

Department of Geography

School of Earth Science

Course Contents & Syllabus

Two -Year Post Graduate (III and IV Semesters)

**Two -Year Post Graduate Programme
Under NEP 2020**

(for Students enrolled 2025-2027 Academic Session Only)



Hemvati Nandan Bahuguna Garhwal University

(A Central University)

Srinagar Garhwal-246174 (Uttarakhand)

Head
Department of Geography
School of Earth Science
H.N.B. Garhwal University
Srinagar (Uttarakhand)

Third Semester for 2- Year PG Programme

Semester	Course Category	Course Title	Credits		Total Credits
			T	P	
III	Discipline Specific Core (DSC)	DSC-1 Research Techniques and Methodology	5	-	5
		DSC-2 Hazards and Disaster Management	5	-	5
		DSC-3 Climate Change and Sustainability	5	-	5
		DSC Practical- Remote Sensing, GIS and Field Study Tour	-	3	3
	Discipline Specific Elective (DSE) (Any 1 out of Minimum 2 electives)	DSE-1 Cultural Geography Health and Medical Geography Oceanography Political Geography Regional Planning and Development Urban Geography	4	-	4
		Elective Practical- Advanced Statistical Techniques in Geography	-	2	2
Total			19	5	24

Fourth Semester for 2- Year PG Programme

Semester	Course Category	Course Title	Credits		Total Credits
			T	P	
IV	Discipline Specific Core (DSC)	DSC-1 Geography of Uttarakhand	5	-	5
		DSC-2 Dissertation	5	-	5
		DSC-3 Bio-Geography	5	-	5
		DSC Practical- Cartography	-	3	3
	Discipline Specific Elective (DSE) (Any 1 out of Minimum 2 electives)	DSE-1 Agricultural Geography Geography of Tourism Geography of Transport Remote Sensing and Digital Cartography Rural Geography Social Geography	4	-	4
		Elective Practical- Qualitative Methods in Geography	-	2	
Total			19	5	24

**Syllabus of M.A./M.Sc. in Geography as per
Two Year Post Graduate Programme Under NEP 2020
Only for Students enrolled in 2025-2026 Academic Session**

Semester	Course Category	Course Title	Credit	
			T	P
III	DSC -1	Research Techniques and Methodology	5	-
	DSC -2	Hazards and Disaster Management	5	-
	DSC -3	Climate Change and Sustainability	5	
	DSC - Practical	Remote Sensing, GIS and Field Study Tour	-	3
	DSE-1	Cultural Geography Medical Geography Oceanography Political Geography Regional Planning and Development Urban Geography	4	-
	DSE-Practical	Advanced Statistical Techniques in Geography	-	2
	Total		24	
Semester	Course Category	Course Title	Credit	
			T	P
IV	DSC -1	Geography of Uttarakhand	5	-
	DSC -2	Dissertation	5	-
	DSC -3	Bio-Geography	5	-
	DSC - Practical	Cartography	-	3
	DSE-1	Agricultural Geography Geography of Tourism Geography of Transport Remote Sensing and Digital Cartography Rural Geography Social Geography	4	-
	DSE-Practical	Qualitative Methods in Geography	-	2
	Total		24	

<u>Master of Arts/ Science (M.A./M.Sc.) 2 Year</u>		
Theory		
Programme: M.A./M.Sc.	Year: Second	Semester: Third
Subject: Geography		
Course Code: SEOS/GEOG/C007	Course Title: Research Methodology and Techniques	
Course Learning Objectives: 1. To understand the concepts, methodologies of geographical research and formulate scientifically relevant research problems. 2. To develop competencies in research design, sampling techniques and the application of appropriate statistical tools. 3. To apply geospatial technologies and interpretation in geographical research. 4. To acquire skills in scientific writing, dissemination of research findings and ethical research practices.		
Course Learning Outcomes: 1. Explain the fundamental concepts and methods in Geography, and formulate appropriate research problems. 2. Design and conduct geographical research using suitable sampling techniques. 3. Analyse and interpret quantitative, qualitative and statistical techniques to address geographical problems. 4. Prepare research proposals, pilot studies, project reports and research papers, citation practices and research ethics.		
Credits: 5	DSC	
Max. Marks: 40+60	Min. Passing Marks: 35	
Total No. of Lectures- Tutorials - Practical (in hours per week): L-T-5/W		
Unit	Course Contents	
UNIT-I	Concept & significance of research in Geography; Nature, objective and basis of research; Types of research, Approaches and methods; Review of literature, Formulation of Research problem; Techniques and research process.	
UNIT-II	Research Design: Meaning, need, features and types; Sampling: Types, methods and steps; Design of spatial sampling; Survey and experiments; Data collection methods - primary and secondary data, schedule, questionnaire and observation.	
UNIT-III	Hypothesis: meaning, characteristic importance and formulation; Testing of Hypothesis; Parametric and non-parametric tests; Introduction to open sources statistical software;	
UNIT-IV	Research Ethics and plagiarism; Writing of research report/paper and dissertation; Framing of pilot projects; Citation and referencing using softwares.	
Suggested Readings: 1. Bhatt H. P. and Bansal S.C. (2012): Research methodology (in Hindi), Meenakshi Prakashan, Meerut. 2. Ahuja, R. (2001): Research Methods, Rawat methodology, Excel Books, New Delhi. 3. Bhattacharya, D.K. (2005): Research Methodology, Excel Books, New Delhi. 4. Blaxter, L.; Hughes, C. and Tight, M. (1996): How to Research. Open University Press, Buckingham. 5. Crang, Mike 1999. Cultural Geography. Routledge, London. 6. Denzin, N.K. and Lincoln, Y.S., (eds.) (2000): handbook of Qualitative Research thousand Oaks C.A. Sage Publications. 7. Dikshit, R.D. (2003): The Art and Science of Geography: Integrated Readings. Prentice- Hall of India, New Delhi. 8. Dorling, D. And Simpson, L.(eds.) (1999): Statistics in Society. Edward Arnold, London. 9. Fisher, P. And Unwin, D., (eds.) (2002): Virtual Reality in Geography, Taylor and Francis, London. 10.Hay, I. (ed.) (2000): Qualitative research Methods in Human Geography. Oxford University Press, New York. 11. Henn, M., Mark W., and Nick F. (2006): A short introduction to Social Research, Vistara Publications, New Delhi. 12. Eyles J. And Smith D.M. (1988): Qualitative Methods in Human Geography, Polity Press, Dales Brewering Cambridge. 13. Kitchin, R. And Tate, N., (2001): Conducting Research into Human geography, Theory, Methodology and Practice. Prentice-hall, London. 14. Har Prasad: Research Methodology and Techniques in Geography, Rawat Publications, Jaipur.		
Suggested Continuous Evaluation Methods: Assignment/ Test/ Quiz (MCQ)/ Seminar/ Presentations (any methods)		

Marks distribution of theory examination: **40 marks** by **internal** assessment and **60 marks** by **external** assessment.

<u>Master of Arts/ Science (M.A./M.Sc.) 2 Year</u>		
Theory		
Programme: M.A./M.Sc.	Year: Second	Semester: Third
Subject: Geography		
Course Code: SEOS/GEOG/C008	Course Title: Hazards and Disaster Management	
Course Learning Objectives: 1. Develop clear understanding of the concepts of disasters, calamity, risk and hazard. 2. Understand natural and anthropogenic hazards, disasters, and disaster risk reduction. 3. Analyze the causes, impacts, vulnerability, and resilience associated with different types of disasters using geographical approaches. 4. Apply geospatial technologies, disaster management frameworks, and field-based methods for disaster preparedness, mitigation, and sustainable development.		
Course Learning Outcomes: 1. Explain the concepts, and components of hazards, disasters, vulnerability, resilience, and disaster risk reduction. 2. Ability to assess the significance of disasters and their implications for communities and society. 3. Prepare disaster management plans integrating preparedness, mitigation, response, recovery, and climate change adaptation strategies. 4. Proficiency in understanding national disaster management policies and requirements.		
Credits: 5		DSC
Max. Marks: 40+60		Min. Passing Marks: 35
Total No. of Lectures- Tutorials - Practical (in hours per week): L-T-5/W		
Unit	Course Contents	
UNIT-I	Meaning, concept, type and magnitude of Hazards and Disaster; Cause and consequences; Major global hazards and disaster.	
UNIT-II	Natural Hazards- Typology; Regional dimension of Hazards; Occurrence and trends; Methods of identifying hazard prone regions; Major terrestrial disaster- seismic disasters, volcanic disaster, landslides and tsunamic disasters; Reasons of increasing frequency of disasters.	
UNIT-III	Disaster Management: Concept, stages, preparedness, prediction and warning; Disaster mitigation and disaster prevention; post-disaster stage-rescue and relief work; Remedial measures; Long term disaster planning.	
UNIT-IV	Disaster and hazard prone areas in India: Policies and approaches; Response to disasters, mitigation and management; Appraisal of government programs/institution of disaster management; Significance of Remote Sensing and GIS; Disaster Scenario and Management System in Uttarakhand.	
Suggested Readings: 1. Alexander, D. (1993). Natural Disasters, ULC Press Ltd, London. 2. Bryant, E. A. (2005). Natural Hazards, Cambridge University Press. <i>Cambridge, New York, Melbourne.</i> 3. Collins, L. R. (2000). Disaster management and preparedness. CRC Press. 4. Coppola, Damon P. (2006). Introduction to International Disaster Management. Butterworth-Heinemann. 5. Edwards, B. (2005): Natural Hazards, Cambridge University Press, UK. 6. Ghosh, S.T. (2013). Disaster Vulnerability, Hazards and Resilience: Perspectives from India. Rawat Publications. 7. Government of India, (1997). Vulnerability Atlas of India, New Delhi, Building Materials & Technology Promotion Council, Ministry of Urban Development, Govt. of India. 8. Government of India, (2005). Disaster Management Act, 2005, The Gazette of India, New Delhi. 9. Government of India. (2011). Disaster Management in India. Ministry of Home Affairs. Government of India Publication. 10. Gupta, H. K. (2003). Disaster Management. Universities Press. 11. Hyndman, D., & Hyndman, D. (2006). Natural hazards and disasters. Cengage Learning. 12. Kataria, S.K. (2020). Disaster Management: Future Challenges and Opportunities. Kataria Publications. 13. Kapur, A. (2010). Vulnerable India: A Geographical Study of Disasters, Sage Publication, New Delhi. 14. Kapur, A. (2005). Disasters in India: Studies of grim reality, Rawat Publications, New Delhi.		

