very high resolution interpolated climate surfaces for global land areas 1978, 1965–1978.doi:10.1002/joc.1276

Unit 2: **(11 hours)**

Late Quaternary Glacial History of Himalayas: History of glacial studies in Himalaya, Late Quaternary glacial history of Himalaya, its synchronous and asynchronous character. Last Glacial Maximum vs Local Last Glacial Maximum; Style and timing of Glaciation across valleys' of Himalaya.

Readings for Unit 2

- Gillespie, A., Molnar, P., 1995. Asynchronous maximum advances of mountain and continental glaciers. Reviews of Geophysics 33, 311. doi:10.1029/95RG00995
- Murari, M.K., Owen, L.A., Dortch, J.M., Caffee, M.W., Dietsch, C., Fuchs, M., Haneberg, W.C., Sharma, M.C., Townsend-Small, A., 2014. Timing and climatic drivers for glaciation across monsoon-influenced regions of the Himalayan-Tibetan orogen, Quaternary Science Reviews 88, 159–182. doi:10.1016/j.quascirev.2014.01.013
- Owen, L.A., Finkel, R.C., Caffee, M.W., 2002a. A note on the extent of glaciation throughout the Himalaya during the global Last Glacial Maximum. Quaternary Science Reviews 21, 147–157. doi:10.1016/S0277-3791(01)00104-4
- Owen, L.A. (2020). Quaternary Glaciation of the Himalaya and Adjacent Mountains. In: Dimri, A., Bookhagen, B., Stoffel, M., Yasunari, T. (eds) Himalayan Weather and Climate and their Impact on the Environment . Springer, Cham. https://doi.org/10.1007/978-3-030-29684-1_13

Unit 3: **(11 hours)**

Holocene Glacier History of Himalaya: History of Climate change, periods of Rapid Climate Change (RCC), periods of cold events (Ice Age & little Ice age) and periods of warm events . Style and timing of Holocene Glacier fluctuation across Himalayan valleys' and their patterns, Phases of Glacial expansion and retreat, Proxies used and methods applied in reconstruction, limitation of the glacial chronology of the period and future areas of research.

Readings for Unit 3

- Mayewski, P.A., Rohling, E.E., Stager, J.C., Karln, W., Maascha, K.A., Meeker, L.D., Meyerson, E.A., Gasse, F., Kreveld, S. Van, Holmgren, K., Lee-Thorp, J., Rosqvist, G., Rack, F., Staubwasser, M., Schneidr, R.R., Steig, E.J., 2004b. Holocene climate variability. Quaternary Research 62, 243–255. doi:10.1016/j.yqres.2004.07.001
- Solomina, O.N., Bradley, R.S., Hodgson, D.A., Ivy-ochs, S., Jomelli, V., Mackintosh, A.N., Nesje, A., Owen, L.A., Wanner, H., Wiles, G.C., Young, N.E., 2015. Holocene glacier fluctuations. Quaternary Science Reviews 111, 9–34.doi:10.1016/j.quascirev.2014.11.018

Unit 4: **(11 hours)**

Glacial Chronology of last Millenium: Introduction to the Little Ice Age (LIA), causes of Little Ice Age, Glacial chronology of the last Millennium in the Himalaya, methods used for the reconstruction of LIA in Himalaya its spatial pattern and limitation, future areas of research.

Readings for Unit 4

- Rowan, A. V., 2016. The 'Little Ice Age in the Himalaya: A review of glacier advance driven by Northern Hemisphere temperature change. The Holocene0959683616658530. doi:10.1177/0959683616658530.
- Fagan, Brian (2020) The Little Ice Age, how climate made history 1300-1850, Basic Books, New York.
- Xu, X., Yi, C., 2014. Little Ice Age on the Tibetan Plateau and its bordering mountains: Evidence from moraine chronologies. Global and Planetary Change 116, 41–53. doi:10.1016/j.gloplacha.2014.02.003

Tutorial Exercises **(15 hours)**

- What is the role played by the Himalaya in Global Wind Circulation and Monsoon pattern?
- Describe the role of topography on the distribution and dynamics of glaciers.
- Evaluate the style and timing of Last Glacial Maximum in Himalaya and its spatial and temporal pattern.
- Generate a synthesis of glacier fluctuation across Himalayan valleys' across the Holocene.
- Critically examine the glacial chronology of the last millennium in the Himalayan region, on the methods applied and area targeted.

Practical Record: Not Applicable

Suggested Readings:

- Doyle, P; Bennet, M.R.; Baxter, A.N. (2001) The Key to Earth History, an introduction to stratigraphy, Wiley, Singapore.
- Fagan, Brian (2020) The Little Ice Age, how climate made history 1300-1850, Basic Books, New York.
- Hambrey, M. and Alean, A.J. (2004) Glaciers, Cambridge University Press, Cambridge.
- Hubbard, B. and Glasser, Neil (2005) Field Techniques in Glaciology and Glacial Geomorphology, John Wiley & Sons, Singapore.
- Hughes, P.D., Gibbard, P.L., A stratigraphical basis for the Last Glacial Maximum (LGM), Quaternary International (2014), http://dx.doi.org/10.1016/j.quaint.2014.06.006
- Wallace, R.W (2013) Glacial Epoch and Warm Polar Climates, Read Books Ltd.
- Xu, X., Yi, C., 2014. Little Ice Age on the Tibetan Plateau and its bordering mountains: Evidence from moraine chronologies. Global and Planetary Change 116, 41–53.

Digital materials: Not Applicable

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE – GEOG-E406: GEOGRAPHY OF SOCIAL JUSTICE IN INDIA

Course title & Code	Credits	Duration (per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical/ Practice		
GEOG-E406: GEOGRAPHY OF SOCIAL JUSTICE IN INDIA	4	3	1	0	BA/ BSc in Geography	NIL

Learning Objectives:

The learning objectives of this course are as follows:

- To provide a critical understanding of conceptual foundations, key components, and evolving theoretical approaches to social justice from a geographical and interdisciplinary perspective.
- To examine the historical trajectories of marginalization, social stratification, and spatial disparities in India, focusing on caste, class, and minority identities within rural and urban contexts.
- To evaluate the efficacy of policies and grassroots interventions aimed at promoting social equity, inclusive development, and sustainable empowerment to the marginalized communities in India.

Learning Outcomes:

Having completed this course, students will learn:

- To develop a nuanced understanding of social justice as a geographical construct, recognizing its relevance in addressing inequality and promoting equitable spatial development in India.
- To critically examine socio-historical processes and spatial patterns of caste-based discrimination, migration, poverty, and resource access across diverse socio-economic landscapes.
- To acquire analytical tools to assess constitutional provisions, human rights frameworks, development programs, and the role of civil society in achieving empowerment and sustainable justice for unrepresented groups.

Course Outline:

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Introduction to Geography of Social Justice:

Nature, Scope and Relationship of Geography of Social Justice; Conceptual framework, components, principles and approaches of Social Justice; Geographical Perspective of Social Justice; Overview of social justice theories.

Readings:

- Ahmad, A. (2012). Social Geography of India (2nd Revised and Enlarged ed.). Concept Publishing Company Pvt. Ltd., New Delhi.
- Harvey, D. (1993). Social Justice and the City (Reprinted ed.). Basil Blackwell Oxford.
- Omvedt, G. (2014). Dalits and the Democratic Revolution: Dr. Ambedkar and the Dalit Movement in Colonial India. Sage Publication Pvt. Ltd., New Delhi.

Unit 2: **(11 hours)**

Historical Context of Marginalisation and Injustice:

Stratification of Indian society; Caste system; Caste discrimination, Atrocities and violence against SC/ST; Spatial distribution of SC, ST, OBC and Minorities population; Resource distribution.

Readings:

- Balagopal, K. (2020). Probings in the Political Economy of Agrarian Classes and Conflicts (2nd online ed.). Perspectives, Hyderabad.
- Borooah, V. K. et al. (2015). Caste, Discrimination, and Exclusion in Modern India. Sage Publications Pvt. Ltd., New Delhi.
- Channa, S. M., & Mencher, J. P. (Eds.). (2013). Life as a Dalit: Views from the Bottom on Caste in India. Sage Publication Pvt. Ltd., New Delhi.

