GEOGRAPHY

भूगोल

NATIONAL EDUCATION POLICY-2020

Common Minimum Syllabus for University Campus and all Affiliated College of Sri Dev Suman Uttarakhand University for First Three Years of Higher Education

STRUCTURE OF UG –GEOGRAPHY SYLLABUS-2022-2023

Course Name: B.A./B.Sc.

Sri Dev Suman Uttarakhand University,Badshahithoul,Tehri Garhwal-Uttarakhand

Subject: Geography

Modification Expert Committee

S.N.	Name	Designation	Department	Affiliation
1.	Dr.D.C.Goswami	Professor, Head & Dean of Arts Faculty	Department of Geography	Sri Dev Suman Uttarakhand University, Campus- Rishikesh
2.	Dr. T.B.Singh	Professor	Department of Geography	Sri Dev Suman Uttarakhand University, Campus- Rishikesh
3.	Aruna P. Sutradhar	Associate Professor	Department of Geography	Sri Dev Suman Uttarakhand University, Campus- Rishikesh
4.	Dr.A.P.Dubey	Associate Professor	Department of Geography	Sri Dev Suman Uttarakhand University, Campus- Rishikesh

Expert Committee,**Uttarakhand**

S.N	Name	Designation	Department	Affiliation
1	Dr. R.K.Pande	Head & Dean of Arts Faculty	Department of Geography	D.S.B. Kumaun University, Nainital
2.	Dr.D.C. Goswami	Head & Dean of Arts Faculty	Department of Geography	Sri Dev Suman Uttarakhand University, Campus- Rishikesh
3	Dr. Jyoti Joshi	Asso. Professor & Head of the Department	Department of Geography	Soban Singh Jeena Almora University, Almora
4	Dr. R.C. Joshi	Professor	Department of Geography	D.S.B. Kumaun University, Nainital
5.	Dr.Anita Pande	Professor	Department of Geography	D.S.B. Kumaun University, Nainital

SRI DEV SUMAN UTTARAKHAND UNIVERSITY
Badshahithaul, Tehri Garhwal (Uttarakhand)
List of Members of Board of Studies

Sl. No.	Name of the Members	Designation	Nominated as
1	Prof. Dinesh Chandra Goswami	Dean of Arts	**Chairman**
2	Prof. Muktinath Yadav	Professor	**Member**
3	Prof. Hemant Kumar Shukla	Professor	**Member**
4	Prof. Sangeeta Mishra	Professor	**Member**
5	Prof. Preeti Kumari	Professor	**Member**
6	Prof. Anand Prakash Singh	Professor	**Member**
7	Prof. Pushpanjali Arya	Asso. Professor	**Member**
8	Prof. D K P. Choudhury	Professor	**Member**
9	Dr. Poonam Pathak	Professor	**Member**
10	Dr. Atal Bihari Tripathy	Asst. Professor	**Member**
11	Dr. Pushkar Gaur	Asst. Professor	**Member**
12	Dr. Shikha Mamgai	Asst. Professor	**Member**
13	Prof. M. S, Mawri	Professor	**Member**
14	Dr. Preeti Gupta	Asst. Professor	**Member**
15	Dr. Narmadeshwar Shukla	Professor	**Member**
16	Dr. Poonam Pandey	Asst. Professor	**Member**
17	Dr. Vandana Sharma	Principal	**Member**
1	Prof, Janki Panwar	Principal	GPGC Kotdwar
2	Prof. Lovely Rajvanshi LOVNEY	Principal	GPGC, Jaiharikhal
3	Prof. K. L. Talwar	Principal	GDC, Chakrata
4	Dr. Himanshu Das	Director	NIVH, Rajpur Road
5	Prof. M. S. M. Negi	Professor	SRT Campus, HNBGU, Srinagar
6	Prof. M. C. Sati	Professor	HNBGU, Srinagar
7	Prof. S. L. Bhatt	Ex. Principal	GPGC, Kotdwar
8	Dr. P.C. Painuli	Asst. Professor	GPGC, New Tehri
9	Dr. Asha Devi	Asso. Prof.	GPGC, Kotdwar

10.8.22

List of all Papers in Six Semester
Semester-wise Titles of the Papers in B.A./B.Sc.Geography
2022-2023 onwards

Year	Semester	Course Code	Paper Title	Theory/ Practical/Project	Credits
			Certificate Course in Arts/Science		
1	I	GEOG101T	Physical Geography	Theory	4
		GEOG102P	Basic Cartographic Techniques and Map Reading	Practical	2
	II	GEOG201T	Human Geography	Theory	4
		GEOG202P	Surveying Techniques	Practical	2
			Diploma in Art/Sciences		
2	III	GEOG301T	Tourism Geography	Theory	4
		GEOG302P	Thematic Cartography	Practical	2
	IV	GEOG401T	Regional Planning and Development	Theory	4
		GEOG402P	Statistical and Map Projection Techniques	Practical	2
			Bachelor of Arts/Science		
3	V	GEOG501T	Geography of India	Theory	4
		GEOG502T	Economic Geography	Theory	4
		GEOG503P	Educational Tour	Practical	2
		GEOG504R	Survey based Project -1	Project	3
	VI	GEOG601T	Evolution of Geographical Thoughts	Theory	4
		GEOG602T	Agricultural Geography	Theory	4
		GEOG603P	Remote Sensing & GIS Techniques	Practical	2
		GEOG604R	Survey based Project -2	Project	3
1-2		**GEO- SKILL-101**	Course Title: **Field survey**	Skill Enhancement	3
1-2		**GEO-SKILL-202**	Course Title: **Element's of Map Readings**	Skill Enhancement	3
1-2		**GEO-ELECTIVE-T101**	Course Title: **Applied Geomorphology**	Minor Elective	4
1-2		**GEO-ELECTIVE-T201**	Course Title: **Social and Cultural Diversity in Uttarakhand**	Minor Elective	4

Subject prerequisites:

Subject is open to all have passed 10+2 level in any stream

But, preference shall be given:

1. To study Geography, a student had the subject Geography learnt at 10+2 level.
2. Anyone who has mathematics, physics, biology as base subjects at 10+2 level.
3. Keen interest in Earth and its physical and social environment and maps.
4. Computer and drawing skills.
5. Creativity, sound observation and analytical aptitude while working on scientific procedures and research.

COURSE INTRODUCTION

Geography helps us to have an awareness of a place. All places and spaces have a history behind them, shaped by humans, earth, and climate. It also helps students with spatial awareness on the globe. Understanding direction and where things are in the world is still a vital skill, despite having easy access to this information online. **Physical Geography:** includes the study of the physical composition of a land which includes climate, landforms, soil and growth, bodies of waters, and natural resources. **Human Geography:** on the other hand, includes the study of people and culture and how they are distributed across the globe and are more likely to participate in the global community. Geography helps to develop factual reading skills — not only in the studying of maps, but also in the reading materials that are associated with geography. Geography often involves first-hand accounts, reading of research studies, and analysis of data sets. Geography puts history in context.

It helps us see the why, when, and how of what happened in history. One can learn History better by learning Geography.

Globalization is the process of cultures travelling globally and having an effect on others. Studying geography helps to understand where globalization might lead. Studying geography will make you better understand current events. Studying geography can enhance your navigation skills, no matter where you are. Studying geography will help you make sense of and appreciate different cultures around the globe. Learning about land, resource availability, and how that has shaped a culture to be the way it is today helps you understand the uniqueness of a culture. The study of geography helps us to understand relationships between cultures. Ultimately, this leads to a more accepting and culturally aware society.

Those who study geography have a unique outlook — one that comes with the knowledge of many cultures and spatial awareness that is not replicated in other disciplines. This mix of knowledge can help geographers come up with significant and unique solutions that others may not be able to see. Another way geography can have a positive influence in the world is by creating awareness of the effect of climate change. Geographers have intimate knowledge of weather patterns and climate changes throughout the course of history on areas of land. They also have studied how those changes have affected humans in those areas. That knowledge is shared with others to hopefully bring an understanding and global awareness of the effects of climate change on human society.

Geography will help you better understand news, help fight climate change, be a part of a global community, understand cultures, and learn history. At the end of the day, geography will help to become a better overall global citizen.

Programme outcomes (POs): (After 3 Years of Study in Geography Under Graduate Programme)	
PO 1	This course will provide students, the basic concepts of Physical & Human Geography.
PO2	It will help in developing analytical and critical thinking based on the themes and issues of Geography.
PO 3	Students will be able to analyze the problems of present physical as well as cultural world and they will try to find out the possible measures to solve those problems.
PO 4	Students will be able to understand applied and interdisciplinary aspects of Geography.
PO 5	Students will be able to design and conduct research projects in geography.
PO 6	Students will learn how to use various surveying instruments in the field.
PO 7	Students will be equipped with various statistical techniques and their uses.
PO 8	Students will learn how to prepare maps based on toposheets as well as GIS.
PO 9	Students will be able find out an original research question appropriate for geographic analysis.
PO10	Students will be able to design and implement legitimate geographic methodology.
PO 11	As a student of Geography, they will be capable to develop their observation power through field experience and to identify the socio-environmental problems of the areas and regions.
PO 12	Students will prepare themselves for professional careers in Geography.
PO 13	As a spatial science subject will train students to employ in the sectors of geospatial analysis, regional planning and development, tourism, mapping and surveying etc.
PO 14	Through this course students will be able to prepare themselves for Post Graduate and further Ph.D. programs in Geography.
PO 15	Students will be able to relate and use geographical knowledge and its practical aspects in their realistic life.

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. Applied geomorphologists working independently or serving on multidisciplinary advisory panels are well positioned to influence public policy to the benefit of society and the earth sciences.

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 outcomes (PSOs):
UG III Year / Bachelor of Arts/Science

PSO 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.
PSO 2	Understanding the role and functioning of global economies, industrial locations; and the use and exploitation of resources with impacts.
PSO 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.
PSO 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 methods, techniques and trends used in agriculture, Understand the concept of sustainable agricultural development.
PSO 5	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
PSO6	Training in practical techniques of mapping, cartography, softwares, interpretation of maps, photographs and images etc; so as to understand the spatial variation of phenomena on the Earth's surface.
PSO7	Students will learn how to prepare map based on GIS by using the modern geographical map making techniques.
PSO8	Development of Observation Power: As a student of Geography Course they will be capable to develop their observation power through field experience and in future they will be able to identify the socio-environmental problems of a locality.
PSO9	After the completion of the project they will be efficient in their communication skill as well as power of social interaction. Some of the students are being able to understand and write effective reports and design credentials, make effective demonstrations, and give and receive clear instructions.
PSO 10	Demonstrate knowledge and understanding of the management principles and apply these to their own work, as a member and leader in a team, to manage projects. They will perform effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PSO 11	Employment Opportunities: Many geography grads go into urban and regional planning, a field that is growing fast. Other geographers work in environmental management and consultation and can have a direct impact in the fight against climate change. Also, the skills learned during a geography degree, such as cartography, data representation, and research writing, transfer well into the workforce and can make you a standout applicant.
PSO12	Inculcating a tolerant mindset and attitude towards the vast socio-cultural diversity of Uttarakhand by studying and discussing contemporary concepts of social and cultural geography. Explaining and analyzing the regional diversity of Uttarakhand through interpretation of Physical regions.