15. Kumar, M. (2021). Emergencies and Disaster Management. Sage Publications India.
16. Modh, S. (2010) Managing Natural Disaster: Hydrological, Marine and Geological.
17. NDMA (2005 & updates). Disaster Management Guidelines. Government of India.
18. NDMA (2009): National Policy on Disaster Management, NDMA, New Delhi.
19. Parasuraman, S. (2000). India Disasters Report: Towards a Policy Initiatives, Oxford University Press.
20. Petak, W. J., & Atkisson, A. A. (1982). *Natural hazard risk assessment and public policy: anticipating the unexpected* (p. 489). New York: Springer-Verlag.
21. Punmia, B.C. (2005). Natural Hazards and Disaster Management: Vulnerability and Mitigation. Firewall Media.
22. Sahni, Pardeep et.al. (Eds.) 2002, Disaster Mitigation, Experiences and Reflections. Prentice Hall of India, New Delhi.
23. Shaw, R., & Krishnamurthy, R. (2009). Disaster Management: Global Challenges and Local Solutions. Universities Press.
24. Singh, R. B. (ed.), (2006). Natural Hazards and Disaster Management: Vulnerability and Mitigation, Rawat Publications, New Delhi.
25. Smith, K. (2011): Natural Hazards, Routledge, London.
26. United Nations ISDR. (2004). Living with Risk: A Global Review of Disaster Reduction Initiatives. UN Publications.
27. White, G.F.: (ed.) (1974): Natural Hazards – Local, National, Global. Oxford University Press.
32. कुमार, अशोक (2015). आपदा विज्ञान. शारदा पुस्तक भवन.
33. कुमार, सुरेश (2022). आपदा: एक सामाजिक अध्ययन, अनामिका पब्लिशर्स.
34. कौल, वसंत (2009). आपदा प्रबंधन. ओरिएंट ब्लैकस्वान.
37. मिश्रा, एस.एन (2013). आपदा जोखिम न्यूनीकरण. जॉहर पब्लिशर्स.
39. रंजन, राजीव (2011). आपदा प्रबंधन और भारतीय संदर्भ. यूनिवर्सिटी साइंस प्रेस.
40. शर्मा, डी.एन (2017). प्राकृतिक आपदाएँ और प्रबंधन. प्रवालिका पब्लिकेशंस.

Suggested Continuous Evaluation Methods: **Assignment/ Test/ Quiz (MCQ)/ Seminar/ Presentations** (any methods)

Marks distribution of theory examination: **30 marks** by **internal** assessment and **70 marks** by **external** assessment.

<u>Master of Arts/ Science (M.A./M.Sc.) 2 Year</u>		
Theory		
Programme: M.A./M.Sc.	Year: Second	Semester: Third
Subject: Geography		
Course Code: SEOS/GEOG/C009	Course Title: Climate Change and Sustainability	
Course Learning Objectives: 1. Develop an in-depth understanding of the science, drivers, impacts, and risks of climate change. 2. Explain the principles of sustainability and sustainable development from geographical and socio-ecological perspectives. 3. Critically examine climate governance, international environmental agreements, and national policies related to climate change and sustainability. 4. Evaluate adaptation, mitigation, resilience, and sustainable development strategies for addressing contemporary environmental and developmental challenges.		
Course Learning Outcomes: 1. Explain the scientific basis, causes, impacts, and vulnerability dimensions of climate change. 2. Analyse the interrelationships among climate change, sustainability, socio-ecological systems, demographic dynamics, and development. 3. Critically evaluate global and national climate governance frameworks, climate finance, climate justice, and sustainability policies. 4. Apply concepts of adaptation, mitigation, resilience, sustainable resource management, and governance to analyse real-world climate and sustainability issues.		
Credits: 5	DSC	
Max. Marks: 40+60	Min. Passing Marks: 35	
Total No. of Lectures- Tutorials - Practical (in hours per week): L-T-5/W		
Unit	Course Contents	
UNIT-I	Introduction to climate change: concepts, nature and scope; climate change theories; causes of climate change, evidence and impacts; climate vulnerability and risk; adaptation and resilience; IPCC and CoP findings.	
UNIT-II	Global climate change and governance; international climate agreements; climate finance; India's climate policy; climate justice; emerging climate issues, measures and mitigation strategies.	
UNIT-III	Introduction to sustainability, nature and approaches, Geography and sustainability relationship, Social- ecological systems perspective, Demographic changes and environmental issues.	
UNIT-IV	Concept of development and growth, Emerging global policies on sustainability, Sustainability and human health, Energy crisis and development, Management practices and approaches, governance and policy issues in India.	
Suggested Readings: 1. Barry, R. G. and Chorley, R. J. 2003: Atmosphere, weather and climate, Routledge, 8th edition. London: Methuen. 2. United Nation (1972): Report of the United Nations Conference on the Human Environment, Stockholm, New York 3. Walter Leal Filho (Editor) (2019): Encyclopaedia of Sustainability in Higher Education, Springer 4. Fabio Zagonari (2022): Environmental Ethics, Sustainability and Decisions-Literature Problems and Suggested Solutions, Springer 5. H. Komiyama, S. Kraines (2008): Vision 2050 Roadmap for a Sustainable Earth, Springer 6. Huddart, D. and Stott, T. 2010: Earth environments past, present and future, Wiley Blackwell, 1st edition, West Sussex. 7. Shroder, J.F. (edited) 2005: Himalaya to the sea geology, geomorphology and the Quaternary, Taylor & Francis, London. 8. Margaret Robertson (2017): Sustainability Principles and Practice (2nd Ed), Routledge, NY 9. Anderson, G.D.; Maasch, K.A.; Sandweiss, D.H. (edited) 2007: Climate Change and cultural dynamics, a global perspective on Mid-Holocene Transition, Academic Press, London. 10. Andreas Schmittner, Introduction to Climate Science, OREGON STATE UNIVERSITY CORVALLIS, Introduction to Climate Science – Open Textbook (oregonstate.education).		

11. Craig D. Idso, Robert M. Carter, S. Fred Singe (2016) Why Scientists Disagree About Global Warming the NIPCC Report on Scientific Consensus, Published by The Heartland Institute, Illinois.
12. Mike Hulme (2022) Climate Change key ideas in Geography, Routledge.
13. Navroz K. Dubash (2012) Handbook of Climate Change and India Development, Politics and Governance, Routledge, Taylor and Francis Group.
14. Walker, Mike 2005: Quaternary Dating Methods, John Wiley & Sons, West Sussex. Last, W.M. and Smol, J.P. (edited) 2002: Tracking Environmental change using lake sediment vol I, Kluwer Academic Publishing, New York.
15. Bennet, M.R. and Glasser, N.F. 2009: Glacial geology ice sheets and landforms, Wiley Blackwell, West Sussex.
16. IPCC Assessment Reports (2001, 2004, 2007, 2020)
17. Climate Change- An Indian Perspective by S.K.Das , Foundation books
18. United Nations Conference Proceeding (1972-2022): <https://www.un.org/en/conferences/environment/rio1992>

Journals:

Climate Dynamics, Weather and Climate Extremes, Climate of the Past, Nature Geoscience, Quaternary International, Quaternary International Review, Journal of Quaternary Science, Quaternary, International Journal of Sustainable Development & World Ecology

Other Readings:

Climate Change Reconsidered – Climate Change Reconsidered

Suggested Continuous Evaluation Methods: **Assignment/ Test/ Quiz (MCQ)/ Seminar/ Presentations** (any methods)

Marks distribution of theory examination: **40 marks** by **internal** assessment and **60 marks** by **external** assessment.

<u>Master of Arts/ Science (M.A./M.Sc.) 2 Year</u>		
Practical		
Programme: M.A./M.Sc.	Year: Second	Semester: Third
Subject: Geography		
Course Code: SEOS/GEOG/C010 (P)	Course Title: Remote Sensing & GIS and Field Study Tour	
Course Learning Objectives: 1. Develop proficiency in Remote Sensing, GIS, and field-based geospatial techniques. 2. Acquire skills in spatial data collection, processing, and geospatial database management. 3. Integrate field observations with geospatial technologies for spatial analysis and mapping. 4. Evaluate geographical and environmental problems using geospatial tools and field evidence.		
Course Learning Outcomes: 1. Skilled in remote sensing, GIS, and field surveying techniques. 2. Create technical reports, geographical databases, and thematic maps. 3. Utilize geospatial techniques to analyze geographical and environmental challenges. 4. Analyze geospatial solutions for planning, resource management, and research.		
<i>Credits: 5</i>	<i>DSC</i>	
<i>Max. Marks: 40+60</i>	<i>Min. Passing Marks: 35</i>	
Note: The Syllabi for practical are divided into two sections, Section- ‘A’ is related to laboratory work and section ‘B’ is related to field work (Geographical Tour). The Laboratory work is divided into four units. Eight questions will be set selecting at least two questions from each unit. The division of marks in practical is given below:		
Note: Examination Departmental Committee Appointed by HoD for University Campuses. External Examiners will be Appointed by the University for Affiliated Colleges.		
Laboratory Work:	M.M. 20	
Field Work:	M.M. 30	
Sessional Records:	M.M. 05	
Viva-voce:	M.M. 05	
<i>Total No. of Lectures- Tutorials - Practical (in hours per week): L-T-5/W</i>		
SECTION A – Laboratory Work		
Unit	Course Contents	
UNIT-I	Concept, type and elements of maps; Coordinate systems, Datum and map projections, Geospatial data sources and types, Layer stacking of multispectral imagery.	
UNIT-II	Georeferencing and digitization, Image enhancement and image classification technique, Satellite data acquisition and earth observation missions -IRS, Landsat, Sentinel, Cartosat.	
UNIT-III	Digital elevation models and terrain derivatives, Land use/land cover mapping and change detection, Preparation of thematic maps and cartographic visualization, Introduction to web GIS and cloud-based geospatial platforms.	
UNIT-IV	Planning and design of field investigations, Reconnaissance survey and sampling techniques, Mobile GPS/GNSS-based field data collection, Report writing.	
SECTION B – Field Work		
(i) The field study is compulsory for all students, those who will not take part, will not be given any mark for this. The field study work is designed to acquaint the students that, “Geography is an observational science” and field work is one of the important methodologies in geographical studies.		
(ii) The students are to be sensitized about pre-field work preparation, conduct of field work, post field work and report writing.		
(iii) Filed study tour to provide traverses across and macro regions of the country especially problem areas, areas in news and needs will be arranged of about two-week duration. Student will be trained in field work collection of data, mapping, sketching and collection of socio-economic data etc. using observational and interview method etc.		
(iv) The report will involve statement of objective, selection of area (reasons), method of field study data collection, analysis of collection data/information etc. in which minimum 5 maps and diagrams and 50 pages of write up is necessary.		

(v) Field Study Guide (Faculty) will submit a precise report (1 or 2 pages) of field study work with the list of students present/attended the field study to the HOD concern.

Suggested Readings:

1. Jenson, J.R.: Introduction to Digital Image Processing, Prentice Hall, Englewood Cliffs, NJ.
2. Pratt, W.K.: Digital Image Processing, John Wiley & Sons, New York, 1995.
3. Hord, R.M.: Digital Image Processing of Remotely sensed data, Academic Press, New York, 1989.
4. Nag, P.: Thematic cartography and Remote Sensing Concept, Publishing House, New Delhi.
5. Blackwell, B.: Statistics in Geography, Basil Blackwell Ltd., 1988.
6. Sinha, P.K. & Sinha, P.: Computer Fundamentals, 3rd Ed. B.P.B. Publishing.
7. Lo, C.P.: Applied Remote Sensing, Longman Scientific and Technical, Harlow, ESSEX.
8. PEUQUET, D.J. & Marble, D.F.: Introductory Readings in Geographic Information Systems, Taylor & Francis, Washington, 1990.
9. Spurr, R.: Photogrammetry and Photo Interpretation, The Rolland Press, Co. London, 1960.
10. Cole, J.P. and King, C.A.M.: Quantitative Geography, John Wiley, London, 1968.