Unit 3: **(11 hours)**

Social (in) Justice in India:

Urban and Rural dimensions; Dalit Rights; Social exclusion and segregation, Migration; Poverty, Inequality, land rights and security: Case Studies.

Readings:

- Gorski, P. C., & Pothini, S. G. (2024). Case Studies on Diversity and Social Justice Education (3rd ed.). Routledge, New York.
- Karade, J. (Ed.). (2008). Development of scheduled castes and scheduled tribes in India. Cambridge Scholars Publishing, United Kingdom.
- Schejtman, A. (1999). Urban dimensions in rural development. Cepal Review, (67), 15-33.

Unit 4: **(11 hours)**

Social Justice Empowerment and Legal framework:

Role of civil society and media; Contemporary movements; Inclusive Development, Human rights, Constitutional Provisions, Laws, Acts, Programs & Policies.

Readings:

- Atkinson, A. B. (1983). Social Justice and Public Policy (First MIT press ed.). Wheatsheaf Books Ltd., Great Britain.
- Srivastava, D. K. (2019). Legal Protection of Scheduled Castes and Tribes (Constitutional Safeguards and Social Justice). Jain Book Agency, New Delhi.
- Thorat, S. (2006). Ambedkar's Role in Economic Planning, Water and Power Policy (2nd ed.). Shipra Publication, New Delhi.

Tutorial Exercises **(15 hours)**

- Based on case studies evaluate the marginalized communities to map local knowledge on resource access, discrimination, and resistance.
- Use district-level data to identify spatial clusters of educational disadvantage among scheduled castes, tribes, and minorities.
- Compare spatial patterns of inequality in Indian cities through key historical and contemporary events.
- Examine development-induced displacement and its social-geographic impact on indigenous and marginalized communities.
- Analyze the geographic spread of social justice movements using social media and demographic data.
- Create a spatial database combining multiple indicators of inequality for a selected district.
- Analyse the intersections of caste, class, and gender influence access to urban public spaces based on observation.

Suggested Readings:

- Arneson, R. J (1989). Equality and Equal Opportunity for Welfare. Philosophical Studies: An International Journal for Philosophy in the Analytic Tradition, 56 (1), 77-93. Springer Nature, Singapore.
- Gupta, N. (Ed.). (2021). *Social justice and human rights in India* (2nd ed.). Rawat Publications.
- Hopkins, P. (2025). Social justice and geography. In B. Warf (Ed.), *The encyclopedia of human geography*. Springer Nature, Switzerland.
- Kumar, A., & Das, R. (2025). *Reimagining spatial justice in India through the lens of legal geography. Liverpool Law Review*. Springer Nature, United Kingdom.
- Puniyani, R. (2010). Social Justice (An illustrated Introduction). Vani Prakashan, India. (Hindi)
- Wellman, C. (1997). Social justice and human rights. In *An approach to rights*. Law and Philosophy

Library. Vol. 29, pp. 251–272. Springer Nature, Dordrecht (Netherlands).

Digital materials: Not Applicable

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE: GEOG-E407: GEOGRAPHY OF CRYOSPHERE

Course Title & Code	Credits	Duration (hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical/ Practice		
GEOG-E407: GEOGRAPHY OF CRYOSPHERE	4	3	1	0	BA/BSc in Geography	Basic Knowledge of Geography

Learning Objectives

The learning objectives of this course are as follows:

- To make students understand the nature and distribution of the cryosphere in a changing climate.
- To understand the different processes of glacial and periglacial environments.
- To have a good command of glacial hazards and the role of technology and traditional knowledge in risk mitigation
- To be well-versed in how glacier variations respond to water-energy security and SDGs?

Learning Outcomes

Having completed this course, students will learn:

- The course will help in understanding cryosphere geography while focusing on glacial systems, the Periglacial Environment, the Lake environment and its relevance in the changing climate.
- Students will also learn how to identify various glacier-related hazards, risks, and vulnerabilities, and about various risk-mitigating measures.
- This course will give them the opportunity to link the changing cryosphere with water, energy and SDGs in a geographical perspective.

Course Outline

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Introduction: Concept, Nature, Scope, Spatial Distribution of Cryosphere

Readings

- Barry, Roger G and Gan, Thian Yew, 2011. The Global Cryosphere Past, Present and Future. Cambridge University Press.
- Marshall, S.J., 2011. The cryosphere. Princeton University Press.
- Qin, D, Yao, T, Ding, Y, and Ren, J (Eds.), (2021). *Introduction to Cryospheric Science*. Springer Nature.

Unit 2: **(11 hours)**

Glacial System and Climate Change: Glacial System, Periglacial Environment, Role of RS and GIS in Snow, Glacier and Glacial Lake Monitoring.

Readings

- Cuffey, K.M. and Paterson, W.S.B., 2010. The physics of glaciers. Academic Press.
- Sugden, D. E. and John, B. S. 1976. Glaciers and Landscape, New York, New York
- Pellikka, P., and Rees, W.G. 2010. Remote Sensing of Glaciers-Techniques for Topographic, Spatial and Thematic Mapping of Glaciers, CRC Press/Taylor and Francis Group, London, U.K.

Unit 3: **(11 hours)**

Cryospheric Hazards and Risk: Types of Cryospheric hazards, Avalanche, Glacial Lake Outburst Floods (GLOFs) Risk and Vulnerability, Technology (Participatory GIS, RS, Early Warning System) and Traditional Knowledge in Resilience Building, Hazards and Risk Mapping.

Readings

- Richardson, Shaun D. and Reynolds, John M. 2000. An overview of glacial hazards in the Himalayas, Quaternary International, 65/66, 31-47
- ICIMOD, 2013, Glacial Lakes and Glacial Lake Outburst Floods in Nepal, http://www.icimod.org/publications/index.php/search/publication/750
- Bolch, T., Kulkarni, A., Kääb, A., Huggel, C., Paul, F., Cogley, J.G., Frey, H., Kargel, J.S., Fujita, K., Scheel, M. and Bajracharya, S., 2012. The State and Fate of Himalayan Glaciers. Science, 336(6079), pp.310-314.

Unit 4: **(11 hours)**

Applied Glaciology: Climatic and Environmental Record in Cryosphere, Glacier Variations-Response to Water and Energy Security, Cultural dimensions of Cryosphere, Changing Cryosphere and Sustainable Development Goals (SDGs), Follow-up Field Trip

Readings

- IPCC Special Report 'State of the Cryosphere Reports 2024' https://www.un-glaciers.org/en/articles/state-cryosphere-report-2024
- Slaymaker, Olav and Kelly, Richard, 2006. The Cryosphere and Global Environmental Change, Wiley-Blackwell
- Glacier: Nature and Culture, 2019, Peter G. Knight. London: Reaktion Books, ISBN: 978-1-78914-134-4.

Tutorial Exercises **(15 hours)**

- Discussion about the Electromagnetic spectrum (focusing on snow & glacier properties)
- Discussion on the keys of satellite image interpretation
- Visual interpretation of change in snow cover area
- Identification of glacial and periglacial landforms
- Discussion on the limitations of Earth observation (EO) in the cryosphere environment studies

Practical Record: *Not Applicable*

Suggested Readings:

- C.J. van der Veen. 2013. Fundamentals of Glacier Dynamics, Second Edition, CRC Press
- Embleton, C., and King, C. A. M. 1975. Glacial Geomorphology, New York, New York, Wiley
- Raina, V.K. and Srivastava, S.H. Om. हिमानी (हिम-नहियाँ). The Geological Society of India.
- Singh Savindra. 2022. हिम भूगोल. Pravalika Publication

Digital Materials: *Not Applicable*

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE: GEOG-E408: GEOGRAPHY OF HEALTH

Course title & Code	Credits	Duration (per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical/ Practice		
GEOG-E408: GEOGRAPHY OF HEALTH	**4**	**3**	**1**	**0**	**BA/ BSc in Geography**	**Basic Knowledge of Geography**

Learning Objectives:

The learning objectives of this course are as follows:

- To explain the spatial foundations of health and disease, including major sources of health data and the geographical dynamics of emerging and re-emerging diseases.
- To identify and analyze environmental pollution and spatial health risks, focusing on determinants, exposure patterns, and hotspot identification.
- To examine spatial inequalities in health across global, regional, and neighbourhood scales, combined with vulnerability mapping and community-level assessment.
- To evaluate emerging health challenges and policy initiatives at national, regional, and international levels, emphasizing geographically informed health interventions.