	Subject: Geography									
Course/ Entry – Exit Levels	**Year**	**Sem**	**Paper 1**	**Credit/ hrs**	**Paper 2**	**Credit/ hrs**	**Paper 3**	**Credit/ hrs**	**Research Project**	**Credit/ hrs**
Certificate Course in Arts/Science	I	I	Physical Geography	4	Basic Cartographic Techniques and Map Readings	2	Applied Geomorphology	4	--	--
		II	Human Geography	4	Surveying Techniques	2	--	--	--	--
Diploma in Arts/Science	II	III	Tourism Geography	4	Thematic Cartography	2	Social and Cultural Diversity in Uttarakhand	4	--	--
		IV	Regional planning and Development	4	Statistical and Map Projection Techniques	2	--	--	--	--
Bachelor of Arts/Science	III	V	Geography of India	4	Economic Geography	4	Educational Tour	2	Survey/ Research Project-1	4
		VI	Evolution of Geographical Thoughts	4	Agricultural Geography	4	Remote Sensing & GIS Techniques	2	Survey/ Research Project-2	4
Comments										

Internal Assessment	**Marks 25**	**External Assessment**
Internal Assessment would be based on Written Test	**20**	External Assessment would be done on the Basis of University Examination System.
Internal Assessment would be based on Attendance	**05**	

CERTIFICATE COURSE IN ARTS/SCIENCE		
Programme: *Certificate Course in Arts/Science*	**Year: I**	**Semester: I Paper-I**
Subject: Geography		
Course Code: GEOG101T	**Course Title: Physical Geography**	

Course Outcomes:

1. Understand the origin of Universe, Earth and Solar system.
2. Learn about the Continents and Oceans.
3. Plate tectonics and related movements.
4. Origin and development of different Landforms on the Earth.
5. Earth's climate and factors influencing it.
6. Understand formation of Soil, types, profiles and biogeography.
7. Ocean systems of the world.

Credits: 04	**Core Compulsory**
Max. Marks: 25+75	**Min. Passing Marks: 33**

Total No. of Lectures-Tutorials-Practical (in hours per week): 4-0-0

Unit	Topic	No. of Lectures
Unit I	Meaning, Scope and Branches of Physical Geography, Origin of Universe, Solar system and Earth. Geological Time Scale, Theories of Laplace, Chamberlin, James Jeans, Jeffreys, and Hoyle & Lyttleton, Interior of the earth, Rocks: origin and classification.	12
Unit II	Origin of continents and ocean basins: Continental drift and convectional current theories, Plate Tectonics, Isostasy, Earth movements, Endogenetic forces, landforms: Mountains, Plateau and Plains, Gradational processes, Weathering and Erosion, normal cycle of erosion, Arid, Glacial, Marine and Karst topographies, Vulcanicity and Earthquakes.	15
Unit III	Soil as a basic component of environment, Soil profile (Soil horizon): Characteristics and Significance, Processes and factors of soil formation. Biodiversity and Biosphere, Biotic succession, Biomes and their types. Biodiversity conservation.	10
Unit IV	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.	14
Unit V	Ocean bottom topography, Ocean deposits, Salinity, Temperature, Ocean currents, Tides and Coral reefs.	09

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. Lake, P. (1979). Physical Geography (English & Hindi Edition) Cambridge Univ. Press, Cambridge.
6. Monkhouse, F I (1979). Physical Geography, Methuen, London.
7. Singh, S. (2003). Physical Geography (English and Hindi Editions) Prayag Pustak Bhawan, Allahabad.
8. Singh, M.B. (2001) Bhoutik Bhoogol, Tara Book Agency, Varanasi.
9. Strahler, A.N. and Strahler A.M. (1992). Modern Physical Geography, John Wiley and Sons, New York
10. Wooldridge, S.W. and Morgan, R.S. (1959). The Physical Basis of Geography: An Outline of Geomorphology.Longman, London.

Suggested equivalent online courses:

https://onlinecourses.swayam2.ac.in/cec21_hs03/preview
https://onlinecourses.swayam2.ac.in/nos20_sc25/preview

This course can be opted as an elective by the students: Open to all

Suggested Continuous Evaluation (25 Marks): Assignment / Class Test / Quiz (MCQ) / Seminar/ Presentations

CERTIFICATE COURSE IN ARTS/SCIENCE		
Programme: *Certificate Course in Arts/Science*	**Year: I**	**Semester: I Paper-II**
Subject: Geography		
Course Code: GEOG102P	**Course Title: Basic Cartographic Techniques and Map Readings**	

Course Outcomes:

1. Learn basics of Cartography and Map making.

2. Understand and interpret toposheets and weather maps.

3. Draw maps with the help of toposheets.

4. Learn function and use of meteorological instruments.

Credits: 2	**Core Compulsory**
Max. Marks: 25+75 (75=60+10+5 Lab exercise-+Record File+Viva-Voce)	**Min. Passing Marks:33**
Total No. of Lectures-Tutorials-Practical (in hours per week): L-T-P:0-0-2	

Unit	Topic	No. of Lectures
Unit I	Meaning, importance and types of Scale, Conversion of Scale, Construction of Plain, Comparative and Diagonal Scale. Methods of enlargement and reduction of maps.	14
Unit II	Definition, nature and scope of cartography, Globe and maps, Essentials of maps, History of map making, Types and uses of maps, Elements of map reading.	8
Unit III	Cartographic representation of relief: Hachures, Contours, Form line, Spot height, Bench mark, Trig point, Layer tint; Interpolation of contours.	10
Unit IV	Indian topographical map system: Their classification and types. Interpretation of topographical maps and preparation of base map, index map, drainage map, toporographic map, land use map, settlement map and transportation network map.	16
Unit V	Indian weather maps: Interpretation and preparation of weather report, Meteorological instruments; Barometer, Thermometer (Minimum, Maximum, Dry and Wet bulb), Rain gauge, Wind vane and Anemometer.	12

Suggested Reading:

1. Monkhouse, F.J. & Wilkinson, F.J. (1985). Maps and Diagrams. Methuen, London.
2. Raisz, E (1962). General Cartography. John Wiley &Sons, New York.
3. Sharma, J.P. (2001). Prayogik Bhoogol. Rastogi Pub, Meerut.
4. Singh, R. L. & Singh, Rana PB (1993). Elements of Practical Geography (Hindi & English Editions), Kalyani Publishers, New Delhi.
5. Singh, L. R. (2006). Fundamentals of Practical Geography. Sharda Pustak Bhawan, Allahabad.

Suggested equivalent online courses:

This course can be opted as an elective by the students: Open to all.

Suggested Continuous Evaluation (25 Marks): Assignment / Class Test / Quiz (MCQ) / Seminar/ Presentations

CERTIFICATE COURSE IN ARTS/ SCIENCE		
Programme: *Certificate Course in Arts/Science*	**Year: I**	**Semester: II Paper-I**
Subject: Geography		
Course Code: GEOG201T	**Course Title: Human Geography**	

Course Outcomes:

1. Learn Meaning, Concept, Nature, Scope and development of Human Geography.
2. Understand Cultural Changes in and around the world.
3. Learn about the different races, religions, tribes, their culture and cultural development.

Credits: 04	**Core Compulsory**
Max. Marks: 25+75	**Min. Passing Marks:33**

Total No. of Lectures-Tutorials-Practical (in hours per week): 4-0-0

Unit	Topic	No. of Lectures
Unit I	Definition and scope of Human Geography; human versus physical geography; branches of Human Geography; Development of Human Geography; Contributions of German and French Geographers. Contribution of Indian Geographers.	12
Unit II	Schools: Determinism, possibilism, welfare or humanistic and positivism; Approaches: ecological, landscape, locational, welfare and humanistic.	12
Unit III	Elements of environment; physical and human environment; constraints and opportunities of the environment; impact of environment on man; impact of man on environment; environmental problems; pollution, Hazards, and climate change.	12
Unit IV	Evolution of man: Classification of races, Characteristics of races and their world distribution, Human adaptation to the environment: Eskimo, Bushman and Masai. Tribes of India; habitat, economy and culture with special reference to Naga, Bhil, Santhal, Gaddi, Bhotia, Jounsari and Tharu tribes.	14
Unit V	Human Settlements: Origin, types and patterns (Rural and Urban) characteristics, House types and their distribution with special reference to India.	10

Suggested Reading:

1. Singh, L.R. (2005). Fundamentals of Human Geography. Sharda Pustak Bhawan, Allahabad.
2. DeBlij, H.J. Human Geography: Culture, Society and Space. John Wiley, New York.
3. Haggett, P. (2004). Geography: A Modern Synthesis. Harper & Row, New York
4. Hussain, M. (1994): Human Geography. Rawat Publication, Jaipur.
5. Norton W. (1995). Human Geography. Oxford University Press, New York.
6. Singh, K. N. & Singh J. (2001). Manviya Bhoogol. Gyanodaya Prakashan, Gorakhpur
7. Kaushik, S.D.& Sharma, A.K. (1996): Principles of Human Geography (in Hindi), Rastogi Pub. Meerut

Suggested equivalent online courses:

Courses on Swayam / MOOCs https://onlinecourses.swayam2.ac.in/nou20_hs18/preview

This course can be opted as an elective by the students: Open to all.

Suggested Continuous Evaluation (25 Marks): Assignment / Test / Quiz (MCQ) / Seminar/ Presentations

CERTIFICATE COURSE IN ARTS/SCIENCE		
Programme: *Certificate Course in Arts/Science*	**Year: I**	**Semester: II Paper-II**
Subject: Geography		
Course Code: GEOG202P	**Course Title: Surveying Techniques**	

Course Outcomes:

1. Understand importance of Surveying.
2. Learn to use Different Surveying instruments including GPS.

Credits: 2	**Core Compulsory**
Max. Marks: Max. Marks: 25+75 (75=60+10+5 Lab exercise-+Record File+Viva-Voce)	**Min. Passing Marks:33**

Total No. of Lectures-Tutorials-Practical (in hours per week): 0-0-2

Unit	Topic	No. of Lectures
Unit I	Fundamentals of Surveying: Objects, Primary divisions of survey, Classification.	4
Unit II	Plane Table Surveying: Radiation, Intersection, Close Traverse, Open Traverse, Resection by two point and three-point problems.	18
Unit III	Surveying by Prismatic Compass: Close Traverse, Open Traverse, and Correction of bearing.	18
Unit IV	Measurement of height and depth by Indian Pattern Clinometer.	10
Unit V	Use and Applications of GPS in surveying	10

Suggested Reading:

1. Monkhouse, F.J. & Wilkinson, F.J. (1985). Maps and Diagrams. Methuen, London.
2. Raisz, E. (1962). General Cartography. John Wiley & Sons, New York.
3. Sharma, J.P. (2001). Prayogik Bhoogaol. Rastogi Pub, Meerut.
4. Singh, R.L. & Singh, Rana P.B. (1993) Elements of Practical Geography (Hindi & English Editions), Kalyani Publishers, New Delhi.
5. Singh, L. R. (2006). Fundamentals of Practical Geography. Sharda Pustak Bhawan, Allahabad.