Suggested Continuous Evaluation Methods: **Assignment/ Test/ Quiz (MCQ)/ Seminar/ Presentations** (any methods)

Marks distribution of theory examination: **40 marks** by **internal** assessment and **60 marks** by **external** assessment.

<u>Master of Arts/ Science (M.A./M.Sc.) 2 Year</u>		
Theory		
Programme: M.A./M.Sc.	Year: Second	Semester: Third
Subject: Geography		
Course Code: SEOS/GEOG/E004	Course Title: Regional Planning and Development	
Course Learning Objectives: 1. To understand the fundamental concepts, and significance in balanced regional development. 2. To develop knowledge of regional planning methodologies and decentralized scales. 3. To analyse regional development strategies for different geographical settings and sustainable regional development. 4. To evaluate regional disparities, planning challenges, contemporary development policies, and the role of institutions.		
Course Learning Outcomes: 1. Explain the concepts, scope and planning regions of India in the context of regional planning. 2. Apply appropriate regional planning methodologies, and planning processes for spatial and sectoral development. 3. Assess regional development strategies and critically examine planning issues and Himalayan regions. 4. Evaluate regional inequalities, development indicators and contemporary regional development policies.		
Credits: 3		DSE
Max. Marks: 40+60		Min. Passing Marks: 35
Total No. of Lectures- Tutorials - Practical (in hours per week): L-T-4/W		
Unit	Course Contents	
UNIT-I	Concept, scope and types of planning, Regional planning: meaning and needs; Approaches to regional planning; Historical development of regional planning, Planning regions of the India.	
UNIT-II	Methodology and techniques of regional planning; Analytical techniques and procedural techniques; Principles of regionalization; Planning processes- sectoral and spatial planning; Short-term and long-term perspective planning; multi-regional, multi- level and decentralize planning.	
UNIT-III	Regional development strategies: Identification of planning region; Regional Planning strategies for backward areas, hill areas, tribal areas; Problems and prospects of Himalayan region.	
UNIT-IV	Spatial inequalities and regional imbalances in India; Problems of planning regions, indicators and level of regional development; Regional planning and development strategies in the 21st century; NITI Aayog.	
Suggested Readings: 1. Chandna, R. C. (2000): Regional Planning: A Comprehensive Text. Kalyani Publishers., New Delhi. 2. Chaudhuri, J. R. (2001): An Introduction to Development and Regional Planning with special reference to India. Orient Longman, Hyderabad. 3. Cowen, M.P. and Shenton, R.W. (1996): Doctrines of Development. Routledge, London. 4. Doyle, T. and McEachern, D. (1998): Environment and Politics. Routledge, London. 5. Friedmann, J. (1992): Empowerment: The Politics of Alternative Development. Blackwell, Cambridge MA and Oxford. 6. Friedmann, J. and Alonso, W. (ed.) (1973): Regional Development and Planning. The MIT Press, Mass. 7. Hettne, B.; Inotai, A. and Sunkel, O. (eds.) (1999 – 2000): Studies in the New Regionalism. Vol. I-V. Macmillan Press, London. 8. Isard, W. (1960): Methods of Regional Analysis. MIT Press, Cambridge, MA. 9. Kuklinski, A. R. (1972): Growth Poles and Growth Centers in Regional Planning. Mouton and Co., Paris. 10. Kuklinski, A.R. (ed.) (1975): Regional Development and Planning: International Perspective, Sijthoff-Leydor. 11. Leys, C. (1996): The Rise and Fall of Development Theory. Indian University Press, Bloomington, and James Curry, Oxford. 12. Mahapatra, A.C. and Pathak, C. R. (eds.) (2003): Economic liberalization and Regional Disparities in India. Special Focus on the North Eastern Region. Star Publishing House, Shillong. 13. Kane, M. and William M.K.T. (2007): Concept Mapping for Planning and Evaluation, Sage Publications, London.		

14. Misra, R. P. (ed.) (1992): Regional Planning: Concepts, Techniques, Policies and Case Studies. 2nd edition. Concept Publishing Company., New Delhi.
15. Misra, R.P. and Natraj, V.K. (1978): Regional Planning and National Development. Vikas, New Delhi.
16. Misra, R.P., Sundaram, K. V. Pradas Rao, V. L. S. (1976): Regional Development Planning in India. Vikas Publishers, New Delhi.
17. Moseley, M.J., (1974): Growth Centres in Spatial Planning. Pergamon Press, Oxford.
18. Närman, A. and Karunanayake, K. (eds.) (2002): Towards a New Regional and Local Development Research Agenda. Dept. of Geography, Göteborg University (Sweden), series B, No100 and Centre for Development Studies, University of Kelaniya (Sri Lanka), No. 1. Norgaard,
19. R. B. (1994): Development Betrayed. The End of Progress and a Coevolutionary Revisioning of the Future. Routledge, London.
20. Pathak, C. R. (2003): Spatial Structure and Processes of Development in India. Regional Science Association., Kolkata.
21. Sanyal, B. M. (2001): Decentralised Planning: Themes and Issues. Concept Publishing. Company, New Delhi.
22. Sharma, P. V., Rao, V. L., and Pathak, C. R. (eds.) (2000): Sustainable Regional Development (with special reference to Andhra Pradesh). Regional Science. Association, Kolkata and School of Economics, Andhra University, Vishakapatnam.
23. Sen, A. (1999): Development as Freedom. Oxford University Press, Oxford.
24. Sen, A. and Dreze, J. (eds.) (1996): Indian Development: Selected Regional Perspectives. Oxford University Press, Oxford.
25. Smith, D. and Närman, A. (eds.) (1999): Development Theory and Practice: Current Perspectives on Development and Development Co-operation. Longman, London.
26. Stöhr, W. B. and Taylor, D.F.R. (eds.) (1981): Development from Above and Below? The Dialectics of Regional Planning in Developing Countries. John Wiley and Sons, Chichester.
27. Sundaram, K. V. (1997): Decentralized Multilevel Planning: Principles and Practice (Asian and African Experiences). Concept Publishing Company, New Delhi.
28. Sundaram, K. V. (2004): The Trodden Path: Essays on Regional and Micro Level Planning. Anaunya Publications., New Delhi.

Suggested Continuous Evaluation Methods: **Assignment/ Test/ Quiz (MCQ)/ Seminar/ Presentations** (any methods)

Marks distribution of theory examination: **40 marks** by **internal** assessment and **60 marks** by **external** assessment.

<u>Master of Arts/ Science (M.A./M.Sc.) 2 Year</u>		
Theory		
Programme: M.A./M.Sc.	Year: Second	Semester: Third
Subject: Geography		
Course Code: SEOS/GEOG/E005	Course Title: Health and Medical Geography	
Course Learning Objectives: 1. To provide students with a comprehensive understanding of the scope, evolution, and theoretical foundations of medical and health geography. 2. To develop knowledge of epidemiological concepts, disease classification, and global health measurement frameworks. 3. To examine the role of environment, ecology, and socio-economic determinants in shaping health outcomes and inequalities. 4. To analyze health care delivery systems, policies, and reforms in India, with emphasis on the National Health Policy 2017 and National Digital Health Mission. 5. To equip students with geospatial and analytical tools for studying health patterns, disease mapping, and health system performance.		
Course Learning Outcomes: 1. Explain the concepts, evolution, theories, and interdisciplinary nature of Medical and Health Geography, and distinguish it from related disciplines. 2. Analyse the spatial distribution, determinants, and epidemiological patterns of diseases using concepts of epidemiology, disease ecology, and health transition. 3. Evaluate the influence of environmental, socio-economic, demographic, and behavioral determinants on health inequalities and population health outcomes. 4. Assess the organization, functioning, and effectiveness of health care systems, health policies, and public health programmes in India, including the National Health Policy (2017) and the Ayushman Bharat Digital Mission (ABDM). 5. Apply geospatial technologies, GIS, and spatial analytical methods to map disease patterns, assess health care accessibility, and support evidence-based public health planning and decision-making.		
Credits: 4		DSE
Max. Marks: 40+60		Min. Passing Marks: 35
Total No. of Lectures- Tutorials - Practical (in hours per week): L-T-4/W		
Unit	Course Contents	
UNIT-I	Nature, Scope and evolution of medical and health geography, Different perspectives and approaches, basic concepts, epidemiology and public health, epidemics and pandemic, endemic, types of diseases.	
UNIT-II	Morbidity vs mortality, measures of morbidity-rate, ratio, incidence, prevalence, International Classification of Diseases and causes of death, Epidemiological transition model, One health, global health, Global Burden of Disease and Measurements-DALY, HALY.	
UNIT-III	Health inequalities, determinants affecting human health and diseases, human ecology, disease ecology, environment-health relationship, climate change & health, Geospatial methods in applied medical geography.	
UNIT-IV	Health care delivery system, Indian Public Health Standards, challenges in Indian health care system, determinants and measurement of health system performance; human rights approach in health; National & International health policies, National Health Policy 2017 & Ayushman Bharat Digital Health Mission.	
Suggested Readings: 1. Meade, M. S., & Emch, M. (2010). <i>Medical geography</i> (3rd ed.). Guilford Press. 2. Bhunia, G. S., & Shit, P. K. (2019). <i>Geospatial analysis of public health</i> . Springer. https://doi.org/10.1007/978-3-030-01680-7 3. Park, K. (2025). Park's textbook of preventive and social medicine (28th ed.). Banarsidas Bhanot Publishers.		

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6. Omran A. R. (2005). The epidemiologic transition: a theory of the epidemiology of population change. 1971. *The Milbank quarterly*, 83(4), 731–757.
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10. World Health Organization. (2023). *One Health*. <https://www.who.int/health-topics/one-health>
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14. Gwatkin, D.R. (2000). Health inequalities and the health of the poor: what do we know? What can we do? *Bulletin of the World Health Organization* 78(1):3-18.
15. Link, B. G., & Phelan, J. (1995). Social conditions as fundamental causes of disease. *Journal of health and social behavior, Spec No*, 80–94.
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17. Klotz, S., Bielefeldt, H., Schmidhuber, M., & Frewer, A. (Eds.). (2017). *Healthcare as a human rights issue: Normative profile, conflicts and implementation*. transcript Verlag. <https://doi.org/10.1515/9783839440544>
18. Nambiar, D., & Muralidharan, A. (Eds.). (2017). *The social determinants of health in India: Concepts, processes, and indicators*. Springer. <https://doi.org/10.1007/978-981-10-5999-5>
19. Murray, C.J.L., Frenk, J. (2000). A framework for assessing the performance of health systems, *Bulletin of the World Health Organization* 78(6): 717-731. Mills, A., Rasheed, F., Tollman, S. (2006). *Strengthening health systems, In Disease Control Priorities in Developing Countries (2nd Edition)*, pages 87-102, New York: Oxford University Press.
20. Merson, M. H., Black, R. E., & Mills, A. J. (Eds.). (2006). *International public health: Diseases, programs, systems, and policies* (2nd ed.). Jones and Bartlett Publishers.
21. Murray, C.J.L., Saloman, J.A., Mathers, C.D., Lopez, A.D. (2002). *Summary measures of population health: concepts, ethics, measurement and applications*, The World Health Organization: Geneva.
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Suggested Continuous Evaluation Methods: **Assignment/ Test/ Quiz (MCQ)/ Seminar/ Presentations** (any methods)

Marks distribution of theory examination: **40 marks** by internal assessment and **60 marks** by external assessment.

