National Education Policy-2020

Common Minimum Syllabus for Uttarakhand State Universities and Colleges
Four Year Undergraduate Programme-
FYUP/Honours Programme/Master in Arts

2025

COURSE STRUCTURE FOR FYUP/MASTER'S

DEPARTMENT OF GEOGRAPHY
SOBAN SINGH JEENA, UNIVERSITY
ALMORA

COMMITTEE OF BOARD OF STUDY

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NEP Tentative Course Structure
Geography

Sem	**Core** Discipline Specific Course (DSC) (4)	Discipline Specific Elective Course (DSE) 4	Generic Elective (GE) 4	Ability Enhancement Course (AEC) 2	Skill Enhancement Course (SEC) (2)	Internship/ Apprenticeship/Project (IAPC) (2)	Value Added Course (VAC) (2)	Total Credit
I	DSC A1 (4) **GG.DSC01-T: Theory (3)- Physical Geography** **GG.DSC01-P: Practical (1) -Basic Cartographic Techniques**	**X**	Choose one from a pool of courses GE-1 (4) **GG.GE01-T: Geomorphology**	Choose one from a pool of AEC courses (2)	Choose one from a pool of SEC courses **2**	**X**	Choose one from a pool of courses (2)	
	DSC B1 (4)							
	DSC C1(4)							
	12		**4**	**2**	**2**		**2**	**22**
II	DSCA2 (4) **GG.DSC02-T: Theory (3) –Human Geography** **GG.DSC02-P: Practical (1) –Research Methodology**	**X**	Choose one from a pool of courses GE-2 (4) **GG.GE02-T: Social and Cultural Diversity of Uttarakhand**	Choose one from a pool of AEC courses (2)	(SEC2) Choose one from a pool of SEC courses	**X**	Choose one from a pool of courses (2)	
	DSCB2 (4)							
	DSCB3 (4)							
	12		**4**	**2**	**2**		**2**	**22**
								Total 44

Sem.	Core Discipline Specific Course (DSC) 4	Discipline Elective Course (DSE) 4	Ability Enhancement Course (AEC) 2	Skill Enhancement Course (SEC) 2	Internship/ Apprentice ship/Project (IAPC) (2)	Value Added Course (VAC) 2	Total Credit
III	DSC A3 (4) **GG.DSC03-T:** **Theory (3) – Evolution of Geographical Thought** **GG.DSC03-P:** **Practical (1) – Surveying Technique** DSC B3 (4) DSC C3 (4)	Choose one from pool of courses, DSE – 1 of A or B or C (4) **GG.DSE03-Ti:** **DSE(3) - Climatology** **GG.DSE03-Pi:** **Pract. (1) : Indian Weather Maps and Representation of Climatic data** **GG.DSE03-Tii:** **DSE(3) - Bio –Geography** **GG.DSE04-Pii:** **Pract. (1): Measurement of Biodiversity** OR Choose one from pool of courses, GE -3 (4) **GG.GE03-T:** **GE-World Regional Geography**	Choose one from a pool of AEC courses (2)	(SEC3) Choose one from a pool of SEC courses	**X**	Choose one from a pool of courses (2)	
	12	**4**	**2**	**2**		**2**	**22**
IV	DSC A4 (4) **GG.DSC04-T:** **Theory (3) Economic Geography** **GG.DSC04-P:** **Practical (1) - Basic computer Application and Quantitative Techniques** DSC B4 (4) DSC C4 (4)	Choose one from pool of courses, DSE – 2 (4) **GG.DSE04-Ti:** DSE(3) **- Geography of Tourism** **GG.DSE04-Pi:** **Pract. (1) :** Schematic Representation of Tourism Data **GG.DSE04-Tii:** DSE**- Regional Planning & Development** **GG.DSE04-Pii:** **Pract. (1)** : Models & Regional Disparities OR in the alternative choose one from pool of courses GE - 4 (4) **GG.GE04-T:** GE**-Environmental Geography**	Choose one from a pool of AEC courses (2)	(SEC 4) Choose one from a pool of SEC courses	**X**	Choose one from a pool of courses (2)	
	12	**4**	**2**	**2**		**2**	**22**
							Total 88

Sem.	Core Discipline Specific Course (DSC) 4	Discipline Specific Elective (DSE) 4	Generic Elective 4	Skill Enhancement Course (SEC) 2	Internship/ Apprentice ship/Project (IAPC) (2)	Value Added Course (VAC) 2	Total Credits
V	DSC A5 (4) **GG.DSC05-T:** **Theory- (3)** **Geography of India** **GG.DSC05-T:** **Practical (1) -Map Projection** DSC B5 (4) DSC C5 (4)	Choose one from a pool of courses DSE (4) **GG.DSE05-Ti:** **DSE (3) - Agricultural Geography** **GG.DSE05-Pi:** **Pract. (1): Agricultural Data Analysis** **GG.DSE05-Tii:** **DSE(3) –Mountain Geography with special reference to the Himalaya** **GG.DSE05-Pii:** **Pract. (1): Field Visit and Report Writing** Or Choose one from a pool of courses GE-5 (4) **GG.GE05-T:** GE-**Settlement Geography**		(SEC 5) Choose one from a pool of SEC courses	Choose one SEC OR Internship/Apprenticeship/Project/Community Outreach (IAPC) (4)*	**X**	
	12	**4**		**2**	**4**		**22**
VI	DSC A6 (4) **GG.DSC06-T:** **Theory-(3)** **Geoinformatics** **GG.DSC06-P:** **Practical (1) -** **Remote Sensing and GIS Exercise** DSC B6 (4) DSC C6 (4)	Choose one from a pool of courses DSE - 4 (4) **GG.DSE06-Ti:** **DSE(3) - Rural Geography** **GG.DSE06-Pi:** **Pract. (1): Surveying** **GG.DSE06-Tii:** DSE**- Introduction to Cryogeography** **GG.DSE06-Pii:** **Pract. (1): Glacial Data Analysis and Mapping** **or** Choose one from a pool of courses GE-6 (4) **GG.GE06-T:** GE**- Socio Cultural Geography**		(SEC 6) Choose one from a pool of SEC courses	Choose one SEC OR Internship/Apprenticeship/Project/Community Outreach (IAPC) (4)	**X**	
	12	**4**		**2**	**4**		**22**
							Total 132

Sem.	Core Discipline Specific Course (DSC)	DSC/GE 4		Total

	4			Credit
VII	DSC7 (3+1=4) **GG.DSC07-T:** **<u>Theory (3)-</u> Advanced Geomorphology** **<u>Practical-(1)</u>** **GG.DSC07-P:** **Mapping of Landforms**	Choose three DSE (3x4) courses OR Choose two DSE- (2x4) and one GE (4) course OR Choose one DSE (4) and two GE (2x4) courses (total = 12) **GG.DSE07-Ti:** **DSE (3) -Urban Geography** **GG.DSE07-Pi:** **Pract. (1): Urban Data Analysis** **GG.DSE07-Tii:** **DSE (3) -Climate Change and Adaptation** **GG.DSE07-Pii:** **Pract: Exercises based of Climatological Data** **GG.DSE07-Tiii:** **DSE (3) – Paleogeography** **GG.DSE07-Piii:** **Pract. (1): Introduction to Dating Techniques and Methods** **GG.GE07-Ti:** **GE- Remote Sensing** **GG.DSE07-Tii:** **GE- Emerging Geographical thoughts**	Dissertation on Major (6) OR Dissertation on Minor (6) OR Academic project/ Entrepreneurship (6)	
	4	**12**	**6**	**22**
VIII	DSC8 (3+1=4) **GG.DSC08-T:** **<u>Theory (3)-</u> GIS and GPS** **GG.DSC08-P:** **<u>Practical (1)</u>** **GIS & GPS/DGPS Mapping**	Choose three DSE (3x4) courses OR Choose two DSE- (2x4) and one GE (4) course OR Choose one DSE (4) and two GE (2x4) courses (total = 12) **GG.DSE08-Ti:** **DSE (3) – Aeolian Geomorphology** **GG.DSE08-Pi:** **Pract. (1): Identification of Aeolian Landforms and Mapping** **GG.DSE08-Tii:** **DSE (3) - Soil Geography** **GG.DSE08-Pii:** **Pract. (1): Identification of Soil Characteristics** **GG.DSE08-Tiii:** **DSE (3) - Environmental Management & Sustainable Development** **GG.DSE08-Piii:** **Pract.(1): Field Visit and Report writing** **GG.GE08-Ti:** **GE - Political Geography** **GG.GE08-Tii:** **GE - Oceanography**	Dissertation on Major (6) OR Dissertation on Minor (6) OR Academic project/ Entrepreneurship (6)	
	4	**12**	**6**	**22**
				Total 176

Sem.	Core Discipline Specific Course (DSC) 4	DSE/GE 4		Total Credit
IX	DSC9 (3+1=4) **GG.DSC09-T:** **Theory (3)** **Regional Geography of India** **GG.DSC09-P:** **Practical (1)** **Field Survey and Report Writing**	Choose three DSE (3x4) courses OR Choose two DSE- (2x4) and one GE (4) course OR Choose one DSE (4) and two GE (2x4) courses (total = 12) **GG.DSE09-Ti:** **DSE(3) Natural Resource Management** **GG.DSE09-Pi:** **Pract.(1): RS and GIS Application** **GG.DSE09-Tii:** **DSE(3) -Fluvial Geomorphology** **GG.DSE09-Pii:** **Pract. (1): Drainage Basin Morphometry** **GG.DSE09-Tiii:** **DSE(3) - Population Geography** **GG.DSE09-Piii:** **Pract. (1): Population Data Analysis** **GG.GE09-Ti:** **GE- Cultural Geography** **GG.DSE09-Tii:** **GE- Geography of Uttarakhand**	Dissertation on Major (6) OR Dissertation on Minor (6) OR Academic project/ Entrepreneurship (6)	
	4	**12**	**6**	**22**
X	DSC10 (3+1=4) **GG.DSC10-T:** **Theory (3) Hydrology** **GG.DSC10-P:** **Practical (1) Hydrological Data Analysis**	Choose three DSE (3x4) courses OR Choose two DSE- (2x4) and one GE (4) course OR Choose one DSE (4) and two GE (2x4) courses (total = 12) **GG.DSE10-Ti:** **DSE(3) - Glacial and Periglacial Geomorphology** **GG.DSE10-Pi:** **Pract. (1):Landform identification and mapping** **GG.DSE10-Tii:** **DSE (3) -Integrated Watershed Management** **GG.DSE10-Pii:** **Practical (1): Watershed Management** **GG.DSE10-Tiii:** **DSE(3) -Agricultural Geography and Agro-Ecosystem Management** **GG.DSE10-Piii:** **Pract. (1): Agricultural Statistics** **GG.GE10-Ti:** **GE - Conceptual Foundations & Perspectives of Sustainable Development** **GG.GE10-Tii:** **GE- Disaster Management**	Dissertation on Major (6) OR Dissertation on Minor (6) OR Academic project/ Entrepreneurship (6)	
	4	**12**	**6**	**22**
				Total 220

PROGRAMME OUTCOMES [POs]:

PO1: Enrichment of Intellectual Ability: The programme develops students' comprehensive understanding of the various dimensions of geographical and interdisciplinary knowledge and field realities. It acquaints students with the major concepts, thoughts, and ideas of both conventional and modern branches of Geography and interdisciplinary streams of knowledge, and their field applications. It also enriches their analytical, critical, creative faculties.

PO2: Inculcation of Planning Abilities: The programme develops effective planning abilities including time management, resource management, delegation skills and organizational skills of students which may develop their leadership qualities.

PO3: Appropriate Application of Knowledge Methodological Tools: The programme makes a sincere attempt of familiarizing students with critical knowledge and methodological tools which help them in making applications of new ideas, thoughts, and concepts in the real world.

PO4: Formation of Professional Identity: The programme intends to develop professional skills among students that would help them in building their professional identity as well becoming professional leadership from local to global level.

PO5: Developing Communicative Competence: The programme intends to develop grammatical and communicative competence among students and make them aware of the nature, form and function of Hindi and English languages. The programme therefore nurtures listening, writing, speaking and reading skills of students which allow them to communicate effectively and improves their access to new knowledge.

PO6: The knowledge, Knower and Society: The programme disseminates the fact the conception and distribution of knowledge in any form seems meaningless unless it is seen functioning in a society which is defined by the existence of human beings. Thus, the programme intends to integrate knowledge with the human society and nature. This will help in Creating a Sustainable, Flexible, Enduring and Peaceful Global Society.

PO7: Environment and Sustainability: The unprecedented growth and development have disrupted the nature as well as natural resources. In view of this, the programme intends to prepare students to respond to some major issues of environmental conservation and sustainable development. PO8: Lifelong Learning: The programme would motivate and inspire the students to strive on the path of lifelong learning as creation and acquaintance of emerging knowledge and ideas.

Programme Specific Prerequisites: To acquire a Certificate in Science/Arts, with geography as one of the major subjects, a student should have passed 10+2 or equivalent subjects.
Programme specific outcomes (PSOs*): UG I Year / Certificate course Arts/Science*
1. Student will gain the knowledge of Physical Geography. Student will have a general understanding about the geomorphological and geotechnical process and formation. They will be able to correlate the knowledge of physical geography with the human geography. 2. Imbibing knowledge, skills and holistic understanding of the Earth, atmosphere, oceans and the planet through analysis of landform development; crustal mobility and tectonics, climate change and dynamics; soil formation and classification; hydrological and oceanographic studies etc. 3. Associating landforms with structure and process; establishing man-environment relationships; and exploring the place and role of Geography vis-a-vis other social and earth sciences. 4. They will be able to acquire the knowledge of Human Geography and will correlate it with their practical life. 5. Student will be able to analyse the problems of physical as well as cultural environments of both rural and urban areas. Moreover, they will try to find out the possible measures to solve those problems. 6. Students will be able to learn various Field Survey Techniques with diverse Survey Instruments. 7. Students will be able to learn the application of various modern instruments (GPS) and by these they will be able to collect primary data. 8. Students having applied geomorphological knowledge can work independently and will contribute significantly on multidisciplinary streams.
Programme Specific Prerequisites: To acquire Diploma in Science/Arts, with geography as one of the major subjects, a

student should have obtained Certificate Course in Arts/Science from any recognized university.
Programme specific outcomes (PSOs): *UG II Year/ (Diploma in Arts/Science)*
1. Student will have a general understanding about the Tourism Geography of any region. They will be able to correlate the knowledge of Tourism Geography with the Regional Development and Planning. 2. Students will be able analyze the prospects and potential of tourism in Uttarakhand State. Moreover, they will try to find out the possible contribution of tourism development in regional development and planning. 3. Expertise in Statistical Techniques will be useful in quantitative assessment of the geographical data the students can be able to justify their research outcomes which will ultimately contribute to the proper formulation of developmental plans. 4. The earth is three dimensional, and it is a challenge to show information in 3D to communicate with others. The map projection techniques will be helpful to put the earth on the flat surface which makes it easier for all to understand. The map projection techniques the students will be able to map and communicate the geographical information of any region and any plans they have for solving problems that arise.

Programme Specific Prerequisites: To acquire a Bachelor of Arts/Science degree, with geography as one of the major subjects, a student should have obtained Diploma Course in Arts/Science from any recognized university.
Programme specific outcomes (PSOs): UG III Year / Bachelor of Arts/Science
1. Inculcating a tolerant mindset and attitude towards the vast socio-cultural diversity of India by studying and discussing contemporary concepts of social and cultural geography. Understanding and accounting for regional disparities, poverty, unemployment and the impacts of globalization. Explaining and analyzing the regional diversity of India through interpretation of natural and planning regions. 2. Understanding the role and functioning of global economies, industrial locations; and the use and exploitation of resources with impacts. 3. Understanding the history of the subject; over viewing ancient and contemporary geographical thought and its relationship with modern concepts of empiricism, positivism, radicalism, behaviouralism, idealism etc. 4. Students correlate activity of agriculture and its determinants, classify various types of agriculture in the world and differentiate,

Discuss the problems and prospects of agriculture, Acquire new

5. methods, techniques and trends used in agriculture, Understand the concept of sustainable agricultural development.
6. Conduct Social Survey Project: They will be eligible for conducting social survey project which is needed for measuring the status of development of a particular group or section of the society
7. Training in practical techniques of mapping, cartography, software's, interpretation of maps, photographs and images etc; so as to understand the spatial variation of phenomena on the Earth's surface.

Programme Specific Prerequisites: To acquire Bachelor (Research) of Arts/science degree, in Geography, a student should have obtained three-year Bachelor of Arts/Science degree from any recognized university.

Programme specific outcomes (PSOs): ***UG IV Year / Bachelor of Arts/Science (Honors/Research)***

1. The course intended to establish foundation of research in geographical sciences by teaching advanced core and sub-disciplines of Geography.
2. The students are enabled to engage in laboratory and field survey together to enhance their knowledge in applied geography subjects, such as Demographic science, Advanced Geospatial science.
3. Introduction of Geospatial science encouraged students to participate in advance surveying techniques for better understanding the current scenario and helps them to collect research specific data.
4. The purpose of this course is to introduce students to the process of conducting Physical and social geography research projects. The student will be to conceptualize, design and execute a research project by a teacher guide.
5. The students have to identify the objectives related to the topic of research project proposed.

Programme Specific Prerequisites: To acquire Master of Arts/Science, in Geography, a student should have obtained three-year Bachelor of Arts/Science and one year Bachelor (research) of Arts/Science from any recognized university. Student should have research-oriented aptitude for gaining the advanced knowledge in the subject field so that he/she can apply the gained knowledge to resolve related research and professional issues.
Programme specific outcomes (PSOs): P*G I Year / Master of Arts/Science in Geography*
1. Establish the position of Geography as a subject and its importance and interrelationships that reiterate and validate the Man Environment relationship. 2. In the course of field surveys, students acquire a greater understanding of the socio-economic and cultural dimensions of the populations with greater focus on marginalized section of society. 3. Physical field surveys enable the students to understand the landforms, geomorphic process and associated hazards. 4. Provide training to students in handling modern instruments and methods like Aerial Photographs, Satellite Imagery, Total Station and Meteorological instruments. 5. Computer-based techniques (RS & GIS) are incorporated in the syllabus which prepares the students for further analytical studies. 6. The students are directed towards problem analysis so that they can design and conduct independent research. 7. The comprehensive syllabus promotes and develops a thorough knowledge of concepts, methods and theory. 8. The Ability Enhancement Course strives to develop communication powers in the student, both written and oral. 9. The Dissertations written by the students prepare them to examine social and environmental issues along with the causes, consequences and remedial measures emerging at local and national levels. 10. The syllabus is oriented towards emerging job opportunities and future prospects for the students.

DEPARTMENT OF GEOGRAPHY
B.A./B.Sc.
(Semester I & II)

Sem	**Core** Discipline Specific Course (DSC) (4)	Discipline Specific Elective Course (DSE) 4	Generic Elective (GE) 4	Ability Enhancement Course (AEC) 2	Skill Enhancement Course (SEC) (2)	Internship/ Apprenticeship/Project (IAPC) (2)	Value Added Course (VAC) (2)	Total Credit
I	DSC A1 (4) **GG.DSC01-T: Theory (3)- Physical Geography GG.DSC01-P: Practical (1) -Basic Cartographic Techniques**	**X**	Choose one from a pool of courses GE-1 (4) **GG.GE01-T: Geomorphology**	Choose one from a pool of AEC courses (2)	Choose one from a pool of SEC courses **2**	**X**	Choose one from a pool of courses (2)	
	DSC B1 (4)							
	DSC C1(4)							
	12		**4**	**2**	**2**		**2**	**22**
II	DSCA2 (4) **GG.DSC02-T: Theory (3) –Human Geography GG.DSC02-P: Practical (1) – Research Methodology**	**X**	Choose one from a pool of courses GE-2 (4) **GG.GE02-T: Social and Cultural Diversity of Uttarakhand**	Choose one from a pool of AEC courses (2)	(SEC2) Choose one from a pool of SEC courses	**X**	Choose one from a pool of courses (2)	
	DSCB2 (4)							
	DSCB3 (4)							
	12		**4**	**2**	**2**		**2**	**22**
								Total 44

DEPARTMENT OF GEOGRAPHY
B.A./B.Sc Geography
DISCIPLINE SPECIFIC CORE COURSE (DSC) Physical Geography

Programme: Under Graduate in Arts/Science	**Year: I**	**Semester: I Paper:**
Subject: Geography	**Course Code: GG.DSC01-T**	**Course Title: Physical Geography**

Course Outcomes
Holistic understanding of Earth as a planet in the Solar System and its relationships with other terrestrial planets. Understanding of the processes occurring in lithosphere, hydrosphere, biosphere, and atmosphere

Theory- (Credit-3)	**Distribution of marks according the University rule**
Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Units	Course Contents	Lectures
Unit – I	Meaning, Scope and Branches of Physical Geography, Origin of Earth. Geological Time Scale, Interior of the earth, Rocks: origin and classification.	15
Uni t – II	Origin of continents and ocean basins: Isostasy, Continental drift and Plate Tectonics, Landforms: Fluvial, Arid, Glacial, Marine and Karst topographies, Ocean bottom topography, Ocean deposits, Salinity, Temperature, Ocean currents, Tides and Coral reefs.	15
Unit – III	Composition and structure of atmosphere, Insolation, Vertical and Horizontal Distribution of temperature, Pressure and pressure belts, Winds: Planetary, Periodic and Local. Humidity, Clouds and Precipitation, Cyclones and Anticyclones.	15
Practical (Credit-1) **GG.DSC01-P**	**Course Title: Basic Cartographic Techniques** Scale and its type, Nature and scope of cartography, Cartographic representation of relief: Hachures, Contours, Form line, Spot height, Bench mark, Trig point, Layer tint; Indian topographical map system: Their classification and types. Interpretation of topographical maps and preparation of base map, index map, drainage map, topographic map, land use map, settlement map and transportation network map.	30

Suggested Reading:

1. Barry, R.G. and Chorley, R.J. (1998). Atmosphere, Weather and Climate. Routledge, London.
2. Bryant, H. Richard (2001). Physical Geography Made Simple. Rupa and Co., New Delhi.
3. Bunnett, R.B. (2003). Physical Geography in Diagrams, Fourth GCSE edition, Pearson Education (Singapore) Pvt Ltd.

4. Garrison T (1998). Oceanography. Wordsworth Cp, Bedmont.
5. Karlekar Shrikant (2019), Introduction to Physical Geography, Daimond Publication, Pune
6. Lutgens, F.K. and Tarbuck, E.J., (2007), The Atmosphere, Pearson Prentice Hall, New Jersey.
7. Lake, P. (1979). Physical Geography (English & Hindi Edition) Cambridge Univ. Press, Cambridge.
8. Monkhouse, F I (1979). Physical Geography, Methuen, London.
9. Singh, S. (2003). Physical Geography (English and Hindi Editions) Prayag Pustak Bhawan, Allahabad.
10. Singh, M.B. (2001) Bhoutik Bhoogol, Tara Book Agency, Varanasi.
11. Strahler, A.N. and Strahler A.M. (1992). Modern Physical Geography, John Wiley and Sons, New York
12. Wooldridge, S.W. and Morgan, R.S. (1959). The Physical Basis of Geography: An Outline of Geomorphology.Longman, London.

DEPARTMENT OF GEOGRAPHY
B.A./B.Sc
GENERIC ELECTIVE (GE) – Geomorphology

Programme: Under Graduate in Arts/Science	**Year: I**	**Semester: I Paper-**
Subject: Geography	**Course Code: GG.GE01-T**	**Course Title: Geomorphology**

Course Outcomes
Understanding of landforms their origin and forces responsible for shaping the landforms. Understanding of the conceptual and dynamic aspects of landform development.

Theory- (Credit-4)	**Distribution of marks according the University rule**
Total No. of Lectures – Tutorials – Practical (in hours per week): 4-0-0	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Unit	Course Content	Lectures
Unit – I	Definition, subject matter and Scope of Geomorphology, Principle of Uniformitarianism ; Cycle concepts, Views of W.M. Davis, Penk and L C King	15
Unit – II	Crustal Deformation Theories and Principles: Wegner's Continental Drift Theory , Sea Floor Spreading and Convection current Theory of Holmes	15
Unit – III	Mass wasting Processes; Fluvial and Aeolian Landforms	15
Unit – IV	Glacial and Periglacial landforms	15

Suggested Readings:

1. Bloom, A.L. (1992) Geomorphology - A Systematic Analysis. PHI, New Delhi
2. Chorley R J (1972 Spatial Analysis in Geomorphology. Methuen London
3. Cooke R U & Doornkamp, J C (1974) Geomorphology and Environmental Management: An Introduction, Clarendon Press, Oxford.
4. Condie, K.C. 2003. Plate Tectonic and Crustal Evolution, Butterworth-Heinemann, Oxford, Burlington
5. Fairbridge, R W (1968) Encyclopedia of Geomorphology, Reinholdts, New York
6. Huggett, R.J. 2011. Fundamentals of Geomorphology, Routledge, New York.
7. Kale, V. and Gupta, A. (2001): Elements of Geomorphology. Oxford University Press, Delhi.
8. Pitty, A F (1971) Introduction to Geomorphology. Methuen, London

9. Sparks, B.W. (1960) Geomorphology. Longman, London
10. Singh, S. (2004): Geomorphology, Prayag Pustak Bhawan, Allahabad
11. Thornbury, W.D. (1960) Principles of Geomorphology, John Wiley, New York

DEPARTMENT OF GEOGRAPHY
B.A./B.Sc
DISCIPLINE SPECIFIC CORE COURSE (DSC) Human Geography

Programme: Under Graduate in Arts/Science	**Year: I**	**Semester: II Paper-**
Subject: Geography	**Course Code: GG.DSC02-T**	**Course Title: Human Geography**

Course Outcomes
Introduction to Human Geography. This course aims to bring forward the complex and dynamic behavior and nature of Humans in reference to their surroundings. Also to understand the interaction of Humans with its surroundings.

Theory- (Credit-3)	**Distribution of marks according the University rule**
Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Units	Contents	Lectures
Unit – I	Definition and Scope of Human Geography; Human Versus Physical Geography; Branches of Human Geography; Development of Human Geography.	14
Unit – II	Contributions of German and French and Indian Geographers; Schools: Determinism, Possibilism and Positivism; Approaches: Ecological, Landscape, Locational, Welfare and Humanistic.	16
Unit – III	Evolution of Man: Classification of Races, Characteristics of Races and their World Distribution, Human Adaptation to the Environment; Tribes of India: Habitat, Economy and Culture.	15
Practical (Credit-1) **GG.DSC02-P**	**Course Title: Research Methodology** Research and its Types, Tools and techniques of data collection, construction of survey schedule, types of sampling, secondary sources of data; Final report writing	30

Suggested Reading:

1. Hussain, M. (1994): Human Geography. Rawat Publication, Jaipur.
2. Norton W. (1995). Human Geography. Oxford University Press, New York.
3. Kaushik, S.D. and Sharma, A.K. (1996): Principles of Human Geography (Hindi), Rastogi Publication Meerut.
4. Singh, K.N. and Singh J. (2001). Manviya Bhoogol. Gyanodaya Prakashan, Gorakhpur.
5. Haggett, P. (2004). Geography: A Modern Synthesis. Harper and Row, NewYork
6. Singh, L.R. (2005): Fundamentals of Human Geography. Sharda Pustak Bhawan, Allahabad.
7. Singh, J. (2009). मानव भूगोल, Radha Publication.
8. Hushain, M. (2012). Human Geography/ मानव भूगोल (English/Hindi). Rawat Publication, New Delhi.

9. Maurya, S.D. (2021). मानव भूगोल में मॉडल, सिद्धांत एवं नियम, Pravalika Publications.
10. Upadhyay, P.K. (2022). Manav Bhugol ke Pramukh Siddhant, K.K. Publication.
11. Mamoriya, C. (2023). Human Geography, Sahitya Bhawan Publications.
12. Mourya, S.D. (2023). मानव भूगोल, Generic Publication.
13. Singh, V.N. and Singh, M.K. (2021). मानव भूगोल का स्वरुप, Pravalika Publications.
14. Bhalla, L.R. (2022).मानव भूगोल, Kuldeep Publication

DEPARTMENT OF GEOGRAPHY

B.A./B.Sc

GENERIC ELECTIVE (GE) - Social and Cultural Diversity in Uttarakhand

Programme: Under Graduate in Arts/Science	**Year: I**	**Semester: II Paper-**
Subject: Geography	**Course Code: GG.GE02-T**	**Course Title: Social and Cultural Diversity in Uttarakhand**

Course Outcomes

To establish basic understanding on socio-economic setup of Uttarakhand and its diversity.
To understand the physical and cultural diversity within the state.
To identify the impact of physical diversity in determining the Socio-Cultural diversity of the state.