Suggested equivalent online courses:

This course can be opted as an elective by the students: Open to all.

Suggested Continuous Evaluation (25 Marks): Assignment / Test / Quiz (MCQ) / Seminar/Present

DIPLOMA IN ARTS/SCIENCE		
Programme: *Diploma in Arts/Science*	**Year: II**	**Semester: III Paper-I**

Subject: Geography	
Course Code: GEOG301T	**Course Title: Tourism Geography**

Course Outcomes:

1. Understand the concept and importance of tourism and tourism Geography.
2. Infrastructure required by the tourism services.
3. Learn impacts on Environment, economy and society.
4. Tourism prospects and challenges in Uttarakhand.

Credits: 4	**Core Compulsory**
Max. Marks: 25+75	**Min. Passing Marks:33**

Total No. of Lectures-Tutorials-Practical (in hours per week): 4-0-0

Unit	Topic	No. of 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.	12
Unit II	Impact of Tourism: Physical, Economic, Social and Cultural Impacts; Concept of Ecotourism; New Emerging Trends in Tourism. Statistics of tourism and data collection.	12
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.	12
Unit IV	Globalization and Tourism; Tourism in India; Resource and Growth; National Tourism Policy in India; Tourism Organizations. Role of WTO, IATA, UPTAA, AI, IATO, etc. in promotion and development of tourism	12
Unit V	Sustainable Tourism Development in Uttarakhand: Policies and Planning for Tourism Development; Tourism Carrying Capacity and Limits of Acceptable Change; Pro-Poor Tourism (PPT); Environmental, Cultural, Social and Historical Attractions with special reference to Uttarakhand Himalaya; Framework for Monitoring Sustainability of Tourism in Uttarakhand.	12

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. Pande, G.C. and D.C. Pandey (1999). Environmental Development and Management: Strategies and Policies, New Delhi.

Suggested equivalent online courses:

This course can be opted as an elective by the students: Open to all

Suggested Continuous Evaluation (25 Marks): Assignment / Test / Quiz (MCQ) / Seminar/ Presentations

DIPLOMA IN ARTS/SCIENCE		
Programme: *Diploma in Arts/Science*	**Year: II**	**Semester: III Paper-II**
Subject: Geography		
Course Code: GEOG302P	**Course Title: Thematic Cartography**	

Course Outcomes:

1. Learn theme-based cartography.

2. Able to represent geographical data of different types using diagrams,graphs and maps.

Credits: 2	**Core Compulsory**
Max. Marks: 25+75 (75=60+10+5 Lab exercise-+Record File+Viva-Voce)	**Min. Passing Marks:33**

Total No. of Lectures-Tutorials-Practical (in hours per week): 0-0-2

Unit	Topic	No. of Lectures
Unit I	Cartography: Meaning, Rules and Methods of Geographical data representation, Types of Diagrams, Graph, Distribution maps and cartogram. Isopleth and choropleth maps.	12
Unit II	Cartographic representation of geographical data by (a) dot method (b) proportional sphere method and circle method. Representation of economic data: Agricultural, land use, production and industrial data.	12
Unit III	Representation of population data: Growth, distribution and employment.	12
Unit IV	Representation of climatic data: Climatograph, Climograph and Hythergraph.	12
Unit V	Drainage ordering, Slope analysis: Wentworth's and Smith's methods.	12

Suggested Reading:

1. Monkhouse, F.J. & Wilkinson, F.J. (1985) Maps and Diagrams. Methues, London.
2. Raisz, E (1962) General Cartography. John Wiley &Sons, New York.
3. Sharma, J.P. (2001) Prayogik Bhoogol. Rastogi Pub, Meerut.
4. Singh R.L. & Singh, Rana P B (1993) Elements of Practical Geography (Hindi & English Editions), Kalyani Publishers, New Delhi.
5. Singh, L R (2006) Fundamentals of Practical Geography. Sharda Pustak Bhawan, Allahabad.

Suggested equivalent online courses:

This course can be opted as an elective by the students: Open to all

Suggested Continuous Evaluation (25 Marks):. Assignment / Test / Quiz (MCQ) / Seminar/ Presentations

DIPLOMA IN ARTS/SCIENCE		
Programme: *Diploma in Arts/Science*	**Year: II**	**Semester: IV Paper-I**
Subject: Geography		
Course Code:GEOG401T	**Course Title: Regional Planning and Development**	

Course Outcomes:

1. Understand the concept of region, planning and development

2. Understand the importance of Regional planning.

3. Learn the process and strategies of planning.

4. Understand the theories of regional planning.

5. Problems of planning and causes of regional disparities.

Credits: 4	**Core Compulsory**
Max. Marks:25+75	**Min. Passing Marks:33**

Total No. of Lectures-Tutorials-Practical (in hours per week): 4-0-0

Unit	Topic	No. of 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.	10
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, Planning for regional development and multi-	14

	regional planning in national context	
Unit III	Regional development strategies: Concentration vs. dispersal, Case studies for plans of developed and developing countries. Regional planning and development in India through Five year plans, problems and prospects. Regional disparities: causes and consequences.	13
Unit IV	Concept of Multi-level planning: Decentralized planning; peoples participation in the planning process. Concept and approaches of urban development. Landscape ecology and sustainable urban development. Application of remote sensing and Geographic Information System in Development Planning.	13
Unit V	Theories and Models for Regional Planning: Growth Pole Model of Perroux; Myrdal, Hirschman, Rostow and Friedmann.	10

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.

Suggested equivalent online courses: https://onlinecourses.swayam2.ac.in/aic19_ge05/preview

This course can be opted as an elective by the students: Open to all.

Suggested Continuous Evaluation (25 Marks): Assignment / Test / Quiz (MCQ) / Seminar/ Presentations

Course Prerequisites:

DIPLOMA IN ARTS/SCIENCE		
Programme: *Diploma in Arts/Science*	**Year: II**	**Semester: IV Paper-II**
Subject: Geography		
Course Code: GEOG402P	**Course Title: Quantitative Techniques and Map Projections**	

Course Outcomes:

1. Understand the importance of statistical methods in Geographical studies.

2. Learn data collection, tabulation, analysis and prediction.

3. Understand the need of projection and construction methods.

Credits: 2	**Core Compulsory**
Max. Marks: 25+75 (75=60+10+5 Lab exercise-+Record File+Viva-Voce)	**Min. Passing Marks:33**
Total No. of Lectures-Tutorials-Practical (in hours per week): 0-0-2	

Unit	Topic	No. of Lectures
Unit I	Data: Meaning, and Types, Collection of data, Sampling Techniques and Methods, Measures of central tendency: Mean, Mode, and Median.	14
Unit II	Measures of dispersion; Mean Deviation, Quartile Deviation and Standard deviation, Correlation: Karl Pearson's and Spearman's methods.	10
Unit III	Definition, Necessity and Classification of map projection, Mathematical method of drawing projections, Construction of map projections: Simple conical projection with one and two standard parallels, Bonne's projection, Polyconic projection.	14
Unit IV	Cylindrical projections: Equidistant and Equal area cylindrical projections, Mercator's, Gall's stereographic projection.	12
Unit V	Zenithal Projections: Polar zenithal equidistant, Equatorial zenithal equidistant, Polar zenithal equal-area, Equatorial zenithal equal-area.	10

Suggested Readings:

1. Monkhouse, F.J. &Wilkinson, F.J.(1985)Maps and Diagrams. Methues, London.
2. Raisz, E. (1962). General Cartography. John Wiley & Sons, New York.
3. Sharma, J.P. (2001). Prayogik Bhoogaol. Rastogi Pub, Meerut.

4.Singh, R.L. &Singh, Rana P.B.(1993).Elements of Practical Geography (Hindi & English Editions), Kalyani Publishers, New Delhi.
5. Singh, L. R. (2006). Fundamentals of Practical Geography. Sharda Pustak Bhawan, Allahabad.

This course can be opted as an elective by the students: Open to all

Suggested Continuous Evaluation (25 Marks): Assignment / Test / Quiz (MCQ) / Seminar/ Presentations

Course Prerequisites:

DEGREE IN ARTS/SCIENCE		
Programme: *Degree in Arts/Science*	**Year: III**	**Semester: V Paper-I**
Subject: Geography		
Course Code: GEOG501T	**Course Title: Geography of India**	

Course Outcomes:

1. Help students to know the Uniqueness of India in the world.
2. Learn about the physical and cultural diversities and interrelationships of India.
3. Understand the agricultural, industrial and trade aspects of India.

Credits: 4	**Core Compulsory**
Max. Marks: 25+75	**Min. Passing Marks:33**

Total No. of Lectures-Tutorials-Practical (in hours per week): 4-0-0

Unit	Topic	No. of Lectures
Unit I	India- A subcontinent, Physical features, Geologic structure, Drainage system, Climate, Natural vegetation, Soils, Natural regions.	16
Unit II	Agriculture, Crops (Food, plantation and commercial), Agriculture production, Agriculture regions, Irrigation, Livestock raising and Fishery.	10
Unit III	Industries: Metallurgical, Textile, Engineering, Chemical, Food, Leather, Forest and Agro-industries, Industrial regions, Minerals and Power resources.	10
Unit IV	Population (density, distribution and urbanization), Multipurpose projects. Regional development and planning, Regional disparities, Five-year plans, Integrated rural development programme, Panchayati raj, Command area and watershed management.	14
Unit V	Transportation: Roads and railways, air transportation and pipeline transportation. Trade: Internal and External (Trend, composition and direction); SEZ (Special Economic Zones).	10

Suggested Reading:

1. Chauhan B.S. & Gautam Alka (2011) Bharat (Geography of India), Rastogi Publication, Meerut.
2. Chauhan B.S.& Gautam Alka (2013) Bharatvarsh kaVistrat Bhogool, Rastogi Publication, Meerut.
3. Hussain, Majid (2015) Geography of India, McGraw Hill Education, New Delhi.
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)Bharat ka Bhogool, Rastogi Publication, Meerut.
8. Singh R. L. (1993) Regional Geography of India, National Geographic Society of India, Varanasi.

Suggested equivalent online courses:
Courses on Swayam / MOOCs https://onlinecourses.swayam2.ac.in/nou20_ag10/preview

This course can be opted as an elective by the students: Open to all

Suggested Continuous Evaluation (25 Marks): Assignment / Test / Quiz (MCQ) / Seminar/ Presentations

DEGREE IN ARTS/SCIENCE		
Programme: ***Degree in Arts/Science***	**Year: III**	**Semester: V Paper-II**
Subject: Geography		
Course Code: GEOG502T	**Course Title: Economic Geography**	

Course Outcomes:

1. Understand broad meaning and scope of Economic Geography.
2. Understand Economic landscape.
3. Learn world production of crops, industries, resources, and petroleum etc.
4. Learn theories of industrial location and factor responsible.
5. Understand trade and transportation scenario of the world.