<u>Master of Arts/ Science (M.A./M.Sc.) 2 Year</u>		
Theory		
Programme: M.A./M.Sc.	Year: Second	Semester: Third
Subject: Geography		
Course Code: SEOS/GEOG/E006	Course Title: Cultural Geography	
Course Learning Objectives: 1. To understand the key concept of culture and its various aspects. 2. To discuss the development of culture and cultural values in human history. 3. To study the evolution and types of the human race. 4. To provide a critical understanding of the contemporary issues.		
Course Learning Outcomes: 1. Explain the key concepts related to the field of cultural geography. 2. Elaborate the development of cultural geography. 3. Explain the developmental history of the human being as a race. 4. Explain the contemporary issues related to culture.		
<i>Credits: 4</i>	<i>DSE</i>	
<i>Max. Marks: 40+60</i>	<i>Min. Passing Marks: 35</i>	
<i>Total No. of Lectures- Tutorials - Practical (in hours per week): L-T-4/W</i>		
Unit	Course Contents	
UNIT-I	Cultural Geography: Meaning, Nature & Definition, Concept, Scope and Development; Cultural Landscape; Process of Cultural Evolution; Cultural diffusion.	
UNIT-II	Evolution and Development of Man; Cultural Hearths, Cultural Ecology, Cultural Complexes, Cultural Convergence, Cultural Heritage.	
UNIT-III	Human Races: Definition, Origin, dispersal, Bases of race determination, Types, distribution and theories; Ethnic groups; Languages groups; Religion.	
UNIT-IV	Cultural Realm of the World: Meaning, Concept, Bases of Delimitation and Classification; Contemporary Issues.	
Suggested Readings: 1. Spencer, J.E & thomses, W.I.: Introducing cultural Geography. 2. Rostlund, F. Outline of cultural Geography. 3. Wegner, P. J & Mikesell, M.W[eds] Reading cultural Geography. 4. Frezir, D. E.: Rece and cultural contact in the modern word. 5. Sopher, D.F.: Geography of Religions. 6. Carter G.F.: Man, and the land a cultural Geography. 7. Dhora, F.E. &Sommers L.M. [eds] Cultural Geography selected Readings. 8. Brood, J. M.: Geography of mankind. 9. Jain, J.K. & Vohara, D.M.: Sanaskritbhoogol (hindi). 10. Prasad, Gayatri: Sanskrit bhoogol (hindi)		
Suggested Continuous Evaluation Methods: Assignment/ Test/ Quiz (MCQ)/ Seminar/ Presentations (any methods)		
Marks distribution of theory examination: 40 marks by internal assessment and 60 marks by external assessment.		

Master of Arts/ Science (M.A./M.Sc.) 2 Year Theory			
Programme: M.A./M.Sc.		Year: Second	Semester: Third
Subject: Geography			
Course Code: SEOS/GEOG/E007		Course Title: Political Geography	
Course Learning Objectives: 1. Understand the basic concepts, theories and approaches of Political Geography, including state, territory, boundaries, geopolitics and electoral geography. 2. Analyse contemporary geopolitical processes, territorial issues, international relations and India's strategic position at regional and global levels. 3. Develop the ability to interpret political patterns, electoral changes and spatial issues using geographical perspectives.			
Course Learning Outcomes: 1. Identify the fundamental concepts, terminologies and major theories related to Political Geography and Geopolitics. 2. Explain the relationship between territory, state, boundaries, geopolitical processes and political developments. 3. Apply geographical knowledge to examine contemporary geopolitical issues, electoral patterns and political changes at different spatial levels. 4. Analyze geopolitical situations, border issues, voting behaviour and changing political landscapes through geographical approaches. 5. Evaluate the impact of geopolitical developments, electoral processes and strategic decisions on regional, national and global political systems.			
<i>Credits: 4</i>		<i>DSE</i>	
<i>Max. Marks: 40+60</i>		<i>Min. Passing Marks: 35</i>	
<i>Total No. of Lectures- Tutorials - Practical (in hours per week): L-T-4/W</i>			
Unit		Course Contents	
UNIT-I	Political Geography and Political Space: Meaning, scope, approaches and development; nation, state, territory; spatial organization of states, core areas, core-periphery, buffer states and strategic regions. Classical and contemporary geopolitics: Sea power, Heartland, Spykman's Rimland Theories; Geostrategy and recent geopolitics.		
UNIT-II	Capital city, boundaries and Maritime Space: Types and functions of capital cities; boundaries and frontiers, delimitation and territorial disputes; maritime boundaries, Zones of Sea and Indian Ocean geopolitics. Regional and Emerging Geopolitical Blocs: NATO, SAARC, ASEAN, and OPEC, QUAD and BRICS.		
UNIT-III	Resources, Security and Geopolitics: Colonialism, decolonisation, neo-colonialism, and globalisation; federalism, military alliances, collective security, and the Non-Aligned Movement: water dispute, energy, terrorism, and climate security, India's role in regional and global cooperation.		
UNIT-IV	Electoral geography and representation: Meaning, scope, approaches and development; Constituencies, delimitation, electoral boundaries, gerrymandering and legislative representation; Bases of political parties, voting and electoral change; Voting behaviour: social, economic, demographic, and spatial factors; Emerging political landscape; Delimitation and re-delineation; Electoral reforms; GIS based electoral management.		
Suggested Readings: 1. Acharya, A. (2014). The end of American world order. Polity Press. 2. Adhikari, S. (2017). Political geography. Rawat Publications. 3. Agnew, J. (1994). The territorial trap: The geographical assumptions of international relations theory. Review of International Political Economy, 1(1), 53–80. 4. Agnew, J. (1996). Mapping politics: How context counts in electoral geography. Political Geography, 15(2), 129–146. 5. Agnew, J. (2003). Geopolitics: Re-visioning world politics (2nd ed.). Routledge. 6. Bergman,E.F.: Modern Political Geography, WMC Brown. CO Dobuque, Iowa, 1975. 7. Dalby, S. (2009). Security and environmental change. Polity Press.			

8. Dikshit R.D.: Political Geography- A Century of Progress, sage. New Delhi, 1999.
9. Dikshit, R.D.: RajnitikBhoogol, Tata MaGraw Hill, New Delhi.
10. Dikshit,R.D.: Political Geography-a Contemporary Perspective, Tata MaGraw Hill Pub, New Delhi, 1996.
11. Dodds, K. (2019). Geopolitics: A very short introduction (3rd ed.). Oxford University Press. (OUP Academic)
12. Duggan, N. (Ed.). (2020). BRICS and the evolution of a new world order: Perspectives from Brazil, Russia, India, China and South Africa. Routledge.
13. Dwivedi,R.L.: Political Geography, Chaitanya Publication Allahabad.
14. Election Commission of India. (2023). Delimitation and electoral statistics.
15. Harvey, D. (2003). The new imperialism. Oxford University Press.
16. IPCC. (2023). Climate change 2023: Synthesis report. Intergovernmental Panel on Climate Change.
17. Jaishankar, S. (2020). The India way: Strategies for an uncertain world. HarperCollins India.
18. Johnston, R. J. (2005). Putting voters in their place: Geography and elections. Routledge.
19. Johnston, R. J., & Taylor, P. J. (1979). Geography of elections. Croom Helm.
20. Jonston, R.J.: Geography and the state, Macmillan.
21. Kaplan, R. D. (2010). Monsoon: The Indian Ocean and the battle for the twenty-first century. Random House.
22. Longley, P. A., Goodchild, M. F., Maguire, D. J., & Rhind, D. W. (2015). Geographic information science and systems (4th ed.). Wiley.
23. Ministry of External Affairs, Government of India. (2023). India's Indo-Pacific vision and initiatives.
24. Mohan, C. R. (2012). Samudra Manthan: Sino-Indian rivalry in the Indo-Pacific. Carnegie Endowment for International Peace.
25. Mohan, C. R. (2015). Modi's world: Expanding India's sphere of influence. HarperCollins India.
26. Newman, D. (2006). The lines that continue to separate us: Borders in our "borderless" world. Progress in Human Geography, 30(2), 143–161.
27. Nijman,A.J.: The Geopolitics of Power and Conflict, Belhaven Press, 1993.
28. Nkrumah, K. (1965). Neo-colonialism: The last stage of imperialism. Thomas Nelson & Sons.
29. Norrils R.E.: and Haring, L.L.: Political Geography, Bell and Hawell, 1980.
30. Ó Tuathail, G. (1996). Critical geopolitics: The politics of writing global space. University of Minnesota Press.
31. O'Brien, K., & Williams, M. (2016). Global political economy: Evolution and dynamics (5th ed.). Palgrave Macmillan.
32. Pant, H. V. (2021). Indian foreign policy: An overview. Orient BlackSwan.
33. Prescott, J. R. V. (1987). Political frontiers and boundaries. Routledge.
34. Rogers, P., & Lydon, P. (1994). Water in the Arab world: Perspectives and prognoses. Harvard University Press.
35. Sack, R. D. (1986). Human territoriality: Its theory and history. Cambridge University Press.
36. Scott, D. (2018). The Indo-Pacific in US strategy: Responding to power shifts. Routledge.
37. Short,J.R.: An Introduction to Political Geography, Routledge, London,1982.
38. Sinha, Manorma: Political Geography, Horizen Publication, Allahabad.
39. Taylor, P. J., & Flint, C. (2000). Political geography: World-economy, nation-state and locality (4th ed.). Pearson Education.
40. Taylor, P. J., & Johnston, R. J. (1979). Geography of elections. Croom Helm.
41. United Nations. (1982). United Nations Convention on the Law of the Sea (UNCLOS).
42. Zeitoun, M. (2011). The global water politics of hydropower. Routledge.

<https://carnegieendowment.org/>

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<https://www.ipcc.ch/report/ar6/syr/>

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<https://www.routledge.com/Geopolitics-Re-Visioning-World-Politics/Agnew/p/book/9780415307152>

https://www.un.org/depts/los/convention_agreements/convention_overview_convention.htm

<https://www.upress.umn.edu/book-division/books/critical-geopolitics>

Suggested Continuous Evaluation Methods: **Assignment/ Test/ Quiz (MCQ)/ Seminar/ Presentations** (any methods)

Marks distribution of theory examination: **40 marks** by **internal** assessment and **60 marks** by **external** assessment.