Theory- (Credit-4)	**Distribution of marks according the University rule**
Total No. of Lectures – Tutorials – Practical (in hours per week): 4-0-0	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Unit	Course Content	Lectures
Unit – I	Fundamental Base: Location and Extent; Geology; Physiography; Climate and Drainage System; Demographic and Socio-cultural Characteristics.	15
Unit – II	Socio-cultural Milieu: Ethnic/tribal Groups and their Spatial Distribution, Fairs, Festivals and Languages and Dialects, Settlements: Types and Patterns.	15
Unit – III	Socio-cultural Diversity: Components of social diversity; tribes and their distribution; Tribal region; Cultural regions: elements of cultural regionalization: race, caste, dance, music, cuisine, costumes, dialect, language, religion	15
Unit – IV	Regional perspectives: Socio-cultural diversity in the tribal groups of mountains and foothills; Changing cultural adaptations.	15

Suggested Readings

1. Singh O.P. (ed.). (1983): The Himalaya: Nature, Man and Culture
2. Joshi, S.C. (2001): Uttaranchal: Environment & Development
3. Planning Commission (1981) : Report on Development of Tribal Areas, Government of India.
4. Srivastava, S.K.(1958): The Tharus, A study of Culture Dynamics, Agra
5. Walton, H.G. (1921) British Garhwal: A Gazetteer, Vol. xxxvi, District Gazetteer of the United Provinces of Agra, Allahabaad
6. Singh, L.R. (1965): The Tarai Region of U.P., Allahabad
7. Guha, B.S.: Racial Elements in India's Population.

DEPARTMENT OF GEOGRAPHY
B.A./B.Sc.
(Semester III & IV)

Sem.	Core Discipline Specific Course (DSC) 4	Discipline Elective Course (DSE) 4	Ability Enhancement Course (AEC) 2	Skill Enhancement Course (SEC) 2	Internship/ Apprentice ship/Project (IAPC) (2)	Value Added Course (VAC) 2	Total Credit
III	DSC A3 (4) **GG.DSC03-T: Theory (3) – Evolution of Geographical Thought** **GG.DSC03-P: Practical (1) – Surveying Technique**	Choose one from pool of courses, DSE – 1 of A or B or C (4) **GG.DSE03-Ti: DSE(3) - Climatology** **GG.DSE03-Pi: Pract. (1) : Indian Weather Maps and Representation of Climatic data** **GG.DSE03-Tii: DSE(3) - Bio –Geography** **GG.DSE03-Pii: Pract. (1): Measurement of Biodiversity** OR Choose one from pool of courses, GE -3 (4) **GG.GE03-T: GE-World Regional Geography**	Choose one from a pool of AEC courses (2)	(SEC3) Choose one from a pool of SEC courses	**X**	Choose one from a pool of courses (2)	
	DSC B3 (4)						
	DSC C3 (4)						
	12	**4**	**2**	**2**		**2**	**22**

IV	DSC A4 (4) **GG.DSC04-T:** **<u>Theory</u> (3)** **Economic Geography** **GG.DSC04-P:** **<u>Practical (1) -</u>** **Basic computer Application and Quantitative Techniques** DSC B4 (4) DSC C4 (4)	Choose one from pool of courses, DSE – 2 (4) **GG.DSE04-Ti:** DSE(3) **- Geography of Tourism** **GG.DSE04-Pi:** **Pract. (1) :** Schematic Representation of Tourism Data **GG.DSE04-Tii:** DSE**- Regional Planning & Development** **GG.DSE04-Pii:** **Pract. (1)** : Models & Regional Disparities OR in the alternative choose one from pool of courses GE - 4 (4) **GG.GE04-T:** GE**-Environmental Geography**	Choose one from a pool of AEC courses (2)	(SEC 4) Choose one from a pool of SEC courses	OR Internship/Apprenticeship/Project/Community Outreach (IAPC) (2) **X**	Choose one from a pool of courses (2)	
	12	**4**	**2**	**2**		**2**	22
							Total 88

DEPARTMENT OF GEOGRAPHY
B.A./B.Sc
DISCIPLINE SPECIFIC CORE COURSE (DSC) Evolution of Geographical Thought

Programme: Under Graduate in Arts/Science	**Year: II**	**Semester: III Paper-**
Subject: Geography	**Course Code: GG.DSC03-T**	**Course Title: Evolution of Geographical Thought**

Course Outcomes

1. Main objectives of this course are to acquaint the students with the philosophy.
2. Also teach the Methodology and historical development of geography as a professional field.
3. The idea is to address the spirit and purpose of the changing geographies and to what we as geographers contribute towards knowledge production.
4. Know the impact of expedition, discoveries and exploration on Geographical knowledge.

Theory- (Credit-3)	**Distribution of marks according the University rule**
Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Units	Contents	Lectures
Unit – I	Definition and purpose of Geography, Science and philosophy of Geography, The basic concepts of Geography, Techniques and tools in Geography, Different branches of Geography, Aspects of study and Relationship with other Sciences.	14
Uni t – II	Geography in classical times: Greek and Roman Geographers, Contribution by Arab and Indian Geographers, Renaissance, Eighteenth century Geography, Classical period of Geography.	16
Unit – III	Formulation of scientific Geography, Schools of thought; German, French, British, American and former Soviet Union; Environmental determinism, Possibilism and Neo-determinism	15
Practical (Credit-1) **GG.DSC03-P**	**Course Title: Surveying Technique** i. Fundamentals of Surveying: Objects, Classification. ii. Plane Table Surveying: Radiation, Intersection, Close Traverse, Open Traverse, Resection by two point and three-point problems; Measurement of height and depth by Indian Pattern Clinometer.	30

Suggested Readings

1. Abler, Ronald; Adams John S. Gould, Peter (1971) Spatial Organization: The Geographer's View of the world. Prentice Hall.N.I.
2. Ali.S.M: The Geography of Puranas (1996) People of Publishing House, Delhi.
3. Husain, Majid. (2002): Evolution of Geographical Thought, Rawat Publications, Jaipur.
4. Amedeo, Douglas (1971) An Introduction to scientific Reasoning in Geography, John Wiley, USA.
5. Dikshit, R. D. (2003): Geographical Thought. A Critical History of Ideas. Prentice-Hall of India, New Delhi. (in English and Hindi). Hartshone, R. (1959) Perspectives on Nature of Geography, Rand Mcnally &co.
6. Husain, M. (1984) Evaluation of Geographical thought, Rawat Publication, Jaipur.
7. Johston,R.J.(1983)PhilosophyandHumanGeography,EdwardArnoldLondon,Johnston
8. R.H. (1988) The future of Geography, Methuen, London.
9. Rawling, E. and Daugherty, R. (eds.) (2005): Geography into the Twenty-first Century. 2nd edition. John Wiley and Sons, Chichester.
10. Mishull, R. (1970) The Changing Nature of Geography, Hutchinson University library, London.
11. Adhikari S. (1992): Geographical Thought, Chiatanya Pub. House, Allahabad.
12. Chorley, R.J. & Hagget.P.(1965) Frontier in Geographical Teaching, Oxford University Press.
13. Singh, Ravi S. (ed.) 2009: Indian Geography in the 21st Century: The Young Geographers Agenda. Cambridge Scholars Publishing, New Castle upon Tyne (UK).

DEPARTMENT OF GEOGRAPHY
B.A./B.Sc
DISCIPLINE SPECIFIC ELECTIVE (DSE) Climatology

Programme: Under Graduate in Arts/Science	**Year: II**	**Semester: III Paper-**
Subject: Geography	**Course Code: GG.DSE03-Ti**	**Course Title: Climatology**

Course outcomes

On successful completion of this course, students should be able to understand the mean global atmospheric circulations and disturbances, world climate systems, climatic variability and change.

Theory-(Credit-3)	**Distribution of marks according the University rule**
Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Units	Contents	Lectures
Unit – I	Nature and scope of climatology, General circulation of the atmosphere, The monsoon, Local winds, Humidity, Fog and clouds, Precipitation, Cyclones and anticyclones	15
Unit – II	Atmospheric Processes: Air masses, fronts and associated atmospheric disturbances; concepts and methods of determining evaporation; evapotranspiration and moisture indices.	15
Unit – III	Classification of climate: Koeppen classification and Thornthwaite classification, Climate type and their distribution, Climate change.	15
Practical (Credit-1) **GG.DSE03-Pi**	**Course Title: Indian weather maps and Representation of Climatic Data:** Interpretation and preparation of weather report, Climatograph, Climograph, and Hythergraph.	30

Suggested Readings:

1. Aguado, E. Burt, J.E. (2001): Understanding Weather and Climate, Prentice Hall of India Pvt. Ltd, New Delhi.
2. Critchfield, H.J. (1983): General Climatology, Prentice Hall of India, New Delhi.
3. Lal, D. S. 2003. Climatology, Allahabad: Sharda Pustak Bhawan.
4. Oliver John, E. and Hidore John, J. (2003): Climatology, Pearson Education.

5. Subramanyam (1983): General Climatology, Heritage, New Delhi.
6. Singh Savindra 2015. Paryawaran Bhoogol, Prayag Pushtak Bhawan, Allahabad (Hindi).
7. Parmesan, C., Yohe, G. 2003. A globally coherent fingerprint of climate change impacts across natural systems. Nature, Inaugurating 421 (6918), 37–42.
8. Trewartha, G.T. and Horn, L.A. (1980): An Introduction to Climate, Mc Graw Hill, New York.

DEPARTMENT OF GEOGRAPHY
B.A./B.Sc
DISCIPLINE SPECIFIC ELECTIVE (DSE) Bio-Geography

Programme: Under Graduate in Arts/Science	**Year: II**	**Semester: III Paper-**
Subject: Geography	**Course Code: GG.DSE03-Tii**	**Course Title: Bio-Geography**
Course Outcomes Developed the concept of biogeography. Its components, interpretation and application of biogeography. Interaction between living organisms and non-living organisms.		
Theory- (Credit-3)	**Distribution of marks according the University rule**	
Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**	

Unit	Course Content	Lectures
Unit – I	Fundamental Concepts: Concept, Scope, Significance and Development of Biogeography; Environment, Habitats and Plant-animal Association.	14
Unit – II	Biosphere & bio-geography-concept, scope and components, Ecosystem concept, component and functioning, Distribution of plants in different ecosystem and ecological conditions, Distribution of animals in different ecosystem and ecological conditions.	16
Unit – III	National Forest and Wildlife Policy of India, Conservation of biotic resources. Protected Areas and their management with special reference to National Parks and Biosphere Reserves of Uttarakhand.	15
Practical (Credit-1) **GG.DSE03-Pii**	**Course Title: Measurement of Biodiversity** – Alpha diversity, Beta diversity, Gamma diversity, Identification of plant type/class growing in and around your college/campus and their habitat characteristics.	30

Suggested Readings:

1. Agarwal, D.P. (1992) : Man and Environment in India Through Ages, Books and Books.
2. Bradshaw, M.J. (1979): Earth and Living Planet, ELBS, London.
3. Cox, C.D. and Moore, P.D. (1993): Biogeography: An Ecological and Evolutionary Approach, 5th Edn., Blackwell.
4. Gaur, R. (1987): Environment and Ecology of Early Man in Northern India, R.B. Publication, Corporation.
5. Hoyt, J.B. (1992): Man and the Earth, Prentice Hall, U.S.A.
6. Odum, P. E. and Barret, W. G. (2005): Fundamentals of Ecology, Thomson Asia Pvt Ltd, Singapur.
7. Hugget, R.J. (1998): Fundamentals of Biogeography, Routledge, U.S.A.
8. Sivaperuman, Chandrakasan et al. 2018. Biodiversity and Climate Change Adaptation in Tropical Islands. Academic Press, London.

DEPARTMENT OF GEOGRAPHY
B.A./B.Sc
GENERIC ELECTIVE (GE) – World Regional Geography

Programme: Under Graduate in Arts/Science	**Year: II**	**Semester: III Paper-**
Subject: Geography	**Course Code: GG.GE03-T**	**Course Title: World Regional Geography**

Course Outcomes

1. Students will get an introduction to the main regions of the world in terms of both their uniqueness and similarities.
2. Students will be exposed to historical, economic, cultural, social and physical characteristics of different regions of the world.
3. Evaluating the impacts of human activities on natural environments special reference to global regions.

Theory-(Credit-4)	**Distribution of marks according the University rule**
Total No. of Lectures – Tutorials – Practical (in hours per week): 4-0-0	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Units	Contents	Lectures
Unit – I	Meaning and scope of Regional Geography, Regions and regionalism, Globalization and WTO	15
Unit – II	Europe: A geographical introduction, Physical structure, Economic and demographic pattern, Regional study of United Kingdom.	15
Unit – III	North America: A geographical introduction, Physical structure, Economic and demographic pattern, Regional study of United States of America.	15
Unit – IV	Latin America: A geographical introduction, Physical structure, Economic and demographic pattern, Regional study of Brazil.	15

Suggested Readings:

1. Hobbs, J J (2007) World regional geography. Wadsworth publishing con inc
2. Hobbs, J J (2012) Fundamentals of world regional geography. Brooks cole
3. Fouberg, E H & Moseley W G (2016) Understanding world regional geagraphy. Wiley
4. Johnson, D L, Haarmann & Johnson M L (2015) World regional geography: a development approach. Pearson
5. Saksena, H M, Saksena, & Saksena, Pooja (2010) Vishwa ka pradeshik bhugol. Rastogi publication, Meerut.
6. di Blij, H. and Muller, O. (1993): Geography: Regions and Concepts. John Wiley and Sons, New York.
7. Jackson, R. H. and Husman, L. E. (1991): World Regional Geography: Issues for Today. John Wiley and Sons, New York.

8. Jones, P. and Bryan, P. (1954): North America: An Historical, Economic and Regional Geography, Methuen and Company. Ltd, London.
9. Stamp, L. D. (1976): Asia: A Regional and Economic Geography, Methuen, London

DEPARTMENT OF GEOGRAPHY

B.A./B.Sc

DISCIPLINE SPECIFIC CORE COURSE (DSC) Economic Geography

Programme: Under Graduate in Arts/Science	**Year: II**	**Semester: IV Paper-**
Subject: Geography	**Course Code: GG.DSC04-T**	**Course Title: Economic Geography**

Course Outcomes

Economic geography is the study of the spatial distribution of economic activity and development. It also helps us to identify and measure the industrial specialization of a given region and the regional concentration. And how in an increasingly globalized world, economic activities occur unevenly over geographical space

Theory- (Credit-3)	**Distribution of marks according the University rule**.
Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Units	Contents	Lectures
Unit – I	Meaning, aim and scope of economic geography; Resources: Meaning, classification, conservation	15
Uni t – II	Primary production, Vegetation & forest economy, Soil resources, Mineral resources (Iron ore and bauxite), Power resources (Coal, Petroleum and Hydroelectricity).	15
Unit – III	Main crops in the world: Wheat, paddy, sugarcane, coffee and tea; Industries: Iron & steel, textiles, petro-chemical and sugar.	15
Practical (Credit-1) **GG.DSC04-P**	**Course Title: Basic computer Application and Quantitative Techniques:** Computer and its application: Components of a Computer, Computer Software. Data: Meaning, and Types, Collection of data, Sampling Techniques and Methods, Measures of central tendency: Mean, Mode, and Median; Measures of dispersion; Mean Deviation, Quartile Deviation and Standard deviation.	30

Suggested Reading:

1. Alexander, I W (1988) Economic Geography. Prentice Hall, New Delhi.
2. Boesch, H (1964) A Geography of World Economy. Von Nostrand, New York.
3. Gautam, A (2006) Arthik Bhugol ke Mool Tatve. Sharda Pustak Bhawan, Allahabad.
4. Hartshorne, TA & Alaxender IW (1988) Economic Geography. Englewood Cliff, New Jersey.
5. Singh, KN and Singh I (2003) Arthik Bhugol ke Mool Tatve. Gyanodaya Prakashan,Gorakhpur
6. Hanink, D. M. (1997): Principles and Applications of Economic Geography: Economy, Policy, Environment. John Wiley and Sons, Inc, New York.
7. Hartshorne, T. A. and Alexander, J. W. (1988): Economic Geography (3rd revised edition) Englewood Cliff , New Jersey, Prentice Hall
8. Hudson, R. (2005): Economic Geographies: Circuits, Flows and Spaces. Sage Publications, London.

9. Knowles, R, Wareing, J. (2000): Economic and Social Geography Made Simple, Rupa and Company, New Delhi.
10. Sokal, Martin 2011. Economic Geographics of Globalisation: A short Introduction. Cheltenham, UK : Edward El

DEPARTMENT OF GEOGRAPHY
B.A./B.Sc
DISCIPLINE SPECIFIC CORE COURSE (DSE) Geography of Tourism

Programme: Under Graduate in Arts/Science	**Year: II**	**Semester: IV Paper-**
Subject: Geography	**Course Code: GG.DSE04-Ti**	**Course Title: Geography of Tourism**

Course Outcomes
Introduction to the subject is helps us identify and understand geographical approaches to tourism and categories of tourism places, spaces and landscapes. It will also help to learn to comprehend the possibilities and unforeseen challenges in travel and tourism activity.

Theory- (Credit-3)	**Distribution of marks according the University rule**.
Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Unit	**Tourism Geography**	Lectures
Unit - I	Concept of Leisure and Tourism; Development of Tourism; Types of Tourism; Definition, Scope and Significance of Geography of Tourism; Geographical, Basis of Tourism; Resources and Infrastructure for Tourism: Transportation, Accommodation and Basic Infrastructure.	16
Unit- II	Impact of Tourism: Physical, Economic, Social and Cultural Impacts; Concept of Ecotourism; New Emerging Trends in Tourism.	14
Unit – III	Tourism Marketing: Marketing Concepts and Marketing in Tourism; The Tourist Product; Segmentation- A Priori Segmentation; Tourism Circuits; Tour Agencies. Components of a Tourism Plan, The Tourism Planning Process.	15
Practical (Credit -1) **GG.DSE04-Pi**	**Course Title: Schematic Representation of Tourism Data**: Preparation of line, bar, and pie diagrams of tourism data and analysis. Preparation of flow, proportional circle and choroschematic maps by using tourism data and interpretation.	30

Suggested Reading:

1. Bhatia A.K. (1978). Tourism in India. Sterling pub. New Delhi.
2. Burkarl, A.J. (1974). Tourism, Past, present and future Heineman London.
3. Gearing Charles, E (1976). Planning for Tourism development Praeger Pub, NewYork
4. Lawbon, F &Bauet B. (1977) Tourism and recreation Development mass, CBI pub.
5. Robinson H. (1976). A Geography of Tourism. MacDonald and Evans Ltd; London.
6. Douglas Pearce (1981). Topics in Applied Geography, Tourist Development. Longman London New York

7. Stephen L.J. smoth (1989). Tourism Analysis: A Handbook-Longman Scientific of Telchnical.
8. Ministry of Tourism Govt. of India (1999): Report on National Tourism.
9. Seth, P. N., (1992), Successful Tourism Management Vol. 1 & 2, Sterling Publications, Delhi
10. Pande, G.C. and D.C. Pandey (1999). Environmental Development and Management: Strategies and Policies, New Delhi.

DEPARTMENT OF GEOGRAPHY
B.A./B.Sc
DISCIPLINE SPECIFIC CORE COURSE – 1 (DSE) Regional Planning and Development

Programme: Under Graduate in Arts/Science		**Year: II**	**Semester: IV Paper-**
Subject: Geography		**Course Code: GG.DSE04-Tii**	**Course Title: Regional Planning and Development**
Course Outcomes Regional planning helps us to understand concepts, and theoretical approaches related to regional development and planning. It involves the efficient placement of land-use activities, infrastructure, and settlement growth across a larger area of land.			
Theory-(Credit-3)	**Distribution of marks according the University rule**.		
Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1		**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**	

Units	Contents	Lectures
Unit I	Regional concept in Geography: Concept, Scope & purpose of regional planning, Types of regions: Formal and functional; uniform and nodal, single purpose and composite region.	14
Unit II	Regional Planning: Planning process - sectoral, temporal and spatial dimensions; short-term and long-term perspective planning, Indicators of development and their data sources, measuring levels for regional development and disparities	16
Unit III	Regional development strategies: Regional planning and development in India through Five year plans and NITI Ayog, problems and prospects, Regional disparities: causes and consequences. Concept of Multi-level planning: Decentralized planning; Theories and Models for Regional Planning: Growth Pole Model of Perroux; Myrdal, Rostow and Friedmann	15
Practical (Credit-1) **GG.DSE04-Pii**	**Course Title: Models & Regional Disparities:** Exercises on gravity model, measure of centrality, location quotient analysis, and cell model. Measurement of Regional Disparities –Quartile index method, aggregation of relative scores method, standard deviation method, range categorization method.	***30***

Suggested Reading:

1. Chitambar, J.B. (1993) Introductory Rural Sociology, Wiley Eastern, New Delhi.
2. Goomen, M.A. and Datta, A. (1995) Panchayats and their Finance, Rawat Pub. Co., New Delhi.
3. Matthews G. (editor) (1995) Status of Panchayati Raj: 1994, Institute of Social Sciences / Rawat Pub. Co.,New Delhi.

4. Matthews A. (1994) Panchayati Raj: From Legislation to Movements, Rawat Pub. Co., New Delhi:
5. Misra, H.M. (ed) (1987) Contributions to Indian Geography, Volume 9: New Delhi.
6. De Blij, H.J. and Muller, P.O. (1997) Geography: R.R.C, 8th edition, J. W. & S. Ltd., NewYork.
7. Dickinson, J., Gould, B., Clarke, C., Mather, S., Prothero, M., Siddle, D., Smith, C. and Thomas-Hope, E. (1996) A Geography of the Third World, 2nd edition, Routledge, London
8. Bhat, L.S. (1972) Regional Planning in India, Indian Statistical Institute, Calcutta.
9. Bhat, L.S. (2003) Micro Planning: A Case Study of Karnal Area, KB Publications, New Delhi.
10. Chand, M. and Puri, V.K. (2004) Regional planning in India; Allied Publishers, New Delhi.
11. Chandana, R. C. (2005) Regional Development and Planning. Kalyani Publishers, New Delhi.
12. Dube, K.K. and Singh, M.B. (1986): Pradeshik Niyojan. Tara Book Agency, Varanasi.
13. Friedman, J.& Alonse, W. (1968) Regional Development & Planning, M.I.T. Press, Cambridge Massachusetts.
14. Kuklinski, A.R. (ed.) (1975) Regional Development & Planning: International Perspectives.
15. Kuklinski, A.R. (1972) Growth Centres in Regional Planning. Mounton and Company, Paris.
16. Mishra, R.P, Sundaram, K.V., and Prakasarao, V.L.S. (1976) Regional Development Planning in India, Vikas Publishers., New Delhi.
17. Mishra, R.P. (1969) Regional Planning. University of Mysore, Mysore.
18. Mishra, R.P. (2002) Regional Planning, Concepts, Techniques, Policies and Case Studies, Concept Publishing Company, New Delhi.
19. Pandey, D.C. and P.C. Tiwari (1989) Dimensions of Development Planning, Volumes I and II, New Delhi.
20. Singh O.P. and D.C. Pandey (1986) Development Planning: Theory and Practice, Nainital.
21. Sharma, P.R. (ed.) (1993) Regional Policies and Development in the Third World. Rishi Publication.,Varanasi.
22. Sundaram, K.V. (1977) Urban and Regional Planning in India, Vikas Publishers. New Delhi.
23. Sundaram, K.V. (1997) Decentralized Multilevel Planning: Principles and Practice. Asian and African Experience. Concept Publishing Company, New Delhi.

DEPARTMENT OF GEOGRAPHY
B.A./B.Sc
General Elective (GE) Environmental Geography

Programme: Under Graduate in Arts/Science	**Year: II**	**Semester: IV Paper-**
Subject: Geography	**Course Code: GG.GE04-T**	**Course Title: Environmental Geography**

Course Outcomes
Environmental geography is the study of the spatial interactions between the natural world and humanity. It describes the components of the environment, human interactions with those components, and the spatial variation of these components across the Earth's surface.

Theory- (Credit-4)	**Distribution of marks according the University rule**.
Total No. of Lectures – Tutorials – Practical (in hours per week): 4-0-0	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Unit	Contents	Lectures
Unit - I	Definition, Scope and evolution of Environmental Geography, Concepts of Environmental Geography, Environment, Man and environmental processes.	15
Unit- II	Ecosystem: Food chains, Trophic levels and Productivity, Energy flow, Circulation of element and Geobiochemical cycle.	15
Unit – III	Ecosystem services, Biomes, Bio-diversity, Soil system, Man and climate.	15
Unit – IV	Environmental degradation, Environmental events and hazards, Environmental pollution, Environmental conservation and planning. Environmental Programmes and Policies – Global, National and Local levels	15

Suggested Reading:

1. Chandna R. C., 2002: Environmental Geography, Kalyani, Ludhiana.
2. Botkin, D B and Keller E A (1982) Environmental Studies. Bell & Howell Co, London
3. Chanlett, E T (1979) Environmental Protection. McGraw Hill, New York
4. Garrels T A (1975) Chemical Cycle and the Global Environment. William Kaufmann,California
5. Cunninghum W. P. and Cunninghum M. A., 2004: Principals of Environmental Science: Inquiry and Applications, Tata Macgraw Hill, New Delhi.
6. Goudie A., 2001: The Nature of the Environment, Blackwell, Oxford.
7. Singh, R.B. (Eds.) (2009) Biogeography and Biodiversity. Rawat Publication, Jaipur
8. Miller G. T., 2004: Environmental Science: Working with the Earth, Thomson BrooksCole, Singapore.

9. MoEF, 2006: National Environmental Policy-2006, Ministry of Environment andForests, Government of India.
10. Singh, R.B. and Hietala, R. (Eds.) (2014) Livelihood security in Northwestern Himalaya: Case studies from changing socio-economic environments in Himachal Pradesh, India. Advances in Geographical and Environmental Studies, Springer
11. Odum, E. P. et al, 2005: Fundamentals of Ecology, Ceneage Learning India.
12. Singh S., 1997: Environmental Geography, Prayag Pustak Bhawan. Allahabad.
13. UNEP, 2007: Global Environment Outlook: GEO4: Environment For Development, United Nations Environment Programme.
14. Singh, M., Singh, R.B. and Hassan, M.I. (Eds.) (2014) Climate change and biodiversity: Proceedings of IGU Rohtak Conference, Volume 1. Advances in Geographical and Environmental Studies, Springer
15. Singh, Savindra 2001. Paryavaran Bhugol, Prayag Pustak Bhawan, Allahabad. (in Hindi)

DEPARTMENT OF GEOGRAPHY
B.A./B.Sc.
(Semester V and VI)

Sem.	Core Discipline Specific Course (DSC) 4	Discipline Specific Elective (DSE) 4	Generic Elective 4	Skill Enhancement Course (SEC) 2	Internship/ Apprenticeship/Project (IAPC) (2)	Value Added Course (VAC) 2	Total Credits
V	DSC A5 (4) **GG.DSC05-T: <u>Theory-</u> (3) Geography of India GG.DSC05-T: <u>Practical (1) -</u> Map Projection** DSC B5 (4) DSC C5 (4)	Choose one from a pool of courses DSE (4) **GG.DSE05-Ti: DSE (3) - Agricultural Geography GG.DSE05-Pi: Pract. (1): Agricultural Data Analysis GG.DSE05-Tii: DSE(3) –Mountain Geography with special reference to the Himalaya GG.DSE05-Pii: Pract. (1): Field Visit and Report Writing** Or Choose one from a pool of courses GE-5 (4) **GG.GE05-T:** GE-**Settlement Geography**		(SEC 5) Choose one from a pool of SEC courses	Choose one SECmOR Internship/Apprenticeship/Project/Community Outreach (IAPC) (4)*	**X**	
	12	**4**		**2**	**4**		**22**
VI	DSC A6 (4) **GG.DSC06-T:**	Choose one from a pool of courses DSE - 4 (4)		(SEC 6) Choose one	Choose one SEC OR		

	<u>Theory-</u>(3) Geoinformatics **GG.DSC06-P: <u>Practical (1) -</u> Remote Sensing and GIS Exercise** DSC B6 (4) DSC C6 (4)	**GG.DSE06-Ti:** **DSE(3) - Rural Geography** **GG.DSE06-Pi:** **Pract. (1): Surveying** **GG.DSE06-Tii:** DSE**- Introduction to Cryogeography** **GG.DSE06-Pii:** **Pract. (1): Glacial Data Analysis and Mapping or** Choose one from a pool of courses GE-6 (4) **GG.GE06-T:** GE**- Socio Cultural Geography**		from a pool of SEC courses	Internship/Apprenticeship/Project/Community Outreach (IAPC) (4)	**X**	
	12	**4**		**2**	**4**		**22**
							Total 132

DEPARTMENT OF GEOGRAPHY
B.A./B.Sc.

DISCIPLINE SPECIFIC CORE COURSE (DSC) Geography of India

Programme: Under Graduate in Arts/Science	**Year: III**	**Semester: V**
Subject: Geography	**Course Code: GG.DSC05-T**	**Course Title: Geography of India**

Course Outcomes
The course provides the basic understanding of India in a brief but adequate manner. At the end of this course, students are expected to have an understanding of the inter linkages and interaction between physical aspects and resource base of India.

Credits: 03	**Distribution of marks according the University rule**.
Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Unit	Course Content	Lectures
Unit– I	India- A Subcontinent, Physical Features, Geology, Drainage System, Climate, Natural Vegetation, Soils	14
Unit– II	Crops (Food, Plantation and Commercial), Agriculture Production, Agriculture Regions, Irrigation, Livestock Raising and Fishery. Industries:, Steel and iron, Textile, sugar; Minerals and Power Resources	16
Unit – III	Population (Density, Distribution and Urbanization), Multipurpose Projects. Regional Development and Planning, Regional Disparities, Transportation: Roads and Railways, Air Transportation and Pipeline Transportation; Trade: Internal and External (Trend, Composition and Direction); SEZ (Special Economic Zones).	15
Practical (Credit-1) **GG.DSC05-P**	**Course Title: Map Projection:** Definition, Necessity and Classification of map projection, Construction of map projections: Simple conical projection with one and two standard parallels, Bonne's projection, Polyconic projection. Cylindrical projections: Mercator's, Gall's stereographic projection. Zenithal Projections: Polar zenithal equidistant, Equatorial zenithal equidistant.	30

Suggested Readigs

1. Chauhan B.S. & Gautam Alka (2011) Bharat (Geography of India), Rastogi Publication, Meerut.
2. Chauhan B.S. & GautamAlka (2013) Bharat Varshka Vistrat Bhogool, Rastogi Publication, Meerut.
3. Hussain, Majid (2015) Geography of India, McGraw Hill Education, NewDelhi.
4. Mamoria, C.B. (2007) Bharat Ka Bhoogol. Sahitya Bahwan, Agra.
5. Sharma, Y.K. (2009) Geography of India, Lakshmi Narayan, Agra.