Credits: 4	**Core Compulsory**
Max. Marks: 25+75	**Min. Passing Marks:33**

Total No. of Lectures-Tutorials-Practical (in hours per week): 4-0-0

Unit	Topic	No. of Lectures
Unit I	Meaning, aim and scope of economic geography, Resources: Meaning, classification, conservation and concepts, Economic landscapes.	14
Unit II	Primary production, Vegetation & forest economy, Soil resources, Mineral resources (Iron ore and bauxite), Power resources (Coal, Petroleum and Hydro-electricity), Resource conservation.	12

Unit III	Main crops in the world: Wheat, paddy, sugarcane, coffee and tea. industries: Iron & steel, textiles, petro-chemical and sugar.	12
Unit IV	Theory of industrial location: Weber and Losch, Industrial regions of India and World.	10
Unit V	World transportation: trans-continental railways, sea and air routes, international trade, patterns and trends, trade blocks: NAFTA, EEC, ASEAN, G7 and G20, Globalization and developing countries.	12

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 Geograohy. Englewood Cliff, New Jersey.
5. Singh, KN and Singh I (2003) Arthik Bhugol ke Mool Tatve.Gyanodaya Prakashan,Gorakhpur.

Suggested equivalent online courses:

Courses on Swayam / MOOCs https://onlinecourses.nptel.ac.in/noc21_hs50/preview

This course can be opted as an elective by the students: Open to all

Suggested Continuous Evaluation (25 Marks): Assignment / Test / Quiz (MCQ) / Seminar/ Presentations

DEGREE IN ARTS/SCIENCE		
Programme: ***Degree in Arts/Science***	**Year: III**	**Semester: V Paper-III**
Subject: Geography		
Course Code: GEOG503P	**Course Title: Field Excursion**	
Course Outcomes: **1.** Understand different physio-cultural settings of the visited region or area. **2.** Understand the geographical differences among regions and areas and their causes. **3.** Learn to interact with peoples of different culture. **4.** Learn to Prepare tour report		
Credits: 2	**Core Compulsory**	

Max. Marks: 25+75 (75=60+15 Tour report+Viva-Voce)		Min. Passing Marks:33
Total No. of Lectures-Tutorials-Practical (in hours per week): 0-0-2		
Unit	**Topic**	**No. of Lectures**
Unit I	How to prepare Field Manuscript, Steps and methods of preparing Tour report, Methodology adopted for Research in Field Trip, Various other aspects of study in Field Trip, Preparation of Surveying in Field Trip. Prerequisites of field trip. Conducts during field visit. (Different lectures would be taken before and during field visit).	60

Suggested Continuous Evaluation Methods:

The following shall be the guidelines and structure of Educational tour;

Geographical Excursion Committee

1. All faculty members shall organize geographical excursion as 'tour in-charge' in rotation according to departmental seniority list.
2. There shall be Geographical Excursion Committee headed by HOD in University and Principal in colleges. Tour in-charge shall act as convener of committee and shall convene a meeting at the beginning of session or semester. All other teachers of department shall be member of committee. Four/Five meritorious students based on last available examination result shall be invited by the tour in-charge to participate in meeting as members of committee.
3. Committee shall:

a) Review the tour plan.
b) Confirm that all arrangements shall be made in advance before tour departure.
c) Listen to the opinion of students and give recommendations to tour in-charge accordingly.
d) Review academic nature of tour and evaluate day wise tour plan and academic activity as submitted by Tour in-charge.

Structure of the tour party

1. For 20 or less than 20 students one faculty member with one non teaching staff shall accompany the Tour party. For 21 to 50 students two faculty members with one non teaching staff shall accompany the Tour party. If two faculty members are required for tour, second faculty member shall be selected on the recommendation of tour in-charge. If students are more than 50 then a separate tour batch shall be constituted in same manner.

2. If female students are also participating in tour and tour in-charge, accompany other faculty member or Non teaching staff none are female then one female attended (Female faculty member from Geography or any other departments/female non teaching staff) shall accompany with tour party.

Responsibility of tour in-charge

1. Tour shall at least of 6 days stay at location with inter region variation.
2. Tour in-charge shall submit tentative day wise activity report in advance to HOD in University and Principal in colleges.
3. Tour in-charge shall coordinate with Institutes/Colleges/ Universities/Research institutes etc in location where tour is being planned for following activities like;

a) Interaction of students.
b) Lectures on various local physical and cultural attributes of the area by the experts.
c) Local visit with faculty members having academic understanding of the area.

4. Lectures by tour in-charge on physical and human characteristics of area being visited for educational tour.
5. Survey with students with at least one instrument like Dumpy Level, Sextant, Theodolite, GPS etc.
6. Questionnaire survey on various socio-cultural or any other aspects. Questionnaire must be prepared in advance and shall be shared during Geographical Excursion Committee meeting.
7. Tour in-charge shall collect undertaking from all students which shall be counter signed by their guardian.
8. Tour in-charge will prepare list of students accompanying the tour with their information like mobile number, address, guardian contact information and one recent color photo. One copy will also be submitted to the head in universities and Principal in colleges.
9. Teacher shall always try to minimize tour expenditure of students by;

a) Using concession train reservation and avoiding buses if possible.
b) Making stay arrangements of students in advance in youth hostels/lodges/guese house etc.
c) Try to visit few important locations only with objective of spot study and avoiding unnecessary travel for sightseeing.

10. After the completion of tour there shall be presentation by students regarding learning outcomes and experiences under the supervision of tour in-charge. Presentation shall be attended by Geographical Excursion Committee members along with other faculty members, staff, students etc.
11. All students shall submit tour report under supervision of Tour in-charge for evaluation. Tour report shall portray all activities conducted and places visited for the purposes of study.
12. In case of any incident/injury where one or more than one student can't join tour party in return journey. One teaching/non teaching staff member shall stay with student until student's guardian arrives or alternative arrangement is not made by the college. In case tour in-charge stays the other teacher/staff member shall act as tour in-charge for remaining tour period according to seniority.

Exemption of Students from Tour

1. Tour can be exempted in very special circumstances on recommendation of tour incharge and head (in University) or Principal (in Colleges). Exempted students will prepare local tour report based on his/her own local tour visits. Report shall be prepared under supervision of tour in-charge.

TA, DA and other expenses

1. The TA, DA and other expenses of teachers and attendants shall be met out by college as admissible to their cadre as per government rules.

DEGREE IN ARTS/SCIENCE		
Programme: *Degree in Arts/Science*	**Year: III**	**Semester: V Paper-IV**
Subject: Geography		
Course Code: GEOG504R	**Course Title: Survey/ Research Project -I**	

Course Outcomes:

1. Understand the importance of research and research methodology.
2. Learn how to conduct research project.
3. Learn to prepare project report.

Credits: 4 (3 credits for Theory and 1 credit for preparation of field survey)	**Core Compulsory**
Max. Marks: 100	**Min. Passing Marks:40**

Total No. of Lectures-Tutorials-Practical (in hours per week): L-T-P: 0-0-P

Unit	Topic	No. of Lectures
Unit I	Meaning, types and significance of Research, Literature review and formulation of research design, research problem, objectives, hypothesis, Research materials and methods, Sampling. Techniques of writing scientific reports: Preparing notes, references, bibliography, abstract and keywords etc.	45
Unit II	Selection of research problem and study area.	15
Note	1. Each faculty member shall teach these topics of research to his/her Group of students independently. 2. Student shall choose supervisor according to his/her research interest and specialisation of Faculty member.	

Suggested equivalent online courses:

This course can be opted as an elective by the students: Open to all

Suggested Continuous Evaluation (25 Marks): Seminar/ Presentations

DEGREE IN ARTS/SCIENCE		
Programme: Degree *in Arts/Science*	**Year: III**	**Semester: VI Paper-I**
Subject: Geography		
Course Code: GEOG601T	**Course Title: Evolution of Geographical Thoughts**	

Course Outcomes:

1. Understand the development of Geography as a scientific discipline.
2. Learn the basic concepts of Geography.
3. Know the impact of expedition, discoveries and exploration on Geographical knowledge.
4. Contributions of Indian, Arab, Greek, Roman, and modern geographers.

Credits: 4	**Core Compulsory**
Max. Marks: 25+75	**Min. Passing Marks:33**

Total No. of Lectures-Tutorials-Practical (in hours per week):L-T-P: 4-0-0

Unit	Topic	No. of 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, Relationship of Geography with other Sciences.	12
Unit II	Geography in classical times: Greek and Roman Geographers, Contribution by Arab Geographers.	12
Unit III	Renaissance, Eighteenth century Geography, Development of Geographical Thought in India: Ancient and Modern. Contribution of Important Indian Geographers.	12
Unit IV	Formulation of scientific Geography, Schools of thoughts; German, French, British, American and former Soviet Union. Environmental determinism, possibilism, Neo-determinism and probabilism.	12
Unit V	Dualism in Geography, Dichotomy of scientific and regional Geography; Unity in Geography, Concept of Regions and regionalization, Quantitative Geography, Recent Trends in Geography.	12

Suggested Reading:

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. Amedeo, Douglas (1971) An Introduction to scientific Reasoning in Geography, John Wiley, USA.
4. Dikshit, R.D. (ed): The Arts and science of Geography integrated readings, P.H.I, New Delhi.
5. 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. Mishull, R. (1970) The Changing Nature of Geography, Hutchinson University library, London.
10. Adhikari S. (1992): Geographical Thought, Chiatanya Pub. House, Allahabad.
11. Chorley, R.J. & Hagget.P.(1965) Frontier in Geographical Teaching, Oxford University Press.

Suggested equivalent online courses:

Courses on Swayam / MOOCs https://onlinecourses.swayam2.ac.in/cec21_lg06/preview

This course can be opted as an elective by the students: Open to all

Suggested Continuous Evaluation (25 Marks): Assignment / Test / Quiz (MCQ) / Seminar/ Presentations

DEGREE IN ARTS/SCIENCE		
Programme: *Degree in Arts/Science*	**Year: III**	**Semester: VI Paper-II**
Subject: Geography		
Course Code: GEOG602T	**Course Title: Agricultural Geography**	

Course Outcomes:

1. Understand the meaning, scope and approaches of Agricultural Geography.
2. Learn factors influencing Agriculture.
3. Learn techniques and methods of agricultural regionalization.
4. Come to know the agricultural location theory.
5. Understand the agricultural scenario of India.