<u>Master of Arts/ Science (M.A./M.Sc.) 2 Year</u>		
Theory		
Programme: M.A./M.Sc.	Year: Second	Semester: Third
Subject: Geography		
Course Code: SEOS/GEOG/E008	Course Title: Urban Geography	
Course Learning Objectives: 1. To understand the meaning, scope, and various approaches of Urban Geography, including its changing paradigms over time. 2. To explore the development of Urban Geography in India, tracing its historical evolution and contemporary trends. 3. To analyze theories of urban origin, urbanization cycles. 4. To study global and Indian trends in urbanization from both historical and spatial perspectives.		
Course Learning Outcomes: 1. Identify and explain the changing paradigms within Urban Geography, illustrating how theoretical frameworks have evolved over time. 2. Evaluate the significance of Urban Geography in the context of India, recognizing its unique challenges and contributions to the discipline & global landscape. 3. Analyse spatial structure and morphology of the cities using classical and contemporary models of urban land use and urban development. 4. Demonstrate effective communication and teamwork through presentations and reports on urban geographical issues.		
Credits: 4		DSE
Max. Marks: 40+60		Min. Passing Marks: 35
Total No. of Lectures- Tutorials - Practical (in hours per week): L-T-4/W		
Unit	Course Contents	
UNIT-I	Meaning, nature and scope of urban geography; Approaches to study urban geography; Urbanisation: concept and characteristics; Theories of urban origin; early Urban Hearths.	
UNIT-II	Trends of urbanisation in developed and developing nations; Concept of Primate City and Rank Size Rule; Concept of City Region; Functional Classification of Towns.	
UNIT-III	Urban Land use Theories: Concept and Characteristics of Central Business District; Morphology of urban place, Concentric Zone Theory, Sector Theory, and Multiple Nuclei Theory; Concept of Centrality: Christaller's Central Place Theory; Rural- Urban Fringe; Concept of Umland, concept of 15 minutes cities.	
UNIT-IV	Urban Problems: Urban Poverty, Housing, Slums, Solid Waste, Transportation and Urban Environment-Case Study of Delhi and Dehradun, Concept of Smart City, Planned cities - Chandigarh and New Tehri, National Urban Policy.	
Suggested Readings: 1. Singh, L.S. and Goiledge, R.G.: Cities, Space and Behaviour: Elements of Urban Geography, Prentice Hall, New Delhi. 2. Mishra, H.N. (ed.): Urban Geography, Heritage. 3. Northam, R.M.: Urban Geography, John Wiley, New York. 4. Short, R.J.: An Introduction to Urban Geography, Routledge and Kegan Paul, London,1984. 5. Johnston, R.J.: City and Society, Hutchinson, London. 6. Herbert, D.T.: Urban Geography: A Social Perspective, David and Charles Newton and Abbot, 1977. 7. Johnston, J.H.: Urban Geography: An Introductory Analysis, Pergamon Press, London,1972. 8. Singh, R.L.: Urban Geography in Development Countries, National Geographical Society of India, Varanasi. 9. Berry, B.J.L. and Harton, F.F.: Geographic Perspective on Urban System, Prentice Hall, Englewood Cliffs, New Jersey, 1970. 10. Ramchandran, R.: Urbanization and Urban System of India, Oxford, New Delhi, 1993. 11. Knox, P.L. and Taylor, P.J.: World Cities in a World System, Cambridge University Press, UK, 1995. 12. Harvey, D.: Social Justice and the City, Arnold, 1973.		
Suggested Continuous Evaluation Methods: Assignment/ Test/ Quiz (MCQ)/ Seminar/ Presentations (any methods)		
Marks distribution of theory examination: 40 marks by internal assessment and 60 marks by external assessment.		

<u>Master of Arts/ Science (M.A./M.Sc.) 2 Year</u>		
Theory		
Programme: M.A./M.Sc.		Year: Second
Semester: Third		
Subject: Geography		
Course Code: SEOS/GEOG/E009		Course Title: Oceanography
Course Learning Objectives: 1. To understand the fundamental principles, scope, and significance of oceanography. 2. To analyze the physical and chemical properties of ocean water and their spatial variations. 3. To study oceanic processes such as currents, tides, and waves, and their influence on global climate. 4. To examine marine resources, oceanic hazards, and sustainable management strategies.		
Course Learning Outcomes: 1. Students will comprehend the structure and configuration of ocean basins and submarine topography. 2. Students will understand oceanic temperature, salinity, circulation systems, and their climatic implications. 3. Students will analyze marine deposits, coral reefs, and resource utilization patterns. 4. Students will evaluate oceanic environmental issues, including pollution, sea-level change, and global warming		
Credits: 4		DSE
Max. Marks: 40+60		Min. Passing Marks: 35
Total No. of Lectures- Tutorials - Practical (in hours per week): L-T-4/W		
Unit	Course Contents	
UNIT-I	Meaning, objectives, scope, and significance of oceanography; submarine topography and ocean floor configuration; sea-floor spreading and plate tectonics and distribution and characteristics of the Pacific, Atlantic, and Indian Ocean basins.	
UNIT-II	Temperature and salinity of ocean water; oceanic circulation: Waves, gyres, currents, and tides; Ocean-atmosphere interaction; Ocean and global climate.	
UNIT-III	Ocean deposits and coral reefs; marine resources: mineral, biotic, and energy resources; marine pollution and ocean dumping; Coastal erosion and management strategies.	
UNIT-IV	Zonation of seas and laws; Tsunami, El Niño & La Niña-modoki, ENSO, ocean dipole phenomena; global warming and sea-level change, ocean acidification and sustainable ocean management policies.	
Suggested Readings: 1. Davis, R. J. A. (1986). <i>Oceanography – An Introduction of the Marine Environment</i>. Wm. C. Brown, Iowa. 2. Griffith, J. F. (1976). <i>Applied Climatology</i>. Oxford University Press, New York. 3. Huntington, E., & Visher, S. S. (1922). <i>Climatic Changes</i>. Yale University Press, New Haven. 4. Hussain, T., & Tahir, M. (2003). <i>Oceanography</i>. Jawahar Publishers, New Delhi. 5. King, C. A. M. (1963). <i>An Introduction to Oceanography</i>. McGraw-Hill, New York. 6. Lamb, H. H. (1972). <i>Climate: Present, Past and Future</i>. Methuen, London. 7. Thurman, H. V. (1978). <i>Introduction to Oceanography</i>. Charles E. Merrill Publishing Co., London. 8. Weyl, P. K. (1970). <i>Oceanography – An Introduction of the Marine Environment</i>. John Wiley & Sons Ltd., London. 9. Barry, R. G., & Chorley, R. J. (1995). <i>Atmosphere, Weather and Climate</i>. Methuen & Co. Ltd., London. 10. Critchfield, H. J. (2002). <i>General Climatology</i>. Prentice Hall of India, New Delhi. 11. Oliver, J. E., & Hiddore, J. J. (2003). <i>Climatology: An Atmospheric Science</i>. Pearson Education, India. 12. Trewartha, G. T. (1954). <i>An Introduction to Climate</i>. McGraw-Hill, New York. 13. Lal, D. S. <i>Climatology</i>. Sharda Pustak Bhawan, Allahabad. 14. Singh, Savindra. (2005). <i>Climatology</i>. Prayag Pustak Bhawan, Allahabad. 15. Lal, D. S. <i>जलवायु विज्ञान (Jalvayu Vigyan)</i>. Sharda Pustak Bhawan, Allahabad. 16. Singh, Savindra. <i>जलवायु विज्ञान (Jalvayu Vigyan)</i>. Prayag Pustak Bhawan, Allahabad. 17. Lal, D. S. <i>Climatology and Oceanography</i>. Sharda Pustak Bhawan, Allahabad. 18. Lal, D. S. <i>जलवायु एवं समुद्र विज्ञान (Jalavayu Evam Samudra Vigyaan)</i>. Sharda Pustak Bhawan, Allahabad. 19. Singh, Savindra. <i>समुद्र विज्ञान (Samudra Vigyan)</i>. Prayag Pustak Bhawan, Allahabad.		
Suggested Continuous Evaluation Methods: Assignment/ Test/ Quiz (MCQ)/ Seminar/ Presentations (any methods)		

Marks distribution of theory examination: **40 marks** by **internal** assessment and **60 marks** by **external** assessment.

<u>Master of Arts/ Science (M.A./M.Sc.) 2 Year</u>		
Practical		
Programme: M.A./M.Sc.	Year: Second	Semester: Third
Subject: Geography		
Course Code: GEOG/DSE02 (P)	Course Title: Advanced Statistical Techniques in Geography	
Course Learning Objectives: 1. To understand the nature, significance, techniques in geographical research. 2. To develop practical skills in using statistical software such as SPSS, R, and Excel. 3. To understand and apply multivariate, point-pattern, GIS and geostatistical techniques.		
Course Learning Outcomes: 1. Identify and analyse different types of geographical data. 2. Apply statistical software and multivariate techniques,. 3. Analyse PCA and PRA analysis and GIS application.		
Credits: 2	DSC	
Max. Marks: 40+60	Min. Passing Marks: 35	
Total No. of Lectures- Tutorials - Practical (in hours per week): L-T-2/W		
Unit	Course Contents	
UNIT-I	Nature and significance of statistical methods, Types of geographical data: spatial and non-spatial data, Statistical software applications-SPSS, R and Excel in geographical research.	
UNIT-II	Introduction to Multivariate Statistical Analysis, Principal Component Analysis, Participatory Rural Appraisal, Applications of GIS and Geostatistics in spatial analysis and decision-making.	
Suggested Readings: 1. Berry, B. J. L., & Marble, D. F. (Eds.). (1968). Spatial Analysis: A Reader in Statistical Geography. Prentice-Hall. 2. Cliff, A. D., & Ord, J. K. (1981). Spatial Processes: Models & Applications. Pion. 3. Davis, J. C. (2002). Statistics and Data Analysis in Geology. John Wiley & Sons. 4. Griffith, D. A. (1987). Spatial Autocorrelation: A Primer. Association of American Geographers. 5. Johnston, R. J. (1978). Multivariate Statistical Analysis in Geography: A Primer on the General Linear Model. Longman. 6. Mitchell, A. (2005). The ESRI Guide to GIS Analysis: Spatial Measurements and Statistics. ESRI Press. 7. Rogerson, P. A. (2015). Statistical Methods for Geography: A Student's Guide. SAGE Publications. 8. Singh, R. L., & Singh, R. P. B. (2015). Elements of Practical Geography. Kalyani Publishers. 9. Waller, L. A., & Gotway, C. A. (2004). Applied Spatial Statistics for Public Health Data. Wiley-Interscience. 10. Webster, R., & Oliver, M. A. (2007). Geostatistics for Environmental Scientists. John Wiley & Sons. 11. DeLyser et al. (2010). SAGE Handbook of Qualitative Geography 12. Clifford & Valentine (2010). Key Methods in Geography 13. Silverman, D. (2011). Interpreting Qualitative Data		
Suggested Continuous Evaluation Methods: Assignment/ Test/ Quiz (MCQ)/ Seminar/ Presentations (any methods)		
Marks distribution of theory examination: 40 marks by internal assessment and 60 marks by external assessment.		