Learning Outcomes:

Having completed this course, students will learn:

- Apply spatial concepts and data sources to interpret population health patterns, monitor emerging health risks, and understand spatial variations in health outcomes.
- Assess environmental pollution and its health impacts through spatial analysis, including mapping pollution sources, risk zones, and changing risk environments.
- Carry out vulnerability mapping, and generate community-level vulnerability profiles.
- Critically analyze health policies and initiatives and propose spatially informed strategies for addressing global, national, and regional health challenges.

Course Outline:

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Introduction: Conceptual Foundations of Health & Disease, Mortality and morbidity, International Classification of Diseases (ICD), Sources of Health Data, Health Indicators and Measurements, Spatial Epidemiology.

Readings

- Anthony C. Gatrell, & Susan J. Elliott. (2015). Geographies of health: An introduction (3rd ed.). Wiley-Blackwell.
- Emch, M., Root, E. D., & Carrel, M. (2017). Health and medical geography (4th ed.). Guilford Press.
- Helen Hazen, H., & Peter Anthamatten, P. (2020). *An introduction to the geography of health* (2nd ed.). Routledge. https://doi.org/10.4324/9780429024115

Unit 2: **(11 hours)**

Changing Environment and Health Landscape: Disease ecology and geographical transmission; Social and Environmental Determinants of Health; emerging ecologies of diseases across world regions, including Tuberculosis, Malaria, HIV/AIDS, and Ebola; epidemic and pandemic diseases; Epidemiological transition; Nutritional transition, Global environmental change and health.

Readings

- Eyles, J., & Baxter, J. (2017). Environments, risks and health: Social perspectives. Routledge. https://doi.org/10.4324/9781315580081
- Galea, S. (Ed.). (2007). Macrosocial determinants of population health. Springer. https://doi.org/10.1007/978-0-387-70812-6
- Michael Marmot, M., & Richard G. Wilkinson, R. G. (Eds.). (2006). Social determinants of health (2nd ed.). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780198565895.001.0001

Unit 3: **(11 hours)**

Spatial Inequalities and Health Risks: Geographical perspectives on health and inequality, Health inequalities across global, regional, and neighbourhood scales, Vulnerability Mapping, Community-Level Vulnerability Assessment

Readings

- Curtis, S. E. (2004). Health and inequality: Geographical perspectives. SAGE

Publications.

- Ozdenerol, E. (2016). Spatial health inequalities: Adapting GIS tools and data analysis. CRC Press. https://doi.org/10.1201/9781315371894
- Souris, M. (2019). Epidemiology and geography: Principles, methods and tools of spatial analysis. Wiley. https://doi.org/10.1002/9781119528203

Unit 4: **(11 hours)**

Emerging Health Challenges and Policy Initiatives: Global and Regional Health Challenges, National-Level Health Initiatives (India), Health care systems, Political economy of health and health care, Emerging health issues and policies.

Readings

- Brown, G. W., Yamey, G., & Wamala, S. (2014). The handbook of global health policy. Wiley. https://doi.org/10.1002/9781118509623
- Herrick, C., & Reubi, D. (Eds.). (2017). Global health and geographical imaginaries. Routledge. https://doi.org/10.4324/9781315723525
- Johnson, S. A. (2017). Challenges in health and development: From global to community perspectives, second edition. Springer International Publishing. https://doi.org/10.1007/978-3-319-53204-2

Tutorial Exercises **(15 hours)**

- Discussion on the spatial foundations of health and disease with emphasis on geographic factors that shape disease patterns.
- Identification and analysis of environmental pollution sources and associated spatial health risk zones.
- Discussion on spatial inequalities in health at global, regional, and neighbourhood scales.
- Analysis of emerging health challenges and national–international policy initiatives
- Review and comparison of major methods used in spatial health analysis, including disease surveillance, hotspot identification, and community-level vulnerability assessment.

Practical Record: Not Applicable

Suggested Readings:

- Abdi, Y. H., Abdi, M. S., Bashir, S. G., Ahmed, N. I., & Abdullahi, Y. B. (2025). Understanding global health inequality and inequity: Causes, consequences, and the path toward justice in healthcare. Public Health Challenges, 4(4), Article e70156. https://doi.org/10.1002/puh2.70156
- Andrew T. A. Learmonth (1988). Disease ecology: An introduction to ecological medical geography. Basil Blackwell.
- Arcaya, M. C., Arcaya, A. L., & Subramanian, S. V. (2015). Inequalities in health: Definitions, concepts, and theories. Global Health Action, 8(1), Article 27106. https://doi.org/10.3402/gha.v8.27106
- Anthamatten, P., & Hazen, H. (2011). An introduction to the geography of health. Routledge.
- Balarajan, Yarlini, Selvaraj, Sakthivel, & Subramanian, S. V. (2011). Health care and equity in

India. The Lancet, 377(9764), 505–515. https://doi.org/10.1016/S0140-6736(10)61894-6

- Berkman, L. F., & Kawachi, I. (2000). Social epidemiology. Oxford University Press.
- Bezner Kerr, R., & Luginaah, I. (Eds.). (2015). Geographies of health and development. Routledge
- Braveman, P., Egerter, S., Williams, D.R. (2011) The social determinants of health: coming of age. Annual Review of Public Health 32:381-398.
- Brown, T., McLafferty, S., & Moon, G. (Eds.). (2010). A companion to health and medical geography. Wiley-Blackwell.
- Burton, L. M., Kemp, S. P., Leung, M., Matthews, S. A., & Takeuchi, T. A. (2011). Communities, neighbourhoods, and health: Expanding the boundaries of place. Springer.
- Curtis, S. (2004). Health and inequality: Geographical perspectives. Sage Publications.
- Freudenberg, N., Klitzman, S., & Saegert, S. (Eds.). (2009). Urban health and society: Interdisciplinary approaches to health and practice. Jossey-Bass.
- Gaimard, M. 2014. Population and Health in Developing Countries, Springer, New York.
- Galea, S., & Vlahov, D. (Eds.). (2005). Handbook of urban health: Populations, methods, and practice. Springer. https://doi.org/10.1007/b104167
- Gatrell, A. C., & Elliott, S. J. (2015). Geographies of health: An introduction (3rd ed.). Wiley-Blackwell.
- Harrington, D. W., McLafferty, S., & Elliott, S. J. (Eds.). (2016). *Population health intervention research: Geographical perspectives*. Routledge. https://doi.org/10.4324/9781315601502
- Jones, Kelvyn, K., & Moon, Graham. (1987). Health, disease and society: A critical medical geography. Routledge & Kegan Paul.
- Kanaroglou, P., Delmelle, E., & Páez, A. (Eds.). (2015). Spatial analysis in health geography. Routledge. https://doi.org/10.4324/9781315610252
- Kawachi, I., and Berkman, L.F. (eds.) (2003) Neighborhoods and health. Oxford: Oxford University Press.
- Luginaah, I., & Kerr, R. B. (Eds.). (2015). Geographies of health and development. Ashgate.
- Lynch, J. (2020). Regimes of inequality: The political economy of health and wealth. Cambridge University Press. https://doi.org/10.1017/9781139051576
- Misra, R. P. (2007). Geography of health: A treatise on geography of life and health in India. Concept Publishing Company.
- Omran, A. R. (1971). The epidemiologic transition: A theory of the epidemiology of population change. The Milbank Memorial Fund Quarterly, 49(4), 509–538. https://doi.org/10.2307/3349375
- Ozdenerol, E. (2016). Spatial Health Inequalities: Adapting GIS Tools and Data Analysis (pp. 1–173). CRC Press. https://doi.org/10.1201/9781315371894
- Raphael, D., Bryant, T., Mikkonen, J., & Raphael, A. (2020). Social determinants of health: The Canadian facts (2nd ed.). Ontario Tech University Faculty of Health Sciences & York University School of Health Policy and Management. https://thecanadianfacts.org/The_Canadian_Facts-2nd_ed.pdf
- Roig, B., Weiss, K., & Thireau, V. (2018). Management of emerging public health issues and risks: Multidisciplinary approaches to the changing environment. Elsevier. https://doi.org/10.1016/C2016-0-00995-6
- Sen, G. (2012). Universal health coverage in India: A long and winding road. Economic and

Political Weekly, 47(8), 45–52.
- Smith, S. J., & Easterlow, D. (2005). The strange geography of health inequalities. Transactions of the Institute of British Geographers, 30(2), 173–190. https://doi.org/10.1111/j.1475-5661.2005.00159.x
- Valorie A. Crooks, Gavin J. Andrews, & Jamie Pearce (Eds.). (2018). Routledge handbook of health geography. Routledge. https://doi.org/10.4324/9781315104584
- Williams, A., & Luginaah, I. (Eds.). (2022). Geography, health and sustainability: Gender matters globally. Routledge
- Wilson, Mary E. (2017). Geography of infectious diseases. In Infectious Diseases (4th ed., Vol. 1, pp. 938–947.e1). Elsevier. https://doi.org/10.1016/B978-0-7020-6285-8.00106-4
- World Health Organization. (2009). Global health risks: Mortality and burden of disease attributable to selected major risks. World Health Organization.