Credits: 4	**Core Compulsory**
Max. Marks: 25+75	**Min. Passing Marks:33**

Total No. of Lectures-Tutorials-Practical (in hours per week): L-T-P: 4-0-0

Unit	Topic	No. of Lectures
Unit I	Nature, scope, significance and development of Agriculture Geography, Approaches to the study of Agricultural Geography: Commodity, systematic, regional, behavioral and recent approaches etc., Origin and dispersal of agriculture.	12
Unit II	Determinants of agricultural land use: Physical, economic, social and technological factors, Land holding and land tenure systems in India, Land use and land capability.	12
Unit III	Agricultural efficiency Concepts, Techniques and Methods of measurements; Methods of delimiting crop combination region, cropping pattern, crop concentration, intensity of cropping, degree of commercialization, diversification and specialization.	12
Unit IV	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.	12

Unit V	Regional pattern of productivity in India, Green Revolution, White Revolution, Food deficit and food surplus regions; World pattern of Agriculture: Subsistence agriculture, Commercial farming, Plantation agriculture, Mixed agriculture, State, collective and cooperative farming.	12

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, Krishi Bhoogol, Madhya Pradesh Hindi Granth Academi, Bhopal,MP.

Suggested equivalent online courses:

This course can be opted as an elective by the students : Open to all

Suggested Continuous Evaluation (25 Marks): Assignment / Test / Quiz (MCQ) / Seminar/ Presentations

DEGREE IN ARTS/SCIENCE		
Programme: *Degree in Arts/Science*	**Year: III**	**Semester: VI Paper-III**
Subject: Geography		
Course Code: GEOG603P	**Course Title: Basics of Remote Sensing and GIS**	
Course Outcomes: **1.** Understand the meaning and importance of Remote Sensing and GIS. **2.** Learn to map making by using RS and GIS.		
Credits: 2	**Core Compulsory**	
Max. Marks: 25+75	**Min. Passing Marks:33**	
Total No. of Lectures-Tutorials-Practical (in hours per week): L-T-P: 0-0-2		

Unit	Topic	No. of Lectures
Unit I	Remote Sensing: Components of Remote Sensing, Thermal and Radar Remote Sensing; Image Processing Techniques: Visual and Digital, Classification: Supervised and Unsupervised.	12
Unit II	GIS: Geographic Data Types; Spatial and Non-Spatial Data; Raster and Vector Data, Linkages and Matching, Principal Functions of GIS; Data Capture; Geographic Analysis; Scanning System; Data Conversion, Data Base Management System (DBMS), Data Base and Spatial Data Management; Geo-Relational Data Model; Topological Data Structure; Attribute Data Management; Relational Database-Concepts & Model, Digital Elevation Model (DEM): Process, Derivatives and applications.	12
Unit III	Geo-Referencing and Its Importance. Spatial Data Integration (Digitization) – Point, Line, Polygon. Map Design or Layout, Map Production. Import And Export of Map in Various Formats.	10
Unit IV	Satellite Data and its type. Downloading Sources of Satellite Data (Google Earth, USGS, GLCF Etc.). Download Process Satellite Imagery. Remote Sensing data download from open sources.	10
Unit V	GIS Software (Including Open-Source Softwares). Creation of Shape files in GIS Softwares. Geo-Referencing and Digitization in GIS Software. Attribute Data Entry, Manipulation of Fields and Attribute Data.	16

Suggested Reading:

1. Curran, P.J. (1985): Principles of Remote Sensing, Longman, London
2. Chaunial, D. D. (2004): Remote Sensing and Geographical Information System (in Hindi), Sharda Pustak Bhawan, Allahabad
3. Cracknell, A. and Ladson, H. (1990): Remote Sensing Year Book. Taylor and Francis, London.
4. Curran, P.J. (1985): Principles of Remote Sensing. Longman, London.
5. Deekshatulu, B.L. and Rajan, Y.S. (ed.) (1984): Remote Sensing. Indian Academy of Science, Bangalore.
6. Floyd, F. and Sabins, Jr. (1986): Remote Sensing: Principles and Interpretation. W.H. Freeman, New York.
7. Gautam, N.C. and Raghavswamy, V. (2004). Land Use/ Land Cover and Management Practices in India. B.S. Publication., Hyderabad.
8. Jensen, J.R. (2004): Remote Sensing of the Environment: An Earth Resource Perspective. Prentice Hall, Englewood Cliffs, New Jersey. Indian reprint available.
9. Lillesand, T.M. and Kiefer, R.W. (2000): Remote Sensing and Image Interpretation. John Wiley and Sons, New York.
10. Nag, P. (ed.) (1992): Thematic Cartography and Remote Sensing. Concept Publishing Company, New Delhi.
11. Rampal, K.K. (1999): Handbook of Aerial Photography and Interpretation. Concept Publishing. Company, New Delhi.
12. Campell, J. B. (2003): Introduction to Remote Sensing. 4th edition. Taylor and Francis, London.

Suggested equivalent online courses:

Courses on Swayam / MOOCs https://onlinecourses.swayam2.ac.in/aic20_ge05/preview

This course can be opted as an elective by the students: Open to all
Suggested Continuous Evaluation (25 Marks): N.A.

DEGREE IN ARTS/SCIENCE		
Programme: *Degree in Arts/Science*	**Year: III**	**Semester: VI Paper-IV**
Subject: Geography		
Course Code: GEOG604R	**Course Title: Survey/ Research Project-2**	

Course Outcomes:

1. Implementation of Research Methodology.

2. Field Survey and Data collection and Data Analysis.

3. Report Writing.

Credits: 4	**Core Compulsory**
Max. Marks: 100	**Min. Passing Marks:40**

Total No. of Lectures-Tutorials-Practical (in hours per week): L-T-P: 0-0-4

Unit	Topic	No. of Lectures
Unit I	Project should be based on problem oriented research using quantitative techniques and appropriate graphical representation of Data.	60
Note	1. Each faculty member shall teach and guide to his/her Group of students independently. 2. Student shall choose supervisor according his/her research interest and specialisation of Faculty member.	

Suggested Readings:

Suggested equivalent online courses:

This course can be opted as an elective by the students: Open to all

Suggested Continuous Evaluation (25 Marks): Presentation

Sri Dev Suman Uttarakhand University
Badshahithoul,Tehri Garhwal

Subject: Geography

Under Graduate Syllabus
For
Minor Elective Course

(Session 2022-23 onwards)

ELECTIVE COURSE IN ARTS/SCIENCE		
Programme: *Elective Course in Arts/Science*	**Year: I**	**Semester: I Paper-III**
Subject: Geography		
Course Code: GEOGME103	**Course Title: Applied Geomorphology**	

Course Outcomes:

1. To understand the impact of landforms on various spheres of human life.
2. To analyse the role of human being in mitigating the geomorphic hazards.
3. The applied geomorphological knowledge is useful to scientists, engineers, consultants, and decision-makers involved with hazards, land-use planning, natural resources, environmental management, and global environmental change.

Credits: 4	**Minor Elective**
Max. Marks: 25+75	**Min. Passing Marks:33**

Total No. of Lectures-Tutorials-Practical (in hours per week): 4-0-0

Unit	Topic	No. of Lectures
Unit I	Introduction : Definition, Nature and scope of Applied Geomorphology	10
Unit II	Geomorphic Hazards and Mitigation Measures: Landslides Flash Floods and Flood Hazards, Avalanches, Earthquakes and Tsunamis, Volcanic Eruptions.	15
Unit III	Geomorphology in Civil Engineering: Dam Construction, Road construction, Site selection for the construction of Airport	15
Unit IV	Geomorphology and Natural Resources: Geomorphology and Groundwater Studies; Soil and Geomorphology; Application of Geomorphology in agriculture and resource management.	20

Suggested Readings:

1. Coats, D.R. (1981. edt.). Geomorphology and Engineering, George Allen and Unwin, London.
2. Cooke, R.U. and J.C. Doornkamp (1974) : Geomorphology in Environmental Management, Oxford University Press.
3. Hart, M.G. (1986) : Geomorphology : Pure and Applied, George Allen and Unwin, London.
4. Gares, P.A, D.J. Sherman, and K.F. Nordstrom. 1994. Geomorphology and natural hazards. Geomorphology 10: 1-18.
5. Panizza, M. 1987. Geomorphological hazard assessment and the analysis of geomorphological risk. In V. Gardiner (ed.), International Geomorphology 1986, pp. 225-229. Part I. New York: Wiley.
6. Slaymaker, O. 1996. Introduction. In: Slaymaker, O. (Ed.), Geomorphic Hazards. Wiley, Chichester, pp. 1-7.
7. Craig, R.G. and Craft, J.L. 1982 Applied Geomorphology Allen & Unwin, London

8. Verstappen, H. Th. 1983 Applied Geomorphology: Geomorphological Surveys for Environmental Development Elsevier, Amsterdam
9. Cooke, R.U. and Doornkamp, J.C. 1974 Geomorphology in Environmental Management ,Oxford University Press, Oxford
10. Singh, S. 1998: Geomorphology,(Hindi and English Editions), Prayag Publications, Allahabad.

Suggested equivalent online courses:

This course can be opted as an elective by the students: Open to all

Suggested Continuous Evaluation (25 Marks): Assignment / Test / Quiz (MCQ) / Seminar/ Presentations

ELECTIVE COURSE IN ARTS/SCIENCE		
Programme: ***Elective Course in Arts/Science***	**Year: II**	**Semester: III Paper-III**
Subject: Geography		
Course Code:GEOGME303	**Course Title: Social and Cultural Diversity in Uttarakhand**	

Course Outcomes:

1. To understand the physical and cultural diversity within the state.
2. To identify the impact of physical diversity in determining the Socio-Cultural diversity of the state.

Credits: 4	**Minor Elective**
Max. Marks: 25+75	**Min. Passing Marks:33**

Total No. of Lectures-Tutorials-Practical (in hours per week): 4-0-0

Unit	Topic	No. of Lectures
Unit I	**Fundamental Base**: Location and Extent; Geology; Physiography; Climate and Drainage System; Demographic and Socio-cultural Characteristics.	**10**
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.	**20**
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 and Awadh, Allahabaad
6. Singh, L.R. (1965): The Tarai Region of U.P., Allahabad
7. Guha, B.S.: Racial Elements in India's Population.

Suggested equivalent online courses:

This course can be opted as an elective by the students: Open to all

Suggested Continuous Evaluation (25 Marks): Assignment / Test / Quiz (MCQ) / Seminar/ Presentations

SRI DEV SUMAN UTTARAKHAND UNIVERSITY

BADSHAHITHOUL (TEHRI GARHWAL) UTTRAKHAND

U.G. SYLLABUS

GEOGRAPHY

FOR

VOCATIONAL/SKILL ENHANCEMENT COURSE

SESSION-2022-23 (ONWARDS)

Prepared

BY:

DEPARTMENT OF GEOGRAOPHY

PT. L.M.S SRI DEV SUMAN UTTARAKHAND UNIVERSITY, CAMPUS, RISHIKESH

Programme: Certificate in Faculty	**Year:** First	**Semester:** Paper: I
Subject:	Geography	
Course Code: **GEO-SKILL-101**	Course Title: **Field survey**	

Course outcomes:

1. Understand importance of Surveying.
2. Learn to use Different Surveying instruments including GPS

Credits: 3	Vocational /Skill Enhancements
Max. Marks: 25+75(40+20+10+5)	Min. Passing Marks: 33

Total No. of Lectures-Tutorials-Practical (in hours per week): L-T-P:4-0-0

Unit	Topics	No. of Lectures
I	Definition and types of serving	10
II	Plane Table Survey -Radiation & Intersection Methods.	15
III	Methods' of GPS Survey & Remote Sensing	15
IV	Field Excursion	05

Suggested Readings:

6. Monkhouse,F.J.&Wilkinson,F.J.(1985)
7. MapsanDiagrams.Methues,London.Raisz, E(1962)GenerlCartography.JohnWiley& Sons,NewYork.
8. Sharma, J.P. (2001) PrayogikBhoogaolk. Rastogi Pub, Meerut.
9. SinghR.L.&Singh,RanaPB(1993)ElementsofPractical Geography(Hindi&EnglishEditions), Kalyani Publishers, NewDelhi.
10. Singh, L R (2006) Fundamentals of Practical Geography. Sharda Pustak Bhawan, Allahabad.