<u>Master of Arts/ Science (M.A./M.Sc.) 2 Year</u>		
Theory		
Programme: M.A./M.Sc.	Year: Second	Semester: Four
Subject: Geography		
Course Code: SEOS/GEOG/C011	Course Title: Geography of Uttarakhand	
Course Learning Objectives: </		

<u>Master of Arts/ Science (M.A./M.Sc.) 2 Year</u> Major (Practical)		
Programme: M.A./M.Sc.	Year: Second	Semester: Four
Subject: Geography		
Course Code: SEOS/GEOG/C012	Course Title: Dissertation	
Course Learning Objectives: To discuss how to write report/dissertation.		
Course Learning Outcomes: To explain the report/dissertation writing process.		
<i>Credits: 5</i>	<i>DSC</i>	
<i>Max. Marks: 40+60</i>	<i>Min. Passing Marks: 35</i>	
Note: Topic of dissertation will be assigned by HOD or Supervisor of the Dept. concerned. HOD will ensure no repetition of topic and area. Dissertation topic will be selected from any core/elective paper offered by the student in semester only. Area of study shall be the Himalaya region preferably. Distribution of marks Periodical presentation (Internal Assessment) by Supervisor - 40 Marks Dissertation (evaluation by external examiner and supervisor jointly) - 50 Marks Power Point/ Viva-voce - 10 Marks		
The project report will involve statement of objectives and scope of field investigation, methods of field work for studies of different scales (Macro, Meso and Micro), Preparation of a questionnaire/schedule, sampling techniques, collection, processing, presentation, analysis and interpretation of data/information. The candidates are required to write a project report on assigned problem involving field investigations.		
1. The candidates are required to submit their project reports one week before the commencement of examination to the concerned head of the department.		
2. Assessment of report will be done by a Board of Examiners, consisting of external examiner and internal examiner.		
3. Power point presentation is must, Separate external examiner will be appointed by the University, Supervisor of dissertation will act as an Internal examiner. In the absence of Supervisor, HOD will act as internal examiner.		
Suggested Continuous Evaluation Methods: Assignment/ Test/ Quiz (MCQ)/ Seminar/ Presentations (any methods)		
Marks distribution of theory examination: 40 marks by internal assessment and 60 marks by external assessment.		

Master of Arts/ Science (M.A./M.Sc.) 2 Year		
Theory		
Programme: M.A./M.Sc.	Year: Second	Semester: Four
Subject: Geography		
Course Code: SEOS/GEOG/C013	Course Title: Bio-Geography	
Course Learning Objectives: 1. To develop an advanced understanding of the spatial and temporal distribution of plants and ecosystems across the earth. 2. To examine the ecological, evolutionary, geological and climate factors that influence species distribution and biodiversity. 3. To assess the role of bio-geography in biodiversity conservation and sustainable natural resource management. 4. To conduct independent research by interpreting biogeographical data and addressing contemporary environmental issues such as climate change, habitat fragmentation, and invasive species		
Course Learning Outcomes: 1. Demonstrate a comprehensive understanding of the concepts, theories, and process governing the distribution of flora, fauna, and ecosystems. 2. Evaluate the influence of climate, evolution and human activities on species distribution and biodiversity patterns at different spatial and temporal scales. 3. Critically assess biodiversity conservation strategies, habitat loss, invasive species, and the impact of climate change using biogeographical principles. 4. Design and carry out biogeographical research by collecting, analysing, interpreting and presenting scientific data in accordance with academic and professional standards.		
Credits: 5		DSE
Max. Marks: 40+60		Min. Passing Marks: 35
Total No. of Lectures- Tutorials - Practical (in hours per week): L-T-5/W		
Unit		Course Contents
UNIT-I	Biogeography: meaning, nature, approaches, significance, and scope; Historical development of Bio-Geographic studies; Recent trends and development in Bio-Geography; Concept of biodiversity and endemism.	
UNIT-II	Ecological Succession: mono-climax and Poly-climax; Ecological Biogeography: Environmental gradients and species distributions; Factors influencing the distribution of life; Biogeographic regions of the world and characteristics.	
UNIT-III	World Distribution of plants and animals; Biodiversity and global climate change; Adaptations of plants and animals to the environment; Biodiversity of Uttarakhand Himalaya;	
UNIT-IV	In situ and ex situ conservation; Conservation of wildlife and forestry; Biodiversity hotspots in India; International and national policies for biodiversity conservation.	
Suggested Readings: 1. Bradshaw, M.J.: Earth and Living Planet, ELBS, London, 1979. 2. Cox, C.B. and Moore, P.D.: Biogeography: An Ecological and Evolutionary Approach, 5th Edition Blackwell, 1993. 3. Hoyt, J.B.: Man, and the Earth, Prentice Hall, USA, 1992. 4. Huggett, R.J.: Fundamentals of Biogeography, Rout ledge, USA, 1998. 5. Bansereau, B.M.: Biogeography-An Ecological perspective, Round Press, New York, 1957. 6. Joy, T.: Biogeography: A study of Plants in the Ecosphere, Oliver & Boyd, Edinburgh, 1977. 7. Mani, M.S. (ed.): Biogeography of India, The Hague, 1975. 8. Martin, C.: Plant Geography, Methuen, London, 1975. 9. Singh, Savindra Jaiv Bhoogol (Hindi). Allahabad, India: Prayag Pushtak Bhawan, 2015 10.L.C. Aggarwal, Biogeography, Rawat publication Jaipur, 2018		
Suggested Continuous Evaluation Methods: Assignment/ Test/ Quiz (MCQ)/ Seminar/ Presentations (any methods)		
Marks distribution of theory examination: 40 marks by internal assessment and 60 marks by external assessment.		

<u>Master of Arts/ Science (M.A./M.Sc.) 2 Year</u>		
Major (Practical)		
Programme: M.A./M.Sc.	Year: Second	Semester: Four
Subject: Geography		
Course Code: SEOS/GEOG/C014 (P)	Course Title: Cartography	
Course Learning Objectives: 1. To develop an advanced understanding of cartographic principles, map design, and spatial data visualization. 2. To train students in conventional and digital cartographic techniques for geographical analysis. 3. To enable students to interpret, and evaluate thematic and digital maps using modern techniques.		
Course Learning Outcomes: 1. Explain the principles of map projections, and visualization. 2. Prepare and interpret topographic, thematic, and digital maps using conventional and GIS-based techniques. 3. Apply cartographic methods for spatial analysis, planning, and decision-making.		
Credits: 3		DSC
Max. Marks: 40+60		Min. Passing Marks: 35
Total No. of Lectures- Tutorials - Practical (in hours per week): L-T-3/W		
Unit	Course Contents	
UNIT-I	Map Projection: Principles and Classification; Mercator’s, Polyconic, Stereographic, Interrupted Mollweide’s and Interrupted Sinusoidal Projection.	
UNIT-II	Slope Analysis: Wentworth’s, Smith’s, Henry-Riaz’s and Robinson’s Methods; Analysis of relief characteristics from contour; Topographic Profile: Transverse, Longitudinal, Serial, Superimposed, Projected and Composite; Area-height, Altimetric Frequency and Hypsometric Curve.	
UNIT-III	Morphometric Analysis: Linear, Areal and Relief; Geomorphic Mapping.	
UNIT-IV	Interpretation of Topographical maps; Topographical mapping; Geological Cross - Section Drawing; Tourist mapping; Service and utility mapping.	
Suggested Readings: 1. Anson R. and Ormelling F. J., 1994: International Cartographic Association: Basic Cartographic Vol. Pregmen Press. 2. Archer, J.E., & Dalton, T.H. (1968). Fieldwork in Geography, London. 3. Campbell, J. (1984). Introductory Cartography, Prentice Hall, Inc., Englewood Cliff, New Jersey. 4. Cuff, D.J., & Mattson, M.T. (1982). Thematic Maps, their Design and Production, Mathuen, New York. 5. Davis, P. (1947). Data Description and Presentation. Oxford University Press. London. 6. Dent B. D., Torguson J. S., and Holder T. W., 2008: Cartography: Thematic Map Design (6thEdition), Mcgraw-Hill Higher Education. 7. Dickinson. G.C. (1968). Statistical Mapping and Presentation of Statistics. Edward Arnold. London. 8. Dickinson, G.C. (1969). Maps and Air Photographs. Edward Arnold. London. 9. Garnett, A. (1930). Geographical Interpretation of Topographical Maps. Harrap. 10. Gupta K.K. and Tyagi, V. C. (1992). Working with Map, Survey of India, DST, New Delhi. 11. Ishtiaque, M., A Textbook of Practical Geography. 12. Khan, J., Hasan, T., & Shamshad. (2014). Scales, Academic Publications. 13. Lawrence. G.R.P. (1971). Cartographic Methods. Methuen, London. 14. Mishra, R.P. & Ramesh, A. (1989). Fundamentals of Cartography. Concept Publishing Company. New Delhi. 15. Monkhouse. F. J. and Wilkinson. H. R. (1963). Maps and Diagrams. Methuen & Co. Ltd. London 16. National Atlas and Thematic Maps Organization (NATMO): National Atlas of India, Calcutta. 17. Raisz. E. (1962). Principles of Cartography. McGraw Hill, New York. 18. Raza, M. (1978). Sources of Economic and Social Statistics of India. Eureka Publication. New Delhi. 19. Rhind D. W. and Taylor D. R. F., (eds.), (1989). Cartography: Past, Present and Future, Elsevier,International Cartographic Association. 20. Robinson. A.H. (1969). Elements of Cartography. John Wiley, New York. 21. Sarkar, A. (2015) Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi. 22. Sharma, J.P. (2024). Prayogik Bhugol (Practical Geography) (Hindi). Rastogi Publications. 23. Sharma, J. P. (2010). Prayogtmak Bhugol ki Rooprekha, Rastogi Publications, Meerut. 24. Singh, L.R. (2010). Fundamentals of Practical Geography. Sharda Pustak Bhawan. 25. Singh, R. L. & Dutta, P K (2012). Prayogatmak Bhugol, Central Book Depot, Allahabad. 26. Singh, L. R. & Singh R. (1977): Manchitra or Pryaogatamek Bhugol , Central Book. Depot, Allahabad.		

Suggested Continuous Evaluation Methods: Assignment/ Test/ Quiz (MCQ)/ Seminar/ Presentations (any methods)
Marks distribution of theory examination: 40 marks by internal assessment and 60 marks by external assessment.