Digital materials: Not Applicable

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE: GEOG-E409: GEOGRAPHY OF HIMALAYA

Course Title & Code	Credits	Duration (hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-E409: GEOGRAPHY OF HIMALAYA	4	3	1	0	BA/BSc in Geography	-

Learning Objectives:

The learning objectives of this course are as follows:

- Understanding physiological characteristics, ecology of river basins of Himalaya.
- Mapping vulnerability, hazards and Disaster Risk Reduction (DRR) in Himalaya.
- Evaluation of livelihood and Sustainability in Himalaya.

Learning Outcomes:

Having completed this course, students will learn:

- In depth understanding of Third Pole and regional entity of Himalaya.
- Spatial distribution of hazards and risks and mitigation in Himalaya.
- Conservation strategies, good practices and success stories.

Course Outline:

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Introduction: Himalayan Physiology: Structures; Folds and faults and Vertical divisions; Regional Entity: Regional characteristics, river basin-based divisions (Sir Sydney Burrard)

Readings for Unit 1

- Ahmad, E. 1992. *Geography of the Himalaya*, Kalyani Publication, Ludhiana.
- Burrard, S. G., Hubert, S. and Hayden, H. 1908. A Sketch of the Geography and Geology of the Himalaya Mountains and Tibet: The high peaks of Asia, Superintendent Government Printing.

Unit 2: **(11 hours)**

Hazard-Risk and Vulnerability: Floods/Flash Floods, Cloudburst, Earthquake, Landslides and GLOF (Case Study).

Readings for Unit 2

- Bose, S.C. 1976. *Geography of the Himalaya*, National Book Trust, New Delhi.
- Pandey, B.W. 2002. *Geo-environmental Hazards in Himalaya, Assessment and Mapping*, Mittal Publication, New Delhi.

Unit 3: **(11 hours)**

Developmental Implications: Fragile Ecosystem Syndromes at Spatial Scale (Case Studies).

Readings for Unit 3

- Lall, J.S. (ed.), 1981. *The Himalaya: Aspects of Change*, Oxford University Press, Delhi.
- Kapur, A. 1995. *Paradise in Peril: An Ecological Profile of the Kashmir valley*, Allied publishers, Delhi.

Unit 4: **(11 hours)**

Management of Himalayan Fragility: Integrated Resource Management, Movements and Institutions for Himalayan Conservation (Case studies).

Readings for Unit 4

- Singh, R.B. 1998. *Sustainable Development of Mountain Environment of India and Canada*, New Delhi, Oxford & IBH Pub., 1998, Pages 345.
- Singh, R. B. Schickhoff, Udo and Mal Suraj (eds) 2016. *Climate Change, Glacier Response and Vegetation Dynamics in the Himalaya, Springer, Switzerland.*

Tutorial Exercises **(15 hours)**

- **Physiographic Mapping:** Prepare a physiographic map showing major divisions, folds, and faults of the Himalaya.
- **River Basin Analysis:** Study and delineate Himalayan river basins following Burrard's regional classification.
- **Hazard Mapping:** Identify and map flood, landslide, and cloudburst-prone zones using case studies.
- **Livelihood and Sustainability Survey:** Assess livelihood patterns and sustainability challenges in a selected Himalayan region.
- **Conservation Case Study:** Evaluate institutional and community-based initiatives for Himalayan biodiversity and ecosystem conservation.

Practical Record: Not Applicable

Suggested Readings:

- Lall, J.S. (ed.), 1981. *The Himalaya: Aspects of Change*, Oxford University Press, Delhi.
- M.J. Crozier, 1986. *Landslides: Causes, Consequences and Environment*, Croom Helm, London.
- Mohammad, Noor and Rai, S.C. 2014. *Agricultural Diversity and Food Security in the Mountain Ecosystem*, Concept Publishing Company, New delhi.
- Pandey, B.W. 2002. *Geo-environmental Hazards in Himalaya, Assessment and Mapping*, Mittal Publication, New Delhi.
- Pandey, B. W, Negi, V. S. and Kumria, Poonam, 2018. *Environmental Concerns and Sustainable Development in Himalaya*, Research India Press, New Delhi.
- Sah, N.K., Bhatt, S.D., and Pande, R.K. (eds.), 1990. *Himalaya: Environment, Resources and Development,* Shree Almora Book Depot, Almora.
- Sen Roy, S. and Singh, R.B. 2002. Climate Variability, Extreme Events and Agricultural Productivity in Mountain Regions, Oxford & IBH Pub., New Delhi, pages 232.
- Singh, R. B. Schickhoff, Udo and Mal Suraj (eds) 2016. *Climate Change, Glacier Response and Vegetation Dynamics in the Himalaya, Springer, Switzerland.*
- Singh, R.B. 1998. *Sustainable Development of Mountain Environment of India and Canada*, New Delhi, Oxford & IBH Pub., 1998, Pages 345.

Digital materials: Not Applicable

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE: GEOG-E410: MACHINE LEARNING AND ADVANCE GEO COMPUTATION

Course Title & Code	Credits	Duration (hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-E410: MACHINE LEARNING AND ADVANCE GEO COMPUTATION	4	3	1	0	BA/BSc in Geography	Foundations of Geospatial Science

Learning Objectives:

- This course introduces the domain of data science in geo-spatial analysis
- It sets the foundation of AI-ML with the integration of advanced geo-spatial analysis
- To efficiently solve contemporary geographical problems with AI-ML tools

Learning Outcomes:

Having completed this course, students will learn:

- Students will be acquainted with contemporary Data Science and conceptual understanding of Artificial Intelligence – Machine Learning theories.
- Ability to execute geo-spatial problems with data mining and extraction approach through AI-ML models.
- Capability to provide solutions to contemporary geographical problems with AI-ML tools.

Course Outline:

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Concept of Geo-computation: scopes and limitations, introduction to AI-ML, evolution, basic concepts and terminologies.

Readings for Unit 1

- Lary, D. J. (2018). Artificial Intelligence and Deep Learning for Earth Sciences. Springer.
- Gao, S., Hu, Y., & Li, W. (2024) Handbook of Geospatial Intelligence, CRC Press.

Unit 2: **(11 hours)**

Theories of AI-ML: mathematical building blocks of neural network, Keras and Tensor Flow, gradient-based optimization, backpropagation algorithm

Readings for Unit 2

- Zhang, C., & Zhu, A.-X. (2018). Machine Learning in Geospatial Analysis: Theory and Applications. Springer.
- Gao, S., Hu, Y., & Li, W. (2024) Handbook of Geospatial Intelligence, CRC Press.