This course can be opted as an elective by the students : Open to all

Suggested Continuous Evaluation Methods: Assignment / Test / Quiz (MCQ) /

Seminar/ Presentations		
Suggested equivalent online courses:		
Programme: Certificate in Faculty	**Year:** Second	**Semester:** Paper: II
Subject:	Geography	
Course Code: **GEO-SKILL-T202**	Course Title: **Element's of Map Readings**	

Course outcomes:

1. Learn basics of Cartography and Map making
2. Understand and interpret toposheets and weather maps
3. Draw maps with the help of toposheets..

Credits: 3	Vocational /Skill Enhancements
Max. Marks: 25+75(60+10+5)	Min. Passing Marks: 33

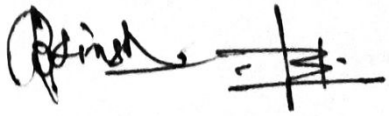
Total No. of Lectures-Tutorials-Practical (in hours per week): L-T-P:0-0-4

Unit	Topics	No. of Lectures
I	Meaning, importance and types of Scale, Conversion of Scale, Interpretation of topographical maps	12
II	Interpretation of Indian Weather maps	10
III	India -Locational aspects -An outline map of India will be provided to the students and they will have to mark location on it. Physical & political Aspect -mountains, river, lakes, capitals, etc.	13
IV	Arial photography & satellite Imagery.	10

Suggested Readings:

1.Monkhouse,F.J.&Wilkinson,F.J.(1985)Mapsan Diagrams.Methues,London.Raisz,E(1962)Generl Cartography.JohnWiley&Sons,NewYork.

2.Sharma, J.P. (2001) PrayogikBhoogaolk. Rastogi Pub, Meerut.



परीक्षा प्रणाली

श्री देव सुमन उत्तराखण्ड विश्वविद्यालय परिसर, ऋषिकेश में दिनांक 10 अगस्त 2022 को कला संकाय की अध्यापन समिति (Board of Studies) में लिए गए निर्णय के क्रम में श्री देव सुमन उत्तराखण्ड विश्वविद्यालय में संचालित स्नातक पाठ्यक्रमों के निम्न विषयों -

हिन्दी ,
अंग्रेजी ,
संस्कृत,
इतिहास ,
गृह विज्ञान ,
भूगोल,
राजनीति विज्ञान ,
समाज शास्त्र,
अर्थशास्त्र ,
शिक्षा शास्त्र ,
शारीरिक शिक्षा ,
संगीत ,
चित्रकला ,
मानव शास्त्र ,
मनोविज्ञान ,
दर्शन शास्त्र तथा
सैन्य विज्ञान विषयों के स्नातक कक्षाओं के सेमेस्टर परीक्षा 2022-23 हेतु पारित निर्णय निम्नवत हैं :

राष्ट्रीय शिक्षा नीति 2020 के अंतर्गत प्रवर्तित पाठ्यक्रमों के प्रत्येक सेमेस्टर में प्रत्येक लिखित प्रश्न पत्र तीन घंटों का होगा तथा प्रत्येक प्रश्न पत्र अधिकतम 75 अंकों का होगा । प्रत्येक प्रश्न पत्र के दो खंड होंगे - खंड अ और खंड ब । खंड अ में 8 लघु उत्तरीय प्रश्न पूछे जाएंगे जिनमे से परीक्षार्थी को 5 प्रश्नों के उत्तर देना अनिवार्य होगा । खंड अ का प्रत्येक प्रश्न 6 अंकों का होगा । खंड ब में 5 प्रश्न दीर्घ उत्तरीय प्रकृति के होंगें जिनमें से परीक्षार्थी को 3 प्रश्नों के उत्तर देना अनिवार्य होगा । प्रत्येक दीर्घ उत्तरीय प्रश्न 15 अंकों का होगा ।

10-8-22

अध्यक्ष , अध्यापन समिति (Board of Studies)
कला संकाय, श्री देव सुमन उत्तराखण्ड विश्वविद्यालय , बादशाहीथाल

NATIONAL EDUCATION POLICY-2020

Comman Minimum Syllabus for University Campus and all Affiliated Colleges of Sri Dev Suman Uttarakhand University

STRUCTURE OF VOCATIONAL

(SKILL ENHANCEMENT)

COURSE IN DISASTER MANAGEMENT (INCREMENTAL MODE)

SYLLABUS

2023-2024

Curriculum Design Committee, Uttarakhand

Sr.No.	Name & Designation
1.	Prof. N.K. Joshi Vice-Chancellor, Sri Dev Suman Uttarakhand University,Tehri Chairman
2.	Vice- Chancellor, Kumaun University, Nainital
3.	Prof. Jagat Singh Bisht Vice-Chancellor, Soban Singh Jeena University Almora Member
4.	Prof. Surekha Dangwal Vice-Chancellor, Doon University, Dehradun Member
5.	Prof. O.P.S. Negi Vice-Chancellor, Uttarakhand Open University Member
6.	Prof. M.S.M. Rawat Advisor, Rashtriya Uchchatar Shiksha Abhiyan, Uttarakhand Member
7	Prof. K. D. Purohit Advisor, Rashtriya Uchchatar Shiksha Abhiyan, Uttarakhand Member

Syllabus Preparation Committee

S.No.	Name	Designation	Department Affiliation
1	Dr. D.C. Goswami	Professor, Head & Dean of Arts,	Department of Geography Sri Dev Suman Uttarakhand University, Campus Rishikesh
2	Dr. T.B. Singh	Professor	Department of Geography Sri Dev Suman Uttarakhand University, Campus Rishikesh
3	Dr. A.P. Dubey	Professor	Department of Geography Sri Dev Suman Uttarakhand University,Campus Rishikesh
4	Dr. Aruna P. Sutradhar	Associate Professor	Department of Geography Sri Dev Suman Uttarakhand University, Campus Rishikesh

SRI DEV SUMAN UTTARAKHAND UNIVERSITY
Badshahithaul, Tehri Garhwal (Uttarakhand)
Members of Board of Studies Geography

S.N.	Name of the Members	Designation	Nominated As	Signature
1.	Dr. D.C. Goswami	Professor, Head & Dean of Arts,	Chairman	
2.	Dr. T.B. Singh	Professor	Member	
3.	Dr. A.P. Dubey	Professor	Member	
4.	Dr. Aruna P. Sutradhar	Associate Professor	Member	
5.	Dr. R.C. Joshi	Professor, Head Kumaun University, Nainital	Member	
6.	Prof. Janki Panwar	Principal	G.P.G.C. Kotdwar	
7.	Prof. Lovney R. Rajvanshi	Principal	G.P.G.C. Jaiharikhal	
8.	Prof. K.L. Talwar	Principal	G.D.C. Chakrata	
9.	Nedesak, Uttarakhand Bhasa Sansthan	Nedesak	Rajpur Road, Dehradun	

Vocational Course Syllabus

NEP Under Graduate Programme

Disaster Management (Incremental Mode)

(For Under Graduate Students to opt it in first four semester)

Year	Sem	Course/Paper	Credit	Total Credits
First	I	**GEO-Skill 101 Disaster Management -I** Course Title: Disaster Management: An Introduction to Disaster & Hazards	3	
First	II	**GEO-Skill 102 Disaster Management –II** Course Title: Disaster Management: Understanding Natural Disaster	3	
Second	III	**GEO-Skill 103 Disaster Management –III** Course Title: Disaster Management: Stages of Disaster Management	3	
Second	IV	**GEO-Skill 104 Disaster Management –IV** Course Title: Disaster Management: Planning, Policy & Management	3	12

Every U G Student has to choose one Vocational (Skill Enhancement) Course in First four semester

Vocational Course Syllabus
NEP Under Graduate Programme

Disaster Management (Incremental Mode)

First Semester

Programme: Under Graduate VocationalArts/Science/Commerce	**Year: I**	**Semester: I Paper-I**
Subject: Disaster Management(Incremental Mode) Geography		
Course Code: GEOG SKILL101		**Course Title: Disaster Management: An Introduction to Disaster & Hazards**
Course Outcome: This course will develop the skill of understanding about natural calamities and disaster and, also realize the consequences aswell as preparedness. It will also give an exposure about the natural and manmade disasters of Uttarakhand		
Credits: 03		Max. Marks: 25 Internal Assessment (IS10+P/S10+P5) 75 Term End Exam.

Unit	Course Content	No. of Lectures
Unit – I	Meaning, Concept and Significance of Disasters, Hazards, Vulnerability and Resilience.	10
Uni t – II	Natural and human induced Causes of Disaster	10
Unit – III	Risk and Vulnerabilities analyses of disasters	10
Unit – IV	Global, National and local Scenario of Disaster Management. Training & Drills, Case Studies	15

Vocational Course Syllabus
NEP Under Graduate Programme

Disaster Management (Incremental Mode)

Second Semester

Programme: Under Graduate Vocational Arts/Science/Commerce	**Year: I**	**Semester:II Paper II**
Subject: Disaster Management (Incremental Mode) Geography		
Course Code: GEOG SKILL102	**Course Title: Disaster Management: Understanding Natural Disaster**	
Course Outcome: This course will develop the skill of understanding about natural calamities and disasters and, shall make aware regarding various types of disasters and their impacts on natural landscape and society.		
Credits: 03		Max. Marks:25 Internal Assessment (IS10+P/S10+P5) 75 Term End Exam.