<u>Master of Arts/ Science (M.A./M.Sc.) 2 Year</u>		
Theory		
Programme: M.A./M.Sc.	Year: Second	Semester: Four
Subject: Geography		
Course Code: SEOS/GEOG/E010	Course Title: Rural Geography	
Course Learning Objectives: 1. To understand the concepts, significance and theoretical approaches of Rural Geography and rural settlements. 2. To examine the origin, evolution, morphology, and spatial characteristics of rural settlements in India. 3. To analyse rural land use systems, and sustainable land management practices using geographical approaches. 4. To evaluate the structure of the rural economy and contemporary rural development issues in India and Uttarakhand.		
Course Learning Outcomes: 1. Explain the concepts, scope, significance and approaches of Rural Geography 2. Analyse rural settlement morphology and contemporary transformations in rural landscapes. 3. Assess rural land-use systems, land degradation and sustainable resource management. 4. Evaluate the rural economy for sustainable rural development in India and Uttarakhand.		
Credits: 4	DSE	
Max. Marks: 40+60	Min. Passing Marks: 35	
Total No. of Lectures- Tutorials - Practical (in hours per week): L-T-4/W		
Unit	Course Contents	
UNIT-I	Meaning, nature, scope and significance of Rural Geography; Concepts, approaches and characteristics of Rural Settlements. Histogenesis of Rural Settlements, Sequence of occupancy; Site, situations, size, type, pattern and spacing of rural settlements.	
UNIT-II	Morphology of Rural settlement with special reference to India, House types and field patterns, their categories and related factors; Rural houses in different Geographical environs folk culture and folk architecture, Contemporary transformations in rural settlements.	
UNIT-III	Concepts and classification of rural land use, Agricultural land utilization and cropping systems, Forest land, pasture land, wasteland, and their sustainable management; Land Use and Land Cover-concepts, techniques, changing patterns, Land degradation, land-use conflicts and contemporary issues in agricultural land management.	
UNIT-IV	Rural Economy; Primary occupation Agriculture; Animal husbandry, Transhumance in Himalayan region. Rural handicrafts; economic potential; contemporary issue related to rural economy of India and Uttarakhand. National rural development programmes and policies.	
Suggested Readings: 1. Bhatt H.P. & Bhatt Sangeeta: Environmental Dimensions of Rural Settlements in the Himalaya in 1993. 2. Daniel, P. (2002): Geography of Settlement. Rawat Publications., Jaipur and New Delhi. 3. Ghosh, S. (1999): A Geography of Settlements. Orient Longman, Kolkata. 4. Hudson, F. S. (1976): A Geography of Settlements. MacDonald and Evans, New York. 5. Mitra, A. (1960): Report on House Types and Village Settlement Patterns in India. Publication Division, Govt. of India, New Delhi. 6. Mosley, M.J. (2005): Rural Development: Principles and Practice. Sage Publication, London. 7. Oliver, P. (1987): Dwellings. The House across the World. University of Texas Press, Austin. 8. Rapoport, A. (1969): House, Form and Culture. Prentice-Hall, Inc., 9. Englewood Cliffs, NJ. Rykwert, J. (ed.) (2004): Settlements. University of Pennsylvania Press, University Park, USA. 10. Singh, R.L. (eds.) (1973): Rural Settlements in Monsoon Asia, National Geographical Society of India, Varanasi. 11. Singh, R. L., Singh, K.N. and Singh, Rana P.B., (eds.) (1975): Readings in Rural Settlement Geography, National Geographical Society of India, Varanasi. 12. Singh, R.Y. (2005): Geography of Settlements. Rawat Publications, Jaipur and New Delhi. 13. Singh, S.B. (1977): Rural Settlement Geography. U.B.B.P., Publications, Gorakhpur. 14. Tiwari, R. C. (2000): Settlement Geography; in Hindi. Prayag Pustak Bhawan Allahabad.		

15. Wood, M. (2005): Rural Geography: Processes, Responses and Experiences of Rural Restructuring. Sage Publication, London.
Suggested Continuous Evaluation Methods: Assignment/ Test/ Quiz (MCQ)/ Seminar/ Presentations (any methods)
Marks distribution of theory examination: 40 marks by internal assessment and 60 marks by external assessment.

<u>Master of Arts/ Science (M.A./M.Sc.) 2 Year</u>		
Theory		
Programme: M.A./M.Sc.	Year: Second	Semester: Four
Subject: Geography		
Course Code: SEOS/GEOG/E011	Course Title: Social Geography	
Course Learning Objectives: 1. To introduce students to the fundamental concepts, nature, scope, approaches, and contemporary perspectives of Social Geography. 2. To develop an understanding of the spatial dimensions of social structures, social diversity, inequality, and social transformation. 3. To familiarize students with theories and methods used in analysing social well-being, social development, and social justice from a geographical perspective. 4. To enable students to critically examine social development policies, planning, and regional disparities in India with special reference to Uttarakhand.		
Course Learning Outcomes: 1. To learn the nature, scope, and relevance of Social Geography, its approaches and to understand the different fundamental concepts of Social Geography. 2. To apply social geographical perspective to examine the spatial distribution and diversity, processes of social transformation and social mobility of different social groups in India. 3. To analyse the different indicators of social well-being and social development for detailed understanding of different social issues in India. 4. To evaluate the development policies and planning (in promoting equity and social development) with reference to India and Uttarakhand.		
Credits: 4		DSE
Max. Marks: 40+60		Min. Passing Marks: 35
Total No. of Lectures- Tutorials - Practical (in hours per week): L-T-4/W		
Unit	Course Contents	
UNIT-I	Definition, nature and scope of social geography; concept of place, space and society and relevance of social geography; approaches and methods.	
UNIT-II	Key concepts in social geography- social stratification and differences, social hierarchy, culture, social structure, power structure and space; social ecology and space, mobility and space, social pluralism and diversity.	
UNIT-III	Components of social space in India, process of social transformation- Sanskritization, westernization, modernization, post-modern approaches, social bases of identity; social groups, distribution of castes, tribes and language in India, social factors in region formation; socio-cultural regionalism in India.	
UNIT-IV	Segregation and assimilation; social and spatial justice; inclusion and exclusion, indicators of social well-being and social pathology, problems and processes of socio-economic and political-inequality, social security and protective discrimination, policies and planning with special reference to India and Uttarakhand.	
Suggested Readings: 1. Ahmed, A. (1999). Social Geography, Rawat Publication, Jaipur. 2. Kath Browne, D. Borisa, M. Gilmartin, Niharika Banerjea (2024). Social Geographies the Basics, Routledge, London 3. Social Geography, IGNOU Self Learning Material, https://egyankosh.ac.in/handle/123456789/109916 4. Jones, E. and John Eyles (1979). Social Geography. Oxford University Press, London 5. Harvey, D. (1989). The Condition of Postmodernity: An Enquiry into the Origins of Cultural Change. Oxford: Blackwell. 6. Smith, David M. (1977). Human Geography: A Welfare Approach, Edward Arnold, London		

7. Soja, E. W. (2009). The city and spatial justice. <http://www.jssj.org>.
8. Pirie, G. H. (1983). On Spatial Justice. Environment and Planning : Economy and Space. 15(4)
<https://doi.org/10.1068/a150465>.
9. Crane, R.I. (1973), Regions and regionalism in South Asia Studies: An Exploratory Study, Durham, Duke University.
10. Dube, S.C. (1991), Indian Societies, National Book Trust of India, New Delhi.
11. Kaufmann V. (2005). Re-thinking Mobility. Contemporary Sociology, Hampshire: Ashgate
12. Rawat, P.S. (1993): Migration and structural change a study of rural society in Garhwal Himalaya, Sarita Book House, Delhi, India
13. Indian Institute of Public Administration. (2020). Caste-Based Segregation in Public Spaces. New Delhi: IIPA.
14. Lefebvre, H. (1991). The Production of Space. Blackwell.
15. Pahl, R. E. (1965). 'Trends in Social Geography.', In Chorley, R. J. & Haggett, P. (Eds.). Frontiers in Geographical Teaching., London: Routledge.
16. Sheldon, Eleanor B., and Wilbert E. Moore (Eds.) (1968). Indicators of Social Change: Concepts and Measurements. New York: Russell Sage Foundation.
17. Laitinen, A., & Särkelä, A. (2018). Four conceptions of social pathology. European Journal of Social Theory, 22(1), 80-102.
<https://doi.org/10.1177/1368431018769593> (Original work published 2019)
18. Mukherjee, R. (1979). The construction of social indicators, The Use of Socio-Economic Indicators in Development Planning. Paris: UNESCO, United Nations Educational, Scientific and Cultural Organization, pp. 33 59.
19. Bhagat, R. B. (2023). Population and Political Imagination: Census, Register and Citizenship in India, Routledge, London

Suggested Continuous Evaluation Methods: **Assignment/ Test/ Quiz (MCQ)/ Seminar/ Presentations** (any methods)

Marks distribution of theory examination: **40 marks** by **internal** assessment and **60 marks** by **external** assessment.

Master of Arts/ Science (M.A./M.Sc.) 2 Year Theory			
Programme: M.A./M.Sc.		Year: Second	Semester: Four
Subject: Geography			
Course Code: SEOS/GEOG/E012		Course Title: Agricultural Geography	
Course Learning Objectives: - To understand the concepts, principles, and approaches of sustainable agriculture and agroecosystems. - To examine sustainable farming practices, agricultural innovations, and climate-resilient agricultural strategies. - To analyse the relationship between climate change, agricultural policies, food systems, and sustainable livelihoods. - To evaluate the challenges and prospects of Himalayan agriculture and sustainable mountain development with special reference to Uttarakhand.			
Course Learning Outcomes: - Explain the concepts, principles, and approaches of sustainable agriculture and agroecosystem management. - Evaluate sustainable agricultural practices, innovations, and climate-smart farming strategies. - Analyse the impacts of climate change, agricultural policies, and food systems on agricultural resilience and livelihoods. - Assess the challenges and opportunities of Himalayan agriculture, terrace farming, and sustainable mountain development with special reference to Uttarakhand.			
Credits: 4		DSE	
Max. Marks: 40+60		Min. Passing Marks: 35	
Total No. of Lectures- Tutorials - Practical (in hours per week): L-T-4/W			
Unit		Course Contents	
UNIT-I	Agricultural Geography: Meaning, Nature, Theory, & Philosophies; Origin and Dispersion of Agriculture, Contemporary Agricultural Issues: World, India & Uttarakhand.		
UNIT-II	Agricultural Governance; Growth & Development: Productivity, Crop Diversification, & Specialization; Climate-Smart Agriculture; Precision Agriculture; Circular Agriculture, SDGs 2&3.		
UNIT-III	Agricultural Regionalization: India & World; Crop Combination Region; Agro-Climatic Region; Agricultural policies: India & Uttarakhand.		
UNIT-IV	Agriculture of Uttarakhand: Organic Farming, Horticulture, Mixed Farming; Challenges of Terrace Farming; Sustainable Mountain Agricultural Development.		
Suggested Readings: - Altieri, M. A. (2018). <i>Agroecology: The science of sustainable agriculture</i> (2nd ed.). CRC Press. - Food and Agriculture Organization of the United Nations. (2013). <i>Climate-smart agriculture sourcebook</i>. FAO. - Gliessman, S. R., Engles, E., & Krieger, R. (1998). <i>Agroecology: Ecological processes in sustainable agriculture</i>. CRC Press. - Government of India. (2014). <i>National mission for sustainable agriculture (NMSA): Mission document</i>. Ministry of Agriculture and Farmers Welfare, Government of India. - Intergovernmental Panel on Climate Change. (2019). <i>Climate change and land: An IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems</i>. IPCC. - Lal, R. (2020). Regenerative agriculture for food and climate. <i>Journal of Soil and Water Conservation</i>, 75(5), 123A–124A. https://doi.org/10.2489/jswc.2020.0620A - Pretty, J. (2002). <i>Agri-culture: Reconnecting people, land and nature</i>. Earthscan. - Pretty, J. (2008). Agricultural sustainability: Concepts, principles and evidence. <i>Philosophical Transactions of the Royal Society B: Biological Sciences</i>, 363(1491), 447–465. https://doi.org/10.1098/rstb.2007.2163 - Rahaman, H. Ansari, S. (2025). <i>Sustainable land use practice and agricultural innovation in India: A case study from Murshidabad district of West Bengal</i>. Springer Nature. - Singh, J., & Dhillon, S. S. (2004). <i>Agricultural geography</i> (3rd ed.). Tata McGraw-Hill Education.			
Suggested Continuous Evaluation Methods: Assignment/ Test/ Quiz (MCQ)/ Seminar/ Presentations (any methods)			
Marks distribution of theory examination: 40 marks by internal assessment and 60 marks by external assessment.			