Unit 3: **(11 hours)**

Connecting AI-ML to Geo-Spatial technologies: data mining, extractions, cleaning and representation, Algorithms/models and fullstack workflow: random forest, decision tree, support vector machine, XGBOOST, MLPNN; Model validation: accuracy matrices and visualization

Readings for Unit 3

- Fischer, M. M., & Getis, A. (2010). Handbook of Applied Spatial Analysis: Software Tools, Methods,
  and Applications. Springer.
- Korstanje, J. (2022) Machine Learning on Geographical Data Using Python: Introduction into Geodata with Applications and Use Cases, Apress Berkeley, CA

Unit 4: **(11 hours)**

Applications of ML in Geo-computation (GeoAI): hazard assessment, regional planning, climate modelling

Readings for Unit 4

- Lary, D. J. (2018). Artificial Intelligence and Deep Learning for Earth Sciences. Springer.
- Goodchild, M. F., & Longley, P. (1999). The Future of the Spatial Information Infrastructure. Wiley.

Tutorial:

- GeoAI Interface
- Data generation and pre-processing
- Vectorisation of data, data structure and algorithm (DSA)
- Libraries of DSA
- Data loading and restructuring
- Building of models
- Model execution, accuracy and hyperparameter tuning
- Accuracy matrices and visualisation
- Projection on new data and post-processing in GIS software.

Practical Record: Not Applicable

Suggested Readings:

- Brunsdon, C., & Singleton, A. (2015). Geocomputation: A Practical Primer. SAGE Publications.
- Fischer, M. M., & Getis, A. (2010). Handbook of Applied Spatial Analysis: Software Tools, Methods, and Applications. Springer.
- Goodchild, M. F., & Longley, P. (1999). The Future of the Spatial Information Infrastructure. Wiley.
- Lary, D. J. (2018). Artificial Intelligence and Deep Learning for Earth Sciences. Springer.
- Miller, H. J., & Han, J. (2009). Geographic Data Mining and Knowledge Discovery (2nd ed.). CRC Press.
- Mas, J. F., Karp, A., Souza, C. M., & Aragón-Carrasco, F. (2021). Machine Learning for Remote Sensing Applications. CRC Press.
- Matt, D., Qian, S., & Worboys, M. F. (2024). GIS: A Computational Perspectives (3rd ed.). CRC Press.
- Korstanje, J. (2022) Machine Learning on Geographical Data Using Python: Introduction into Geodata with Applications and Use Cases, Apress Berkeley, CA

Digital materials: Not Applicable

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE: GEOG-E411: REGIONAL GEOGRAPHY OF INDIA

Course Title & Code	Credits	Duration (hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-E411: REGIONAL GEOGRAPHY OF INDIA	4	3	1	0	BA/BSc in Geography	

Learning Objectives:

The learning objectives of this course are as follows:

- The students will be exposed to 'regional' approach in studying geography.
- The students will be conscious of the various facets of regional geography – foundations and dimensions, regional consciousness and identity, and forms and evolution.
- The students will be aware of the hierarchy of regional divisions of India.

Learning Outcomes:

Having completed this course, students will learn:

- The students will be able to understand and analyze the principal issues confronting the regions today.
- The students will get an insight into 'how regions work', through case-study from India.
- The students will be able to understand and analyse the principal issues confronting the different regions of India.

Course Outline:

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Introduction: Regional Studies and Approach, Concept of Region, Methods of Regionalization, Regional Consciousness, Regionalism, Regional Planning.

Readings

- Deshpande C. D. 1992. India: A Regional Interpretation, ICSSR, New Delhi.
- Spate O. H. K. and Learmonth A. T. A. 1954. India and Pakistan – A General and Regional Geography, Methuen.

Unit 2: **(11 hours)**

Geography of India: An overview of Land, People and Economy.

Readings

- Abler R., Adams J. S., and Gould P. R., 1971. Spatial Organization: A Geographer's View of the World, Englewood Cliffs, Prentice-Hall.
- Minshull Roger, 2007. Regional Geography: Theory and Practice, Transaction Publishers.

Unit 3: **(11 hours)**

Regionalization of India: Basis of Division, Regional Divisions.

Readings

- Claval Paul, 1998. An Introduction to Regional Geography, Blackwell Publishers, Oxford and Massachusetts.
- Johnston R. J. And Hauer J. 1990. Regional Geography: Current Developments and Future Prospects, Taylor and Francis.

Unit 4: **(11 hours)**

Regionalizations by Spate and Learmonth (1954) and Singh (1971): Selective Case Studies.

Readings

- Johnston R. J. and Sidaway J. D. 2004. Geography and Geographers: Anglo-American Human Geography since 1945, Arnold, London.
- Whittlesey D. 1952. The Regional Concept and the Regional Method in P. James and C. F. Jones (eds.), American Geography – Inventory and Prospect, AAAG.

Tutorial Exercises **(15 hours)**

- Discuss the relevance of regional planning
- Selected study of thinkers and their contributions
- Assignment on selected theories
- Evaluate the working of planning process
- Evaluate the contemporary of planning practices in India

Practical Record: Not Applicable

Suggested Readings:

- Glasson John and Marshall Tim, 2007. *Regional Planning*, Taylor and Francis, London and New York.
- Hall Peter and Tewdwr-Jones Mark, 2010. *Urban and Regional Planning*, Routledge, London and New York.
- Kulshreshta S. K. 2012. *Urban and Regional Planning in India: A Handbook for Professional Practice*, Sage, New Delhi.

- Lichfield N., Kettle P. and Whitbread M. 2016. *Evaluation in the Planning Process: The Urban and Regional Planning Series (Volume 10)*, Elsevier.
- Rahmaan A. U. 2011. *The Imperatives of Urban and Regional Planning: Concepts and Case Studies from the Developing World*, Xlibris Corporation.
- Stiftel B. and Watson V. 2005. *Dialogues in Urban and Regional Planning*, Psychology Press.
- Wang X. and Hofe R. 2008. *Research Methods in Urban and Regional Planning*, Springer.
- Wong C. 2006. *Indicators for Urban and Regional Planning: The Interplay of Policy and Methods*, Routledge.

Digital materials: Not Applicable

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE: GEOG-E412: SACRED LANDSCAPE AND PILGRIMAGE GEOGRAPHIES IN INDIA

Course Title & Code	Credits	Duration (hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-E412: SACRED LANDSCAPE AND PILGRIMAGE GEOGRAPHIES IN INDIA	4	3	1	0	BA/BSc in Geography	NA

Learning Objectives:

The learning objectives of this course are as follows:

- To introduce students to the interdisciplinary field of pilgrimage studies with a specific focus on geographical perspectives and India
- To critically analyze the social, cultural, economic, and political impacts of pilgrimage on both sites and the regions they are embedded within
- To explore different theoretical frameworks used in the study of pilgrimage geography, including the concepts of the sacred, profane, and hyper-meaningful journey

Learning Outcomes:

Having completed this course, students will learn:

- Analyze the spatial organization of sacred landscapes and pilgrimages
- Understand and connect to the significance of cultural heritage
- Conceptualize the spatio-spiritual character of India

Course Outline:

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Introduction: Significance of Sacred Landscapes and Pilgrimages, Religious and Secular Dimensions, Vedic vs Buddhist debate, Development of Pilgrimage Studies in Geography.

Readings for Unit 1

- Luitikas, D., 2025. Introduction to Sacred Landscape, Pilgrimage, and Ritual Practices. In *Creating*

the Sacred Landscape: Pilgrimages and Ritual Practices (pp 1-20). Cham: Springer Nature, Switzerland.
- Singh, R.P.B., Niglio, O, & Rana, P.S. (Eds) (2023). *Placemaking and Cultural Landscapes*. Springer.
- Lopez, L., ed., 2023. *Geography of World Pilgrimages: Social, Cultural and Territorial Perspectives*. Springer Nature.

Unit 2: **(11 hours)**

Key Concepts: Sacred & Profane, Hierophany, Axis Mundi, Sacred Geometry:-Cosmogram; (Microcosm, Mesocosm, Macrocosm), Sacred Journeys and spaces.

Readings for Unit 2

- Singh, R. P. B., 2013. *Hindu Tradition of Pilgrimage: Sacred Space and System*. [Planet Earth & Cultural Understanding Series, Pub. 9]. Dev Publishers & Distributors, New Delhi

Unit 3: **(11 hours)**

Geography of Sacred Sites: Mandalas, Sacred Circuits; Directions, Routes and Temporality, Case Studies, Sacred Geographies of India.