Unit	Course Content	No. of Lectures
Unit – I	**Various types of disasters; Natural Disasters-** Earthquake, Cyclone, Drought Landslides, Volcanic eruption	10
Uni t – II	**Natural Disasters-** Avalanches, Cloud burst, Cyclone, Tsunami, Storm	10
Unit – III	Extreme heat, Cold waves, Climate change, Global warming,Sea level rise	10
Unit – IV	**Human Induced Disaster**: Nuclear, chemical and Biological Disaster, Building fire, Forest fire, Coal and oil fire, Water, Air and Industrial Pollution, Road, Rail, Air & Sea Accidents and Epidemic, Pandemic.	15

Third Semester

Programme: Under Graduate Vocational Arts/Science/Commerce		Year: II	Semester: III Paper III
Subject: Disaster Management (Incremental Mode) Geography			
Course Code: GEOG SKILL103		**Course Title: Disaster Management: Stages of Disaster Management**	
Course Outcome: This course will develop the skill of understanding about natural calamities and disasters and, shall make aware regarding various aspects of its management..			
Credits: 03		Max. Marks: 25 Internal Assessment (IS10+P/S10+P5) 75 Term End Exam.	
Unit	Course Content	No. of Lectures	
Unit – I	Management of Disasters: Disasters Preparedness and Prevention	10	
Unit – II	Disasters- Mitigation ,Response and Recovery	10	
Unit – III	Role of Central, state, District and Local Bodies in Disaster Risk Reduction	10	
Unit – IV	Field Work: Field study of a disaster prone or disastrous area and its impact analysis	15	

Fourth Semester

Programme: Under Graduate Vocational Arts/Science/Commerce		Year: II	Semester: IV Paper- IV
Subject: Disaster Management (Incremental Mode) Geography			
Course Code: GEOG SKILL103		Course Title: Disaster Management: Planning, Policy & Management	
Course Outcome: This course will develop the skill of understanding about Management skill regarding pre,during and post disaster management.			
Credits: 03		Max. Marks: 25 Internal Assessment (IS10+P/S10+P5) 75 Term End Exam.	
Unit	Course Content	No. of Lectures	
Unit – I	Disaster Mapping. Use of GIS and Remote Sensing techniques Disaster Management Act and Policy	10	
Uni t – II	Search, Rescue, Evacuation and Logistic Management, Relief (water, food, sanitation, shelter, health and waste management),	10	
Unit – III	Long and Short Term Counter Disaster Planning.A 4 page note shall be prepared by the student on Long and Short Term Counter Disaster Planning on any specific disaster.	10	
Unit – IV	Damage assessment, Rehabilitation, Reconstruction.	15	

Suggested Reading:

Bhargava, Gopal (1992): Environmental Challenges and Ecological Disaster, Mittal Publication, New Delhi

Kapur, A. (2010) Vulnerable India: A Geographical Study of Disasters, Sage Pub. New Delhi,

Muhammad Z Mamun and A T M Nurul Amin, Densification: A Strategic Plan to Mitigate River bank Erosion Disaster inBangladesh, The University Press Limited (UPL), 1999 .

Sahni, Pardeep et.al. (eds.) 2002, Disaster Mitigation Experiences and Reflections, Prentice Hall of India, New Delhi.

Modh, S. (2010) Managing Natural Disaster: Hydrological, Marine and Geological Disasters, Macmillan, Delhi.
Singh, R.B. (2005) Risk Assessment and Vulnerability Analysis, IGNOU, New Delhi.

Singh, R. B. (ed.), (2006) Natural Hazards and Disaster Management: Vulnerability and Mitigation, Rawat Publications, New DelhiGovernment of India. (1997) Vulnerability Atlas of India. New Delhi, Building Materials & Technology Promotion Council, Ministry of Urban Development, Government of India.

Feilden, B. 1987, "Between Two Earthquakes; Cultural Property in Seismic Zones", ICCROM and Getty Conservation Institute, Online Bibliography for Museum Emergency Programme; http://gcibibs.getty.edu/asp/ accessed on 25 August 2008

Stovel, H. 1998, ICCROM "Risk Preparedness: A Management Manual for World Cultural Heritage", Rome,

Jigyasu, R. & Masuda, K. 2005, "Proceedings; Cultural Heritage Risk Management", World Conference on Disaster Reduction Kyoto; Research Center for Disaster Mitigation of Urban Cultural Heritage, Ritsumeikan; Kyoto, Japan

Menegazzi, C. 2004, "Cultural Heritage Disaster Preparedness and Response", Proceedings of the International Symposium held atSalar Jung Museum, Hyderabad, India, 23-27 November 2003, ICOM Paris http://icom.museum/disaster_preparedness_book/copyright.pdf accessed on 15 August 2008

Spenneman, D. & Look, D. (eds.) 1998, "Disaster Management Programs for Historic Sites",

US National Park Service, Western Chapter of the Association of Preservation Technology, California and the Johnstone Centre, Charles Sturt University, Albery, Proceedings of a Symposium organized by the U.S. NationalPark Service, Western Regional Office, San Francisco, in collaboration with the Western Chapter of the Association for Preservation Technology, and held on 27-29 June, 1997 in San Francisco

UNESCO-WHC 1983, "Desirability of adopting an international instrument on the Protection

of the cultural heritage against natural disasters and their consequences", Report of the Director General; http://unesdoc.unesco.org/images/0005/000560/056088eo.pdf accessed on 15 August 2008

UNESCO-WHC 2008, "Policy Document on the Impacts of Climate Change on World

Heritage Properties", UNESCO Paris document/ "Case Studies on Climate Change and World Heritage", 2007,UNESCO: Paris http://unesdoc.unesco.org/images/0015/001506/150600e.pdf

Michalski S. 2004, "Care and Preservation of Collections", in Running a Museum, A Practical Handbook (ed. P. Boylan),ICOM, Paris. p. 51 - 91

Waller R. 2003, Canadian Museum of Nature", Gutenberg Studies in Conservation 13, Gutenberg Act UniversitatisGothoburgensi

NATIONAL EDUCATION POLICY-2020

Common Minimum Syllabus
for all Uttarakhand State Universities and Colleges
for
B.A. Higher Education

PROPOSED STRUCTURE OF 4th YEAR UG GEOGRAPHY SYLLABUS

2023-24

Curriculum Design Committee, Uttarakhand

Sr.No.	Name & Designation
1.	Prof. N.K. Joshi Vice-Chancellor, Sri Dev Suman Uttarakhand University,Tehri Chairman
2.	Vice- Chancellor, Kumaun University,Nainital Member
3.	Prof. Jagat Singh Bisht Vice-Chancellor, Soban Singh Jeena University Almora Member
	Prof. Surekha Dangwal Vice-Chancellor, Doon University, Dehradun Member
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2	Dr. D.C. Goswami	Professor, Head & Dean of Arts Faculty	Department of Geography Sri Dev Suman Uttarakhand University, Campus-Rishikesh
3	Dr. Jyoti Joshi	Associate Professor & Head	Department of Geography Soban Singh Jeena Almora University, Almora
4	Dr. Kritika Bora	Guest Faculty	Department of Geography D.S.B. Kumaun University, Nainital

SRI DEV SUMAN UTTARAKHAND UNIVERSITY
Badshahithaul, Tehri Garhwal (Uttarakhand)
Members of Board of Studies Geography

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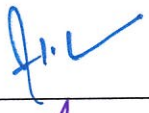
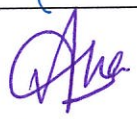
2.	Dr. T.B. Singh	Professor	Member	
3.	Dr. A.P. Dubey	Professor	Member	
4.	Dr. Aruna P. Sutradhar	Associate Professor	Member	
5.	Dr. R.C. Joshi	Professor, Head Kumaun University, Nainital	Member	
6.	Prof. Janki Panwar	Principal	G.P.G.C. Kotdwar	
7.	Prof. Loveny R. Rajvanshi	Principal	G.P.G.C. Jaiharikhal	
8.	Prof. K.L. Talwar	Principal	G.D.C. Chakrata	
9.	Nedesak, Uttarakhand Bhasa Sansthan	Nedesak	Rajpur Road, Dehradun	

Geography
NEP Graduation Programme (BA) 4th Year

Year	Sem.	Course/Paper	Credit	Geography Minor	Research Project	Credit	Total Credits
Fourth Year	VII	GEOG701T Geomorphology	4	GEOG707M Climate Change and Adaptation(T)	GEOG706 Pr Project	4	52
		GEOG702T Natural Resource Management	4				
		GEOG703T Climatology	4				
		GEOG704T Soil Geography	4				
		GEOG705P Surveying and Research Methodology	4				
	VIII	GEOG801T Social and Cultural Geography	4		GEOG806 Pr Project	4	
		GEOG802T Environmental Management and sustainable Development	4				
		GEOG803T Remote Sensing	4				
		GEOG804T GIS& GPS	4				
		GEOG805P Satellite Data Interpretation and GIS Mapping	4				

T=Theory, P= Practical, Pr=Project, M= Minor

Programme: Under Graduate in Arts		Year: IV	Semester: VII Paper-I
Subject: Geography	**Course Code: GEOG701T**	**Course Title: Geomorphology**	

Course Outcome

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.

Credits: 04	**Max. Marks: 100** **Internal Assessment Marks: 25:** Assignment - I (10 Marks) Question paper will be prepared by the faculty member from the syllabus of his/her course taught for the Internal Assessment and written examination will be conducted. Assignment - II (10 Marks) Seminar Presentation A seminar topic will be provided to all students in advance by the faculty member from the syllabus of his/her course taught and students will be asked to give a ppt presentation for the Internal Assessment. (5 Marks) Attendance and overall performance of the student during class room teaching and interaction. **Term End Exam: 75**	
Unit	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	10
Unit – II	Processes and Landforms: Tectonic processes and tectonic landforms both large and small scales; Drainage patterns and systems, Periglacial processes and landforms; Glacial processes and landforms, Arid processes and landforms, Fluvial processes and landforms, Karst Topography;	14
Unit – III	Landscape Dating and Evolution: Radiocarbon dating, tree-ring dating (Dendrochronology), and Lichenometry. Interruptions in the evolution of landforms: Polycyclic landforms	10
Unit– IV	Theories and Techniques: Theories of Hill-slope Evolution; Erosion Surfaces; Geomorphic Mapping Techniques; Systems and Models in Geomorphology.	12
Unit – V	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.	14

Suggested Readings:

Bloom, A.L. (1978) : A Systematic Analysis of late Cenozonic Landforms, Englewe Cliffs, M.J. Prentice Hall.
Condle, K.C. (1989) : Plate Tectonics and Crustal Evolution. Pergamon Press. New York.
Chorley, R.J. (ed.) : Spatial Analysis in Geomorphology, London, Metheun.
Chorley, R.J. , S.A. Schum and D.E. Sugden (1985): Geomorphology, London
Coats, D.R. (1981. edt.). Geomorphology and Engineering, George Allenand Unwin,London.
Cooke, R.U. and J.C. Doornkamp (1974) : Geomorphology in Environmental Management, Oxford University Press.
Embleton, C. and J. Thornes : Processes in Geomorphology, London, Edward Arnold.
Garner, H.F. : The Origin of Landscape – A Synthesis of Geomorphology, Oxford University Press, London, 1974.
Goudie, A. (ed.) (1990): Geomorphological Techniques. London, George Unwin and Hyman.
Hart, M.G. (1986) : Geomorphology : Pure and Applied, George Allen and Unwin, London.
Holmes, A. : Principles of Physical Geology, 3rd Edn. London . Nelson. 1978.
King, C.A. M. : Techniques in Geomorphology : London : Edward Arnold.
Leopold, L.B. : Fluvial Processes in Geomorphology.
Lobeck, A.K. : Geomorphology.
Ollier, C.D. : Weathering, Edinburgh : Oliver and Royd.
– do - : Tectonics and Landforms. London: Methuen.
Pande, Anita (2014): Mountain Landform (An Investigation from Himalaya), Kathachitra Prakashan, Lucknow, ISBN No. 978-93-82001-09-06
Pitty, A.F. : Geomorphology and Rural Settlement in India.
Scheidegner, A.E. : Theoretical Geomorphology. Berlin : Springer – Verlag.
Sharma, V.K. : Process in Geomorphology (Mc Graw Hill).
Singh,Savindra Bhuakrtivizyan(Vasundhara)
Small, R.J. : A Text Book on the Study of Landforms.
Thorn, C.E. : Introduction to Theoretical Geomorphology.
Thornbury, W.D. : Principles of Geomorphology. New York : Wiley (1969).
Twidale, C.R. : Analysis of Landforms. New York : Wiley.
Worcester, P.G. : A Text Book of Geomorphology.