6. Sharma, M.L. & Sharma H.S. (2011) Bharatka Bhogool, Rastogi Publication, Meerut.
7. Sharma, J.K. & Kalwar, S.C. (2011) Bharatka Bhogool, Rastogi Publication, Meerut.
8. Singh, R.L. (1993) Regional Geography of India, National Geographic Society of India, Varanasi.

DEPARTMENT OF GEOGRAPHY
B.A./B.Sc
DISCIPLINE SPECIFIC CORE COURSE (DSE) – Agricultural Geography

Programme: Under Graduate in Arts/Science	**Year: III**	**Semester: V Paper-**
Subject: Geography	**Course Code: GG.DSE05-Ti**	**Course Title: Agricultural Geography**

Course Outcomes
Agricultural geography is a sub-discipline of human geography that studies the spatial relationships between humans and agriculture which helps to understand the scope and nature of agricultural geography and the factors that influence the agricultural system.

Theory- (Credit-3)	**Distribution of marks according the University rule**.
Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Units	Contents	Lectures
Unit - I	Nature, scope, significance and development of Agriculture Geography, Approaches to the study of Agricultural Geography: Commodity, systematic, regional, and behavioral, Origin and dispersal of agriculture.	14
Unit - II	Determinants of agricultural land use: Physical, economic, social, and technological, Land holding and land tenure systems, Agricultural efficiency Concepts, Techniques and Methods of measurements; Methods of delimiting crop combination, cropping pattern, crop concentration, intensity of cropping	15
Unit - III	Theories of Agriculture Geography, Von Thunen's theory (model) of agricultural location and its recent modifications, Demarcation of Agricultural regions, Whittlesey's classification of agricultural regions; Land use/ Land cover , Green Revolution, White Revolution, Food deficit and food surplus regions.	16
Practical (Credit-1) **GG.DSE05-Pi**	**Course Title: Agriculture Data Analysis:** Crop combination, crop intensity, and agricultural efficiency; Agricultural land use mapping.	**30**

Suggested Reading:

1. Bhalla, G.S. and Alagh, Y.K. (1979) Performance of Indian Agriculture: A District-wise Study, Sterling, New Delhi.
2. Das, M.M. (1982) Peasant Agriculture in Assam, Inter India, New Delhi.
3. Gobind, N. (1986) Regional perspective in agriculture, concept, New Delhi.
4. Hussain, M. (1979) Agricultural Geography, Inter India, New Delhi.
5. Mergra, W.B. & Munton, R.J.C. (1971) Agricultural Geography, methuen, London.
6. Mitchel, P. (1979) Agro-ecosystem, Inter India Publication,New Delhi

7. Shafi, M. (1984) Agricultural productivity and regional imbalance, concept, New Delhi.
8. Singh J. and Dhillon, S.S. (1985) Agricultural Geography, Tata McGraw Hill, New Delhi.
9. Singh, J. (1974) Agricultural Atlas of India: A Geographical perspective, Vishal Publications, Kurukshetra.
10. Kumar, Pramila, (2024) Krishi Bhoogol, Madhya Pradesh Hindi Granth Academi, Bhopal, MP.
11. Ferroni, Marco, 2013. Transforming Indian agriculture- India 2040: Productivity, Markets and Institutions, Sage Publications, New Delhi.
12. White P. 2007. Emergence of agriculture: A global view, Routledge, London.
13. Wright J. 2009. Sustainable agriculture and food security in an era of oil scarcity, Earthscan, London.
14. Singh, R. B. 2000. Environmental Consequences of Agricultural Development: A Case Study from the Green Revolution state of Haryana, India, Agriculture, Ecosystems and Environment 82, 97–103.

DEPARTMENT OF GEOGRAPHY
B.A./B.Sc.

Discipline Specific Elective (DSE) – Mountain Geography with Special Reference to the Himalaya

Programme: Under Graduate in Arts/Science	**Year: IV**	**Semester: V Paper-**
Subject: Geography	**Course Code: GG.DSE05-Tii**	**Mountain Geography with special reference to the Himalaya**

Course Outcomes

1. Ability to describe and compare the geographical features of major mountain systems, particularly the Himalaya, in terms of location, extent, and physiography.
2. Competence in assessing the natural resources of the Himalaya and understanding the implications of resource degradation on ecosystems and communities.
3. Proficiency in recognizing and addressing environmental challenges in the Himalayan region, including implementing strategies for conservation and disaster management.
4. Understanding of the demographic, social, and cultural dynamics of Himalayan communities, including the role of indigenous knowledge in sustainable development.
5. Capability to analyze the economic activities and potentials of the Himalayan region, with a focus on promoting sustainable livelihoods and fostering responsible tourism practices.

Theory- (Credit-3)	**Distribution of marks according the University rule**

Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Unit	**Mountain Geography with special reference to the Himalaya**	Lectures
Unit – I	Mountain Systems of the World: Location, Extent, Origin and Physiography of the major mountain systems (i.e., Alps, Andes, Rockies and Himalaya) of the world. Natural Resources of the Himalaya: Land Resource, Water Resource (Rivers, Glaciers and Lakes), Forests (Natural Vegetation) and Biodiversity; Degradation of natural resources	15
Unit – II	Major Environmental Challenges of the Himalaya: Erosional Hazards, Deforestation, Loss of Biodiversity, and wild life, Natural Disasters: Earthquakes, Landslides, Forest Fires, Climate Change.	15

Unit – III	Demographic Traits, Society and Culture: Population: Growth and Distribution, Population Migration, Major Tribes (Gaddies, Bhotias, Gujars and Galo), Local Indigenous Knowledge of different societies /groups	15
Practical (Credit-1) **GG.DSE05-Pii**	**Course Title: Field Visit in the Himalayan region and Report Writing**	30

Suggested readings:

1. P. Wester, A. Mishra, A. Mukherji, A. B. Shrestha (eds), The Hindu Kush Himalaya
2. Assessment: Mountains, Climate Change, Sustainability and People, Springer Nature Switzerland AG, Cham. pp., 2019
3. World Bank, South Asia's Hotspots Impacts of Temperature and Precipitation Changes on Living Standards, Report Preview Spring 2018, World Ban Group, Washington D.C. 2018
4. S. Irudaya Rajan, R. B. Bhagat eds, Climate Change, Vulnerability and Migration, Routledge, India, 2018
5. M.S.S. Rawat et al. (eds), Environment, Resources and Development of the Indian Himalaya, Transmedia Publication, Srinagar, Garhwal, Uttarakhand, India, 2018
6. Tor H. Aase, Climate Change and the Future of Himalayan Farming, Oxford University Press, 2017
7. Velma Grover et al.(eds), Global Change and Mountains: Consequences, Responsesnand Opportunities, Science Publishers, CRS Press, Taylor and Francis, USA, 2015
8. E. Grohmann et al. (eds), Environmental Deterioration and Human Health: Natural and Anthropogenic Determinents, Springer, Dordrecht, 2014
9. Ning, Wu; Rawat, G.S.; Joshi, S.; Ismail, M.; Sharma, E. (Eds) High-altitude rangelands and their interfaces in the Hindu Kush Himalayas. Kathmandu: ICIMOD, 2013
10. Jean Palutikof et al. (eds.) Climate Adaptation Futures, Wiley Publishing Company, U.K., 2013
11. C. Margottini et al. (eds), Landslide Science and P ractice, Vol. 4, Springer - Verlag, Berlin, Heidelberg, Germany, 2013
12. Velma Grover (ed) Impact of Climate Change on Water and Health, CRC Press, Taylor and Francis Group, 2013
13. G. Rasul and M. Karki (eds) Policy Priorities for Sustainable Mountain Development, Kathmandu: International Center for Integrated Mountain Development, 2008
14. Huddlestone, B., Ataman, E. and d'Ostlanl, L. F., Towards a GIS-based analysis of mountain environments and populations, FAO, Rome, 2003
15. ICIMOD, Mountains of the world: ecosystem Services in a Time of global and climate change: seizing opportunities meeting challenges Framework paper prepared for the Mountain Initiative of the Government of Nepal by ICIMOD and the Government of Nepal, Ministry of Environment

16. IPCC, Climate change: Impacts, adaptation, and vulnerability, Part A: Global and sectoral aspects, Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Summary for policymakers, Cambridge University Press, Cambridge, United Kingdom and New York, USA, 2014
17. Tse-ring, K., Sharma, E., Chettri, N., Shrestha, A. (eds), Climate change vulnerability of mountain ecosystems in the eastern Himalayas. Climate change impact on vulnerability in the eastern Himalayas-synthesis report. Kathmandu: ICIMOD, 2010
18. M. Beniston, Environmental change in mountains and uplands. London, 2000.
19. Food and Agricultural Organization, Food Security in Mountains – High time for action. Brochure of the International Mountain Day 2008. http://www.mountaineering.ie/documentbank/uploads/IMD08%20brochure.pdf
20. Food and Agricultural Organization, International Year of the Mountains. Food and Agriculture Organisation of the United Nations, Rome, 2002.
21. Food and Agricultural Organization, Land-water linkages in rural watersheds. Land and Water Bulletin 9. Food and Agriculture Organisation of the United Nations, Rome, 2002
22. Martin J. Haigh, Headwater control: integrating land and livelihoods, paper presented at the International conference on Sustainable Development of Headwater Resources.
23. United Nation's International University, Nairobi, Kenya, September, 2002.
24. ICIMOD, Mountains of the World –Ecosystem Services in a Time of Global and Climate Change: Seizing Opportunities – Meeting Challenges. Framework paper prepared for the Mountain Initiative of the Government of Nepal by ICIMOD and the Government of Nepal, Ministry of Environment, 2010
25. ICIMOD, The Changing Himalayas: Impact of Climate Change on Water Resources and Livelihoods in the Greater Himalayas. ICIMOD, Kathmandu, Nepal, 2009
26. Postgraduate (MA/MSc) Semester Course Framework of Geography, Kumaun University, Nainital
27. IPCC, Climate change 2007: The scientifi c basis. Working Group I contribution to the Intergovernmental Panel on Climate Change Fourth Assessment Report. Cambridge: Cambridge University Press, 2007
28. IPCC, Climate Change: Impacts, adaptation and vulnerability. Working Group II contribution to the Intergovernmental Panel on Climate Change Fourth Assessment
29. Report. Cambridge: Cambridge University Press, 2007
30. Messerli, B. and Ives, J. D. (eds), Mountains of the world – A global priority. A contribution to Chapter 13 of Agenda 21. New York: Parthenon, 2007

DEPARTMENT OF GEOGRAPHY
B.A./B.Sc.

GERERIC ELECTIVE (GE)- Settlement Geography

Program: Under Graduate in Arts/Science	**Year: III**	**Semester: V Paper-**
Subject: Geography	**Course Code: GG.GE05-T**	**Course Title: Settlement Geography**

Course Outcomes
Introduction to the subject Settlement Geography. Understand the various aspects of origin and growth human settlements in the form of rural and urban. Understand Morphology and Patterns of rural and urban settlement.

Theory- (Credit-4)	**Distribution of marks according the University rule**.
Total No. of Lectures – Tutorials – Practical (in hours per week): 4-0-0	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Unit	Course Content	Lectures
Unit – I	Introduction of Settlement Geography: Settlement Geography: Definitions, Meaning and Scope; Importance of Settlement Studies in Geography; Concept of Hierarchy of Settlement.	10
Uni t – II	Development and classification of Settlement: Development of Settlement; Factors Influencing Growth of Settlements; Industrial growth and urban expansion; Functional Classification of Towns: Rural and Urban Settlement.	12
Unit – III	Rural Settlements in India: Origin and Growth of Rural Settlements in India; Structure of House and Building Materials Used in Rural Settlements of India; Regional Variations in Rural Settlement.	12
Unit – IV	Urban Settlements in India: Origin and Growth of Urban Settlements; Urbanization in India: Trends and Types of Towns; Urban problems in Indian cities; Smart City: Concept, Need and Implementation in India; Urban Morphological Theories: Central Place theory (Christaller), Rank Size Rule and Primate City; Classical Model of Burgess and Homer Hoyt.	26

Suggested Readings

1. Alam, S. M. (2007). Settlement system of India. Rajesh Publications.
2. Bose, A (1980): India's Urbanization, Tata McGraw Hill, New Delhi.
3. Chaudhary, P. (2011). Human settlements in India: Growth and challenges. Concept Publishing.
4. Hall, P. (2014). Cities of tomorrow: An intellectual history of urban planning and design in the twentieth century (4th ed.). Wiley-Blackwell.
5. Hall, T. (2006): Urban Geography, Routledge, London.
6. Harvey, D. (2009). Social justice and the city (Revised ed.). University of Georgia Press.
7. Husain, M. (2014). Urban geography. Rawat Publications.
8. Johnston, R. J. (2000). The dictionary of human geography (4th ed.). Blackwell.
9. Julfikar Hussain (2021): Settlement Geography, Notion Press.
10. Knox, P. L., & McCarthy, L. (2011). Urbanization: An introduction to urban geography (3rd ed.). Pearson.
11. Knox, P. L., & Pinch, S. (2014). Urban social geography: An introduction (6th ed.). Routledge.
12. Kundu A. (1992): Urban Development and Urban Research in India, Khanna Publication.
13. Lehmann, S., & Crocker, R. (Eds.). (2012). Designing for zero waste: Consumption, technologies and the built environment. Routledge.
14. Majid Husain. (2015). Urban geography. Rawat Publications.
15. Mandal, R. B. (2013). Urban geography: A textbook. Concept Publishing Company.
16. Misra, R. P. (2008). Rural development: Towards sustainability. Concept Publishing Company.
17. Mourya S.D. and Kumar P. (2022): अधिवास भूगोल, Sharda Pustak Bhawan.
18. Nanda, R. (2021). City and village: Changing settlement patterns in India. Sage Publications India.
19. Pacione, M. (2005). Urban geography: A global perspective. Routledge.
20. Pacione, M. (2009). Urban geography: A global perspective (3rd ed.). Routledge.
21. Pathak, C. R. (2018). Urbanization and settlement systems in India. Concept Publishing.
22. R. Y. Singh (2002): Geography of Settlements, Rawat Publication.
23. Ramachandran, R. (1992): Urbanisation and Urban Systems in India, Oxford University Press, New Delhi.
24. Roy, R. (2016): Settlement Geography, Centrum Press.
25. Sahay, A., Sinha, V.N.P. and Verma U. (2017): Introduction to Settlement Geography, Rajesh Publications.
26. Sharma, P. R. (2013). Settlement geography of India: Patterns, processes and models. Rawat Publications.
27. Short, J. R. (2019). Human geography: A short introduction. Oxford University Press.
28. Shukla, R. and Shukla R. (2011): अधिवास भूगोल, Arjun publishing house.
29. Singh R. (2005): अधिवास भूगोल, Rawat Publication.

30. Singh R.L. and Kashi Nath Singh (eds.) (1975): Readings in Rural Settlement Geography, National Geographical Society of India, Varanasi.
31. Singh, J. (2015). Urbanisation in India: Nature and patterns. Gyan Publishing House.
32. Singh, R. Y. (2009). Geography of settlement: Rural and urban. Rawat Publications.
33. Singh, S.N. (2023): ग्रामीण अधिवास भूगोल, Radha Prakashan
34. Sinha, V. N. P. (2017). Patterns of rural settlements in India. Gyan Publishing.
35. Smith, M. P. (2016). Transnational urbanism: Locating globalization. Wiley-Blackwell.
36. Soja, E. W. (2010). Seeking spatial justice. University of Minnesota Press.
37. Verma, R. L. (2019). Dynamics of urban and rural settlements in India. Mittal Publications.

Internship/Apprenticeship/Project/Community Outreach (IAPC)

<table>
<tr><td colspan="2">Programme: Under Graduate in Arts/Science</td><td>Year: III</td><td>Semester: V</td></tr>
<tr><td colspan="4">Subject: Geography</td></tr>
<tr><td colspan="2">Course Code: GG.IAPC05</td><td colspan="2">Course Title: Internship/Apprenticeship/Project/Community Outreach (IAPC)</td></tr>
<tr><td colspan="4">Outcome
To learn how to write a project report based on research gap found during the literature survey or field observations made. Preparation of synopsis/outline will be also learned. Finally student will learn how to collect data and write a report based on the data analysis</td></tr>
<tr><td>Credits: 04</td><td colspan="3">Max. Marks: 100 (Evaluation by External & Internal Examiner)
Dissertation: 75
Internal Assessment: Viva Voce + Attendance : 25 (20+5)</td></tr>
<tr><td colspan="4">The students will be required to select a topic and area of their interests with the help of their respective supervisors allotted to them by the Department. Research Project must be submitted to the Department one week before the commencement of the Theory Examinations. The size of the Dissertation normally ranges around 50 to 60 pages. The Research Project Dissertation will be evaluated by the external and internal examiners.</td></tr>
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DEPARTMENT OF GEOGRAPHY
B.A./B.Sc
DISCIPLINE SPECIFIC CORE COURSE (DSC) Geoinformatics

Programme: Under Graduate in Arts/Science	**Year: III**	**Semester: VI Paper-**
Subject: Geography	**Course Code: GG.DSC06-T**	**Course Title: Geoinformatics**

Course Outcomes
Geoinformatics is a science of living structure, not only for better understanding geographic forms and processes but also more importantly for better making and remaking geographic space to be living or more living. Analysis of objects and space time phenomena related to the surface and underneath of Earth. Studying Geoinformatics helps us gaining the skills to collect, analyze, and interpret spatial data, which is highly valuable for informed decision-making.

Theory- (Credit-3)	**Distribution of marks according the University rule**.

Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Unit	Contents	Lectures
Unit – I	Definition of Remote sensing, Advantages and limitations, Remote sensing process, Electromagnetic Radiation (EMR): EMR Spectrum and its properties, EMR wavelength regions and their applications. Remote Sensing Satellite: LISS-I, LISS-II, LISS-III, LISS-IV, Wifs and PAN; Aerial Photograph: Types, Fundamentals of aerial photograph Interpretation.	17
Unit – II	Basics Geodesy, Concept of Datum; Geographic Positioning System and its Components; DGPS.	14
Unit – III	Introduction to GIS; Definition and types, Components; Types of Data: Spatial and Non-Spatial Data, Geometry, Attribute Data in GIS, Application of Geoinformatics: LULC, , Urban Mapping and Vegetation etc.	14
Practical (Credit-1) GG.DSC06-P	**Course Title: Remote Sensing and GIS Exercise:** Base Map Preparation; Familiarization with software; Visualization; Import and export of data to various formats; Geo-referencing of data; Digitization – point, line, polygon; GPS/DGPS Handling and Data collection; Satellite Imagery formats; Layer Stacking of Multispectral Imagery.	30

Suggested Reading:

1. American Society of Photogrammetry, 1983: Manual Of Remote Sensing (2nd Edition), ASP Falls Church, Virginia.

2. Aerial photographic interpretation, Lueder, D.R., McGraw Hill Book Co., 1959 Elements of Photogrammetry, Paul R. Wolf, McGraw-Hill, 2000.
3. Jensen, J.R. 2000, Remote Sensing of the Environment: An Earth resource Perspective. Prentice Hall.
4. Joseph George, 2003, Fundamentals of remote sensing. Universities Press
5. Lillesand, T.M., and Kieffer, R.M., 1987, Remote Sensing and Image Interpretation, John Wiley.
6. Sabbins, F.F., 1985, Remote sensing Principles and interpretation. W.H.Freeman and company
7. Jahne, B. 1991 Digital Image Processing New York: Springer-Verlag.
8. Jain, A.K. 1989, Fundamentals of Digital Image Processing, Englewood Cliffs, NJ, Prentice Hall.
9. Jonson, J.R. 1996, Introductory Digital Image Processing, Printice-Hall, Inc.
10. Peter .A Burroughs and McDonell, Rachel A, Principles of Geographic Information System
11. Ksang-tsung Chang, 2010, Geographic Information System
12. Ahmed El-Rabbany, 2012, Introduction to GPS: The Global Positioning System.

DEPARTMENT OF GEOGRAPHY
B.A./B.Sc
DISCIPLINE SPECIFIC CORE COURSE (DSE) Rural Geography

Programme: Under Graduate in Arts/Science	**Year: III**	**Semester: VI Paper-**
Subject: Geography	**Course Code: GG.DSE06-Ti**	**Course Title: Rural Geography**

Course Outcomes

1. Define the rural areas, rural economy and development and issues or Rural Development in general and address them through various development strategies
2. Explain the rural local self-governance namely Pachayati Raj Institutions and its role in planning and development of rural areas

Credits: 03	**Distribution of marks according the University rule**.
Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Units	Contents	Lectures
Unit – I	The concept of Rural Development, meaning and definition need and objectives of rural development, Dimensions and approaches.	14
Unit – II	Programmes for the rural development: Area Based approach to rural development and their implication; Agricultural development: Green revolution, Sansad Adrash Gram Yojna and Mahatma Gandi National Rural Employment Guarantee scheme.	15
Unit – III	Planning for Rural development: Rural settlement characteristics, influencing factors, ecological and non-ecological, types and patterns; Dimensions of Rural Development: Approaches and problems, Rural Growth Centre approach, identification of problems and planning for development.	16
Practical (Credit-1) **GG.DSE06-Pi**	**Course Title: Surveying:** Introduction to Surveying and Leveling, Dumpy Level Survey: Rise and Fall Method, Theodolite Survey: Slope and Height determination, GPS: Road Mapping. Report writing on Socio-economic study of Rural area. .	30

Suggested Readings

1. Bharati, T. (2022). Changing rural landscapes in India: Regional perspectives. Sage Publications India.
2. Bryant, C. R., & Pini, B. (2010). Gender and rural geography: Identity, sexuality and power in the countryside. Routledge.
3. Cloke, P., Marsden, T., & Mooney, P. H. (Eds.). (2006). Handbook of rural studies. Sage.
4. Gilg A. W. (1985): An Introduction to Rural Geography, Edwin Arnold, London.
5. Halfacree, K. (2007). Trial by space for a 'radical rural': Introducing alternative localities, representations and lives. Journal of Rural Studies, 23(2), 125–141.
6. Krishnamurthy, J. (2000): Rural Development – Problems and Prospects, Rawat Publs., Jaipur.
7. Lapping, M. B. (2021). The rural landscape in North America: Development and change since 1900. Routledge.
8. Lee D. A. and Chaudhri D. P. (eds.) (1983): Rural Development and State, Methuen, London.
9. Marsden, T. (2017). Agri-food and rural development: Sustainable place-making. Bloomsbury.
10. Mishra and Sharma (2007): Rural Growth Centers for micro level planning, Ritu publication.
11. Misra R. P. and Sundaram, K. V. (eds) (1979): Rural Area Development: Perspectives and Approaches, Sterling, New Delhi.
12. Misra, R. P. (ed.) (1985): Rural Development: Capitalist and Socialist Paths, Vol. 1, Concept, New Delhi.
13. Palione M. (1984): Rural Geography, Harper and Row, London.
14. Ramachandran H. and Guimaraes J.P.C. (1992): Integrated Rural Development in Wanmali S. Rural Infrastructure Settlement Systems and Development of the Regional Economy in South India, International Food Policy Research Institute, Washington, D.C.
15. Rao, P. R. (2010). Rural development and rural geography in India. Concept Publishing Company.
16. Robb P. (ed.), (1983): Rural South Asia: Linkages, Change and Development, Curzon Press.
17. Sharma P.K. and Sharma S. C. (2018): Rural Development reading in Settlement Geography, English Bookhouse, Jaipur.
18. Sharma, H. S. (2013). Rural geography of India: Patterns, processes, and development. Rawat Publications.
19. Singh, R. B., & Mishra, S. (2014). Environment, livelihood and rural development: Perspectives from India. Rawat Publications.
20. Singh, R. L. (Ed.). (2009). Readings in rural settlement geography. National Geographical Society of India.
21. Singh, S. (2020). Rural transformations in India: Emerging challenges and opportunities. Springer.
22. Tiwari, R. P. (2012). Agricultural geography and rural development. Prayag Pustak Bhawan.
23. Woods, M. (2005). Rural geography: Processes, responses and experiences in rural restructuring. Sage.

DEPARTMENT OF GEOGRAPHY
B.A./B.Sc
DISCIPLINE SPECIFIC CORE COURSE (DSE) - Cryogeography

Programme: Under Graduate in Arts/Science	**Year: III**	**Semester: VI Paper-**
Subject: Geography	**Course Code: GG.DSE06-Tii**	**Course Title: Cryogeography**

Course Outcomes

After studying Cryogeography, learners will understand its focus on analyzing the Earth's frozen surfaces, encompassing components such as ice sheets, glaciers, and permafrost. They will recognize the global distribution of the cryosphere and its crucial role in climate dynamics, including its impacts on sea levels, weather patterns, and ecosystems. Moreover, students will grasp the environmental and societal implications of cryosphere changes, such as melting ice leading to sea level rise and affecting biodiversity and human communities. They will be familiar with research methods and technologies utilized in Cryogeography, and able to apply this knowledge to real-world scenarios, predicting outcomes and assessing vulnerabilities.

Theory- (Credit-3)	**Distribution of marks according the University rule**.
Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Units	Contents	Lectures
Unit - I	Meaning, concept Scope and significance of Cryogeography; Cryosphere and its component; Ice ages and Glaciation.	16
Unit - II	Glacial and periglacial environment: Types of Permafrost; Glacial and Periglacial Processes and landforms.	15
Unit - III	Cryogeography and Human Society; Human Adaptation: Agriculture, food, settlement and water	14
Practical (Credit-1) **GG.DSE06-Pii**	**Course Title: Glacial data analysis and Mapping:** Collection and Tabulation of published retreat data of glaciers; Extraction of Glacier boundary/outline, Glacial Geomorphological mapping etc.	30

Suggested Reading:

1. Benn, D. I., and Evans, D. J. A. 1998. Glaciers and Glaciations, New York, New York, Wiley
2. Barry Roger G., 2019, The Global Cryosphere, Cambridge University Press, ISBN: 9781108720588, Pages: 586
3. Cortez, Ford, 2016, Cryosphere and Earth Science, Syrawood Publishing House, ISBN-10 : 1682860205 ,ISBN-13 : 978-16828602
4. Dahe Qin, Tandong Yao, Yongjian Ding, Jiawen Ren, 2021, Introduction to Cryospheric Science, Springer Singapore, 978-981-16-6425-0, https://doi.org/10.1007/978-981-16-6425-0
5. Garry Kinder, 2017, The High-Mountain Cryosphere, Cambridge University Press, ISBN 139781107662759
6. Kulkarni, A. V. 1992. Mass balance of Himalayan glaciers using AAR and ELA methods. Journal of Glaciology, 38: 101-104

7. Pelto, Mauri, 2017. Recent Climate Change Impacts on Mountain Glaciers (The Cryosphere Science Series), Wiley-Blackwell, UK
8. Singh, Savindra, 2023, Cryogeography, Pravalika Publications, ISBN: 9789384292782
9. Slaymaker, Olav and Kelly, Richard, 2006. The Cryosphere and Global Environmental Change, Wiley-Blackwel
10. Sugden, D. E. and John, B. S. 1976. Glaciers and Landscape, New York, New York, Wiley

DEPARTMENT OF GEOGRAPHY
B.A./B.Sc.

Generic Elective (GE)- Socio Cultural Geography

Programme: Under Graduate in Arts/Science	**Year: III**	**Semester: VI Paper-**
Subject: Geography	**Course Code: GG.GE06-T**	**Course Title:** Socio Cultural Geography

Course Outcomes

The paper intends to sensitize students with socio-cultural aspects and the related contemporary issues in India and the world with a geographical outlook. The philosophy of the subject is to be taught in order to develop a keen interest in the subject and to pursue it for higher studies.

Credits: 04	**Distribution of marks according the University rule**.
Total No. of Lectures – Tutorials – Practical (in hours per week): 4-0-0	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Unit	Course Content	Lectures
Unit – I	Nature, scope, and significance of Social and Cultural Geography: Definitions of Society, social plurality, culture, cultural types, cultural divergence and cultural convergence.	15
Uni t – II	Geographical Factors in India's Social Evolution; Theories of evolution ofraces, Physical characteristics & early patterns, migration and distribution.	15
Unit – III	Evolution of later social and cultural groups: religions and languages, Socio-cultural diversity in India and in the world.	10
Unit – IV	Components of social diversity; tribes and their distribution; Tribal regions ofIndia; Cultural regions in India: elements of cultural regionalization: race, caste, dialect, language, religion. The Indian tribal groups; Race, language, distribution and cultural adaptations; Impact of globalization and social transformation in India.	20

Suggested Readings

1. Ahmad, Aijazuddin (1999) : Social Geography, Rawat Publication, New Delhi.
2. De Blij, H.D. : Human Geography, John Wiley and Son, New York.
3. Dreze Jean and Amartya Sen (1996) : Economic Development and SocialOpportunity, Oxford University Press, New Delhi.