Readings for Unit 3

- Singh, R. P.B., 2013. *Hindu Tradition of Pilgrimage: Sacred Space and System*. [Planet Earth & Cultural Understanding Series, Pub. 9]. Dev Publishers & Distributors, New Delhi
- Singh, R. P.B., 2009. *Cosmic order and cultural astronomy: Sacred cities of India*. Cambridge Scholars Publishing.
- Singh, R. P.B., 2004. *Cultural Landscapes and the Lifeworld: Literary Images of Banaras*. Indica Books, Varanasi.

Unit 4: **(11 hours)**

Contemporary Issues: Modernity and Tradition, Development, Revitalization, & Heritagization; Local development, Policies and Sustainable Practices.

Readings for Unit 4

- Collins-Kreiner, N., 2010. Geographers and pilgrimages: Changing concepts in pilgrimage tourism research. *Tijdschrift voor economische en sociale geografie*, *101*(4), pp.437-448.
- Chandan, S. and Kumar, A., 2019. Challenges for urban conservation of core area in pilgrim cities of India. *Journal of Urban Management*, *8*(3), pp.472-484.
- Trombino, G. and Trono, A., 2018. Environment and sustainability as related to religious pilgrimage routes and trails. In *Religious pilgrimage routes and trails: Sustainable development*

and management (pp. 49-60). Wallingford UK: CAB International.

Tutorial Exercises **(15 hours)**

- Sacred landscapes: Characteristics
- Case study of sacred site in Delhi
- Mapping Pilgrimage routes in India
- Analysis of Sacred settlements in India: For example: Kashi, Rameshwaram, Rishikesh, Gokarna

Practical Record: Not Applicable

Suggested Readings:

- Bhardwaj, S. M., 1973. *Hindu places of pilgrimage in India: A study in cultural Geography*. Univ of California Press.
- Eck, D. L., 2012. *India: A sacred geography*. Harmony.

Digital materials: Not Applicable

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE: GEOG-E413: TERRAIN MODELLING

Course Title & Code	Credits	Duration (hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-E413: TERRAIN MODELLING	4	3	1	0	BA/BSc in Geography	Knowledge of Geospatial Science

Learning Objectives:

- To develop an understanding of terrain extraction principles, modelling and potential applications.
- To enable students to efficiently deal with problems in physical geography and environmental issues.

Learning Outcomes:

Having completed this course, students will learn:

- Broad understanding of Digital Terrain Modelling
- Understanding of digital terrain and surface model generation tools
- Understanding of Primary and Secondary topographic Attributes and applications

Course Outline:

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Digital Terrain Modelling: principles and applications, data sources, scale and quality assessment.

Readings for Unit 1

- Wilson, J.P. and Gallant, J.C. (eds.), 2000. Terrain Analysis: Principles and Applications, John Wiley & Sons.
- El-Sheimy, N., Valeo, C. and Habib, A. 2005. Digital Terrain Modeling: Acquisition, Manipulation and Applications, Artech House.

Unit 2: **(11 hours)**

Principles of Photogrammetry, Radargrammetry, LiDAR and GPS-based altitude determination. DTM vs. DSM, Contour/Point interpolation: IDW, Spline, Krigging etc.; 3D Visualization

Readings for Unit 2

- Jensen, J.R. 2015. Introductory Digital Image Processing: A Remote Sensing Perspective, 4th Edition, Pearson.
- Li, Z., Zhu, C. and Gold, C. 2004. Digital Terrain Modeling: Principles and Methodology, CRC Press.

Unit 3: **(11 hours)**

Terrain Analysis on Gridded DEM: slope, aspect, curvature, flow direction, watershed delineation etc.

Readings for Unit 3

- Zhou, Q., Lee, B. and Tang, G. (eds.), 2008. Advances in Digital Terrain Analysis, Springer.
- Li, Z., Zhu, C. and Gold, C. 2004. Digital Terrain Modeling: Principles and Methodology, CRC Press.

Unit 4: **(11 hours)**

Terrain Classification; Secondary topography Attributes – wetness indices, stream-power indices, radiation indices, temperature indices etc.

Readings for Unit 4

- Wilson, J.P. and Gallant, J.C. (eds.), 2000. Terrain Analysis: Principles and Applications, John Wiley & Sons.
- Wilson, J.P. 2018. Environmental Applications of Digital Terrain Modeling, Wiley-Blackwell.

Tutorial Exercises **(15 hours)**

- DEM Sources
- DEM Quality Assessment
- Photogrammetric computations
- Radar/LiDAR/GPS-based computations
- Interpolation
- DEM Derivatives
- Watershed Analysis
- Topographic Indices

Practical Record: Not Applicable

Suggested Readings:

- De Mers, M.N. 2008. Fundamentals of Geographic Information Systems, 4th Edition, John Wiley

& Sons, NewYork.

- El-Sheimy, N., Valeo, C. and Habib, A. 2005. Digital Terrain Modeling: Acquisition, Manipulation and Applications, Artech House.
- Florinsky, I.V. 2012. Digital Terrain Analysis in Soil Science and Geology, Academic Press, Elsevier.
- Jensen, J.R. 2007. Remote Sensing of the Environment: An Earth Resource Perspective, 2nd Edition, Pearson.
- Jensen, J.R. 2015. Introductory Digital Image Processing: A Remote Sensing Perspective, 4th Edition, Pearson.
- Peckham, R.J. and Jordan, G. (eds.), 2007. Digital Terrain Modelling: Development and Applications in a Policy Support Environment, Springer.
- Wilson, J.P. 2018. Environmental Applications of Digital Terrain Modeling, Wiley-Blackwell.

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE: GEOG-E414: TRANS GEOGRAPHIES

Course Title & Code	Credits	Duration (hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-E414: TRANS GEOGRAPHIES	4	3	1	0	BA/BSc in Geography	NA

Learning Objectives:

The learning objectives of this course are as follows:

- To apply key concepts of geography to understand Transgender lives and life worlds.
- To bring awareness about Transgender issues.
- To examine the wayforwards for socio-economic development of Trans Persons.

Learning Outcomes:

Having completed this course, students will learn:

- Understanding of concepts and terminologies of Trans communities.
- Application of geographical knowledge to Transperson's issues and life worlds.
- Awareness of Trans persons' needs for policy interventions at different levels and scales.

Course Outline:

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Introduction: Concepts and Terminologies; Geographical concepts; Trans bodies: Key Theorisations

Readings for Unit 1

- Browne, K., Nash, C. J., & Hines, S. 2010. Introduction: towards trans geographies, Gender, Place & Culture, 17(5), 573-57.
- Dutta, Aniruddha, and Raina Roy, 2014. Decolonizing transgender in India: Some reflections, Transgender Studies Quarterly 1, no. 3: 320-337.
- Halberstam, J. 2005. In a Queer Time and Place: Transgender Bodies, Sub cultural Lives, NYU

Press.

Unit 2: **(11 hours)**

Trans persons and space: Home, public space, urban space, work place & region.

Readings for Unit 2

- Doan, P. L. 2010. The tyranny of gendered spaces–reflections from beyond the gender dichotomy, Gender, Place & Culture, 17(5), 635-654.
- Choi, Y. 2013. The Meaning of Home for Transgendered People. In Queer Presences and Absences (pp. 118-140), Palgrave Macmillan, London.
- Bradford, N. J. 1983. Transgenderism and the cult of Yellamma: Heat, sex, and sickness in South Indian ritual, Journal of Anthropological Research, 39(3), 307-322.

Unit 3: **(11 hours)**

Trans persons & the Nation-state: laws, recognitions and Policies for Transgender inclusion, and development.

Readings for Unit 3

- Dhall, P., & Boyce, P. 2015. Livelihood, exclusion and opportunity: socioeconomic welfare among gender and sexuality non-normative people in India (No. IDS Evidence Report; 106). IDS
- Mittal, K. and Garg, S., 2015. Transgender in India: New developments and enactments. International Journal of Multidisciplinary Research and Development, 2(11), pp.402-405.
- Bhattacharya, S., Ghosh, D. and Purkayastha, B., 2022. 'Transgender persons (protection of rights) act'of India: an analysis of substantive access to rights of a transgender community. Journal of Human Rights Practice, 14(2), pp.676-697.