<u>Master of Arts/ Science (M.A./M.Sc.) 2 Year</u>		
Theory		
Programme: M.A./M.Sc.	Year: Second	Semester: Four
Subject: Geography		
Course Code: SEOS/GEOG/E013	Course Title: Remote Sensing and Digital Cartography	
Course Learning Objectives: 1. Understand the principles of Remote Sensing and Digital Cartography. 2. Develop skills in geospatial data acquisition, processing, and visualization.		
Course Learning Outcomes: 1. Explain remote sensing and digital mapping techniques for spatial analysis. 2. Evaluate geospatial applications in research, planning, and resource management		
Credits: 4		DSE
Max. Marks: 40+60		Min. Passing Marks: 35
Total No. of Lectures- Tutorials - Practical (in hours per week): L-T-4/W		
Unit	Course Contents	
UNIT-I	Evolution, concepts, and scope of Remote Sensing, Physics of Electromagnetic Radiation (EMR) and spectral characteristics, Energy-atmosphere-surface interactions, Sensor characteristics and image resolution (Spatial, Spectral, Radiometric, Temporal), Satellite missions and Earth Observation programmes (IRS, Landsat, Sentinel, Cartosat, Resourcesat).	
UNIT-II	Image acquisition, preprocessing, and correction techniques, Image enhancement and transformation, Visual image interpretation and interpretation keys, Digital image classification: Supervised, Unsupervised, and Object-Based approaches, Accuracy assessment and error matrix.	
UNIT-III	Evolution and concepts of Digital Cartography, Digital Elevation Models (DEM), terrain derivatives, and 3D visualization, Land Use/Land Cover (LULC) mapping and change detection analysis, Multi-temporal and multi-spectral data analysis, GIS-based digital mapping concepts.	
UNIT-IV	eospatial database design and management, GPS/GNSS and mobile geospatial data acquisition, Digital map compilation, editing, and database integration, Thematic and analytical mapping techniques, Terrain mapping and cartographic representation, Web Cartography and Geovisualization, Cartographic modelling and spatial decision support, Contemporary trends in Digital Cartography.	
Suggested Readings: 1. Burrough, P. A., & McDonnell, R. A. (1998). Principles of Geographical Information Systems. Oxford University Press. 2. Campbell, J. B., & Wynne, R. H. (2011). Introduction to Remote Sensing (5th ed.). Guilford Press. 3. Lillesand, T. M., Kiefer, R. W., & Chipman, J. W. (2015). Remote Sensing and Image Interpretation (7th ed.). Wiley. 4. Longley, P. A., Goodchild, M. F., Maguire, D. J., & Rhind, D. W. (2015). Geographic Information Science and Systems (4th ed.). Wiley. 5. Jensen, J. R. (2016). Introductory Digital Image Processing: A Remote Sensing Perspective (4th ed.). Pearson. 6. Slocum, T. A., McMaster, R. B., Kessler, F. C., & Howard, H. H. (2022). Thematic Cartography and Geovisualization (5th ed.). CRC Press. 7. Dent, B. D., Torguson, J. S., & Hodler, T. W. (2009). Cartography: Thematic Map Design (6th ed.). McGraw-Hill. 8. Chang, K. T. (2021). Introduction to Geographic Information Systems (10th ed.). McGraw-Hill Education. 9. Joseph, G., & Jagannathan, C. (2018). Fundamentals of Remote Sensing (3rd ed.). Universities Press. 10. Kumar, M. (2018). Digital Cartography. Concept Publishing Company.		
Recommended Software: ✓ QGIS ✓ ArcGIS Pro ✓ ERDAS IMAGINE ✓ SNAP		

✓ Google Earth Pro ✓ Google Earth Engine (Introductory)
Suggested Continuous Evaluation Methods: Assignment/ Test/ Quiz (MCQ)/ Seminar/ Presentations (any methods)
Marks distribution of theory examination: 40 marks by internal assessment and 60 marks by external assessment.

<u>Master of Arts/ Science (M.A./M.Sc.) 2 Year</u>		
Theory		
Programme: M.A./M.Sc.	Year: Second	Semester: Four
Subject: Geography		
Course Code: SEOS/GEOG/E014	Course Title: Geography of Tourism	
Course Learning Objectives: 1. To understand the relationship between Geography and Tourism, including the nature, scope, and significance of Tourism Geography. 2. To explore the concept of tourism and its various types, with a focus on understanding tourism patterns in India, particularly in the Himalayan region. 3. To analyze tourism promotion policies in India, examining their impact on tourism development and sustainability		
Course Learning Outcomes: 1. Demonstrate knowledge of the diverse types of tourism and their patterns in India, with particular emphasis on the Himalayan region, through the determination of tourism patterns. 2. Evaluate the significance of tourism promotion policies in India, understanding their role in shaping tourism development and strategies for sustainable tourism growth.		
<i>Credits: 4</i>		<i>DSE</i>
<i>Max. Marks: 40+60</i>		<i>Min. Passing Marks: 35</i>
<i>Total No. of Lectures- Tutorials - Practical (in hours per week): L-T-4/W</i>		
Unit	Course Contents	
UNIT-I	Geography and Tourism; Nature scope and significance of Tourism Geography; Concept of Tourism; Type of Tourism; Determination of Tourism patterns in India with special reference to Himalaya, Tourism promotion policies in India.	
UNIT-II	Tourism attractions in Uttarakhand - Geographical component; Eco-Tourism; Mass Tourism; Adventure Tourism; Pilgrimage.	
UNIT-III	Tourism Attraction: Switzerland, Singapore, Indonesia, Thailand, Malaysia, Arunachal Pradesh, Assam, Goa, Gujrat, Himanchal Pradesh. Tourism Organization: UNWTO, WTTC, ITDC.	
UNIT-IV	Impact of Tourism in Uttarakhand; economy, environment, society and culture; Tourism Infrastructure; Case Studies of Uttarakhand.	
Suggested Readings: 1. Bhardwaj, D.S. Chaudhary, M.: Contemporary issues in Tourism, Himalaya, Mumbai, 1997. 2. Bhatt, Rajesh and Kumar, K., Uttarakhand Tourism Geography, Research India Press, New Delhi, 2018. 3. Bhatla, A.K.: Tourism Development, Principles and Practices, Sterling, Bangalore, 1989. 4. Cris, Ryan: Recreation Tourism, A Social Science Perspective, Routledge, London, 1991. 5. Garg, N.K.: Tourism and Economics Development, Avishkar, Jaipur, 1996. 6. Hall, C.M: and Page, S.J.: Tourism in South and South East Asia; Issues and Cases Butterworth Heinemann, Oxford, 2001. 7. Kaul, R.K.: Dynamics of Tourism and Recreation, Inter India, New Delhi, 1985.		
Suggested Continuous Evaluation Methods: Assignment/ Test/ Quiz (MCQ)/ Seminar/ Presentations (any methods)		
Marks distribution of theory examination: 40 marks by internal assessment and 60 marks by external assessment.		

<u>Master of Arts/ Science (M.A./M.Sc.) 2 Year</u>		
Theory		
Programme: M.A./M.Sc.	Year: Second	Semester: Four
Subject: Geography		
Course Code: SEOS/GEOG/E015	Course Title: Geography of Transport	
Course Learning Objectives: 1. To introduce students to the basic concepts, scope, and significance of Transport Geography. 2. To understand the different modes of transportation and the transport network in India. 3. To examine the role of transport in regional development, tourism, and the economy, with special reference to Uttarakhand.		
Course Learning Outcomes: 1. Explain the concept, scope, and importance of Transport Geography. 2. Describe the different modes of transport and the transport system in India. 3. Evaluate the role of transport in regional development, tourism, and the economy, and identify the major transport issues of Uttarakhand.		
Credits: 4		DSE
Max. Marks: 40+60		Min. Passing Marks: 35
Total No. of Lectures- Tutorials - Practical (in hours per week): L-T-4/W		
Unit	Course Contents	
UNIT-I	Definition and scope of Transport Geography; Evolution of Transportation: Characteristics and significance of different means of transportation.	
UNIT-II	Structure of transport network; Concept of accessibility and locational utility: concept of gravity potential model and spatial interaction.	
UNIT-III	Transport system in India-Rail, Road, Waterways and Air transport; Major transport routes of the World.	
UNIT-IV	Transport and regional development; Transport planning; transport system and related problems in Uttarakhand; Role of transport in economy and tourism of Uttarakhand.	
Suggested Readings: 1. Hurst, Elliot-Transport Geography: Comments and Readings. 2. Kansky, J. – The structure of transport network. 3. Rolui, R. – The geography of transport. 4. Singh, Jagdish – Transport Geography of South Bihar. 5. Singh, K. N. – Transport network analysis in Geography.		
Suggested Continuous Evaluation Methods: Assignment/ Test/ Quiz (MCQ)/ Seminar/ Presentations (any methods)		
Marks distribution of theory examination: 40 marks by internal assessment and 60 marks by external assessment.		

<u>Master of Arts/ Science (M.A./M.Sc.) 2 Year</u>		
Practical		
Programme: M.A./M.Sc.	Year: Second	Semester: Four
Subject: Geography		
Course Code: GEOG/DSE02 (P)	Course Title: Qualitative Methods in Geography	
Course Learning Objectives: 1. To introduce students to qualitative research traditions in geography 2. To develop skills in qualitative data collection, analysis, and interpretation 3. To understand ethical, positional, and field-based dimensions of research 4. To enable students to design and conduct small-scale qualitative research		
Course Learning Outcomes: 1. Understand the philosophical foundations and approaches of qualitative research 2. Apply qualitative methods such as interviews, ethnography, and observation 3. Critically analyze qualitative data using coding and thematic interpretation 4. Design and present a qualitative research project with ethical considerations		
Credits: 2	DSC	
Max. Marks: 40+60	Min. Passing Marks: 35	
Total No. of Lectures- Tutorials - Practical (in hours per week): L-T-2/W		
Unit	Course Contents	
UNIT-I	Definition, nature and scope of qualitative research in geography; Qualitative vs quantitative vs mixed methods; Positionality, reflexivity, and power relations in research; Tools for data collection: audio-visual methods and focus group discussion.	
UNIT-II	Nature of qualitative data; coding and thematic analysis; discourse and narrative analysis; Use of qualitative data analysis software (basic introduction); Interpretation and representation of qualitative findings.	
Suggested Readings: 1. Hay, I. (2010). Qualitative Research Methods in Human Geography 2. Creswell, J.W. (2009). Research Design 3. DeLyser et al. (2010). SAGE Handbook of Qualitative Geography 4. Clifford & Valentine (2010). Key Methods in Geography 5. Silverman, D. (2011). Interpreting Qualitative Data		
Suggested Continuous Evaluation Methods: Assignment/ Test/ Quiz (MCQ)/ Seminar/ Presentations (any methods)		
Marks distribution of theory examination: 40 marks by internal assessment and 60 marks by external assessment.		



Head
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