4. Dubey, S.C. (1991) : Indian Society, National Book Trust, New Delhi.
5. Gregory, D. and J. Larry (eds) (1985) : Social Relations and Spatial Structures,McMilan.
6. Haq. Mahbulbul : Reflections on Human Development : Oxford University Press,New Delhi.
7. Maloney, Clarence (1974) : People of South Asia, Winston, New York.
8. Planning Commission (1981) : Report on Development of Tribal Areas,Government of India.
9. Rao, M.S. A. (1970) : Urban Sociology in India , Orient Longman.
10. chwartzberg, Joseph (1978) : An Historical Atlas of South Asia, University of Chicago Press, Chicago.
11. Sen, Amartya and Dreze Jean (1996) : Indian Development : Selected Regional Perspectives, Oxford University Press.
12. Smith, David (1977) : Geography : A Welfare Approach, Edward Arnold, London.
13. Sopher, David (1980) : An Exploration of India, Cornell University Press.
14. Subba Rao (1958) : Personality of India : Pre and Proto Historic Foundation of India and Pakistan, M.S. University, Baroda, Vadodara.
15. Gritzer, Charles, F. : The Scope of Cultural Geography, Journal of Geography, V. 65, 1966. pp. 4-11.
16. Jordan, Terry, G. and Rowutree Lester: The Human Mosaic: A Thematic Introduction to Cultural Geography.
17. Thomas, W.L. : Man's Role in Changing the Face of the Earth, Chicago, 1956.
18. Wagner, P.L. and Mikesell, M.W. (ed.) : Readings in Cultural Geography, Chicago, 1962.
19. Risley, H. : The People of India – Delhi, 1969.
20. Bshme, A.L. : The Wonder That was India.
21. Brace, C.L. : The Stages of Human Evolution.
22. Butimer, A. : Values in Geography.
23. Chatterjee, A.B. : Social Geography.
24. De Bliz, H.G. : Human Geography – Culture, Society and Space.
25. Dicken and Pitts : Introduction to Cultural Geography.
26. Ghurey, B.S. : Caste and Class in India.
27. Guha, B.S. : Racial Elements in India's Population.
28. Hagget, P. : Geography – A Modern Synthesis.
29. Harris , K.D. : The Geography of Crime and Justice.
30. Jones, Emrys and Eyles, John : An Introduction to Social Geography.
31. Morril, R.L. : The Spatial Organisation of Society

Internship/Apprenticeship/Project/Community Outreach (IAPC)

Programme: Under Graduate in Arts/Science	**Year: III**	**Semester: VI**
Subject: Geography		
Course Code: GG.IAPC06	**Course Title:** Internship/Apprenticeship/Project/Community Outreach (IAPC)	
Outcome To learn how to write a project report based on research gap found during the literature survey or field observations made. Preparation of synopsis/outline will be also learned. Finally, student will learn how to collect data and write a report based on the data analysis		
Credits: 04	Max. Marks: 100 (Evaluation by External & Internal Examiner) Dissertation: 75 Internal Assessment: Viva Voce + Attendance: 25 (20+5)	
The students will be required to select a topic and area of their interests with the help of their respective supervisors allotted to them by the Department. Research Project must be submitted to the Department one week before the commencement of the Theory Examinations. The size of the Dissertation normally ranges between 50 and 60 pages. The Research Project Dissertation will be evaluated by the external and internal examiners.		

Department of Geography
(Semester VII & VIII)

Sem.	Core Discipline Specific Course (DSC) 4	DSC/GE 4		Total Credit
VII	DSC7 (3+1=4) **GG.DSC07-T:** **<u>Theory (3)-</u> Advanced Geomorphology** **<u>Practical-(1)</u>** **GG.DSC07-P:** **Mapping of Landforms**	Choose three DSE (3x4) courses OR Choose two DSE- (2x4) and one GE (4) course OR Choose one DSE (4) and two GE (2x4) courses (total = 12) **GG.DSE07-Ti:** **DSE (3) -Urban Geography** **GG.DSE07-Pi:** **Pract. (1): Urban Data Analysis** **GG.DSE07-Tii:** **DSE (3) -Climate Change and Adaptation** **GG.DSE07-Pii:** **Pract: Exercises based of Climatological Data** **GG.DSE07-Tiii:** **DSE (3) – Paleogeography** **GG.DSE07-Piii:** **Pract. (1): Introduction to Dating Techniques and Methods** **GG.GE07-Ti:** **GE- Remote Sensing** **GG.DSE07-Tii:** **GE- Emerging Geographical thoughts**	Dissertation on Major (6) OR Dissertation on Minor (6) OR Academic project/ Entrepreneurship (6)	
	4	**12**	**6**	**22**
VIII	DSC8 (3+1=4) **GG.DSC08-T:** **<u>Theory (3)-</u> GIS and GPS** **GG.DSC08-P:** **<u>Practical (1)</u>** **GIS & GPS/DGPS Mapping**	Choose three DSE (3x4) courses OR Choose two DSE- (2x4) and one GE (4) course OR Choose one DSE (4) and two GE (2x4) courses (total = 12) **GG.DSE08-Ti:** **DSE (3) – Aeolian Geomorphology** **GG.DSE08-Pi:**	Dissertation on Major (6) OR Dissertation on Minor (6) OR Academic	

		Pract. (1): Identification of Aeolian Landforms and Mapping **GG.DSE08-Tii:** **DSE (3) - Soil Geography** **GG.DSE08-Pii:** **Pract. (1): Identification of Soil Characteristics** **GG.DSE08-Tiii:** **DSE (3) - Environmental Management & Sustainable Development** **GG.DSE08-Piii:** **Pract.(1): Field Visit and Report writing** **GG.GE08-Ti:** **GE-Political Geography** **GG.GE08-Tii:** **GE-Oceonography**	project/ Entrepreneurship (6)	
	4	**12**	**6**	**22**
				Total 176

DEPARTMENT OF GEOGRAPHY
B.A./B.Sc. Honours
DISCIPLINE SPECIFIC CORE COURSE (DSC)- Advanced Geomorphology

Programme: Under Graduate in Arts/Science	**Year: IV**	**Semester: VII Paper-**
Subject: Geography	**Course Code: GG.DSC07-T**	**Course Title: Advance Geomorphology**

Course Outcomes
This course will familiarize the students with the need for understanding of geomorphology with reference to certain fundamental concepts, focusing on the unity of geomorphology in the earth materials and the processes with or without an element of time. Process component of geomorphology is segmented into the internal and external processes of landscape evolution. Finally, a few selected applications of geomorphology to societal requirements and quality of environment are dealt with.

Theory Credits: 03	**Distribution of marks according the University rule**.
Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Units	Course Content	Lectures
Unit – I	Conceptual Base: Nature, Scope, Trends and Development of Geomorphology; Classical Landscape Evolution / Development Theories: (W.M. Davis, W. Penck, L.C. King, Hack); Recent Trends in Geomorphology	14
Unit – II	Landscape Dating and Evolution: Radiocarbon dating, tree-ring dating (Dendrochronology), and Lichenometry. Interruptions in the evolution of landforms: Polycyclic landforms	15
Unit– III	Theories and Techniques: Theories of Hill-slope Evolution; Erosion Surfaces; Geomorphic Mapping Techniques; Systems and Models in Geomorphology. Applied Geomorphology: Geomorphic Hazards and Mitigation Measures; Geomorphology in Civil Engineering; Geomorphology and Groundwater Studies; Soil and Geomorphology; Application of geomorphology in agriculture and resource Management.	16
Practical	**Course Title: Mapping of Landforms:** Preparation of Relief map, slope map and Relief profile using	30

(Credit-1) **GG.DSE07-P**	topographical maps in GIS platform. Preparation of geomorphological map using Polish Legend System.	

Suggested Readings:

1. Bloom, A.L. (1978), A Systematic Analysis of late Cenozonic Landforms, Englewe Cliffs, M.J. Prentice Hall.
2. Condle, K.C. (1989), Plate Tectonics and Crustal Evolution. Pergamon Press. New York.
3. Chorley, R.J., (ed.)Spatial Analysis in Geomorphology, London, Metheun.
4. Chorley, R.J, .S.A. Schum and D.E. Sugden (1985): Geomorphology, London
5. Coats, D.R. (1981. edt.).Geomorphology and Engineering, George Allenand Unwin,London.
6. Cooke, R.U. and J.C. Doornkamp (1974), Geomorphology in Environmental Management, Oxford University Press.
7. Embleton, C. and J. Thornes : Processes in Geomorphology, London, Edward Arnold.
8. Garner, H.F.The Origin of Landscape – A Synthesis of Geomorphology, Oxford University Press, London, 1974.
9. Goudie, A. (ed.) (1990): Geomorphological Techniques. London, George Unwin and Hyman.
10. Hart, M.G. (1986) : Geomorphology : Pure and Applied, George Allen and Unwin, London.
11. Holmes, A., (1978), Principles of Physical Geology, 3rd Edn. London . Nelson.
12. Huggett, R.J. 2011. Fundamentals of Geomorphology, Routledge, New York.
13. Condie, K.C. 2003. Plate Tectonic and Crustal Evolution, Butterworth-Heinemann, Oxford, Burlington.
14. Singh, S. (2000): Geomorphology. (in Hindi). Vasundhra Prakashan, Gorakhpur.
15. Singh, S. (2004): Geomorphology, Prayag Pustak Bhawan, Allahabad
16. Kale, V. and Gupta, A. (2001): Elements of Geomorphology. Oxford University Press, Delhi.
17. King, C.A. M., Techniques in Geomorphology : London : Edward Arnold.
18. Leopold, L.B., Fluvial Processes in Geomorphology.
19. Ollier, C.D., Weathering, Edinburgh : Oliver and Royd.
20. Tectonics and Landforms. London: Methuen.
21. Pande, Anita (2014), Mountain Landform (An Investigation from Himalaya), Kathachitra Prakashan, Lucknow, ISBN No. 978-93-82001-09-06
22. Pitty, A.F., Geomorphology and Rural Settlement in India.
23. Scheidegner, A.E., Theoretical Geomorphology. Berlin : Springer – Verlag.
24. Thornbury, W.D., (1969), Principles of Geomorphology. New York : Wiley (1969).

DEPARTMENT OF GEOGRAPHY
B.A./B.Sc. Honours

DISCIPLINE SPECIFIC CORE COURSE (DSE) Urban Geography

Programme: Under Graduate in Arts/Science	**Year: IV**	**Semester: VII Paper-**
Subject: Geography	**Course Code: GG.DSE07-Ti**	**Course Title: Urban Geography**

Course Outcomes
To familiarize student with the nature and scope of urban geography. To understand the morphology and hierarchy in urban system. To learn about the importance of urban issues in mega- cities. To provide knowledge about urban planning and governance. To make students learn about the new perspectives of futuristic cities.

Theory Credits: 03	**Distribution of marks according the University rule**.

Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1 15 hrs for 1 credit theory, 30 hrs for 1 credit practical

Units	Contents	Lectures
Unit – I	Definition of urban places, Urbanism and urbanisation, Meaning and characteristics, Theories of urban origins, Trends of urbanization in developed and developing countries.	14
Uni t – II	Towns and culture, Origin and growth of ancient towns, Modern towns and their problems, Urban morphology, Urban Problems and response in less developed countries: poverty, inadequate housing (slums), Lack of urban services, transportation problems	15
Unit – III	Growth and spatial pattern of urbanisation in India, State of urban infrastructure, slums, urban agglomeration, megacities, urban sprawl (In India), Challenges of urbanisation in India	16
Practical (Credit-1) **GG.DSE07-Pi**	Course Title: Urban Data Analysis: Rank Size Distribution of Towns: Zipf and Berry – Garrison; Population Density Gradient in Urban area, Measures of Centrality- Losche; Classification of Towns: Functional Classification - Harris and Nelson.	30

Suggested Readings

1. Bansal, S.C. (2007). *Nagriye Bhugol*. Meenakshi Publication, Meerut.
2. E. G. Andrew et al. (2015). Urban Geography: A Critical Introduction, Wiley Blackwell
3. Morgan, F.W. *Ports and Harbours*. [Date unknown].
4. Pacione, M. (2009). *Urban Geography: A Global Perspective.* Taylor and Francis, UK.
5. Paul L Knox and Linda MacCarthy (2011). Urbanization: An introduction to urban geography, Pearson.
6. Kaplan, D. H., Wheeler, J. O., & Holloway, S. R. (2008). *Urban Geography*. John Wiley, New York.
7. Ramachandran, R. (1992). *Urbanisation and Urban Systems of India*. Oxford University Press, New Delhi.
8. Singh, S., & Saroha, J. (2021). *Urban Geography*. Pearson Education.

DEPARTMENT OF GEOGRAPHY
B.A./B.Sc Honours
DISCIPLINE SPECIFIC ELECTIVE (DSE)- Climate Change and Adaptation

Programme: Under Graduate in Arts/Science	**Year: IV**	**Semester: VII Paper-**
Subject: Geography	**Course Code: GG.DSE07-Tii**	**Course Title: Climate Change and Adaptation**

Course Outcomes

The learning objectives encompass understanding the foundational elements of climate and its relationship with other sciences, alongside examining the concept and global trends of climate change, with a focus on the Himalayan region. Participants will analyze the region's vulnerability to climate change-induced natural disasters, such as droughts and high-intensity rainfall, and assess their impacts on the environment, society, and economy. Moreover, they will explore adaptation strategies, including community-based approaches, and the role of local institutions in mainstreaming adaptation and disaster risk reduction into development planning.

Theory- (Credit-3)	**Distribution of marks according the University rule**
Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Units	Contents	Lectures
Unit – I	Elements of Climate**:** Nature and Scope and Relationship with other Sciences; Understanding Climate Change; Concept of Climate Change; Global Trends of Climate Change; Assessment of Climate Change over mountains.	14
Uni t – II	Trends of Climate Change in Himalaya**:** Himalaya as Climate Change Hot Spot; Trends of Climate Change in Himalaya: Rainfall, Temperature and Extreme Weather Events.	16
Unit – III	Climate Change Vulnerability and adaptation: Concept of Vulnerability and Risk; Assessment of Climate Change Vulnerability and Risk; Upstream downstream linkage of Climate Change; Climate Change Adaptation in Himalaya: Concept of Climate Change, Adaptation; Types of Climate Adaptation; Role of Local Institutions in climate Change Adaptation; Mainstreaming Climate Change Adaptation and Disaster Risk Reduction into Development Planning; Community Based Climate Change Adaptation.	16
Practical (Credit-1) **GG.DSE07-Pii**	**Course Title: Exercises based on Climatological Data:** Changes in temperature (changes in land Surface Temperature, changes in Sea Surface Temperature); Variation in Rainfall and Ice melting and Sea level Rise	30

Suggested Readings:

1. Adger, W. N., Arnell, N. W., & Tompkins, E. L. (2005). Successful adaptation to climate change across scales. Global Environmental Change, 15(2), 77–86. https://doi.org/10.1016/j.gloenvcha.2004.12.005
2. Adger, W. N., Lorenzoni, I., & O'Brien, K. (Eds.). (2009). Adapting to climate change: Thresholds, values, governance. Cambridge University Press.
3. Agarwal, A., & Narain, S. (2010). Global warming in an unequal world: A case of environmental colonialism. Centre for Science and Environment.
4. Dubash, N. K. (Ed.). (2012). Handbook of climate change and India: Development, politics and governance. Oxford University Press.
5. Field, C. B., Barros, V., Stocker, T. F., & Dahe, Q. (Eds.). (2007). Climate change 2007: Impacts, adaptation and vulnerability (Contribution of Working Group II to the Fourth Assessment Report of the IPCC). Cambridge University Press.
6. Field, C. B., Barros, V., Stocker, T. F., & Dahe, Q. (Eds.). (2007). Climate change 2007: Impacts, adaptation and vulnerability (Contribution of Working Group II to the Fourth Assessment Report of the IPCC). Cambridge University Press.
7. Goodell, J. (2023). The heat will kill you first: Life and death on a scorched planet. Little, Brown and Company.
8. Hulme, M. (2009). Why we disagree about climate change: Understanding controversy, inaction and opportunity. Cambridge University Press.
9. Kabat, P., van Vierssen, W., Veraart, J., Vellinga, P., & Aerts, J. (Eds.). (2012). Climate change adaptation in the water sector. Earthscan.
10. Kelkar, U., & Bhadwal, S. (2007). Adaptation to climate change in Asia: A study of seven vulnerable countries. TERI Press.
11. Klein Salamon, D. (2022). Learning to adapt: Resilient cities in the age of climate crisis. Island Press.
12. Klein, R. J. T., Midgley, G. F., Preston, B. L., Alam, M., Berkhout, F. G. H., Downing, T. E., & Shaw, M. R. (2014). Adaptation opportunities, constraints, and limits. In C. B. Field et al. (Eds.), Climate change 2014: Impacts, adaptation, and vulnerability (pp. 899–944). Cambridge University Press.
13. Lynas, M. (2007). Six degrees: Our future on a hotter planet. National Geographic.
14. Moser, S. C., & Boykoff, M. T. (Eds.). (2013). Successful adaptation to climate change: Linking science and practice. Routledge.
15. Portner, H.O., Roberts, D. C., Tignor, M., Poloczanska, E. S., Mintenbeck, K., Alegría, A., ... & Rama, B. (Eds.). (2022). Climate change 2022: Impacts, adaptation and vulnerability. Cambridge University Press.
16. Ramaswamy, R. (2010). Managing climate change: India's response. Oxford University Press.
17. Schipper, E. L. F., & Burton, I. (Eds.). (2009). The Earthscan reader on adaptation to climate change. Routledge.
18. Siders, A. R. (2020). Managed retreat: Strategic relocation from climate-changed areas. Columbia University Press.

19. Singh, S., & Chaturvedi, R. K. (2015). Climate change and India: Vulnerability assessment and adaptation. Universities Press.
20. Srinivasan, J. (2020). Climate change and India: Challenges and opportunities. Indian Academy of Sciences.
21. Stern, N. (2006). The economics of climate change: The Stern review. Cambridge University Press.
22. TERI. (The Energy and Resources Institute). (2014). Adaptation to climate change in the context of sustainable development. TERI Press.

DEPARTMENT OF GEOGRAPHY
B.A./B.Sc. Honours
DISCIPLINE SPECIFIC ELECTIVE (DSE) – PALEOGEOGRAPHY

Programme: Under Graduate in Arts/Science		**Year: IV**	**Semester: VII Paper:**
Subject: Geography			
Course Code: GG.DSE07-Tiii			**Course Title: Paleogeography**
Course Outcomes 1. Describe the evolution of tectonic plates and its impact on paleogeography. 2. Recognize facies concepts and index fossils, aiding in stratigraphic analysis. 3. Identify the distribution of life forms and fossils across geological eras, providing insights into Earth's past environments. 4. Apply paleogeographic reconstruction approaches to understand past climates and landscapes. 5. Utilize dating techniques such as radiocarbon dating and dendrochronology to determine ages of geological formations and events.			
Theory Credits: 03	**Distribution of marks according the University rule**		
Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1		**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**	
Unit	Course Content		Lectures
Unit – I	Introduction to Paleogeography: Nature and Origin of Paleogeography, Origin and Evolution of Tectonic Plates and ocean basins, Volcanic Distribution over time.		14
Uni t – II	Facies concept in stratigraphy, Index fossils, Igneous phenomena, Tectonic phenomena, Rock Suites and petrographic provinces. Geological Time: Geological eras and their sub-divisions: Paleo-biogeography: Atmospheric Evolution; Distribution of life forms/fossils of the time; Faunal Traces; Floral Traces; Indian records of fossils		15
Unit – III	Paleogeographic Reconstruction Approaches: Paleo climatic Reconstructions; Paleogeomorphology Reconstructions; Reconstruction of Soil Cover, profiles of fossil soils, profiles of morainic/glacio-landscape, alluvial and fluvio-glacial deposits.		16
Practical Credit (01) **GG.DSE07-Piii**	**Course Title: Introduction to Dating Techniques and Methods:** Preparation of Practical file – of existing data on Radiocarbon dating; Incremental Methods – dendrochronology (tree-ring dating), Varve Chronology; Age estimate dating - OSL and TSL methods		30

Suggested Readings

1. Ager, D.V. (1973). The Nature of the Stratigraphical Record. London: Macmillan.
2. Ali, J.R., & Aitchison, J.C. (2005). Gondwana to Asia: Plate Tectonics and Paleogeography. London: Geological Society Special Publications.
3. Auden, J.B. (1953). Geology of the Himalayas. London: Longmans.
4. Bangar, K.M. 2020, Principles of Engineering Geology, Standard Publishers Distributors, ISBN-13 978-8180141157
5. Blakey, R.C. (2012). Paleogeography: Understanding the Changing Earth. Cambridge: Cambridge University Press.
6. Bond, G.C. (1979). Paleogeography of North America During the Precambrian. Boulder: Geological Society of America.
7. Boucot, A.J., & Gray, J. (2001). A Critique of Phanerozoic Climate Models. Boulder: Geological Society of America.
8. Brenchley, P.J., & Harper, D.A.T. (2009). Paleoenvironments and Paleogeography. Oxford: Blackwell Publishing.
9. Bullard, E., Everett, J.E., & Smith, A.G. (1965). The Fit of the Continents Around the Atlantic. London: Royal Society Publishing.
10. Chatterjee, S. (1984). The Rise of Birds. Baltimore: Johns Hopkins University Press.
11. Dalziel, I.W.D. (2013). Gondwana Paleogeography and Plate Tectonics. Cambridge: Cambridge University Press.
12. Dietz, R.S. (1961). Continent and Ocean Basin Evolution by Spreading of the Sea Floor. Nature Publishing Group.
13. Dott, R.H., & Batten, R.L. (1971). Evolution of the Earth (1st ed.). New York: McGraw-Hill.
14. Ghosh, R. (2002). Plate Tectonics and Paleogeographic Evolution of India. Kolkata: Allied Publishers.
15. Goswami, B.K. (2020). Himalayan Foreland Basin: Paleogeography and Stratigraphy. New Delhi: Springer India.
16. Gradstein, F.M., Ogg, J.G., & Smith, A.G. (2004). A Geologic Time Scale 2004. Cambridge: Cambridge University Press.
17. Holmes, A. (1951). The Age of the Earth. London: Nelson.
18. Holmes, A. (1965). Principles of Physical Geology (2nd ed.). London: Thomas Nelson.
19. Jain, S. (2003). Paleogeography of the Indian Subcontinent. New Delhi: Scientific Publishers.
20. King, L.C. (1967). The Morphology of the Earth. Edinburgh: Oliver and Boyd.
21. Krumbein, W.C., & Sloss, L.L. (1963). Stratigraphy and Sedimentation. San Francisco: W.H. Freeman.
22. Kupper, W. (1957). Palaeogeography of the Continents. New York: Springer-Verlag.
23. Lauri J. Pesonen, Johanna Salminen, Sten-Ake Elming, 2021, Ancient Supercontinents and the Paleogeography of Earth, Elsevier, ISBN 9780128185339 (ISBN10: 0128185333).

24. Lieberman, B.S. (2000). Paleobiogeography: Using Fossils to Study Global Change, Plate Tectonics, and Evolution. New York: Springer.
25. Mazumder, R. (2015). Precambrian Basins of India: Stratigraphic and Tectonic Context. Amsterdam: Elsevier.
26. Mohanty, A.K. (2017). Tectonics and Paleogeography of the Indian Plate. New Delhi: Primus Books.
27. Paul Upchurch Alistair J. McGowan, Claire S.C. Slater, 2011, Paleogeography and Paleobiogeography Biodiversity in Space and Time, CRC Press Taylor & Francis Group 6000 Broken Sound Parkway NW, Suite 300 Boca Raton, FL 33487-2742
28. Prothero, D.R. (2004). Bringing Fossils to Life: An Introduction to Paleobiology (2nd ed.). New York: McGraw-Hill.
29. Ramkumar, M. (2010). Geological Evolution of India: Precambrian, Proterozoic, and Phanerozoic. New Delhi: New India Publishing Agency.
30. Ravindra Kumar (1982): Fundamentals of Historical Geology and Stratigraphy of India. Willey Eastern Ltd.
31. Scotese, C.R. (2016). Paleogeographic Maps of the Past 750 Million Years. Evanston: PALEOMAP Project.
32. Scotese, C.R. (2021). PALEOMAP PaleoAtlas for ArcGIS. Evanston: PALEOMAP Project.
33. Scotese, C.R. (2025). Paleogeographic Maps of the Future. Evanston: PALEOMAP Project.
34. Shukla, U.K. (2011). Paleoclimatology and Paleogeography of Peninsular India. New Delhi: Macmillan India.
35. Smith, A.G., Smith, D.G., & Funnell, B.M. (2004). Atlas of Mesozoic and Cenozoic Coastlines. Cambridge: Cambridge University Press.
36. Trond H. Torsvik, L. Robin M. Cocks , 2016, Earth History and Paleogeography, ISBN-1107105323, 978-1107105324
37. Valdiya, K.S. (1980). Geology of Kumaun Lesser Himalaya. Dehradun: Wadia Institute of Himalayan Geology.
38. West, W.D. (1962). Geology and Paleogeography of India. Calcutta: Geological Society of India.
39. Wicander, R., & Monroe, J.S. (2009). Historical Geology: Evolution of Earth and Life Through Time (6th ed.). Boston: Cengage Learning.
40. Yin, A., & Harrison, T.M. (2000). Geologic Evolution of the Himalayan-Tibetan Orogen. Palo Alto: Annual Reviews.

DEPARTMENT OF GEOGRAPHY
B.A./B.Sc. Honours

GENERIC ELECTIVE (GE)- Remote Sensing

Programme: Under Graduate in Arts/Science	**Year: IV**	**Semester: VII** **Paper-**
Subject: Geography	**Course Code: GG.GE07-Ti**	**Course Title: Remote Sensing**

Course Outcomes

1. Ability to apply remote sensing principles to analyze and interpret data collected from various sensors.
2. Competence in interpreting aerial photographs and understanding their geometric properties for accurate analysis.
3. Proficiency in utilizing thermal and microwave remote sensing data for geographical studies and resource management.
4. Skill in digital image processing techniques for enhancing and classifying remote sensing data.
5. Capacity to apply remote sensing techniques in real-world scenarios, such as terrain evaluation, land use planning, and forest resource management.

Theory Credit:04	**Distribution of marks according the University rule**.
Total No. of Lectures – Tutorials – Practical (in hours per week): 4-0-0	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Unit	Course Content	No. of Lectures
Unit – I	Bases of Remote Sensing: Definition, interaction of Electro-Magnetic Radiation (EMR) with Atmosphere and Earth surface. Sensors and remote sensing data products.	14
Uni t – II	Aerial Photographs and Photogrammetry: Types of aerial photos, fundamentals of air photographs interpretation. Geometry of aerial photographs: tilt and relief displacement.	14
Unit – III	Thermal and Microwave Remote Sensing: Types; Characteristics; utilization in Geographical studies	14
Unit – IV	Digital Image Processing: Restoration; Enhancement and Classification: supervised and unsupervised; Application of Remote Sensing in terrain evaluation, land use and forest resource inventory.	18

Suggested Readings

1. Avery, T.E. and Berlon, G.L. (1985): Interpretation of Aerial Photographs Burgess Minneapolies.
2. Barrett, E.C. and L.F. Curties (1982): Photo Interpretation, Mcmillan, New York.
3. Bhatta, B. (2011). Remote sensing and GIS (2nd ed.). Oxford University Press India.
4. Campbell, J. B., & Wynne, R. H. (2011). Introduction to remote sensing (5th ed.). Guilford Press.

5. Chatterjee, S. N. (2012). Fundamentals of remote sensing and its applications. SBS Publishers & Distributors Pvt. Ltd.
6. Cracknell, A. P. (2015). Introduction to remote sensing (2nd ed.). CRC Press.
7. Falls Church (1980): American Society of Photogrammetry, Manual of Remote Sensing, Falls Church.
8. Gupta, R. P. (2017). Remote sensing geology (3rd ed.). Springer India.(Classic Indian contribution focused on geological remote sensing.)
9. Jensen, J. R. (2007). Remote sensing of the environment: An Earth resource perspective (2nd ed.). Pearson Education.
10. Jha, C. S., & Dadhwal, V. K. (Eds.). (2020). Remote sensing applications: Society and environment in India. Springer.
11. Jha, C. S., & Goparaju, L. (Eds.). (2016). Remote sensing applications in environmental research. Springer India.
12. Liang, S. (2004). Quantitative remote sensing of land surfaces. Wiley-Interscience.
13. Lillesand, T. M., Kiefer, R. W., & Chipman, J. W. (2015). Remote sensing and image interpretation (7th ed.). Wiley India.
14. (Indian Edition distributed widely in India.)
15. Mather, P. M., & Koch, M. (2011). Computer processing of remotely-sensed images: An introduction (4th ed.). Wiley-Blackwell.
16. Nag, P., & Kudrat, M. (2018). Digital remote sensing. Concept Publishing Company.
17. Navalgund, R. R., Jayaraman, V., & Roy, P. S. (2013). Remote sensing applications: An overview. NRSC/ISRO, Hyderabad.
18. Patel, P., & Joshi, P. K. (2021). Remote sensing for natural resources management. Scientific Publishers India.
19. Pratt, W.K. (1978): Digital Image Processing Wiley, New York.
20. Rao, D.P.(eds.) (1998): Remote Sensing for Earth Resources, Association of Exploration Geophysicist, Hyderabad.
21. Reddy, A. M. (2008). Remote sensing and geographical information systems. BS Publications.
22. Richards, J. A. (2013). Remote sensing digital image analysis: An introduction (5th ed.). Springer.
23. Roy, P. S., & Roy, A. (2010). Land use and land cover mapping using remote sensing data. Indian Society of Remote Sensing (ISRS).
24. Sabins, F.F. (1986): Remote Sensing Principles and Interpretation, Freeman, New York.
25. Schowengerdt, R. A. (2006). Remote sensing: Models and methods for image processing (3rd ed.). Academic Press.
26. Sharma, P. K. (2019). Principles of remote sensing: Concepts and applications. CBS Publishers.
27. Singh, R. B., & Kumar, A. (Eds.). (2008). Remote sensing and GIS for environmental management. Rawat Publications.
28. Thenkabail, P. S. (2021). Remote sensing of global croplands for food security. CRC Press. (Author of Indian origin, internationally recognized.)