Unit 4: **(11 hours)**

Globalisation: Activism & Rights, Trans-local/ National- connections

Readings for Unit 4

- Tyagi, M.S., Vats, A.C. and Tyagi, A.S., 2025. Trans Lives Across Borders: A Comparative Study of Transgender Rights and Realities in India and USA. Journal of Marketing & Social Research, 2, pp.17-24.
- Dutta, A., 2013. Legible identities and legitimate citizens: The globalization of transgender and subjects of HIV-AIDS prevention in Eastern India. International Feminist Journal of Politics, 15(4), pp.494-514.
- Dutta, A., 2024. Globalizing Through the Vernacular: Kothis, Hijras, and the Making of Queer and Trans Identities in India. Bloomsbury Publishing.

Tutorial Exercises **(15 hours)**

- Identifying Trans communities in India and their distinction

- Visiting/ Interacting with Trans persons in Delhi to make note on their experiences in everyday spaces
- Identifying Means and Methods to identify problems and finding solutions through community based engagements for Transgender inclusion in social and economic policy
- Decoding the development of Rights perspectives through translocal and transnational discourses.

Practical Record: Not Applicable

Suggested Readings:

- Nash, C. J. 2010. Trans geographies, embodiment and experience, Gender, Place & Culture, 17(5), 579-595.
- Reddy, G. 2006. With Respect to Sex: Negotiating Hijra Identity in South India, Yoda Press.
- Mondal, B., Das, S., Ray, D. and Banerjee, D., 2020. "Their Untold Stories...": Lived experiences of being a transgender (Hijra), A qualitative study from India. Journal of Psychosexual Health, 2(2), pp.165-173.
- Whittle, S., and Stryker, S. 2006. The Transgender Studies Reader, EEUU: Routledge.

Digital materials: Not Applicable

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE: GEOG-E415: URBAN AND REGIONAL PLANNING

Course Title & Code	Credits	Duration (hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-E415: URBAN AND REGIONAL PLANNING	4	3	1	0	BA/BSc in Geography	Basic Knowledge of Economics

Learning Objectives:

The learning objectives of this course are as follows:

- The students will be exposed to basic concepts of urban and regional planning.
- The students will be conscious of pioneering thinkers in urban planning.
- The students will be aware of the background theory of regional planning and its processes.

Learning Outcomes:

Having completed this course, students will learn:

- The students will learn about basic principles of urban and regional planning.
- The students will know about pioneering thinkers in the field of urban planning.
- The students will study about the different theoretical background and structure of the regional planning process.

Course Outline:

THEORY **(45 hours)**

Unit 1 **(10 hours)**

Introduction: Application to Urban and Regional Planning; 'Planning' as an Activity; Objectives in Planning – Simple and Complex; Pioneer Thinkers in Urban Planning – Anglo-American and European Tradition.

Readings

- Glasson John and Marshall Tim, 2007. *Regional Planning*, Taylor and Francis, London and New York.
- Hall Peter and Tewdwr-Jones Mark, 2010. *Urban and Regional Planning*, Routledge, London and New York.

Unit 2: **(10 hours)**

Theorizing Regional Planning: Introduction, Approaches, Controls, Policy Cycle and Planning Process, Planning Professionals, Power Relations, Regional Growth and Development, Regional Spatial Structure, Sustainable Regional Development.

Readings

- Stiftel B. and Watson V. 2005. *Dialogues in Urban and Regional Planning*, Psychology Press.
- Wang X. and Hofe R. 2008. *Research Methods in Urban and Regional Planning*, Springer.

Unit 3: **(10 hours)**

The Planning Process: Systems Planning versus Master Planning; New Planning Paradigms; Spatial Strategic Coordination.

Readings

- Lichfield N., Kettle P. and Whitbread M. 2016. *Evaluation in the Planning Process: The Urban and Regional Planning Series (Volume 10)*, Elsevier.
- Wong C. 2006. *Indicators for Urban and Regional Planning: The Interplay of Policy and Methods*, Routledge.

Unit 4: **(15 hours)**

Urban and Regional Planning Practices in India: Public Sector (National, Inter-State, State, District, Metropolitan and Local), Private and Joint Sector.

Readings

- Kulshreshta S. K. 2012. *Urban and Regional Planning in India: A Handbook for Professional Practice*, Sage, New Delhi.
- Rahmaan A. U. 2011. *The Imperatives of Urban and Regional Planning: Concepts and Case Studies from the Developing World*, Xlibris Corporation.

Tutorial Exercises **(15 hours)**

- Discuss the relevance of regional planning
- Selected study of thinkers and their contributions
- Assignment on selected theories
- Evaluate the working of planning process
- Evaluate the contemporary of planning practices in India

Practical Record: Not Applicable

Suggested Readings:

- Glasson John and Marshall Tim, 2007. *Regional Planning*, Taylor and Francis, London and New York.
- Hall Peter and Tewdwr-Jones Mark, 2010. *Urban and Regional Planning*, Routledge, London and

New York.
- Kulshreshta S. K. 2012. *Urban and Regional Planning in India: A Handbook for Professional Practice*, Sage, New Delhi.
- Lichfield N., Kettle P. and Whitbread M. 2016. *Evaluation in the Planning Process: The Urban and Regional Planning Series (Volume 10)*, Elsevier.
- Rahmaan A. U. 2011. *The Imperatives of Urban and Regional Planning: Concepts and Case Studies from the Developing World*, Xlibris Corporation.
- Stiftel B. and Watson V. 2005. *Dialogues in Urban and Regional Planning*, Psychology Press.
- Wang X. and Hofe R. 2008. *Research Methods in Urban and Regional Planning*, Springer.
- Wong C. 2006. *Indicators for Urban and Regional Planning: The Interplay of Policy and Methods*, Routledge.

Digital materials: Not Applicable

GENERAL ELECTIVE (GE) COURSE:
GEOG-E416: PRINCIPLES, POLICIES AND PRACTICES OF EIA

Course title & Code	Credits	Duration (per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical/ Practice		
GEOG-E416: PRINCIPLES, POLICY AND PRACTICES OF EIA	4	3	1	0	BA/ BSc in Geography	Basic Knowledge of Geography

Learning Objectives:

The learning objectives of this course are as follows:

- To build a foundational understanding of Environmental Impact Assessment (EIA), its principles, and methodologies.
- To critically examine the socio-economic and ecological implications of development projects through EIA.
- To introduce national and international legal frameworks, policies, and practices related to environmental assessment.
- To equip students with analytical tools to assess, evaluate, and propose mitigation strategies for environmental impacts.

Learning Outcomes:

Having completed this course, students will learn:

- Students will be able to explain key concepts, processes, and different aspects of Environmental Impact Assessment.
- Students will develop the ability to evaluate the environmental consequences of development projects and suggest mitigation strategies.
- Students will be able to critically engage with national and international environmental policies and procedures.

Course Outline:

THEORY **(45 hours)**

Unit 1 **(12 hours)**

Introduction (Theory): Definition and principles of EIA, Concepts and approaches, Methods and procedure and currents issues in EIA.

Readings

- Morrison-Saunders, A., 2023. Advanced introduction to environmental impact assessment. Edward Elgar Publishing.
- Hanna, K. (2022). Routledge Handbook of Environmental Impact Assessment. Routledge. https://doi.org/10.4324/9780429282492

Unit 2: **(11 hours)**

EIA practices in India and the World (Theory): Developed and Developing countries EIA, National Green Tribunal, Earth Summit and Conference of Parties (COP).

Readings

- Rathi, A. K. A. (2024). Indian environmental impact assessment practice: Insights and learnings. Cambridge Scholars Publishing.
- Glasson, J., & Therivel, R. (2019). Introduction to Environmental Impact Assessment (pp. 1–381). Taylor and Francis. https://doi.org/10.4324/9780429470738
- Wood, C. (2002). Environmental Impact Assessment: A Comparative Review. Prentice Hall.

Unit 3: **(11 hours)**

Evaluation Strategies (Theory): Cost-benefit analysis and valuation of environmental impacts, Environmental Impact Assessment Regulations and Policies in India.