29. Tiwari, K. C., & Saxena, A. (2009). Remote sensing and GIS applications in environmental management. Scientific Publishers.

DEPARTMENT OF GEOGRAPHY

B.A./B.Sc. Honours

GENERIC ELECTIVE (GE) - Emerging Geographical thoughts

Programme: Under Graduate in Arts/Science	**Year: IV**	**Semester: VII Paper-**
Subject: Geography	**Course Code: GG.GE07-Tii**	**Emerging Geographical thoughts**

Course Outcomes

1. On transacting this core course, the students will be able to grasp the unique disciplinary focus of Geography
2. Students will be able to identify the key debates that have shaped the subject
3. Students will be well acquainted with the changing paradigms in Geography and the emergence of modern geography

Theory (Credit-4)	**Distribution of marks according the University rule**.
Total No. of Lectures – Tutorials – Practical (in hours per week): 4-0-0	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Unit	Contents	Lect
UNIT-1	**Basic Concepts:** Geography as the study of areal differentiation, environmental determinism to New Environmentalism and Political Ecology. Concepts of Space, Place, Environment, Time, Scale, and Spatial Organization. Region and Regional Typology; Classical and Critical Perspectives. Anthropocene Debate; Implications for geographical thinking. Methods and approaches of Geography	15
UNIT-II	**Paradigm Shifts and Philosophical Contributions:** The Quantitative Revolution; Critiques, and Contemporary Relevance; Humanistic and Phenomenological Geography; Contributions of Yi-Fu Tuan, Edward Relph, and others. Literary Geography and Geo humanities; Reading landscapes as texts. Philosophy and Geography: Contributions of Vidal de la Blache, Carl Sauer, David Harvey, Doreen Massey. Critical Realism and Geography.	15
UNIT-III	**Emerging and Recent Trends:** Qualitative Paradigms and Changing Paradigms in Geography, Critical and Radical Geographies, Postmodernism, Poststructuralism, and Postcolonialism, Decolonial and Indigenous Geographies	12
UNIT - IV	**Modern Techniques and Concepts in Geography**: Remote Sensing, systems approach and Geographic Information System.	18

Suggesting Readings:

1. Agnew, J., Livingstone, D. N., & Rogers, A. (Eds.). (2011). The SAGE handbook of geographical knowledge. Sage.
2. Berry Markble (eds.) (1968): Spatial Analysis, Prentice Hall.
3. Castree, N., Kitchin, R., & Rogers, A. (Eds.). (2013). A dictionary of human geography. Oxford University Press.
4. Chatterjee, S.P. (1964): Fifty Years of Science in India: Progress of Geography, Calcutta.
5. Cloke, P., Crang, P., & Goodwin, M. (2005). Introducing human geographies (2nd ed.). Routledge.
6. Cole and King (1968): Quantitative Geography; Techniques, Theories in Geography, JWS.
7. Cresswell, T. (2013). Geographic thought: A critical introduction. Wiley-Blackwell.
8. Dickinson, R.E. (1969): The Makers of Modern Geography.
9. Dikshit, R. D. (2006). Geographical thought: A contextual history of ideas (2nd ed.). Prentice-Hall of India.
10. Dikshit, R.D. (1997): Geographical Thought, Prentice Hall, India.
11. Freeman, T.W. (1961): A Hundred Years of Geography, London.
12. Gregory, D., Johnston, R., Pratt, G., Watts, M., & Whatmore, S. (Eds.). (2009). The dictionary of human geography (5th ed.). Wiley-Blackwell.
13. Haggett and Chorley (1967): Models in Geography, London.
14. Haggett, P. and Chorley (1969): Models in Geography, London.
15. Haggett, Peter (1975): Geography: A Modern Synthesis, New York.
16. Hartshorne, R. (1939): The Nature of Geography (https://files.cercomp.ufg.br/weby/up/214/o/Livro-The_Nature_of_Geography.pdf)
17. Harvey, D. (1969): Explanation in Geography, London.
18. Harvey, D. (2006). Spaces of global capitalism: Towards a theory of uneven geographical development. Verso Books.
19. Hubbard, P., Kitchin, R., & Valentine, G. (Eds.). (2004). Key thinkers on space and place. Sage.
20. Husain, M. (2004). Evolution of geographical thought (4th ed.). Rawat Publications.
21. Husain, Majid (2001): Evolution of Geographical Thought, Rawat.
22. Kapur, A. (2010). Indian geography: Voice of developing India. Concept Publishing Company.
23. Kuhn, T.S. (1962): The Structure of Scientific Revolution: Chicago.
24. Majid Husain. (2012). Models in geography. Rawat Publications.
25. Minshull, R. (1967): Regional Geography: Theory and Practice.
26. Minshull, R. (1970): The Changing Nature of Geography, London.
27. Mishra, R. P. (2002). Regional planning: Concepts, techniques, policies and case studies. Concept Publishing Company.
28. Peet, R. (1998/2000). Modern geographical thought. Blackwell Publishers.
29. (Still cited widely after 2000, reprinted several times.)
30. Pensore, B. (1952): Travels and Discovery in Renaissance.

31. Rana, L. (2021). Contemporary geographical thought: Issues and challenges. Sage Publications India.
32. Richard Peet (1998): Modern Geographical Thought: Badewell.
33. Singh, R. L. (2009). Foundations of geographical thought. National Geographical Society of India.
34. Singh, S. (2018). Philosophy and methodology of geography. Rawat Publications.
35. Thomas and Hugget (1980): Modeling in Geography, HRP.

Dissertation on Major / Dissertation on Minor / Academic project/Entrepreneurship

Programme: Under Graduate in Arts/Science	**Year: IV**	**Semester: VII**
Subject: Geography		
Course Code: GG.DDPE07	**Course Title:** Dissertation on Major / Dissertation on Minor / Academic project/Entrepreneurship	
Outcome To learn how to select a Research Proposal based on research gap found during the literature survey or field observations made. Preparation of synopsis/outline will be also learned. Finally student will learn how to collect data and write a report based on the data analysis		
Credits: 06	Max. Marks: 100 (Evaluation by External & Internal Examiner) Dissertation: 75 Internal Assessment: Viva Voce + Attendance : 25 (20+5)	
The students will be required to select a topic and area of their interests with the help of their respective supervisors allotted to them by the Department. Research Project must be submitted to the Department one week before the commencement of the Theory Examinations. The size of the Dissertation normally ranges between 80 and 100 pages. The Research Project Dissertation will be evaluated by the external and internal examiners.		

DEPARTMENT OF GEOGRAPHY
B.A. /B.Sc. Honours

DISCIPLINE SPECIFIC COURSE (DSC) – GIS and GPS

Programme: Under Graduate in Arts/Science		**Year: IV**	**Semester: VIII Paper:**
Subject: Geography		**Course Code: GG.DSC08-T**	**Course Title: GIS and GPS**
Course Outcomes It will introduce Geographic Information System (GIS) and Global Positioning System (GPS) as a tool of spatial science and will make understand the basic elements of GIS and GPS. Finally, with some examples the application of these tools will be known.			
Theory Credit:3	**Distribution of marks according the University rule**.		
Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1		**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**	
Units	Contents		Lectures
Unit – I	Geography and Geographical Information System: Geography as a spatial science; Basic concepts of GIS; Components & Elements of GIS. Map Characteristics: Geo-referencing, Scale, Map Resolution; Map Projections, Data Automation; Types of Information in a Digital Map; Attribute Information; Display Information; Layering.		14
Uni t – II	Geographical Data Sets: Geographic Data Types; Spatial and Non-spatial data; Linkages and Matching, Principal Functions of GIS; Data Capture; Geographic Analysis; Scanning System; Data Conversion; Data Base and Spatial Data Management; Geo-Relational Data Model; Topological Data Structure; Attribute Data Management; Relational Database - Concepts & Model.		16
Unit – III	Global Positioning System: Basic Concepts; Components of a GPS; GPS Positioning Types; Accuracy of GPS; GPS Applications.		15
Practical (Credit-1) **GG.DSC08-P**	**Course Title: GIS& GPS/DGPS Mapping**: GPS/DGPS Handling, Data collection; Downloading data from GPS; Mapping and Editing of data; Map elements; Base Map Preparation.		30

Suggested Readings

1. Anji Reddy, M. (2008). Textbook of remote sensing and geographical information systems (2nd ed.). BS Publications.
2. Aroneff, S. (1989): Geographic Information System: A Management Perspective, DDL Publication, Otawa.
3. Bhatta, B. (2011). Remote sensing and GIS (2nd ed.). Oxford University Press India.
4. Bolstad, P. (2016). GIS fundamentals: A first text on geographic information systems (5th ed.). Eider Press.
5. Chaudhary, P. (2012). GIS applications in rural development. Concept Publishing.
6. DeMers, M. N. (2009). Fundamentals of geographic information systems (4th ed.). Wiley.
7. El-Rabbany, A. (2002). Introduction to GPS: The global positioning system. Artech House.
8. Fraser Taylor, D.R. (1991): Geographic Information System, Pergamon Press Oxford.
9. Hegarty, C. J., & Chatre, E. (Eds.). (2020). Understanding GPS/GNSS: Principles and applications (3rd ed.). Artech House.
10. Heywood, I., Cornelius, S., & Carver, S. (2011). An introduction to geographical information systems (4th ed.). Pearson Education.
11. Jha, M. M. (2022). Applied GIS and spatial analysis in India: A practical approach. Sage Publications India.
12. Kennedy, M. (2013). Introducing Geographic Information Systems with ArcGIS (3rd ed.). Wiley.
13. Konecny, G. (2014). Geoinformation: Remote sensing, photogrammetry and geographical information systems. CRC Press.
14. Kumar, P. (2013). Fundamentals of GPS. Universities Press (India) Pvt Ltd.
15. Longley, P. A., Goodchild, M. F., Maguire, D. J., & Rhind, D. W. (2015). Geographic information systems and science (4th ed.). Wiley.
16. Maquire, D.J.M.F. (1991): Goodchild Geographic information Systems: Principles and Application, Taylor & Francis, Washngton.
17. Nag, P. (2005). Geographic information system: Concepts and business opportunities. Concept Publishing Company.
18. Pandey, P. (2021). GIS-based natural resource management. Studium Press.
19. Peterson, M. P. (2012). Online maps with APIs and WebServices. Springer.
20. Peuquet D.J. and D.F. Marble (1990): Introductory Reading in Geographic Information System, Taylor & Francies, Washngton.
21. Roy, P. S. (2010). Geospatial techniques for natural resources management. New India Publishing Agency.
22. Sharma, V. K. (2002). Remote sensing for natural resources management and environmental monitoring. Capital Publishing Company.
23. Srivastava, P. K. (2015). Remote sensing and GIS: Applications in environmental sciences. Oxford Book Company.
24. Srivastava, P. K., Han, D., Rico-Ramirez, M. A., & Islam, T. (Eds.). (2018). Satellite remote sensing and GIS applications in agricultural meteorology. Springer India.

25. Star J. and J.E. Estes (1994): Geographic Information Sytems : An Introduction: Prentice Hall, Engleweed Cliff, New Jersey.
26. Tiwari, K. C. (2016). GIS and remote sensing applications in environmental management. Scientific Publishers.
27. Tiwari, K. C., & Joshi, P. K. (2023). Advanced GIS applications for sustainable development in India. Springer.
28. Van Sickle, J. (2020). GPS for land surveyors (5th ed.). CRC Press.
29. Zhang, J. (2017). Advanced GPS theory and applications. Springer.

DEPARTMENT OF GEOGRAPHY
B.A./B.Sc. Honours
DISCIPLINE SPECIFIC ELECTIVE (DSE) – AEOLIAN GEOMORPHOLOGY

Programme: Under Graduate in Arts/Science	**Year: IV**	**Semester: VIII**	**Paper:**
Subject: Geography			
Course Code: GG.DSE08-Ti		**Course Title: Aeolian Geomorphology**	

Course Outcomes

1. Ability to recognize and interpret aeolian landforms and processes in different environments, applying knowledge of grain motion and wind erosion.
2. Competence in assessing the impacts of wind erosion on agricultural fields and implementing management strategies to control dust.
3. Proficiency in managing coastal dunes and semi-arid dune areas, including measures to prevent desertification with a focus on India.
4. Capability to collect climatic data, photographs, and other relevant information from aeolian regions, and prepare reports and atlases to document and analyze aeolian landforms and their distribution.

Theory Credits: 03	**Distribution of marks according the University rule**.
Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Unit	Course Content	Lect.
Unit – I	Wind Environments: Introduction; desert wind systems; directional variability and resultant drift potential; scope of aeolian geomorphology. Grain in motion: fluid flows - flow types; interaction of the wind and the bed - wind shear; entrainment – lift and drag; Thresholds of movement: static and dynamic ; modes of transport: saltation, creep, reptation and suspension; transport rates.	14
Unit – II	Wind erosion and landforms: Processes: abrasion, deflation and aerodynamic erosion; Landforms: ventifacts, yardangs, pans, stone pavements, deflation hollows; desert varnish; processes and significance. Dusts-Sources; - contemporary and proximal, mineral composition; Dust-generating and dust yielding systems, gross spatial patterns of production and removal; deposition: loess, types, palaeo - environmental significance.	16
Unit – III	Forms of wind deposition: sand ripples, obstacle dunes; dune- classification schemes; morphodynamics of the crescentic, longitudinal and complex dunes; Plaeo—environments: Introduction; sediment movement in the past; relic and active dunes; dating aeolion deposits; Pre-Pleistocene sand dunes; Pleistocene and Holocene dunes; Aeolinites - composition and distribution.	15
Practical Credit (01)	**Course Title: Identification of Aeolian landforms and mapping:** Collection of climatic data from various sources of Aeolian region and report making; Collection of Photographs of Aeolian landforms and Atlas	30

GG.DSE08-Pi	Preparation with distribution and explanation.	

Suggested Readings

1. Bagnold, R. A. (1954). The physics of blown sand and desert dunes. Methuen. (Foundational book.)
2. Bullard, J. E. (2011). Sand and dust storms: Environmental hazards. Routledge.
3. Bullard, J. E., & White, K. (2005). Dust production and sedimentary processes in deserts. Earth-Science Reviews.
4. Cooke, R., Warren, A., & Goudie, A. (1993). Desert geomorphology. UCL Press.
5. Das, G. (2011). *Arid landforms and processes in Rajasthan.* Rawat Publications.
6. Dhir, R. P. (1995). *The Thar Desert: Land, man, and environment.* Scientific Publishers.
7. Goudie, A. (2013). The human impact on the natural environment (7th ed.). Wiley-Blackwell.
8. Goudie, A. S. (1978). Dust storms and their geomorphological implications. Progress in Physical Geography.
9. Goudie, A. S., & Wilkinson, J. (1977). *Desert geomorphology: India and beyond.* Oxford University Press.
10. Greeley, R., & Iverson, J. D. (1985). Wind as a geological process: On Earth, Mars, Venus and Titan. Cambridge University Press.
11. Gupta, V. (2001). *Sand dune dynamics in the Thar Desert.* Rawat Publications.
12. Hastenrath, S. (1988). Climate and circulation of the tropics. Springer. (Includes aeolian processes.)
13. Kar, A. (1993). *Geomorphology and desertification in Thar Desert.* Scientific Publishers.
14. Katra, I. (2014). Aeolian erosion: Monitoring, modeling and management. Springer.
15. Kaul, R. N. (1992). *Management of arid ecosystems: Indian experience.* Scientific Publishers.
16. Kaul, R. N., & Kulshreshtha, S. N. (1970). *Desert environment: A review.* Central Arid Zone Research Institute.
17. Kocurek, G. (1998). Eolian system sedimentology. SEPM Special Publications.
18. Lancaster, N. (1986). Dunes on the Namib Sand Sea: Geomorphology and processes. Geological Society of America.
19. Lancaster, N. (1995). Geomorphology of desert dunes. Routledge.
20. Lancaster, N. (2020). Dryland geomorphology: A global perspective. Wiley-Blackwell.
21. Livingstone, I., & Warren, A. (1996). Aeolian geomorphology: An introduction. Longman.
22. Mainguet, M. (1991). Desertification: Natural background and human mismanagement. Springer.
23. Mathur, R. P. (1980). *Arid region geomorphology: Studies from India.* University of Rajasthan.
24. McKee, E. D. (1979). A study of global sand seas. U.S. Geological Survey.
25. Middleton, N. (2017). Desert dust: Origins, consequences and management. Wiley.

26. Middleton, N., & Thomas, D. (1997). World atlas of desertification. United Nations Environment Programme.
27. Narain, P. (2006). *Desertification control in the Thar Desert of India.* Central Arid Zone Research Institute (CAZRI).
28. Nickling, W. G., & Neuman, C. M. (2009). Aeolian sediment transport: New insights from experiments and models. Springer.
29. Pye, K. (1987). Aeolian dust and dust deposits. Academic Press.
30. Pye, K., & Tsoar, H. (1990). Aeolian sand and sand dunes. Springer.
31. Sharma, H. S. (1990). *Indian geomorphology: Landforms and processes.* Concept Publishing.
32. Singh, S. (2005). *Geomorphology.* Prayag Pustak Bhawan.
33. Singh, S. (2012). *Arid zone geomorphology of India.* Rawat Publications.
34. Stokes, S., & Bray, H. (2005). Late quaternary desert evolution: Geological and climatic controls. Springer.
35. Thakur, V. C. (1988). *Desertification in western Rajasthan: A geomorphological analysis.* Geological Society of India.
36. Thomas, D. S. G. (1997). Arid zone geomorphology: Process, form and change in drylands (2nd ed.). Wiley.
37. Thomas, D. S. G., & Goudie, A. S. (2000). The dictionary of physical geography (3rd ed.). Blackwell Publishers.
38. Tsoar, H. (2001). Types of dunes and their formative conditions. Geomorphology.
39. Warren, A. (2013). Dunes: Dynamics, morphology, history. Springer.
40. Washington, R., & Todd, M. (2005). Atmospheric controls on mineral dust emission. Earth-Science Reviews.

DEPARTMENT OF GEOGRAPHY
B.A./B.Sc. Honours
DISCIPLINE SPECIFIC ELECTIVE (DSE) – Soil Geography

Programme: Under Graduate in Arts/Science	**Year: IV**	**Semester: VIII** **Paper:**
Subject: Geography		
Course Code: GG.DSE08-Tii	**Course Title: SOIL GEOGRAPHY**	

Course Outcomes

1. Ability to analyze the relationship between soil geography and pedology, applying concepts to understand soil formation and distribution.
2. Competence in identifying soil properties and morphology, including physical, chemical, and biological characteristics, and interpreting their implications for soil classification.
3. Proficiency in assessing soil formation processes and capabilities, applying classification systems to evaluate land suitability for various purposes.
4. Understanding of soil degradation mechanisms and management strategies, including the assessment of erosion factors and implementation of conservation measures.
5. Capability to conduct soil measurements and analyses, including pH, temperature, texture, and particle size, and to interpret aerial photographs and satellite imagery for soil mapping purposes.

Credits: 03	**Distribution of marks according the University rule**.
Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Units	Contents	No. of Lectures
Unit – I	Conceptual Base: Concept, scope, approaches and significance Soil Geography and its relationship with Pedology; Soil forming factors and processes.	14
Unit – II	Soil Properties & Morphology: Physical, Chemical and biological properties of soils	15
Unit – III	Soil Classification and Mapping: Genetic Classification of soils; Soil taxonomy: Soils orders and sub-order level; Soil Landscape Mapping. Soil Degradation & Management: Methods of Assessing Soil Erosion; Natural and Anthropogenic Factors of Soil Degradation; Soil Conservation and Management.	16
Practical Credit (01) **GG.DSE08-Pii**	**Course Title: Identification of soil Characteristics:** Measurement of pH value, and temperature; Identification of physical structure of soil, and soil horizons of a soil profile and preparation of diagrams; Determination of soil texture by feel method; Particle size analysis with ploting on ternary graph; Preparation of soil map using satellite data.	30

Suggested Readings

1. Backman, H.O and Brady, N.C. (1960): The Nature and Properties of Soils, Mc Millan New York.
2. Bennet, Hugh H. (1939): Soil Conservation, McGraw Hill, New York. https://archive.org/details/in.ernet.dli.2015.212071/mode/2up
3. Bunting, B.T. (1973): The Geography of Soils, Hutchinson, London.
4. Clarke G.R. (1957): Study of the Soil in the Field, Oxford University Press, Oxford.
5. Coleman, D., Callaham, M. and Crossley, D. (2017): Book Review: Fundamentals of Soil Ecology (Third Edition). https://www.frontiersin.org/journals/environmental-science/articles/10.3389/fenvs.2018.00091/full
6. Daniel Hillel (2007): Soil in the Environment 1st Edition. Academic Press.
7. Donald, Steila, Thomas E. Pond (1989): The Geography of Soils: Formation, Distribution, and Management, 2nd Edition. https://www.goodreads.com/book/show/9007134-the-geography-of-soils
8. Foth H.D. and Turk, L.M. (1972): Fundamentals of Soil science, John Wiley, New York.
9. Govinda Rajan, S.V. and Gopala Rao, H.G. (1978): Studies on Soils of India Vikas, New Delhi.
10. Gurumurthy, P. (2023): Soils and Environment.
11. Kale, V.B. (2020): Soil Goegraphy. Himalaya Publishing House.
12. Kaleeswari, R.K., Rajeswari, R., Sivakumar, K.and Latha, M.R. (2023): Soil Degradation. https://www.satishserial.com/book/9789390660490/soil-degradation
13. Kulkarni, N. and Aithal, S.C. (2017): Modern Approaches in Soil Agriculture and Environmental Microbiology. Himalaya Publishing House.
14. Mc. Bride, M.B. (1999): Environmental Chemistry of Soils, Oxford University Press, New York.
15. Michael J. Goss and Margaret Oliver (2023): Encyclopedia of Soils in the Environment, Second Edition. https://www.sciencedirect.com/referencework/9780323951333/encyclopedia-of-soils-in-the-environment#book-info
16. Mishra, B.B. (2022): The Soils of India. https://www.rawatbooks.com/geography/the-soils-of-india
17. Nye, P.H. and Greene, D.J. (1960): The Soil under Shifting Cultivation Commonwealth Bureau of Soil Science, Technical Communication, No. 51; Harpender, England.
18. Plantes, A.D. (2023): Soil science for regenerative agriculture. Independently published.
19. Raychoudhuri, S.P. (1961): Soils of India, ICAR, New Delhi.
20. Russell, Sir Edward J. (1961): Soil Conditions and Plant Growth, Wiley, New York.

21. Zech, W., Schad, P. and Hintermaier-Erhard, G. (2022): Soils of the World. https://link.springer.com/book/10.1007/978-3-540-30461-6

DEPARTMENT OF GEOGRAPHY

B.A./B.Sc. Honours

DISCIPLINE SPECIFIC ELECTIVE (DSE) – ENVIRONMENTAL MANAGEMENT & SUSTAINABLE DEVELOPMENT

Programme: Under Graduate in Arts/Science	**Year: IV**	**Semester: VIII Paper-**
Subject: Geography	**Course Code: GG.DSE08-Tiii**	**Course Title: Environmental Management and Sustainable Development**

Course Outcomes

1. Ability to analyze the interrelationship between environment and society, applying environmental geography concepts to understand human-environment interactions.
2. Competence in identifying and assessing environmental problems, including their causes, impacts, and potential solutions.
3. Proficiency in understanding the principles of sustainable development and applying them to promote sustainable practices in mountain agriculture and livelihoods.
4. Understanding of environmental management strategies and techniques, including integrated watershed management and disaster preparedness.
5. Capability to evaluate environmental changes and their consequences, develop environmental plans for sustainable development, and contribute to climate change adaptation efforts through practical field visits and report writing.

Theory Credit:3	**Distribution of marks according the University rule**.
Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Unit	Course Content	Lectures
Unit – I	Conceptual Base: Environment: Concepts and Types; Environmental Perception; Environment and Society; Meaning, Scope and Significance of Environmental Geography; Approaches to the Study of Environmental Geography.	14
Uni t – II	Environmental Problems:Types of environmental problems; causes and consequences of environmental problems at global regional and local levels; Global environmental change; Natural disasters; Environmental Impact Assessment (EIA); Sustainable Development: Concepts of Sustainable Development; Need of Sustainable Development; Sustainable Mountain Agriculture and Livelihood.	15
Unit – III	Environmental Management: Concept of Environmental Management; Approaches to Environmental Management; Integrated Watershed Management; Disaster Management; Environmental Management in Uttarakhand Himalaya. Environmental Changes – Causes & Consequences; Environmental Planning & Sustainable Development; Disaster Management; Climate, Change and Adaptation	16
Practical Credit (01)	**Course Title: Field Visit and Report writing**	30

GG.DSE08-Piii		

Suggested Readings:

1. Abu Samah, M.A. and Amri Kamarudin, Mohd K. (2022): Environmental Management and Sustainable Development Case Studies and Solutions from Malaysia. https://link.springer.com/book/10.1007/978-3-030-93932-8
2. Brundland, G. (1988) Our Common Future, Report of the World Commission on Environment and Development, UN.
3. Carpenter R A (ed) (1983): Natural Systems for Development: what planners need to known Mc. Millan London.
4. Cheremisinoff, P.N. & A.C. Morresi (1977): Environment Assessment and Impact studies Handbook. An Arbor, Mich: Anarbor Science.
5. Clini, C., Musu, I. and Gullino, Maria L. (2008): Sustainable Development and Environmental Management Experiences and Case Studies. https://link.springer.com/book/10.1007/978-1-4020-6598-9?page=2&oscar-books=true
6. Das, M.C. (2019): Concepts of Environmental Management for Sustainable Development. Dreamtech Press.
7. Dehalwar, K. (2015): Basics of Environment Sustainability and Environmental Impact Assessment. Edupedia Publications Pvt Ltd https://books.pen2print.org/index.php?route=product/product&product_id=239
8. Fulekar, M.H., Pathak, B. and Kale, R.K. (Eds) (2013): Environment and Sustainable Development Hardcover. Springer Nature.
9. Murali Krishna, I.V. and Manickam, V. (2017): Environmental Management Science and Engineering for Industry 1st Edition. Butterworth-Heinemann. https://shop.elsevier.com/books/environmental-management/krishna/978-0-12-811989-1
10. Omer, Abdeen M. (2015): Sustainable Development and Environment Management: Innovations, Sciences and Technologies. Nova Science Publishers.
11. Pande G.C. & D.C. Pandey (1999): Environmental Development and Management: Strategies and Policies (ed.), New Delhi.
12. Richard Welford (eds) (2016): Corporate Environmental Management 3: Towards Sustainable Development (Environmental Management Set). Routledge; 1st edition
13. Sahu, A.S. and Chatterjee, N.D. (2023): Environmental Management and Sustainability in India. https://link.springer.com/book/10.1007/978-3-031-31399-8
14. Shukla, V. and Kumar, N. (2020): Environmental Concerns and Sustainable Development (Volume 2: Biodiversity, Soil and Waste Management). https://link.springer.com/book/10.1007/978-981-13-6358-0
15. Singh, B. Vishvendra Raj and Batar, A.K. (2024): Sustainable Local Development for Environmental and Social Sustainability. https://link.springer.com/book/10.1007/978-3-031-67303-0

16. Ujikawa, K., Ishiwatari, M., Hullebusch, E.V. (2024): Environment and Sustainable Development Proceedings of the 2023 8th Asia Conference on Environment and Sustainable Development. https://link.springer.com/book/10.1007/978-981-97-3320-0
17. Venkatesan, G., Lakshmana Prabu, S. and Rengasamy, M. (Eds) (2022): Sustainability Studies: Environmental and Energy Management. Bentham Books Publication. https://benthambooks.com/book/9789815039924/preface/
18. Wathern, Peter (1986): Enviromental Impact Assessment: Theory and Practice. Unwin & Hyman, London.

DEPARTMENT OF GEOGRAPHY
B.A./B.Sc. Honours
GENERIC ELECTIVE (GE) – POLITICAL GEOGRAPHY

Program: Under Graduate in Arts/Science	**Year: IV**	**Semester: VIII Paper-**
Subject: Geography	**Course Code: GG.GE08-Ti**	**Course Title: Political Geography**

Course outcomes

1. Understand broad meaning and scope of Political Geography.
2. Learn about the concept of Nation and Nationalism.
3. Learn about Frontier and Boundaries.
4. Learn about theories of Geo-Strategic Views.
5. Understand Geopolitics of India.

Theory Credits: 04	**Distribution of marks according the University rule**.

Total No. of Lectures – Tutorials – Practical (in hours per week): 4-0-0	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Unit	Course Content	Lectures
Unit – I	Definition, Nature and Scope; History and Development of Political Geography; Approaches to the Study of Political Geography.	10
Unit – II	Concept of Nation, State and Nation-State; Geographic Characteristics of States: Size, Shape, Location, Cores and Capitals; Nation Building/Nationalism.	10
Unit – III	Definition of Frontier and Boundaries; Distinction Between Frontier and Boundaries; Genetic, Functional & Morphological Classification of Boundaries.	12
Unit – IV	Global Geo-Strategic Views Related to Heartland and Rim land: Mackinder & Spykman; Cohen's Views; Unitary and Federal Forms of Governance. Political Geography of India; India's Neighbors & Geopolitical Study of Indian Ocean; Changing Political Map of India and Inter-state Disputes Related to Language and Others.	28

Suggested Reading

1. Adhikari, S. (2002). Political geography. Rawat Publications.
2. Agnew, J. (2003). Geopolitics: Re-visioning world politics (2nd ed.). Routledge.
3. Cohen, Samuel (1964) Geography and Politics in Divided World. Random House, New York.
4. Dalby, S. (2013). Security and environmental change. Polity Press.
5. De Blijj, H. J. and Glassner, M. (1968) Syst. Political Geography. J. W. and Sons, New York.
6. Dikshit, R.D. (1987) Political Geography and Geopolitics. Tata McGraw Hill, New Delhi.
7. Dikshit, R.D. (2000) Political Geography: A Contemporary Perspective. P.-Hall, New Delhi.
8. Dodds, K. (2005). Global geopolitics: A critical introduction. Pearson Education.
9. Elden, S. (2013). The birth of territory. University of Chicago Press.
10. Flint, C. (2006). Introduction to geopolitics. Routledge.
11. Flint, C. (2020). Political geography: World-economy, nation-state, and locality (7th ed.). Routledge.
12. Flint, C. (2023). Geopolitical constructs: The multilayered dynamics of states, borders, and regions (2nd ed.). Routledge.
13. Gautam, A. (2018). Political geography of India. Sharda Pustak Bhawan.
14. Glassner, M. I., & Fahrer, C. (2004). Political geography (3rd ed.). Wiley.
15. Husain, M. (2007). Politics and geography. Rawat Publications.
16. Kaul, R. N. (2021). State, politics, and spatiality in India. Sage Publications India.
17. Mamadouh, V. (2002). Political geography: Space, place and politics. Routledge.
18. Misra, K. (2024). Political geography: Trends and theories in Indian context. (Upcoming, Sage India).
19. Murphy, A. B. (2018). The regional dynamics of language and identity in political geography. Taylor & Francis.
20. Nag, P. (2012). Geopolitical affairs and regional perspectives. Concept Publishing Company.
21. Nanda, R. (2022). Borders and borderlands: Geopolitical changes in South Asia. Orient BlackSwan.
22. Painter, J., & Jeffrey, A. (2009). Political geography: An introduction to space and power. Sage Publications.
23. Pandey, A. (2016). Contemporary issues in Indian political geography. Radha Publications.
24. Pannikar, K.M. (1959) Geographical Factors in Indian History. 2 vols. Asia. P. House Bombay
25. Pearcy, G. E. and Fifield, R. (1948) World Political Geography, Thomas Y Crowell, New York.
26. Pounds, N.J.G. (1972) Political Geography. McGraw Hill Publication., New York.
27. Sharma, P. R. (2013). Geopolitics and strategic geography of South Asia. Concept Publishing.
28. Short, John R. (1982) An Introduction to Political Geography. Routledge, London.
29. Siddiqui, K. (2011). Political geography: Concepts, methods and case studies. Gyan Publishing House.
30. Singh, J. (2020). Geopolitics: A contemporary perspective. Rawat Publications.

31. Singh, R. Y. (2010). Political geography. APH Publishing.
32. Singh, T. D. (1988) Hind Mahasagar Avam Parimandaliya Rashtra: Ek Bhougolik Adhyayan, Tara Book Agency, Varanasi.
Taylor, P. J., Flint, C., & Waever, O. (2007). Political geography: World-economy, nation-state and locality (5th ed.). Routledge

B.A./B.Sc. Honours
General Elective (GE) - Oceanography

Programme: Under Graduate in Arts/Science	**Year: IV**	**Semester: VIII Paper-**
Subject: Geography	**Course Code: GG.GE08-Tii**	**Course Title: Oceanography**

Course Outcomes
Oceanography is a branch of science and important today as climate change, pollution, and other factors are threatening the ocean and its marine life. It also helps us predict long-term weather and climate changes, which leads to more efficient use of the Earth's resources. It also helps understand the effect of pollutants on ocean waters.

Theory-(Credit-4)	**Distribution of marks according the University rule**.
Total No. of Lectures – Tutorials – Practical (in hours per week): 4-0-0	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Units	**Contents**	Lectures
Unit - I	Definition, scope and development of Oceanography, Distribution of water over the globe.	10
Unit - II	Relief of the ocean floor, Continental drift and ocean floor spreading, Composition of sea water.	15
Unit - III	Temperature in oceans, Salinity, density and water masses in oceans, Marine deposits.	15
Unit - IV	Coral landforms, Waves and tides, Ocean currents, Marine life. Oceanic Pollution; Possible natural disturbances causing pollution in oceans; Anthropogenic activities resulting in oceanic pollution; The United Nations Convention on the Law of the Sea (UNCLOS).	20

Suggested Reading:

1. Davis Richard J.A. (1986) "Oceanography - An Introduction to the Marine Environment" Wm. C.Brown Lowa.
2. Duxbury C.A. and Duxbury B. (1996) An Introduction to the World's Oceans. C. Brown Lowa 2nd ed.
3. Garrison, T. (2001) "Oceanography - An Introduction to Marine Science. Books/ Cole, Pacific Grove, USA,
4. Gross, M. Grant (1987) Oceanography, A View of the Earth, Prentice Hall Inc. New Jersey, 1987.
5. King, C.A.M. (1962) Oceanography for Geographers.
6. Singh Savindra., (2000), Oceanography, Prayag Pustak Bhavan, Allahabad.
7. Sharma, R.C. (1985) The Oceans" Rajesh New Delhi.
8. Ummerkutty, A.N.P. (1985) Science of the Oceans and Human Life, NBT, New Delhi

Dissertation on Major / Dissertation on Minor / Academic project/Entrepreneurship

<table>
<tr><td colspan="2">Programme: Under Graduate in Arts/Science</td><td>Year: IV</td><td>Semester: VIII</td></tr>
<tr><td colspan="4">Subject: Geography</td></tr>
<tr><td colspan="2">Course Code: GG.DDPE08</td><td colspan="2">Course Title: Dissertation on Major / Dissertation on Minor / Academic project/Entrepreneurship</td></tr>
<tr><td colspan="4">Outcome
To learn how to select a Research Proposal based on research gap found during the literature survey or field observations made. Preparation of synopsis/outline will be also learned. Finally student will learn how to collect data and write a report based on the data analysis</td></tr>
<tr><td>Credits: 06</td><td colspan="3">Max. Marks: 100 (Evaluation by External & Internal Examiner)
Dissertation: 75
Internal Assessment: Viva Voce + Attendance: 25 (20+5)</td></tr>
<tr><td colspan="4">The students will be required to select a topic and area of their interests with the help of their respective supervisors allotted to them by the Department. Research Project dissertation must be submitted to the Department one week before the commencement of the Theory Examinations. The size of the Dissertation normally ranges between 80 and 100 pages. The Research Project Dissertation will be evaluated by the external and internal examiners.</td></tr>
</table>

DEPARTMENT OF GEOGRAPHY
(Semester IX & X)

Sem.	Core Discipline Specific Course (DSC) 4	DSC/GE 4		Total Credit
IX	DSC9 (3+1=4) **GG.DSC09-T:** **<u>Theory (3)</u>** **Regional Geography of India** **GG.DSC09-P:** **<u>Practical (1)</u>** **Field Survey and Report Writing**	Choose three DSE (3x4) courses OR Choose two DSE- (2x4) and one GE (4) course OR Choose one DSE (4) and two GE (2x4) courses (total = 12) **GG.DSE09-Ti:** **DSE(3) Natural Resource Management** **GG.DSE09-Pi:** **Pract.(1): RS and GIS Application** **GG.DSE09-Tii:** **DSE(3) -Fluvial Geomorphology** **GG.DSE09-Pii:** **Pract. (1): Drainage Basin Morphometry** **GG.DSE09-Tiii:** **DSE(3) - Population Geography** **GG.DSE09-Piii:** **Pract. (1): Population Data Analysis** **GG.GE09-Ti:** **GE- Cultural Geography** **GG.DSE09-Tii:** **GE- Geography of Uttarakhand**	Dissertation on Major (6) OR Dissertation on Minor (6) OR Academic project/ Entrepreneurship (6)	
	4	**12**	**6**	**22**

X	DSC10 (3+1=4) **GG.DSC10-T:** **<u>Theory (3)</u> Hydrology** **GG.DSC10-P:** **<u>Practical (1)</u> Hydrological Data Analysis**	Choose three DSE (3x4) courses OR Choose two DSE- (2x4) and one GE (4) course OR Choose one DSE (4) and two GE (2x4) courses (total = 12) **GG.DSE10-Ti:** **DSE(3) - Glacial and Periglacial Geomorphology** **GG.DSE10-Pi:** **Pract. (1):Landform identification and mapping** **GG.DSE10-Tii:** **DSE (3) -Integrated Watershed Management** **GG.DSE10-Pii:** **Practical (1): Watershed Management** **GG.DSE10-Tiii:** **DSE(3) -Agricultural Geography and Agro-Ecosystem Management** **GG.DSE10-Piii:** **Pract. (1): Agricultural Statistics** **GG.GE10-Ti:** **GE - Conceptual Foundations & Perspectives of Sustainable Development** **GG.GE10-Tii:** **GE- Disaster Management**	Dissertation on Major (6) OR Dissertation on Minor (6) OR Academic project/ Entrepreneurship (6)	
	4	**12**	**6**	**22**
				Total 220

DEPARTMENT OF GEOGRAPHY
M.A./M.Sc. Geography
DISCIPLINE SPECIFIC COURSE (DSC) – Regional Geography of India

Programme: Post Graduate	**Year: V**	**Semester: IX Paper -**
Subject: Geography	**Course Code: GG.DSC09-T**	**Course Title: Regional Geography of India**

Course Outcome
Developed the art of regionalization technique while focusing about diversity of Indian region.
Visualized and recognized about regional identities and socio-cultural dimension of regionalization to address the issues and concern needed for regional planning.

Theory Credits: 03	**Distribution of marks according the University rule**.

Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Unit	Course Content	Lectures
Unit – I	Regions in Geography: Process and Concept: Introduction of Regional Geography; Concept of geographical region and regionalization; Nature and scope of regional geography and regional methods of analysis; regional concept and regional geography: Bases of regionalization; previous consideration in Indian Regionalization;	14
Unit – II	Planning and development Approach: Regional development and planning in India, Regional disparities, Five-year plans, NITI Ayog, Integrated rural development programme, Panchayati raj, Command area and watershed management.	16
Unit – III	Schemes of Regionalization in India The Regionalization of India on the basis of population potential of cities; Cultural regions of India; Climate region of India; Geographical regions based on dominant natural vegetation, Soil regions; Structural regions and Physiographic divisions and their sub divisions of India; Agro- climate and its sub regions in India	15
Practical Credit: 1 **GG.DSC09-P**	**Field Survey and Report Writing**	30

Suggested Readings

1. Ahmed, A. (1992). Social geography of India. Rawat Publications.
2. Bagchi-Sen, S., & Smith, H. L. (2006). Economic geography: Past, present and future. Taylor & Francis. (Contains Indian examples.)
3. Bhat, L. S. (1972). Regional planning in India. Statistical Publishing Society.
4. Das, P. (2020). The geography of India. McGraw-Hill India.
5. Dubey, R. N. (2001). Regional development and planning in India. Rajat Publications.
6. Gopalakrishnan, R. (1988). Regional planning in India. Vikas Publishing House.
7. Hussain, M. (2008). Geography of India. Tata McGraw Hill.
8. Jain, S. P. (2005). Development planning for rural development in India. Pointer Publishers.
9. Khullar, D. R. (2011). India: A comprehensive geography. Kalyani Publishers.
10. Mishra, R. P. (2021). Regional development and planning: New strategies for India. Concept Publishing Company.
11. Nag, P. (1992). Geography of India. Concept Publishing Company.
12. Rana, L. (2018). Regional geography of India. Axis Books Pvt. Ltd.
13. Rao, B. P. (2012). Regional planning and development. Sonali Publications.
14. Raza, M., & Aggarwal, Y. (1985). Transport geography of India. Concept Publishing.
15. Raza, M., Ed. (1981). Valley of Kashmir: Regional geography and resource survey. Vikas Publishing.
16. Sharma, R. C. (2006). Regional disparities in India. Anmol Publications.
17. Sharma, T. C. (2003). Economic and commercial geography of India. Vikas Publishing House.
18. Siddhartha, K., & Mukherjee, S. (2001). Cities, urbanization and urban systems. Kisalaya Publications.
19. Singh, J. (2017). Regional planning and development of India. Radha Publications.
20. Singh, R. L. (1971). India: A regional geography. National Geographical Society of India.
21. Singh, R. L. (Ed.). (1971). India: A regional geography. National Geographical Society of India, Varanasi.
22. Singh, S. (2010). Environmental geography. Prayag Pustak Bhawan.
23. Spate, O. H. K., & Learmonth, A. T. A. (1967). India and Pakistan: A general and regional geography (3rd ed.). Methuen & Co. Ltd.
24. Tirtha, R. (2002). Geography of India: Comprehensive, systematic and up-to-date. Rawat

DEPARTMENT OF GEOGRAPHY
M.A./M.Sc. Geography
DISCIPLINE SPECIFIC CORE COURSE (DSE) - Natural Resource Management

Program: Post Graduate	**Year: V**	**Semester: IX Paper-**
Subject: Geography		
Course Code: GG.DSE09-Ti	**Course Title: Natural Resource Management**	

Course Outcomes
This course helps to gain a comprehensive understanding of the concepts and methodologies involved in natural resource management, including the examination of resource utilization and potential misuse. Additionally, to develop proficiency in analyzing the status of natural resources utilizing various techniques, particularly remote sensing and GIS.

Theory Credits:03	**Distribution of marks according the University rule**.
Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Units	Contents	Lectures
Unit – I	Basic Framework: Concept, Definition, Classification of natural resources, Process of resource development.	14
Unit – II	Ecology and Ecosystem: Meaning, Scope, Types and classification of ecology, functioning of ecosystem, energy and nutrients in ecosystem, productivity of ecosystem Trophic levels, food chain, food web, ecological pyramids, bio-geochemical cycles, Significance of ecosystem approach in natural resource studies.	15
Unit – III	Management of Natural Resources: Concept and Approaches of natural resource management, People's participation and shared decision making in natural resource management, Gender issue and livelihood issues in natural resource management; Sustainable Resource Development; Community Based Natural Resource Management.	16
Practical (Credit-1) **GG.DSE09-Pi**	Statistical Analysis: Correlation- Carl Pearson correlation & Spearman's rank correlation. Linear regression analysis & Factor Analysis; Steps of Hypothesis testing. Tests of statistical significance: T-test, Ftest, Chi-Square test, Analysis of Variance.	30

Suggested Readings:

1. Hartshorn, T.A. & Alexander, J.W. Economic Geography, 3rd edn., 1994
2. Boesch, Hans A — Geography of World Economy
3. Fryer, D.W. — World Economic Development
4. Gregor, H.F. — Environment and Economic Life: An Economic and Social Geography
5. Highsmith, R.M.(Jr.) — Case Studies in World Geography
6. Hoffman, L.A. — Economic Geography
7. Zimmerman, E.W. — World Resources and Industries, Harper and Row, London,1951
8. Stringer, A. Davis — A Geography of Resources
9. Zones and Darkenwold — Economic Geography
10. Mccarty & Lindberg — An Introduction to Economic Geography
11. Miller, E.W. — A Geography of Manufacturing
12. Whate, C.L. & Criffin, P.E., — Economic Geography
13. Russel, J. — World Population and Food Supplies
14. Hoover, E.M. — The location of Economic Activity
15. Isard, W. — Location and Space Economy
16. Stuart Mudd — The Population Crisis and the Use of the World Resources
17. Russel Smith — Industrial and Commercial Geography
18. Janaki, V.A. — Economic Geography
19. Guy, Harold Smith — Conserving Natural Resources: Principles & Practice
20. Kates, W. & FireyW,(ed) — Man, Mind and Land: A Theory of Resource Use
21. Zimmerman, E.W. — Introduction to World Resources
22. Singh, K.N. & Singh,J. — Arthik Bhoogol Ke Mool Tatwa (in Hindi)
23. Smith,R.L. — Man and his Environment: An Ecosystem Approach, Harper and Row, London, 1972
24. Strahler, A. — Geography and Man's Environment, John Wiley, New York,1977
25. Singh, J. — Sansadhan Bhoogol, Radha Publications, New Delhi (Hindi), 2006
26. Taylor, Russel D., and Torquebiau, Emmanuel (Eds.). — Natural Resource Management and Local Development, Springer, Netherland.,2011.
27. Thakur, B. — Perspectives in Resource Management in Developing Countries, Vol.1-13, Concept Publishing Company, New Delhi. 2003-2018

DEPARTMENT OF GEOGRAPHY
M.A./M.Sc. Geography
DISCIPLINE SPECIFIC ELECTIVE – (DSE) – Fluvial Geomorphology

Programme: Post Graduate	**Year: V**	**Semester: IX Paper :**
Subject: Geography	**Course Code: GG.DSE09-Tii**	**Course Title: Fluvial Geomorphology**

Course Outcomes

1. Ability to describe and analyze the hydrological processes shaping fluvial environments, including drainage pattern evolution and channel changes over time.
2. Competence in applying principles of river mechanics to understand flow types, sediment transport, and channel morphology.
3. Proficiency in interpreting hydraulic geometry data to assess stream characteristics and channel patterns.
4. Understanding of the role of drainage basins in landscape evolution and the interrelations between morphometric parameters.
5. Capability to apply fluvial geomorphological knowledge to real-world scenarios, such as human adjustments to floodplains, alluvial fans, and deltaic environments, and assess the impacts of reservoirs using remote sensing and GIS techniques.

Theory Credits:03	**Distribution of marks according the University rule**.
Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Unit	Course Content	Lectures
Unit – I	Fluvial Geomorphology and Geography; hydrological cycle and sub cycle; drainage pattern evolution; limits of drainage development; channel changes with time.	14
Unit – II	Fundamentals of river mechanics: - types of flow and flow discrimination; forces acting in channels; Low regimes; sediment load of streams. sediment transport; competent velocity; lift force; critical tractive force	16
Unit – III	Hydraulic geometry of streams at a station and down-stream; channel thalweg; causes of concavity; channel patterns, equilibrium profile - straight, meandering and braided.	15
Practical Credit: 1 **GG.DSE09-Pii**	**Course Title: Drainage Basin Morphometry**: Hack's Stream Gradient Index, Calculation of Velocity and Discharge, Mapping of Landscape Materials: Zingg's Shape Analysis	30

Suggested Readings

1. Ahmad, E. (2009). Geomorphology. Rajesh Publications.
2. Anderson, M. G., & Burt, T. P. (1990). Process studies in hillslope hydrology. Wiley.
3. Charlton, R. (2007). Fundamentals of fluvial geomorphology. Routledge.
4. Chorley, R. J., Schumm, S. A., & Sugden, D. E. (1984). Geomorphology. Methuen.
5. Church, M. (2006). Rivers and streams: Forms and processes. Wiley.
6. Dutta, S. (2016). Fluvial processes and landforms of the Indian subcontinent. Research India Publications.
7. Gomez, B., & Church, M. (1989). Catchment experiments in fluvial geomorphology. Wiley.
8. Goudie, A. (2013). Arid and semi-arid geomorphology. Cambridge University Press. (Important for dryland fluvial studies.)
9. Kale, V. S. (2020). Fluvial geomorphology: A perspective from the tropics. Springer.
10. Kale, V. S., & Gupta, A. (2001). Introduction to geomorphology. Orient Longman.
11. Kale, V. S., & Sinha, R. (2022). Fluvial systems and river dynamics in India. Springer.
12. Knighton, D. (1998). Fluvial forms and processes: A new perspective. Arnold Publishers.
13. Lane, E. W. (1955). Design of stable channels. Transactions of the American Society of Civil Engineers.
14. Leopold, L. B., Wolman, M. G., & Miller, J. P. (1964). Fluvial processes in geomorphology. Dover Publications. (Classic foundational text.)
15. Richards, K. (1982). Rivers: Form and process in alluvial channels. Methuen.
16. Schumm, S. A. (2005). River variability and complexity. Cambridge University Press.
17. Sharma, H. S. (1991). Indian geomorphology. Concept Publishing Company.
18. Sharma, V. K. (1986). Geomorphology. Rawat Publications.
19. Singh, S. (2005). Geomorphology. Prayag Pustak Bhawan.
20. Sinha, R. (2009). The great avulsion of Kosi River. Geomorphology Journal (special issue) — Elsevier.
21. Sinha, R. (Ed.). (2012). Geomorphology of River Systems: Indian case studies. Springer India.
22. Thakur, V. C. (1992). Geomorphology and neotectonics of Himalaya. Geological Society of India.
23. Tooth, S. (2000). Process, form and change in dryland rivers: A review of recent research. Earth-Science Reviews.
24. Valdiya, K. S. (2010). The making of India: Geodynamic evolution. Springer.
25. Wohl, E. (2014). Rivers in the landscape: Science and management. Wiley.

DEPARTMENT OF GEOGRAPHY
M.A./M.Sc. Geography
DISCIPLINE SPECIFIC CORE COURSE (DSE) Population Geography

Programme: Post Graduate	**Year: V**	**Semester:** IX **Paper-**
Subject: Geography	**Course Code: GG.DSE09-Tiii**	**Course Title:** Population Geography

Course Outcomes

This course introduces the spatial distribution of population with causative factors. It also deals with various theories and concepts related with population. Study of population is an essential component in planning of various human related issues. Students would be able to understand the distribution and dynamics of population distribution and its problems and management.

Theory Credits: 03	**Distribution of marks according the University rule**.
Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Units	Contents	Lectures
Unit – I	Definition, nature and scope; Relationship with other disciplines, demography and population studies; sources of data with particular reference to census of India.	14
Uni t – II	Factors affecting population distribution; Population growth: trends and determinants; spatial dimension of population growth in India.	15
Unit – III	Trends and patterns in fertility and mortality; Theories of fertility; Migration: major international migrations; features of internal migration in India; Theories of population growth– pre-Malthusian views, Malthus' Theory, views of socialist writers, optimum population theory, demographic transition model	16
Practical (Credit-1) **GG.DSE09-Piii**	**Course Title: Population Data Analysis:** Calculations of population density, population growth, and population projection; age - sex pyramid, trend graph showing population growth, and Lorenz curve; Preparation of map of India or Uttarakhand showing population density.	30

Suggested Readings

1. Beaujen- Garnier J (1966) Geography of Population; Longman, London.
2. Bhende Asha A and Kanitkar (2002) Principles of Population Studies, 14th Edition, Himalaya Publishing House, Mumbai.
3. Chandana, R.C. (2002) Geography of Population: Concepts, determination and patterns, Kalyani Publishers, New Delhi.

4. Clarke, J.I. (1992) Population Geography, Second Edition, Pergamon Press, Oxford, England.
5. Dyson, T. 2010. Population and Development: The Demographic Transition, London: Zed Books.
6. Hassan, M.I. (2005) Population Geography, Rawat Publication, Jaipur.
7. May, J.F. 2012. World Population Policies: Their Origin, Evolution, and Impact, Washington DC: Springer.
8. Premi, M.K. (1991) India's Population Heading Towards a Billion, B.R. Publishing, Cooperation, New Delhi.
9. Brettell, C. B., and Hollifield, J.F. (eds.) 2014. Migration Theory: Talking across Disciplines, 3d ed. New York: Routledge.
10. Castles, S., de Haas, H. and Miller, M.J. 2014. The Age of Migration: International Population Movements in the Modern World, 5th ed. New York and London: Guilford.

DEPARTMENT OF GEOGRAPHY
M.A./M.Sc. Geography
Generic Elective (GE)- Cultural Geography

Programme: Post Graduate		**Year: V**	**Semester: IX Paper-**
Subject: Geography	**Course Code: GG.GE09-Ti**		**Course Title: Cultural Geography**

Course Outcomes

1. Ability to analyze and interpret cultural landscapes and processes of cultural diffusion, adaptation, and resilience in different geographical contexts.
2. Competence in recognizing and mapping socio-cultural diversity, including ethnic/tribal groups and components of social diversity like religion, caste, and language.
3. Proficiency in understanding the concept of race and its relationship with culture, as well as the distribution of races and cultures globally.
4. Understanding of socio-cultural diversity in India, including regional variations and processes of social change.
5. Capability to apply knowledge of cultural and social geography to analyze and interpret socio-cultural phenomena and trends, both globally and within specific regions like India.

Theory Credit:04	**Distribution of marks according the University rule**.	
Total No. of Lectures – Tutorials – Practical (in hours per week): 4-0-0	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**	

Unit	Course Content	Lectures
Unit – I	Basic Concept: Definition, scope, and significance, Evolution and Development, Place of Cultural and Social Geography within Geography; Cultural Region; Cultural Landscape and Environment. Process: Cultural Landscape Evolution; Cultural Diffusion; Adaptation; Acculturation; Assimilation; and Resistance/ Cultural Resilience.	15
Unit – II	Socio-cultural Diversity: Ethnic/tribal Groups and their Spatial Distribution, Components of social diversity; tribes and their distribution; Tribal region; Cultural regions: elements of cultural regionalization: race, caste, dance, music, cuisine, costumes, dialect, language, religion.	15
Unit – III	Races and Culture Concept of race. Basis of racial classification and their physical characteristics. Races of India. Griffith Taylor and C.S.	15

	Coon's Theories of distribution of races of mankind in the world. Concept of culture, culture areas and culture regions, Cultural hearths and their diffusion, World Culture Realms	
Unit – IV	Socio-cultural Diversity Concept of Dialects and ethnicity. Distribution of Religion, Caste, Tribe, Languages in India. Concept of social areas, North-South Socio-Cultural diversity of India, Processes of Social changes: Modernization, Sanskritization and Globalization	15

Suggested Readings

1. Ahmed, A. (1999). Social Geography. Rawat publications, Jaipur.
2. Ali, S. M. (1966). The geography of the Puranas. People's Publishing House.
3. Anderson, J. (2009). Understanding cultural geography: Places and traces. Routledge.
4. Anderson, Jon. (2010). Understanding Cultural Geography Places and Traces. Routledge, London.
5. Anderson, K. Domosh, M., Pile, S. & Thrift, N. (eds.). (2003). Handbook of Cultural Geography.,Sage Publications, London.
6. Anderson, K., Domosh, M., Pile, S., & Thrift, N. (2003). Handbook of cultural geography. SAGE Publications.
7. Bhattacharya, P. (2012). Urban culture and landscape transformation in India. Mittal Publications.
8. Chattopadhyay, R. (2011). Cultural landscapes and heritage in India. Atlantic Publishers.
9. Cloke, P., Crang, P., & Goodwin, M. (Eds.). (2005). Introducing human geographies. Routledge.
10. Cosgrove, D. (1984). Social formation and symbolic landscape. University of Wisconsin Press.
11. Cosgrove, D. E., & Daniels, S. (1988). The iconography of landscape: Essays on the symbolic representation, design and use of past environments. Cambridge University Press.
12. Crang, M. (1998). Cultural geography. Routledge.
13. Deshpande, C. D. (1992). India: A regional interpretation. ICSSR.
14. Duncan, J. S. (1980). The city as text: The politics of landscape interpretation in the Kandyan Kingdom. Cambridge University Press.
15. Duncan, J., & Ley, D. (1993). Place/culture/representation. Routledge.
16. Entrikin, J. N. (1991). The betweenness of place: Towards a geography of modernity. Johns Hopkins University Press.
17. Gautam, A. (2010). Cultural and human geography of India. Sharda Pustak Bhawan.
18. Ghosh, S. (1985). Urbanization and cultural dynamics in India. Inter-India Publications.
19. Gregory, D., & Urry, J. (1985). Social relations and spatial structures. Macmillan.
20. Harvey, D. (1989). The condition of postmodernity: An enquiry into the origins of cultural change. Blackwell.
21. Jackson, P. (1989). Maps of meaning: An introduction to cultural geography. Routledge.