Readings

- Islam, K.M.B. and Nomani, Z.M., 2021. Environment Impact Assessment: Precept & Practice. CRC Press.
- OECD (2018), Cost-Benefit Analysis and the Environment: Further Developments and Policy Use, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264085169-en
- Divan, Shyam, and Armin Rosencranz, *Environmental Law and Policy in India: Cases and Materials*, 3rd edn (Oxford, 2022; online edn, Oxford Academic, 15 Dec. 2022), https://doi.org/10.1093/oso/9780192865458.001.0001

Unit 4: **(11 hours)**

Selected Case Studies (Theory): Social, Ecological, and Environmental Impact assessment, Current issues and EIA.

Readings

- Goel, R.S. 2000. Environmental Impacts Assessment of water Resources Projects -concerns, Policy Issues Perceptions and Scientific Analysis, Oxford Publishing Co. Pvt. Ltd.

- Becker, Henk, , & Henk Becker University of Utrecht, Netherlands., (2014). Social Impact Assessment: Method And Experience In Europe, North America And The Developing World (1st ed.). Routledge. https://doi.org/10.4324/9781315072432

Tutorial Exercises **(15 hours)**

- Guided discussions on key concepts, principles and processes of Environmental Impact Assessment (EIA).
- Critical review of EIA reports, environmental policies and regulatory frameworks.
- Case study analysis of development projects and their environmental impacts.
- Student presentations and group discussions on contemporary environmental issues.
- Debates on environmental governance, sustainability, mitigation measures and decision-making processes.

Practical Record: Not Applicable

Suggested Readings:

- Bhateria, R. et al., 2024. Environmental impact assessment: A Journey to Sustainable Development. Springer
- Fonseca, A. ed., 2022. Handbook of environmental impact assessment. Edward Elgar Publishing.
- Goudie, A. 2000. The Human Impact on the Natural Environment, Blackwell, Publishers, Oxford.
- Betty Bowers Marriott , 1997. Environmental Impact Assessment, Mc Graw Hill Professional Bookstore.
- Glasson, J., & Therivel, R. (2019). Introduction to Environmental Impact Assessment (pp. 1–381). Taylor and Francis. https://doi.org/10.4324/9780429470738
- Momtaz, S., & Kabir, S. M. Z. (2013). Evaluating Environmental and Social Impact Assessment in Developing Countries (pp. 1–199). Elsevier. https://doi.org/10.1016/C2012-0-06543-X
- Subramanian, V., 2001. Text Book on Environmental Sciences, Narosa Publishing House, N. Delhi.
- Prasad, K. and Goel, R. S. 2000. Environmental Management in Hydro Electric Projects, Concept Pub., New Delhi.
- Smith, L.G., 1993. Impact Assessment and Sustainable Resource Management, Longman, Harlow.
- Richard, K. Morgan, 1999. Environmental Impact Assessment: A Methodological Perspective, Springer.
- Warhurst, A. (1999). Mining and the Environment: Case Studies from the Americas - International Development Research Centre (Canada)

Digital materials: Not Applicable

SKILL BASED (SB) COURSE:
GEOG-S401: INSTRUMENTS FOR GEOGRAPHICAL ANALYSIS

Course title & Code	Credits	Duration (per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-S401: INSTRUMENTS FOR GEOGRAPHICAL ANALYSIS	2	1	0	1	BA/BSc in Geography	

Learning Objectives:

Having completed this course, students will learn:

- To provide advanced theoretical understanding of ground-based instruments essential for geographical analysis in high mountain environments.
- To highlight strength and challenges of using these tools in rugged, high-altitude terrain for mapping, monitoring, and hazard assessment.

Learning Outcomes:

Having completed this course, students will learn:

- Describe principles, and applications of various ground-based instruments used in environmental monitoring, hydrology, and geomorphological analysis.
- Evaluate the strengths, limitations, and suitability of different instruments for high-mountain geographical studies.

Course Outline:

Unit 1 - Theory **(15 hours)**

Ground-based Instrumentation: Instruments used directly in high mountain terrain for positioning, meteorological, hydrological, and geophysical measurements: Total Station, Smart Station, GPS/dGPS, Automatic Weather Station (AWS), Thermometer, Barometer, Sun shine recorder, Rain Gauge, Ground Penetrating Radar (GPR), Water Level Recorder (radar-based and other types), Schmidt Hammer, Snow Density Kit, Terrestrial Laser Scanner, Drone (UAV) with RGB/Multispectral

Camera/LiDAR and Echo Sounder.

Readings for Unit 1

- Hubbard, B., & Glasser, N. F. (2005). Field techniques in glaciology and glacial geomorphology. John Wiley & Sons.
- Jarraud, M. (2008). Guide to meteorological instruments and methods of observation (WMO-No. 8). World Meteorological Organisation: Geneva, Switzerland, 29.
- Surveying Committee. (2022, June). Surveying and geomatics engineering: Principles, technologies, and applications. Reston, VA: American Society of Civil Engineers.

Unit 2: Practical **(30 hours)**

Demonstration of some available instruments for geographical analysis in the department and preparation of report writing.

Field Exercises: Few practical exercises will be conducted using field instruments.

Practical Record: Not Applicable

Suggested Readings:

- Goudie, A. (2003). Geomorphological techniques. Routledge.
- Harrison, R. G. (2014). Meteorological measurements and instrumentation. John Wiley & Sons.
- Kondolf, G. M., & Piégay, H. (2003). Tools in fluvial geomorphology. Problem statement and recent practice. Chichester, Wiley.
- Reynolds, J. M. (2011). An introduction to applied and environmental geophysics. John Wiley & Sons.
- Shaw, E. (2005). Hydrology in practice. CRC press.

Digital materials: Not Applicable

SKILL BASED (SB) COURSE:
GEOG-S402:
TECHNIQUES OF RESEARCH WRITING

Course Title & Code	Credits	Duration (hours per week)			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical / Practice		
GEOG-S402: Techniques of Research Writing	2	1	0	1	BA/BSc in Geography	Basic Knowledge of Geography

Learning Objectives:

The learning objectives of this course are as follows:

- To equip students with techniques and an understanding of the structure and ethical standards of scientific and academic writing in Geography.
- To help conduct literature reviews using a range of academic databases and distinguish between different types of sources.
- To enable students to apply various digital tools effectively for planning, drafting, referencing, editing, and detecting plagiarism in research writing; understand the peer-review process; and produce original, ethically sound research manuscripts/dissertations.

Learning Outcomes:

Having completed this course, students will learn:

- The students will be able to write their own clear, well-structured, and ethically sound dissertation in the standard academic format.
- The students will be able to transform their dissertations into manuscripts in the future using referencing and language-editing tools to improve the quality and organisation of their writing.
- The course will build capacity by training human resources in the domain of academic research writing.

Course Outline:

Unit 1 - Theory **(15 hours)**

Introduction: How to begin with a dissertation writing, Basic traits, structure, norms and ethics of academic dissertations and manuscripts. Literature review: Finding Relevant Research Papers, Grey literature vs peer-reviewed literature, Major Platforms and Databases, Identifying Research Gaps.

Readings for Unit 1

- Booth, W. C., Colomb, G. G., & Williams, J. M. (2009). The craft of research. University of Chicago press.
- Kothari, C. R. (2004). Research methodology: Methods and techniques. New Age International.
- Parsons, T., & Knight, P. G. (2015). How to do your dissertation in geography and related disciplines. Routledge.
- Hart, C. (2018). Doing a literature review: Releasing the research imagination. 2nd ed. London: Sage.
- Fink, A. (2019). Conducting research literature reviews: From the internet to paper. Sage publications.

Unit 2: Practical **(30 Hours)**

Preparing the standard templates of dissertation, Hands on Tools of Mind Mapping for Literature Review, Hands on Language editing Tools, Hands on Referencing Tools.

Practical Record: Not Applicable
Exercise: Few exercise will be conducted in the classroom and in assignment mode.

Suggested Readings:

- Haigh, M. (2013). Writing successfully for the Journal of Geography in Higher Education. Journal of Geography in Higher Education, 37(1), 117-135.
- Swales, J. M., & Feak, C. B. (2004). Academic writing for graduate students: Essential tasks and skills (Vol. 1). Ann Arbor, MI: University of Michigan Press.
- University Grant Commission. (2018). UGC-Promotion of academic integrity and prevention of plagiarism in higher educational institutions, Regulations, 2018.

Digital materials: Not Applicable