22. Johnston, R. J., Gregory, D., et.al. (eds.). (2005). The Dictionary of Human Geography, Blackwell Publishing.
23. Jones, E. and Eyles, J. (1977). Introduction to Social Geography. Oxford University Press.
24. Knox, P.L. (1975). Social Well –being: A Spatial Perspective. Oxford, London.
25. Massey, D. (1994). Space, Place and Gender. Polity Press, Cambridge.
26. Massey, D. (1994). Space, place, and gender. University of Minnesota Press.
27. Mehta, S. R. (1996). Cultural patterns and economic change: A study of rural India. Rawat Publications.
28. Mishra, V. K. (2015). Folk cultures and rural landscapes in India. New India Publishing.
29. Misra, R. P. (1969). Cultural regions of India. National Geographical Society of India.
30. Mitchell, D. (2000). Cultural geography: A critical introduction. Blackwell.
31. Mitchell, D. (2003). The right to the city: Social justice and the fight for public space. Guilford Press.
32. Mukherjee, A. (1991). Cultural geography of India. Rawat Publications.
33. Panikkar, K.M. (1959). Geographical Factors in Indian History. Bharatiya Vidya Bhavan, Bombay.
34. Raza, M. and Ahmed, A. 1990. An Atlas of Tribal India. Concept Publishing Co, Delhi.
35. Robertson, R. (1992). Globalization: Social theory and global culture. SAGE.
36. Sauer, C. O. (1952). Agricultural origins and dispersals. American Geographical Society.
37. Sharma, J. P. (2008). Cultural geography: Concepts and issues. Rawat Publications.
38. Sharma, R. C. (2013). Culture, space, and globalization: Indian realities. Concept Publishing Company.
39. Singh, K. N. (1993). Culture and environment: The Indian perspective. Rawat Publications.
40. Singh, K. S. (1993). People of India: An introduction. Anthropological Survey of India.
41. Singh, K.S. (1993). People of India Vol I to XI. Oxford University Press, New Delhi.
42. Singh, R. B. (2009). Urban development and environmental change: Perspectives from Indian experience. Rawat Publications.
43. Singh, R. B. (2014). Climate change and cultural sustainability: Indian perspectives. Springer.
44. Singh, R. L. (1955). Elements of cultural geography. Nand Kishore and Bros.
45. Smith, N. (1984). Uneven development: Nature, capital, and the production of space. Blackwell.
46. Sopher, D. (ed.). (1980). An Exploration of India: Geographical Perspectives on Society and Culture . Cornell Press, New York.
47. Subba Rao, B. (1958). Personality of India. MS University Press, Baroda.
48. Tiwari, R. C. (2016). Cultural and settlement geography of India. New Academic Publishing.
49. Tuan, Y. F. (1977). Space and place: The perspective of experience. University of Minnesota Press.
50. Vincent J. Del Casino, (2009). Social Geography- Critical Introduction to Geography. Wiley-Blackwell.
51. Yadava, S. (2000). Rural-urban migration and cultural change in India. Concept Publishing.

DEPARTMENT OF GEOGRAPHY
M.A./M.Sc. Geography
Generic Elective (GE)- Geography of Uttarakhand

Programme: Post Graduate	**Year: V**	**Semester: IX Paper-**
Subject: Geography Course Code: GG.DSE09-Tii		**Course Title: Geography of Uttarakhand**

Course Outcomes

1. Ability to assess environmental characteristics and their implications.
2. Competence in analyzing population dynamics and cultural diversity.
3. Proficiency in understanding agricultural trends and resource management.
4. Understanding of mineral resource exploitation and industrial development.
5. Capability to evaluate economic potentials and develop sustainable plans for the region.

Theory Credits: 04	**Distribution of marks according the University rule**.
Total No. of Lectures – Tutorials – Practical (in hours per week): 4-0-0	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Unit	Course Content	Lectures
Unit – I	Physical Background: Geo-environmental background: Geology, Physiography, Climate, Drainage, Soils, flora and fauna, Natural and Bio-geographic Regions.	10
Uni t – II	Population and Settlements: Population and Human Resource Development; Spatial Patterns, Structure, Composition and Dynamics of Population; Tribal Groups and their Spatial Distribution, Fairs Festivals and Languages and Dialects, Settlements: Types and Patterns	15
Unit – III	Agricultural Development: Agricultural Characteristics and Trends; land holdings; Land Reforms; Cropping Pattern; Irrigation; Farm Technology; Agricultural Productivity and Agricultural Regions; Impact of Green Revolution; Horticultural and Floriculture Development including medicinal, aromatic plants and Organic farming.	15
Unit – IV	Mineral and Energy Resources and Industries: Major Mineral Deposits: Distribution and Production, Energy Resources: Development of Hydro- electricity, Industries: Localization and Spatial Distribution, Principal Industries of the region, Industrial Regions, Trade, Transport, Tourism and forestry, Potentials and Prospects; Future Prospects and Development Plans: Prospects of Tourism, Sustainable Development Plan for Uttarakhand Himalaya, Environmental Hazards and	20

	Management in Uttarakhand Himalaya.	

Suggested Reading

1. Badoni, P.D. (2004). Economic Geography of Uttarakhand. New Delhi: Concept Publishing Company.
2. Bahuguna, V. (2002). Natural disasters and mitigation in Uttarakhand. Indian Publishers Distributors.
3. Bhatt, S.C. (2004). Uttarakhand: Ecology and environment. Anmol Publications.
4. Bisht, B.S. (2017). Political Geography of Uttarakhand. New Delhi: Rawat Publications.
5. Bisht, Himani. (2025). Sustainable Geography Practices in Uttarakhand. New Delhi: Rawat Publications.
6. Bose, S.C. (1968). Land and People of the Himalaya, Calcutta.
7. Dhyani, P.P. (2005). Climate change and the Himalayan ecosystem. G. B. Pant Institute of Himalayan Environment.
8. Dobhal, Rajendra. (2012). Urban Geography of Uttarakhand. New Delhi: Mittal Publications.
9. Joshi, B.K. (2001). Uttarakhand: Ecology and Environment. New Delhi: Gyan Publishing House.
10. Joshi, D.C. (2013). Natural Hazards and Geography of Uttarakhand. New Delhi: Scientific Publishers.
11. Joshi, D.D. (1983). Uttaranchal: Past, present, and future. Himalayan Publications.
12. Joshi, Kamal. (2024). Biodiversity and Geography of Uttarakhand. New Delhi: Rawat Publications.
13. Joshi, P. C. (2002). Urbanization in Himalayan region: Issues and challenges. Rawat Publications.
14. Joshi, Rajesh. (2023). Glacial Geography of Uttarakhand. New Delhi: Indus Publishing Company.
15. Joshi, S.C. (2001). Uttaranchal: Environment & Development, 2001
16. Joshi, S.C. et.al. (1983). Kumaun Himalaya, Nainital, 1983.
17. Kala, C. P. (2004). Ecology and conservation of Himalayan forests. Gyan Books.
18. Khanna, D.R. (2022). Agricultural Geography of Uttarakhand. New Delhi: Scientific Publishers.
19. Kishor, Nand. (2015). Tourism Geography of Uttarakhand. New Delhi: Concept Publishing Company.
20. Kuniyal, J.C. (2015). Geomorphology of Uttarakhand. New Delhi: Scientific Publishers.
21. Maikhuri, R.K. (2014). Himalayan Geography: Focus on Uttarakhand. New Delhi: Indus Publishing Company.
22. Nautiyal, Arvind. (2018). Hydrology and Geography of Uttarakhand. New Delhi: Scientific Publishers.
23. Nautiyal, Asha. (2022). Uttarakhand: Geography and Environment. New Delhi: Gyan Publishing House.
24. Nautiyal, P. (2013). Uttarakhand: Dynamics of development. Kalpaz Publications.
25. Nautiyal, Pankaj. (2018). Regional Geography of Uttarakhand. Jaipur: Rawat Publications.

26. Nautiyal, S.P. (2005). Physical Geography of Uttarakhand Himalaya. New Delhi: Mittal Publications.
27. Negi, H.S. (2008). Geographical Perspectives of Uttarakhand. New Delhi: Scientific Publishers.
28. Negi, J. S. (1984). Geography of Uttar Pradesh and Uttarakhand. National Book Trust.
29. Negi, Jyoti. (2023). Watershed Geography of Uttarakhand. New Delhi: New India Publishing Agency.
30. Negi, M.S. (2002). Geography of Uttarakhand. New Delhi: Concept Publishing Company.
31. Negi, S. S. (1995). Uttarakhand: Land and people. M.D. Publications.
32. Negi, S.S. (2020). Changing Landscapes of Uttarakhand. New Delhi: Indus Publishing Company.
33. Pandey, A.K. (2021). Forest Geography of Uttarakhand. New Delhi: Concept Publishing Company.
34. Pandey, D.D. (2010). Climate Change and Geography of Uttarakhand. New Delhi: Concept Publishing Company.
35. Pandey, Savita. (2025). Socio-Economic Geography of Uttarakhand. New Delhi: Indus Publishing Company.
36. Pant B. R. Pant (2010). Tribal Demography of India, Anamika Publication, New Delhi 288p.
37. Pant B. R. Pant (2021). Demographic Study of the Indian Himalayan Region, Ankit Prakashan Haldwani.
38. Pant B. R., R. Chand and B. S. Mehta (2022) उत्तराखंड: जनसँख्या परिदृश्य एवं परिवर्तन, पहाड़ नैनीताल I
39. Pant, Anjali. (2016). Development and Geography in Uttarakhand. New Delhi: Mittal Publications.
40. Pant, Mohan. (2022). Population Geography of Uttarakhand. New Delhi: Rawat Publications.
41. Pant, R. K. (2010). Population dynamics in Himalayan region: A case study of Uttarakhand. Shree Almora Book Depot.
42. Panwar, Virendra. (2019). Mountain Geography of Uttarakhand. New Delhi: Concept Publishing Company.
43. Pathak, S. (1997). Tourism, environment, and ecology of the Garhwal Himalaya. Pointer Publishers.
44. Rawat, A. S. (1999). Forest management in Kumaon Himalaya. Indus Publishing.
45. Rawat, G.S. (2006). Environmental Geography of Uttarakhand. Jaipur: Rawat Publications.
46. Rawat, J.S. (2007). Spatial Patterns in Uttarakhand. New Delhi: Indus Publishing Company.
47. Rawat, M. S. (2012). Tourism in Uttarakhand: Problems and prospects. Mohit Publications.
48. Rawat, M.K. (2011). Uttarakhand: A Geographical Study. New Delhi: Rawat Publications.
49. Rawat, Meenakshi. (2021). Disaster Geography of Uttarakhand. New Delhi: Mittal Publications.
50. Rawat, Neha. (2019). Geographical Information Systems (GIS) Applications in Uttarakhand. New Delhi: New India Publishing Agency.
51. Rawat, Poonam. (2014). Cultural Geography of Uttarakhand. Jaipur: Rawat Publications.
52. Rawat, S.L. (2023). River Systems and Geography of Uttarakhand. New Delhi: Concept Publishing Company.
53. Sah, D. C. (2001). Migration in the mountains: Study of Uttarakhand. Rawat Publications.

54. Semwal, D. P. (2006). Resource management and development in the Himalaya. Shree Almora Book Depot.
55. Sharma, Sangeeta. (2013). Rural Geography of Uttarakhand. New Delhi: Gyan Publishing House.
56. Sharma, V.K. (2021). Uttarakhand Himalaya: Geographical Analysis. New Delhi: Scientific Publishers.
57. Singh, J. (1995). Mountain geomorphology and sustainable development in Himalaya. Mittal Publications.
58. Singh, Praveen. (2024). Geography of Natural Resources in Uttarakhand. New Delhi: Scientific Publishers.
59. Singh, R. B., & Haigh, M. (1995). Sustainable reconstruction of Highland and Headwater Regions: The Himalayan experience. Oxford & IBH Publishing.
60. Singh, R.B. (2016). Environmental Hazards in Uttarakhand. New Delhi: National Book Trust (NBT).
61. Singh, S.K. (2020). Ecological Geography of Uttarakhand. Jaipur: Rawat Publications.
62. Tolia, R.S. (2003). Resource Geography of Uttarakhand. New Delhi: Indus Publishing Company.
63. Valdiya, K. S. (1980). Geology of the Kumaun Lesser Himalaya. Wadia Institute of Himalayan Geology.
64. Valdiya, K. S. (1993). High dams in the Himalaya: Environmental concerns. Konark Publishers.

Dissertation on Major / Dissertation on Minor / Academic project/Entrepreneurship

<table>
<tr><td colspan="2">Programme: Post Graduate</td><td>Year: V</td><td>Semester: IX</td></tr>
<tr><td colspan="4">Subject: Geography</td></tr>
<tr><td colspan="2">Course Code: GG.DDPE09</td><td colspan="2">Course Title: Dissertation on Major / Dissertation on Minor / Academic project/Entrepreneurship</td></tr>
<tr><td colspan="4">Outcome
To learn how to select a Research Proposal based on research gap found during the literature survey or field observations made. Preparation of synopsis/outline will be also learned. Finally student will learn how to collect data and write a report based on the data analysis</td></tr>
<tr><td>Credits: 06</td><td colspan="3">Max. Marks: 100 (Evaluation by External & Internal Examiner)
Dissertation: 75
Internal Assessment: Viva Voce + Attendance : 25 (20+5)</td></tr>
<tr><td colspan="4">The students will be required to select a topic and area of their interests with the help of their respective supervisors allotted to them by the Department. Research Project dissertation must be submitted to the Department one week before the commencement of the Theory Examinations. The size of the Dissertation normally ranges between 80 and 100 pages. The Research Project Dissertation will be evaluated by the external and internal examiners.</td></tr>
</table>

DEPARTMENT OF GEOGRAPHY
M.A./M.Sc. Geography
DISCIPLINE SPECIFIC COURSE (DSC) – HYDROLOGY

Programme: Post Graduate	**Year: V**	**Semester: X : Paper**	
Subject: Geography	**Course Code: GG.DSC10-T**		**Course Title: Hydrology**

Course Outcomes

1. Ability to assess and interpret the components of the hydrological cycle and their interactions.
2. Competence in analyzing the properties and dynamics of the underground hydrosphere.
3. Proficiency in understanding the characteristics of drainage basins and their human impacts.
4. Understanding of flow measurement techniques, hydrograph analysis, and surface water quality assessment.
5. Capability to apply principles of water balance and remote sensing in hydrological analysis and water management, including estimating discharge, runoff volume, and rainfall-runoff relationships.

Theory Credits: 03	**Distribution of marks according the University rule**	
Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**	
Unit	Course Content	Lectures
Unit – I	Conceptual Base**:** Concepts and scope of hydrology, Elements of hydrological cycle: precipitation - intensity and duration; evaporation; infiltration, surface runoff, Man's interference on hydrological cycle	13
Unit – II	Underground Hydrosphere: Hydrological properties of rocks. Structure of the underground hydrosphere - Vadose and phreatic Zones, Types of aquifers, Underground water classification, Recharge and discharge of ground water; Ground Water Movements and Drainage Basin Characteristics Hydraulic conductivity, Darcy's law, Porosity, Permeability, Transmissibility, Drainage basin characteristics: human impact on hydrological system, morphometric analysis	16
Unit – III	Flow Measurements and Hydrograph: Channel flow measurement, Hydrograph analysis; Water quality, Surface water resources of India. Application of Remote Sensing and Water Management: Principles of water balance and their application - its relevance in crop geography; water pollution, need for water management; Application of remote sensing in hydrological studies.	16

Practical Credit (01) **GG.DSC10-P**	**Course Title: Hydrological Data Analysis**: Water Balance Graph; Estimation of discharge, runoff volume and rainfall runoff relationship; Estimation of average depth of rainfall using (a) Arithmetic Mean Method, (b) Thiessen Polygon Method, and (c) Isohyetal Method; Drawing of unit hydrograph and interpretation.	30

Suggested Readings

1. Agarwal, A. & Narain, S. (2000). Dying Wisdom: Rise, Fall and Potential of India's Traditional Water Harvesting Systems. New Delhi: Centre for Science and Environment.
2. Arora, K.R. (2010). Irrigation, Water Power and Water Resources Engineering (4th ed.). New Delhi: Standard Publishers Distributors.
3. Balek, J. (2002). Hydrology and Water Resources in Tropical Regions. London: CRC Press.
4. Best, J. (2022). Sedimentology and Hydrology of Fluvial Systems. Cambridge: Cambridge University Press.
5. Beven, K. (2012). Rainfall-Runoff Modelling: The Primer (2nd ed.). Chichester: Wiley-Blackwell.
6. Bhattacharya, A.K. (2007). Urban Hydrology. New Delhi: New Age International Publishers.
7. Black, P.E. (2017). Watershed Hydrology (2nd ed.). New York: CRC Press.
8. Brutsaert, W. (2005). Hydrology: An Introduction. Cambridge: Cambridge University Press.
9. Chorley, R.J. (ed.) (1969): Water Earth and Man, Methuen, London.
10. Chow, V.T., Maidment, D.R., & Mays, L.W. (2010). Applied Hydrology (2nd ed.). New York: McGraw-Hill.
11. Dakshinamurthy, et.al. (1973): Water, Resources of India and Their Utilization in Agriculture, IARI, New Delhi.
12. Das, P. (2004). Hydrology and Soil Conservation Engineering. New Delhi: Prentice Hall of India.
13. David Knighton (1984): Fluvial Forms and Processes, Edward Arnold, London
14. Dingman, S.L. (2002). Physical Hydrology (2nd ed.). Upper Saddle River: Prentice Hall.
15. Garg, S.K. (2012). Irrigation Engineering and Hydraulic Structures (28th ed.). New Delhi: Khanna Publishers.
16. Goudie, A. (2013). The Human Impact on the Natural Environment: Past, Present, and Future (7th ed.). Oxford: Wiley-Blackwell.
17. Govt. of India, Ministry of Energy and Irrigation (Dept. of Irrigation, 91980), Rashtriya Barh Ayog, Report- National Commission on Floods, Vol. I & II.
18. Goyal, M.R. (2014). Principles and Management of Clogging in Micro Irrigation. New Hampshire: Apple Academic Press.
19. Gregory, K.J. and Walling De (1973): Drainage Basin Form and Processes,Edward Arnold, London.
20. Gupta, R.D. (2003). Hydrology and Watershed Management. New Delhi: Atlantic Publishers.
21. Haan, C.T. (2002). Statistical Methods in Hydrology (2nd ed.). Ames: Iowa State Press.
22. Hannah, D.M., et al. (2011). Large-Scale Hydrology. Chichester: Wiley-Blackwell.

23. Jackson, P.J. (1977): Climate, Water and Agriculture in the Tropics, London.
24. Jain, S.K., Agarwal, P.K., & Singh, V.P. (2007). Hydrology and Water Resources of India. Dordrecht: Springer.
25. Jha, Madan Kumar (2010). Natural and Anthropogenic Disasters: Vulnerability, Preparedness and Mitigation. New Delhi: Capital Publishing Company.
26. Jones, J.A.A (1997): Global Hydrology: Processes, Resources and Environmental Management, Longman, London.
27. Law, B.C. (ed.) (1968): Mountains and Rivers of India, 21, G.C. National Committee for Geography, Calcutta.
28. Linslay, R.K. et.al. (1958): Hydrology for Engineers, Mc Graw Hill.
29. Linsley, R.K., Franzini, J.B., Freyberg, D.L., & Tchobanoglous, G. (2010). Water-Resources Engineering (4th ed.). New York: McGraw-Hill.
30. Matter, J.R. (1994): Water Resources. Distribution, Use and Management, John Wiley, Marylane.
31. Mays, L.W. (2010). Water Resources Engineering (2nd ed.). Hoboken: Wiley.
32. McCuen, R.H. (2016). Hydrologic Analysis and Design (4th ed.). New York: Pearson.
33. Mishra, S.K., & Singh, V.P. (2003). Soil Conservation Service Curve Number Methodology. Dordrecht: Springer.
34. Pal, S.K. (2015). Fundamentals of Fluvial Geomorphology. New Delhi: PHI Learning.
35. Pande, C.B. (2012). Watershed Hydrology and Management. Jaipur: Rawat Publications.
36. Pandey, A., & Chowdary, V.M. (2011). Hydrological Modeling using Remote Sensing and GIS. New Delhi: New India Publishing Agency.
37. Raghunath, H.M. (2006). Hydrology: Principles, Analysis and Design (2nd ed.). New Delhi: New Age International.
38. Shiklomanov, I.A. (2003). World Water Resources at the Beginning of the 21st Century. Cambridge: Cambridge University Press.
39. Singh, R.A. and Singh, S.R. (1972): Water Management: Principles and Practices. Tara Publication, Varanasi.
40. Singh, V.P. (2007). Hydrologic Modeling: Progress and Future Directions. Dordrecht: Springer.
41. Singh, V.P., & Frevert, D.K. (2002). Mathematical Models of Small Watershed Hydrology and Applications. Littleton: Water Resources Publications.
42. Smedema, L.K., & Rycroft, D.W. (2009). Drainage Principles and Applications. Wallingford: CABI Publishing.
43. Sposito, G. (2008). The Chemistry of Soils and Waters. New York: Oxford University Press.
44. Subramanya, K. (2008). Engineering Hydrology (4th ed.). New Delhi: Tata McGraw-Hill.
45. Todd, D.K. (1959): Ground Water Hydrology, John Wiley, New York.
46. Todd, D.K., & Mays, L.W. (2005). Groundwater Hydrology (3rd ed.). New York: Wiley.
47. Ward, R.C., & Robinson, M. (2000). Principles of Hydrology (4th ed.). New York: McGraw-Hill.

DEPARTMENT OF GEOGRAPHY
M.A./M.Sc. Geography
DISCIPLINE SPECIFIC ELECTIVE (DSE) – Glacial and Periglacial Geomorphology

Programme: Post Graduate	**Year: V**	**Semester: X**	**Paper:**
Subject: Geography			
Course Code: GG.DSE10-Ti		**Course Title: Glacial and Periglacial Geomorphology**	
Course Outcomes 1. Describe Pleistocene glaciation and its effects on landscapes. 2. Recognize erosional landforms like cirques and U-shaped valleys. 3. Identify depositional features such as moraines and eskers. 4. Understand periglacial phenomena and their impact on landscapes. 5. Apply remote sensing for identifying and mapping glacial landforms.			
Theory Credits: 03	**Distribution of marks according the University rule**		
Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1		**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**	

Unit	Course Content	Lectures
Unit – I	Theoretical Base: Definition of Glacial Geomorphology; Ice Age; Causes of ice ages; Pleistocene Glaciation; onset and retreat.	14
Unit – II	Erosional Processes and Landforms: Erosional process; glacial erosion, development of erosional landforms; supraglacial, englacial and basal; Depositional Processes and Landforms: Depositional processes: processes-stratified and non-stratified; forms of Moraines; glaciofluvial and glacio-lacustrine environment.	16
Unit – III	Periglacial Processes: Periglacial process: frozen ground phenomenon – identifical, depth variations, classification and distribution; mechanism of frost action. Periglacial Landforms and Human adaptation: Periglacial landforms; frost action and landforms-mass wasting and landforms, adaptation of human beings to periglacial environment.	16
Practical Credit (01) **GG.DSE10-Pi**	**Course Title: Landforms identification and Mapping**: Erosional and Depositional Landforms Identification in satellite imagery/ Google earth image and Mapping, Identification of periglacial/ permafrost landforms with the help of satellite imagery/ Google earth image. Glacial Geomorphological Mapping.	30

Suggested Readings

1. Bali, R. (2010). Landforms and Evolution of Glaciated Landscapes in the Central Himalaya. New Delhi: Rawat Publications.
2. Benn, D.I., & Evans, D.J.A. (2010). Glaciers and Glaciation (2nd ed.). London: Hodder Education.
3. Benn, D.I., & Lehmkuhl, F. (2000). Mass Balance and Glacier Fluctuations in High Asia. Heidelberg: Springer.
4. Bøe, A.G. (2022). Introduction to Permafrost Geomorphology. Cambridge: Cambridge University Press.
5. Brown, R.J.E. (1970). Permafrost in Canada. University of Toronto Press, Toronto.
6. Carson MA. and Kirkby M.J., (1972). Hillslope Form and Process, Cambridge University Press.
7. Coates, D.R.(ed.), (1974). Glacial Geomorphology, State University of New York.
8. Cogley, J.G. (2011). Mass Balance of Glaciers and Ice Sheets. Cambridge: Cambridge University Press.
9. Dixon, J.C. and Abrahams, A.D. (eds.), (1992). Periglacial Geomorphology. John Wiley, New York.
10. Drewry, D. (1986). Glacial Geological Processes, Edward Arnold, London.
11. Dyurgerov, M.B., & Meier, M.F. (2005). Glaciers and the Changing Earth System. Boulder: INSTAAR.
12. Embleton, C. and King, C.A.M., (1968). Glacial and Periglacial Geomorphology, Edward Arnold, London.
13. Embleton, C. and Thormes, J. (eds.) (1980). Process in Geopmorphology, Arnold - Hesnemann, New Delhi.
14. Evans, D.J.A. (2009). Glacial Landsystems. London: Hodder Education.
15. Fabel, D., & Harbor, J. (2021). Glacial Geomorphology: Processes and Forms. New York: Routledge.
16. Fagan, B. (2009). The Great Warming: Climate Change and the Rise and Fall of Civilizations. New York: Bloomsbury Press.
17. French, H.M. (2017). The Periglacial Environment (4th ed.). Chichester: Wiley-Blackwell.
18. Haeberli, W., & Whiteman, C. (2014). Snow and Ice-Related Hazards, Risks, and Disasters. Amsterdam: Elsevier.
19. Hails, J.R. (ed.) (1977). Applied Geomorphology Elsevier Sci. Amsterdam.
20. Hambrey, M.J. (2004). Glacial Environments. Vancouver: UBC Press.
21. Ives, J.D., & Messerli, B. (2004). Himalayan Perceptions: Environmental Change and the Well-Being of Mountain Peoples. London: Routledge.
22. Jha, Madan Kumar (2010). Natural and Anthropogenic Disasters: Vulnerability, Preparedness and Mitigation. New Delhi: Capital Publishing Company.
23. Kale, V.S. (2010). Glaciation and Fluvial Geomorphology in the Himalayas. New Delhi: Allied Publishers.
24. Knight, J., & Harrison, S. (2014). Periglacial and Paraglacial Processes and Environments. London: Geological Society Special Publications.
25. Knight, P.G. (2000). Glacier Science and Environmental Change. Oxford: Blackwell Publishing.
26. Kuhle, M. (2013). Glacial and Periglacial Forms of the Tibetan Plateau. Berlin: Springer.

27. Kumar, A. (2014). Glacial Geomorphology of Garhwal Himalaya. New Delhi: Concept Publishing Company.
28. Leigh, D.S. (2020). Fluvial and Glacial Landscapes. Chichester: Wiley.
29. Matsuoka, N. (2015). Frost Weathering and Periglacial Processes. Cambridge: Cambridge University Press.
30. Mool, P.K. (2001). Glacial Lakes and Glacial Lake Outburst Floods in Nepal. Kathmandu: ICIMOD.
31. Negi, S.S. (2006). Geography of Glaciers. New Delhi: Indus Publishing Company.
32. Owen, L.A. (2017). An Introduction to Global Glaciations. Cambridge: Cambridge University Press.
33. Pandey, P. (2016). Himalayan Glaciers: A Geomorphological Perspective. New Delhi: Scientific Publishers.
34. Pelto, M. (2015). Glaciers: The Politics of Ice. Corvallis: Oregon State University Press.
35. Peterson, D.L., & Buckingham, S.E. (2008). Mountain Weather and Climate. Cambridge: Cambridge University Press.
36. Peterson, W.S.B. (1969). The Physics of Glaciers. Pergamon Press, Oxford.
37. Pewe, T.L.(ed.) (1969). The Periglacial Environment. Mc. Gill- Queen's University Press, Montreal.
38. Price, L.W. (1972). The Periglacial Environment, Permafrost and Man., Commission on College Geography, Resourc Paper No. 14, Washington, D.C.
39. Raina, V.K. (2010). Himalayan Glaciers: A State-of-Art Review of Glacial Studies, Glacial Retreat, and Climate Change. New Delhi: Ministry of Environment and Forests, Govt. of India.
40. Ritter, D.F. Craig, R. and Miller, J.P. (1995). Process of Geomorphology. W.C. Brown Dubuque.
41. Sharma, M.C. (2019). Glaciers and Glacier Lakes of Uttarakhand. Dehradun: Uttarakhand Science Education and Research Centre.
42. Shroder, J.F. (2012). Himalaya: Mountains of Life. New Delhi: Ashoka Trust for Research in Ecology and the Environment.
43. Singh, P., & Jain, S.K. (2002). Snow and Glacier Hydrology. Dordrecht: Springer.
44. Singh, R.B., & Singh, R.L. (2005). Fluvial and Glacial Geomorphology of the Himalaya. New Delhi: New India Publishing Agency.
45. Singh, S. (2012). Geomorphology of the Himalaya. New Delhi: Rawat Publications.
46. Sugden, D.E. and John, B.S. (1976). Glaciers and Landscape. Edward Arnold, London.
47. Vander Veen, C.J., (1999). Fundamentals of Glacier Dynamics., A.A. Balkemma, Rotterdam.
48. Wright, A.E and Mosley, P.(eds) (1975). Ice Ages: Ancient and Modern., Seel House Press, Liverpool.
49. Yao, T. et al. (2022). Asian Water Towers: Critical Resources for Asia. New York: Springer Nature.

DEPARTMENT OF GEOGRAPHY
M.A./M.Sc. Geography
DISCIPLINE SPECIFIC ELECTIVE (DSE) – Integrated Watershed Management

Program: Post Graduate	**Year: III**	**Semester: X Paper-**
Subject: Geography	**Course Code: GG.DSE10-Tii**	**Course Title: Integrated Watershed Management**

Course Outcomes

1. Ability to apply watershed management approaches to assess and address environmental challenges within a watershed context.
2. Competence in analyzing ecosystem components and energy dynamics within watersheds, and their implications for natural resource management.
3. Proficiency in evaluating the environmental health status of watersheds and identifying potential hazards and impacts.
4. Understanding of the functioning of ecosystems within watersheds, including the effects of human activities on ecosystem processes.
5. Capability to implement watershed management techniques and methods, develop sustainable management plans, and utilize remote sensing applications for monitoring and assessment purposes.

Theory Credits: 03	**Distribution of marks according the University rule**
Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Unit	Course Content	Lect
Unit – I	Conceptual Base: Concept, Scope and Significance: Approaches of Watershed Management; Ecosystem and Energy Environment: Land Use Pattern, Natural Resource appraisal and Development, Ecological Processes and Ecosystem: Agro-Ecosystem, forest Ecosystem, River Ecosystem and Hydrological Cycle; Energy Analysis and Energy Budget of the Watershed.	14
Unit – II	Environmental Status and Hazards: Environmental Health Status: Physical properties (Viz, Temperature, Rainfall, Soil etc.) and Human Habitat of the and Anthropogenic Interferences on the Status and Watershed; Impact of Environmental Quality of the Watershed; Major Natural Hazards: Landslides, Erosion, Floods, Droughts, Sedimentation, Disruption of Hydrological Cycle etc.	15
Unit – III	Functioning of Ecosystem:	16

	Impact of Agriculture, Mining and Quarrying, Deforestation, Livestock, Frequent Construction of Roads on Ecosystems Functioning of Watershed with particular reference to Uttarakhand Himalaya; Environmental Impact Assessment (EIA); Watershed Management: Watershed Management: Techniques and Methods, Land and Soil Conservation, Run-off Control, Sustainable Environment Management Plan for Local Resources. Remote Sensing Application in Watershed Management.	
Practical Credit: 01 **GG.DSE10-Pii**	**Course Title: Watershed Management:** Watershed Delineation, Rainfall Distribution , Runoff Estimation, Land and Water Resource Appraisal: Demand and Supply	30

Suggested Readings

1. Agarwal, A., & Narain, S. (1997). Dying wisdom: Rise, fall and potential of India's traditional water harvesting systems. Centre for Science and Environment.
2. Bhattacharya, A. K. (2008). Soil conservation and watershed management. Concept Publishing Company.
3. Bhattacharya, A. K. (2010). Integrated watershed management: Field manual. McGraw Hill India.
4. Brooks, K. N., Ffolliott, P. F., & Magner, J. A. (2012). Hydrology and the management of watersheds (4th ed.). Wiley-Blackwell.
5. Calder, I. R. (2005). Blue revolution: Integrated land and water resource management (2nd ed.). Earthscan.
6. Dubey, D. P. (2005). Watershed management. Dominant Publishers.
7. Falkenmark, M., & Rockström, J. (2004). Balancing water for humans and nature: The new approach in ecohydrology. Earthscan.
8. Garg, S. K. (2008). Irrigation engineering and hydraulic structures. Khanna Publishers.
9. Heathcote, I. W. (2002). Integrated watershed management: Principles and practice (2nd ed.). Wiley.
10. Jha, M. K. (2010). Natural and anthropogenic disasters: Vulnerability, preparedness and mitigation. Springer India.
11. Kurothe, R. S., et al. (2014). Watershed development in India: Economic and policy issues. NIAP.
12. Lal, R. (1990). Soil erosion in the tropics: Principles and management. McGraw-Hill.
13. Ministry of Rural Development, Government of India. (2008). Common guidelines for watershed development projects.
14. Molden, D. (Ed.). (2007). Water for food, water for life: A comprehensive assessment of water management in agriculture. Earthscan/IWMI.
15. Molle, F., & Wester, P. (Eds.). (2009). River basin trajectories: Societies, environments and development. CABI.
16. Morgan, R. P. C. (2005). Soil erosion and conservation (3rd ed.). Blackwell Publishing.
17. Postel, S. (1999). Pillar of sand: Can the irrigation miracle last? W. W. Norton & Company.
18. Prasad, R. N. (2010). Watershed management and sustainable development. Mittal Publications.
19. Rao, K. V. G. K. (1993). Watershed management for sustainable agriculture. Indian Council of Agricultural Research.

20. Reddy, V. R., & Syme, G. J. (2015). Integrated assessment of scale impacts of watershed intervention: Assessing hydrogeological and livelihood impacts in semi-arid India. Elsevier.
21. Saxena, K. G. (2001). Integrated natural resource management: Approaches and lessons from Indian experience. ICIMOD.
22. Sen, R. (2015). Sustainable watershed management: Challenges and solutions. Springer.
23. Sharma, A. (2017). Watershed management: Concepts and case studies. New India Publishing Agency.
24. Sharma, H. S. (1998). Perspectives in resource management in developing countries (Vol. 1). Concept Publishing Company.
25. Sharma, R. K., & Sharma, T. K. (2008). Irrigation engineering. S. Chand & Company.
26. Sikka, A. K., & Samra, J. S. (2005). Watershed management research in India: Strategies and experiences. ICAR.
27. Singh, G., Bandyopadhyay, B. K., & Chattopadhyay, S. (2000). Watershed management. ICAR, New Delhi.
28. Singh, R. B. (2009). Management of water resources: Sustainable practices. Concept Publishing.
29. Singh, S. (2000). Integrated watershed management in India: Policies and practices. MD Publications.
30. Sinha, S. K. (2006). Watershed management and water harvesting. Pointer Publishers.
31. Suresh, R. (2012). Soil and water conservation engineering. Standard Publishers.
32. Tideman, E. M. (1996). Watershed management: Guidelines for Indian conditions. Omega Scientific Publishers.
33. Verma, H. N. (2013). Integrated watershed management for sustainable agriculture. New India Publishing Agency.

DEPARTMENT OF GEOGRAPHY
M.A./M.Sc. Geography
DISCIPLINE SPECIFIC ELECTIVE (DSE) – AGRICULTURAL GEOGRAPHY AND AGRO-ECOSYSTEM MANAGEMENT

Programme: Post Graduate	**Year: V**	**Semester: X**	**Paper:**
Subject: Geography			
Course Code: GG.DSE10-Tiii	**Course Title: Agricultural Geography and Agro- Ecosystem Management**		

Course Outcomes

1. Define Agricultural Geography and apply study approaches to understand agricultural dynamics.
2. Recognize global agricultural types, aiding in understanding their spatial distribution.
3. Proficiently use quantitative techniques for assessing agricultural parameters and regional patterns.
4. Understand agro-ecosystem dynamics and degradation, particularly in mountainous areas.
5. Analyze agricultural statistics and contribute to regional planning for sustainable agricultural development.

Theory Credits: 03	**Distribution of marks according the University rule**	
Total No. of Lectures – Tutorials – Practical (in hours per week): 3-0-1	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**	

Unit	Course Content	Lectures
Unit – I	Concepts: Definition, Nature, scope, Significance of Agricultural Geography, Approaches to the study Agricultural Geography, Agricultural Land Use and Location Theories; Agricultural Types: Agricultural types and their world distribution, Subsistence Agriculture, Commercial farming, Plantation agriculture, Mixed agriculture, State, Collective and Cooperative farming, Spatial patterns of major commodities in each type.	14
Unit – II	Techniques of Agricultural Regionalization: Quantitative Techniques and methods in Agricultural Geography for measuring Agricultural Intensity, Agricultural Efficiency, Concentration and Diversification of Crops, Methods of delimitation of crop Combination and Agricultural regions. Whittlesey's classification of Agricultural regions of the world.	15
Unit – III	Agricultural Ecology and Ecosystem: Agro-ecosystem – connotation, components, types and functioning, agroecosystem degradation with special reference to Himalaya, Agro-ecosystem and agro-energy environment Management. Planning and Management: Regional Perspective: Problems of agriculture and agricultural planning in India, salient features of agricultural development of Uttarakhand Himalaya and their management and planning.	16

Practical Credit (01) **GG.DSE10-Piii**	**Course Title: Agricultural Statistics** – Index of area under crop, index of net area sown, index of cropping pattern, index of yield, and index of productivity; Agricultural land use mapping.	30

Suggested Readings

1. Bhalla, G.S. and Alagh, Y.K. (1979) performance of India, agriculture: a district wise study, sterling, New Delhi.
2. Das, M.M. (1982). Peasant Agriculture in Assam, Inter India, New Delhi.
3. Gobind, N. (1986). Regional perspective in agriculture, concept, New Delhi.
4. Hussain, M. (1979). Agricultural Geography, Inter India, New Delhi.
5. Mergra, W.B. & Munton, R.J.C. (1971). Agricultural Geography, methuen, London.
6. Mitchel, P. (1979). Agro-ecosystem, Inter India Publication,New Delhi
7. Shafi, M. (1984). Agricultural Productivity and Regional Imbalance, Concept, New Delhi.
8. Singh J. & Dhillon, S.S. (1985). Agricultural Geography, Tata McGraw Hill, New Delhi.
9. Singh, J. (1974). Agricultural Atlas of India: A Geographical perspective,Vishal Publications, Kurukshetra.
10. Wathern, Peter (1986). Enviromental Impact Assessment: Theory and Practice.Unwin & Hyman, London. 1986.
11. Brundland, G. (1988). Our Common Future, Report of the World Commission on Environment and Development, UN.
12. Grigg, D. (2003). An Introduction to Agricultural Geography (2nd ed.). London: Routledge.
13. Singh, Jasbir. (2000). Agricultural Geography. New Delhi: Tata McGraw-Hill.
14. Barlowe, Raleigh. (2001). Land Resource Economics (4th ed.). New Delhi: Prentice Hall India.
15. Pretty, Jules. (2002). Agroecology: The Science of Sustainable Agriculture (2nd ed.). London: Earthscan.
16. Singh, R.L. (2003). Fundamentals of Agricultural Geography. Varanasi: Shivalal Agarwala & Co.
17. Gliessman, S.R. (2007). Agroecology: The Ecology of Sustainable Food Systems (2nd ed.). Boca Raton: CRC Press.
18. Thakur, B. (2002). Agricultural Geography. Patna: Vasundhara Prakashan.
19. Altieri, Miguel A. (2012). Agroecology: Principles and Strategies for Sustainable Agriculture. New York: CRC Press.
20. Misra, R.P. (2005). Agricultural Geography and Food Security. New Delhi: Concept Publishing Company.
21. Pretty, Jules. (2008). Sustainable Agriculture and Food. London: Earthscan.
22. Bhalla, G.S., & Singh, G. (2010). Economic Liberalisation and Indian Agriculture. New Delhi: Sage Publications India.
23. Gliessman, S.R. (2014). Agroecology: The Ecology of Sustainable Food Systems (3rd ed.). Boca Raton: CRC Press.
24. Brookfield, Harold. (2001). Exploring Agrodiversity. New York: Columbia University Press.

25. Gautam, N.C. (2006). Advanced Survey Techniques in Agricultural Geography. New Delhi: Concept Publishing.
26. Altieri, M.A., & Nicholls, C.I. (2017). Agroecology: A Global Movement for Food Security and Sovereignty. Boca Raton: CRC Press.
27. Pender, John. (2001). Development Pathways for Sustainable Agriculture in Sub-Saharan Africa and South Asia. Washington D.C.: IFPRI.
28. Rao, P.P., Birthal, P.S., & Joshi, P.K. (2006). Diversification Towards High-Value Agriculture. New Delhi: National Centre for Agricultural Economics and Policy Research (NCAP).
29. Ghatak, Subrata. (2001). Agriculture and Economic Development. London: Macmillan.
30. Deb, D. (2009). Beyond Developmentality: Constructing Inclusive Freedom and Sustainability. New Delhi: Earthscan.
31. Gliessman, S.R. (2021). Transforming Food Systems with Agroecology. Boca Raton: CRC Press.
32. Singh, R.B., & Haigh, M.J. (2004). Sustainable Agriculture and Rural Development in India. New Delhi: Rawat Publications.
33. Altieri, Miguel A. (2018). Agroecology and the Design of Climate-Resilient Farming Systems. New York: CRC Press.
34. Reddy, G.P., & Reddy, V.R. (2005). Agricultural Diversification in India. New Delhi: Mittal Publications.
35. Fan, Shenggen, & Chan-Kang, Connie. (2005). Road Development, Economic Growth, and Poverty Reduction in China. Washington D.C.: IFPRI.
36. Shiva, Vandana. (2016). Agroecology and Regenerative Agriculture: Sustainable Solutions for Hunger and Climate Change. New Delhi: Natraj Publishers.
37. Uphoff, Norman. (2002). Agroecological Innovations: Increasing Food Production with Participatory Development. London: Earthscan.
38. Borras, Saturnino M. (2007). Pro-Poor Land Reform: A Critique. Ottawa: University of Ottawa Press.
39. Saha, S.K. (2012). Agroforestry Systems and Practices. New Delhi: New India Publishing Agency.
40. Joshi, P.K., Gulati, A., & Cummings, R. (2007). Agricultural Diversification and Smallholders in South Asia. New Delhi: Academic Foundation.
41. Singh, Katar. (2010). Rural Development: Principles, Policies and Management (3rd ed.). New Delhi: Sage Publications India.
42. Pretty, Jules. (2020). Agroecology Now! Transformations Towards More Just and Sustainable Food Systems. London: Routledge.
43. Babu, Suresh Chandra, & Blom, Sarah. (2014). Building Resilience for Food and Nutrition Security. Washington D.C.: IFPRI.
44. Tripathi, R.S. (2015). Indian Agriculture: An Analysis of Rural Economy and Agro-environment. New Delhi: Regal Publication

DEPARTMENT OF GEOGRAPHY
M.A./M.Sc. Geography
Generic Elective (GE) - Conceptual Foundations & Perspectives of Sustainable Development

Programme: Post Graduate	**Year: V**	**Semester: X Paper-**
Subject: Geography	**Course Code: GG.GE10-Ti**	**Course Title: Conceptual Foundations & Perspectives of Sustainable Development**

Course Outcomes
Foundation on the concept of sustainable development and to gain an empirical understanding of the emerging global challenges for sustainable environmental and societal governance systems.

Theory- (Credit-4)	**Distribution of marks according the University rule**
Total No. of Lectures – Tutorials – Practical (in hours per week): 4-0-0	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Unit	**Topics**	Lectures
Unit - I	Introduction to Sustainable Development: Glimpse into History and Current practices - Broad introduction to SD - its importance, need, impact and implications; definition coined; evolution of SD perspectives (MDGs AND SDGs) over the years; recent debates; 1987 Brundtland Commission and outcome; later UN summits (Rio summit, etc.) and outcome.	12
Unit- II	Ecosystem & Sustainability: Fundamentals of ecology - types of ecosystems & interrelationships, factors influencing sustainability of ecosystems, ecosystem restoration - developmental needs. Introduction to sustainability & its factors, requirements for sustainability: food security and agriculture, renewable resources - water and energy, non-renewable resources, factors and trade-offs, sustainability conflicts, a conceptual framework for linking sustainability and sustainable development.	12
Unit – III	Dimensions to Sustainable Development - society, environment, culture and economy; current challenges - natural, political, socio-economic imbalance; sustainable development initiatives and policies of various countries: global, regional, national, local; needs of present and future generation - political, economic, environmental.	12
Unit - IV	Frameworks of Sustainability - Analytical frameworks in sustainability studies, sustainability metrics: criteria and indicators; the significance of quantitative and qualitative assessments of sustainability; current metrics and limitations; metrics for mapping and measuring sustainable development; application of the metrics in real scenarios.	12

Suggested Reading:

1. Adams, William M. (2009). Green Development: Environment and Sustainability in a Developing World (3rd Ed.). Routledge.
2. Anand, Sudhir (2022). Inequality and Sustainability. Oxford University Press.
3. Banerjee, Subhabrata Bobby (2007). Corporate Social Responsibility: The Good, the Bad and the Ugly. Edward Elgar Publishing.
4. Baviskar, Amita (2005). In the Belly of the River: Tribal Conflicts over Development in the Narmada Valley (Revised Ed.). Oxford University Press India.
5. Beckerman, Wilfred (2002). A Poverty of Reason: Sustainable Development and Economic Growth. Independent Institute.
6. Bell, Simon, and Stephen Morse. Sustainability indicators: measuring the immeasurable?. Routledge, 2012.
7. Bina, Olivia (2013). The Future of Sustainability. Springer.
8. Chambers, Robert & Conway, Gordon (2011). Sustainable Rural Livelihoods: Practical Concepts for the 21st Century (Reprint). Institute of Development Studies (IDS).
9. Chambers, Robert (2005). Ideas for Development. Earthscan/Routledge.
10. Dent, David, Olivier Dubois, and Barry Dalal-Clayton. Rural planning in developing countries: supporting natural resource management and sustainable livelihoods. Routledge, 2013.
11. Elliott, Jennifer. 2012. An Introduction to Sustainable Development. 4th Ed. Routledge, London.
12. Escobar, Arturo (2011). Encountering Development: The Making and Unmaking of the Third World (New Edition). Princeton University Press.
13. Escobar, Arturo (2018). Designs for the Pluriverse: Radical Interdependence, Autonomy, and the Making of Worlds. Duke University Press.
14. Franco, I.B. and Tracey, J. (2019), "Community capacity-building for sustainable development: Effectively striving towards achieving local community sustainability targets", International Journal of Sustainability in Higher Education, Vol. 20 No. 4, pp. 691-725
15. Gadgil, Madhav & Guha, Ramachandra (2008). Ecology and Equity: The Use and Abuse of Nature in Contemporary India. Routledge India.
16. Gasparatos, Alexandros, and Anna Scolobig. "Choosing the most appropriate sustainability assessment tool." Ecological Economics 80, no. 0 (2012): 1-7.
17. Goodland, Robert (2002). Sustainability: Human, Social, Economic and Environmental. World Bank Publications.
18. Guha, Ramachandra (2014). Environmentalism: A Global History (Updated Edition). Penguin India.
19. Gupta, Joyeeta (2023). Our Earth Matters: Pathways to a Better Common Future. Cambridge University Press.

20. Kates, Robert W., Parris, Thomas M., & Leiserowitz, Anthony A. (2005). What is Sustainable Development? Goals, Indicators, Values, and Practice. Environment: Science and Policy for Sustainable Development (Publication).
21. Kerr, Julie. Introduction to energy and climate: Developing a sustainable environment. CRC Press, 2017.
22. Kothari, Ashish (Ed.) (2017). Alternative Futures: India Unshackled. AuthorsUpFront.
23. Kothari, Ashish, Demaria, Federico & Acosta, Alberto (Eds.) (2020). Pluriverse: A Post-Development Dictionary. Tulika Books/AuthorsUpFront.
24. Lele, Sharachchandra (2018). Sustainability: A Critical Perspective. Routledge India.
25. Meadows, Donella H., Randers, Jørgen & Meadows, Dennis L. (2004). Limits to Growth: The 30-Year Update. Chelsea Green Publishing.
26. Nhamo, Godwell, and Vuyo Mjimba. Sustainable Development Goals and institutions of higher education. Springer, 2020.
27. Our Common Journey: A Transition Toward Sustainability. National Academy Press, Washington D.C. Soubbotina, T. P. 2004.
28. Pretty, Jules (2007). The Earth Only Endures: On Reconnecting with Nature and Our Place in It. Earthscan/Routledge.
29. Raworth, Kate (2017). Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist. Chelsea Green Publishing.
30. Rogers, Peter P., Kazi F. Jalal, and John A. Boyd. "An introduction to sustainable development." (2012).
31. Sachs, J. D. 2015. The Age of Sustainable Development. Columbia University Press, New York.
32. Sachs, Jeffrey D. (2015). The Age of Sustainable Development. Columbia University Press.
33. Sachs, Wolfgang (2019). The Development Dictionary: A Guide to Knowledge as Power (New Edition). Zed Books.
34. Saito, Osamu. Sharing Ecosystem Services. Springer Singapore, 2020.
35. Sala, Serenella, Biagio Ciuffo, and Peter Nijkamp. "A systemic framework for sustainability assessment." Ecological Economics 119 (2015): 314-325.
36. Satterthwaite, David (2001). The Earthscan Reader in Sustainable Cities. Earthscan/Routledge.
37. Saxena, N.C. (2017). Hunger, Under-Nutrition and Food Security in India. Sage Publications India.
38. Scoones, Ian (2015). Sustainable Livelihoods and Rural Development. Practical Action Publishing.
39. Sen, Amartya & Drèze, Jean (2013). An Uncertain Glory: India and its Contradictions. Princeton University Press.
40. Sen, Amartya (2000). Development as Freedom. Oxford University Press.
41. Shiva, Vandana (2005). Earth Democracy: Justice, Sustainability, and Peace. South End Press.
42. Shiva, Vandana (2008). Soil Not Oil: Environmental Justice in an Age of Climate Crisis. South End Press.
43. Stafford-Smith, Mark, David Griggs, Owen Gaffney, Farooq Ullah, Belinda Reyers, Norichika Kanie, Bjorn Stigson, Paul Shrivastava, Melissa Leach, and Deborah O'Connell. "Integration: the key to implementing the Sustainable Development Goals." Sustainability science 12, no. 6 (2017): 911-919.

44. Streimikis, Justas, and Tomas Baležentis. "Agricultural sustainability assessment framework integrating sustainable development goals and interlinked priorities of environmental, climate and agriculture policies." Sustainable Development 28, no. 6 (2020): 1702-1712.
45. Swilling, Mark & Annecke, Eve (2012). Just Transitions: Explorations of Sustainability in an Unfair World. UCT Press/United Nations University Press.
46. Venkatesh, M. (2010). Sustainable Development and Environmental Ethics. Atlantic Publishers.
47. Wackernagel, Mathis & Rees, William (2006). Our Ecological Footprint: Reducing Human Impact on the Earth. New Society Publishers.

DEPARTMENT OF GEOGRAPHY
M.A./M.Sc. Geography
GENERIC ELECTIVE (GE) – DISASTER MANAGEMENT

Programme: Post Graduate	**Year: V**	**Semester: X Paper-**
Subject: Geography	**Course Code: GG.GE10-Tii**	**Course Title: Disaster Management**

Course Outcomes

1. Ability to assess the significance of disasters and their implications for communities and society.
2. Proficiency in understanding national disaster management policies and requirements.
3. Capability to implement long-term measures like prevention, mitigation, and preparedness.
4. Competence in applying disaster legislation and utilizing resources for effective disaster management.
5. Understanding of response mechanisms and post-impact factors such as recovery, relief, and rehabilitation, and their roles in disaster management.

Credits: 04	**Distribution of marks according the University rule**
Total No. of Lectures – Tutorials – Practical (in hours per week): 4-0-0	**15 hrs for 1 credit theory, 30 hrs for 1 credit practical**

Unit	Course Content	Lectures
Unit – I	Fundamentals of Disaster Management: The significance of disaster, Disaster threat, National disaster management policy, Major requirements for coping with disaster, Disaster and disaster management cycle,	13
Uni t – II	Long term Measures: Prevention, Mitigation, Preparedness, Disaster and development, Disaster legislature, Counter disaster resources, Disaster management plans, Utilization of resources.	14
Unit – III	Response to Disaster Impact: Response; Search, Rescue and Evacuation, Logistic; Incident command system.	13
Unit – IV	Major Post impact Factors: Recovery, Post disaster review and damage assessment, Relief, Rehabilitation and Restructuring; Regional Pattern of Disaster Management: International disaster assistance, Leadership in disaster, Organization, Disaster scenario of Uttarakhand, Disaster management system in Uttarakhand.	20

Suggested Readings:

1. Alexander, David. (2002). Principles of Emergency Planning and Management. Oxford University Press.
2. Atakan, Bilge. (2018). Earthquakes and Sustainable Infrastructure. Springer.
3. Bhattacharya, S. (2012). Geoinformatics for Disaster Risk Reduction. CRC Press.
4. Blaikie, P., Cannon, T., Davis, I., & Wisner, B. (1994). At Risk: Natural Hazards, People's Vulnerability and Disasters. Routledge.
5. Coles, Mark S. (2017). Extreme Events: A Physical Reconstruction and Risk Assessment. Cambridge University Press.
6. Coppola, Damon P. (2006). Introduction to International Disaster Management. Butterworth-Heinemann.
7. Coppola, Damon P. (2010). Communicating Emergency Preparedness: Strategies for Creating a Disaster Resilient Public. CRC Press.
8. Diacu, Florin. (2010). Megadisasters: The Science of Predicting the Next Catastrophe. Princeton University Press.
9. Drabek, Thomas E. (2012). The Human Side of Disaster. Routledge.
10. Ghosh, S.T. (2013). Disaster Vulnerability, Hazards and Resilience: Perspectives from India. Rawat Publications.
11. Gupta, Harsh K. (2003). Disaster Management. Universities Press.
12. Hyndman, Donald & Hyndman, David. (2006). Natural Hazards and Disasters. Cengage Learning.
13. Kataria, S.K. (2020). Disaster Management: Future Challenges and Opportunities. Kataria Publications.
14. Kumar, Mukesh. (2021). Emergencies and Disaster Management. Sage Publications India.
15. Mathur, M.C. (2006). Earthquake Disasters and Mitigation. B.S. Publications.
16. Ministry of Home Affairs, Government of India. (2011). Disaster Management in India. Government of India Publication.
17. Murty, Tad S. (2006). Tsunami: To Survive From Tsunami. World Scientific Publishing.
18. National Academies. (2012). Disaster Resilience: A National Imperative. The National Academies Press.
19. National Research Council. (2006). Facing Hazards and Disasters: Understanding Human Dimensions. The National Academies Press.
20. Parasuraman, S. & Unnikrishnan, P.V. (2000). Disaster Risk Reduction in India: Challenges and Strategies. Oxford University Press India.
21. Phillips, Brenda D. (2009). Disaster Recovery. CRC Press.
22. Posner, Richard. (2004). Catastrophe: Risk and Response. Oxford University Press.
23. Punmia, B.C. (2005). Natural Hazards and Disaster Management: Vulnerability and Mitigation. Firewall Media.

24. Shaw, Rajib. (2010). Urban Disaster Management. Elsevier.
25. Shrivastava, A.K. (2012). Climate Change and Disaster Management. APH Publishing.
26. Singh, R.B. (2000). Environmental Hazards: Assessment and Mitigation. Rawat Publications.
27. Srivastava, S. (2005). Natural Disasters: A Guide for Relief Workers. National Institute of Public Administration (NIPA).
28. Sylves, Richard. (2015). Disaster Policy and Politics: Emergency Management and Homeland Security. CQ Press.
29. United Nations ISDR. (2004). Living with Risk: A Global Review of Disaster Reduction Initiatives. UN Publications.
30. Wallace, Michael & Webber, Lawrence. (2004). The Disaster Recovery Handbook. AMACOM.
31. किशोर, कमल. (2018). जलवायु परिवर्तन और आपदा प्रबंधन. अटलांटिक पब्लिशर्स (Atlantic Publishers).
32. कुमार, अशोक (2015). आपदा विज्ञान. शारदा पुस्तक भवन (Sharda Pustak Bhawan).
33. कुमार, सुरेश (2022). आपदा: एक सामाजिक अध्ययन. अनामिका पब्लिशर्स (Anamika Publishers).
34. कौल, वसंत (2009). आपदा प्रबंधन. ओरिएंट ब्लैकस्वान (Orient BlackSwan).
35. चंद्र, रमेश (2016). आपदाएं और विकास. विश्वविद्यालय प्रकाशन (Vishwavidyalaya Prakashan).
36. मिश्र, हरिशंकर (2015). आपदा प्रबंधन एवं सुरक्षा. पॉइंटर पब्लिशर्स (Pointer Publishers).
37. मिश्रा, एस.एन (2013). आपदा जोखिम न्यूनीकरण. जॉहर पब्लिशर्स (Jawahar Publishers).
38. मिश्रा, के.सी (2019). आपदा प्रबंधन: सिद्धांत और व्यवहार. राजकमल प्रकाशन (Rajkamal Prakashan).
39. रंजन, राजीव (2011). आपदा प्रबंधन और भारतीय संदर्भ. यूनिवर्सिटी साइंस प्रेस (University Science Press).
40. शर्मा, डी.एन (2017). प्राकृतिक आपदाएँ और प्रबंधन. प्रवालिका पब्लिकेशंस (Pravalika Publications).

Dissertation on Major / Dissertation on Minor / Academic project/Entrepreneurship

<table>
<tr><td colspan="2">Programme: Post Graduate</td><td>Year: V</td><td>Semester: X</td></tr>
<tr><td colspan="4">Subject: Geography</td></tr>
<tr><td colspan="2">Course Code:GG.DDPE10</td><td colspan="2">Course Title: Dissertation on Major / Dissertation on Minor / Academic project/Entrepreneurship</td></tr>
<tr><td colspan="4">Outcome
To learn how to select a Research Proposal based on research gap found during the literature survey or field observations made. Preparation of synopsis/outline will be also learned. Finally student will learn how to collect data and write a report based on the data analysis</td></tr>
<tr><td>Credits: 06</td><td colspan="3">Max. Marks: 100 (Evaluation by External & Internal Examiner)
Dissertation: 75
Internal Assessment: Viva Voce + Attendance : 25 (20+5)</td></tr>
<tr><td colspan="4">The students will be required to select a topic and area of their interests with the help of their respective supervisors allotted to them by the Department. Research Project dissertation must be submitted to the Department one week before the commencement of the Theory Examinations. The size of the Dissertation normally ranges between 80 and 100 pages. The Research Project Dissertation will be evaluated by the external and internal examiners.</td></tr>
</table>