Programme: Under Graduate in Arts	Year: IV	Semester: VII Paper-II
Subject: Geography		
Course Code: GEOG702T	Course Title: Natural Resource Management	

Course Outcome

It will make to understand the concepts and approaches of natural resource management. The outcome of the study will be helpful to examine use and misuse of various resources and to analyse natural resources' scenario through different techniques, especially remote sensing and GIS,

Credits: 04	**Max. Marks: 100** **Internal Assessment Marks: 25**: Assignment - I (10 Marks) Question paper will be prepared by the faculty member from the syllabus of his/her course taught for the Internal Assessment and written examination will be conducted. Assignment - II (10 Marks) Seminar Presentation A seminar topic will be provided to all students in advance by the faculty member from the syllabus of his/her course taught and students will be asked to give a ppt presentation for the Internal Assessment. (5 Marks) Attendance and overall performance of the student during class room teaching and interaction. **Term End Exam: 75**	
Unit	Course Content	Lectures
Unit – I	Basic Framework: Concept, Definition, Classification of natural resources, Process of resource development.	10
Unit – II	Resource Appraisal: Resource Analysis; Resource Mapping; Natural Resources Information System.	12
Unit – III	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.	14
Unit – IV	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.	14
Unit – V	RS & GIS Applications: Remote Sensing and Geographic Information System (GIS) as tools of natural resource analysis and mapping.	10

Suggested Readings:

Hartshorn, T.A. & Alexander, J.W. Economic Geography, 3rd edn., 1994
Boesch, Hans A Geography of World Economy
Fryer, D.W. World Economic Development
Gregor, H.F. Environment and Economic Life: An Economic and Social Geography
Goswami,D.C.& Pal,Anil Environment & Development HSRA, Bangalore
Highsmith, R.M.(Jr.) Case Studies in World Geography
Pal,A, & Goswami,D.C .Resource Environment & Development, HSRA, Bangalore
Hoffman, L.A. Economic Geography
Zimmerman, E.W. World Resources and Industries, Harper and Row, London,1951
Stringer, A. Davis A Geography of Resources
Zones and Darkenwold Economic Geography
Mccarty & Lindberg An Introduction to Economic Geography
Miller, E.W. A Geography of Manufacturing
Whate, C.L. & Criffin, P.E., Economic Geography
Rawat, M.S.S.,Resource Appraisal,Technology Application & Environment Challenges in Central Himalaya
Rawat, M.S.S.,Resource Environment & Development of Indian Himalaya
Russel, J. World Population and Food Supplies
Hoover, E.M. The location of Economic Activity
Isard, W. Location and Space Economy
Stuart Mudd The Population Crisis and the Use of the World Resources
Russel Smith Industrial and Commercial Geography
Janaki, V.A. Economic Geography
Guy, Harold Smith Conserving Natural Resources: Principles & Practice
Kates, W. & FireyW,(ed) Man, Mind and Land: A Theory of Resource Use
Zimmerman, E.W. Introduction to World Resources
Singh, K.N. & Singh,J. Arthik Bhoogol Ke Mool Tatwa (in Hindi)
Smith,R.L. Man and his Environment: An Ecosystem Approach, Harper and Row, London, 1972
Strahler, A. Geography and Man's Environment, John Wiley, New York,1977

Programme: Under Graduate in Arts	Year: IV	Semester: VII Paper : III
Subject: Geography		
Course Code: GEOG703T	Course Title: Climatology	

Outcome:
The course will provide an understanding of weather phenomena; dynamics of global climates and generation of climatic information and their application.

Credits. 04	**Max. Marks: 100** **Internal Assessment Marks: 25**: Assignment - I (10 Marks) Question paper will be prepared by the faculty member from the syllabus of his/her course taught for the Internal Assessment and written examination will be conducted. Assignment - II (10 Marks) Seminar Presentation A seminar topic will be provided to all students in advance by the faculty member from the syllabus of his/her course taught and students will be asked to give a ppt presentation for the Internal Assessment. (5 Marks) Attendance and overall performance of the student during class room teaching and interaction. **Term End Exam: 75**	
Unit	Course Content	No. of Lectures
Unit – I	Nature and Scope of Climatology: Weather and climate, Elements of Climate-Controlling Factors: Composition and Structure of Atmosphere; Insolation; Heating and Cooling of the Atmosphere. Heat Budget and Latitudinal Heat Balance. Adiabatic Processes, Stability and Instability.	10
Unit – II	Atmospheric Temperature; Factors controlling the temperature; horizontal and vertical distribution of temperature. Inversion of Temperature. Atmospheric Pressure: Vertical and Horizontal Distribution of Pressure: Atmospheric Moisture - forms of Precipitation and types of Rainfall.	14
Unit – III	Winds: Planetary, periodic and local winds (Loo, Mistral, Fohn, and Chinook), factors affecting the winds; General circulation of winds. Origin of the Monsoon and its relation with Jet streams.	12
Unit – IV	Air Masses and Fronts: concepts, classification and properties. Tropical and Temperate cyclones (Polar front theory); Anti-cyclone. Basis of Koppen's classification; Types and characteristics.	14
Unit – V	Climatic changes : Evidences, possible causes; global warming, environmental impacts and society's response	10

Suggested Readings:

Barry R. G. and Carleton A. M., 2001: *Synoptic and Dynamic Climatology*, Routledge, UK.
Barry R. G. and Corley R. J., 1998: *Atmosphere, Weather and Climate*, Routledge, New York.
Critchfield H. J., 1987: *General Climatology*, Prentice-Hall of India, New Delhi.
Lutgens F. K., Tarbuck E. J. and Tasa D., 2009: *The Atmosphere: An Introduction to Meteorology*,Prentice-Hall, Englewood Cliffs, New Jersey.
Oliver J. E. and Hidore J. J., 2002: *Climatology: An Atmospheric Science*, Pearson Education, New Delhi.
Trewartha G. T. and Horne L. H., 1980: *An Introduction to Climate*, McGraw-Hill.
Gupta L S (2000): Jalvayu Vigyan, Hindi Madhyam Karyanvay Nidishalya, Delhi Vishwa Vidhyalaya, Delhi.
Lal, D S (2006): Jalvayu Vigyan, Prayag Pustak Bhavan, Allahabad.
Vatal, M (1986): Bhautik Bhugol, Central Book Depot, Allahabad.
Singh, S (2009): Jalvayu Vigyan, Prayag Pustak Bhawan, Allahabad

Programme: Under Graduate in Arts	Year: IV	Semester: VII Paper: IV
Subject: Geography		
Course Code: GEOG704T	Course Title: SOIL GEOGRAPHY	

Outcome

This course will introduce the students to soil which is one of the important elements of the earth which supports the life system. The overuse and misuse of soil in recent years have resulted in degradation of soil. It will also help the students to appreciate the inherent limitations of soil to a particular managing the soil.

Credits: 04	**Max. Marks: 100** **Internal Assessment Marks: 25**: Assignment - I (10 Marks) Question paper will be prepared by the faculty member from the syllabus of his/her course taught for the Internal Assessment and written examination will be conducted. Assignment - II (10 Marks) Seminar Presentation A seminar topic will be provided to all students in advance by the faculty member from the syllabus of his/her course taught and students will be asked to give a ppt presentation for the Internal Assessment. (5 Marks) Attendance and overall performance of the student during class room teaching and interaction. **Term End Exam: 75**

Unit	Course Contents	No. of Lectures
Unit – I	Conceptual Base: Concept, scope, approaches and significance Soil Geography and its relationship with Pedology; Soil forming factors and profile.	14
Unit – II	Soil Properties & Morphology: Physical, Chemical and biological properties of soils	12
Unit – III	Formation & Capability: Soil Forming Processes; Soil Catena, Land Capability and Land Suitability Classifications.	10
Unit – IV	Soil Classification and Mapping: Genetic Classification of soils; Soil taxonomy: Soils orders and sub-order level; Soil Landscape Mapping.	14
Unit – V	Soil Degradation & Management: Methods of Assessing Soil Erosion; Natural and Anthropogenic Factors of Soil Degradation; Soil Conservation and Management	10

Suggested Readings:

Backman, H.O and Brady, N.C.: The Nature and Properties of Soils, Mc Millan New York, 1960.

Bennet, Hugh H.: Soil Conservation, McGraw Hill, New York .

Bunting, B.T.: The Geography of Soils, Hutchinson, London, 1973.

Clarke G.R.: Study of the Soil in the Field, Oxford University Press, Oxford, 1957.

Foth H.D. and Turk, L.M.: Fundamentals of Soil science, John Wiley, New York,1972.

Govinda Rajan, S.V. and Gopala Rao, H.G.: Studies on Soils of India Vikas, New Delhi,1978.

Mc. Bride, M.B.: Environmental Chemistry of Soils, Oxford University Press, New York 1999.

Nye, P.H. and Greene, D.J.: The Soil under Shifting Cultivation Commonwealth Bureau of Soil Science, Technical Communication, No. 51; Harpender, England,1960.

Raychoudhuri, S.P.: Soils of India, ICAR, New Delhi,1958.

Russell, Sir Edward J.: Soil Conditions and Plant Growth, Wiley, New York, 1961.

Programme: Under Graduate in Arts	Year: IV	Semester: VII Practical Paper V
Subject: Geography		
Course Code: GEOG705P	Course Title: Surveying and Research Methodology	

Outcome
It will enhance the skill of the students in the field of survey for the understanding of the map making using Dumpy Level and Theodolite. It will also make familiar with the research methodology.

Credits: 04	Max. Marks: 100 (Evaluation will be made by both Internal and external Examiners) Internal Assessment : 25 (10-Viva Voce + 10-Record Book + 5-Attendance) Term End Exam : 75 (Theory and Practical)

Unit	Course Contents	No. of Lectures
Part A: Surveying		
Unit – I	Dumpy level: Rise and Fall Method	09
Unit – II	Theodolite – horizontal and vertical (height) measurement	09
Part B: Research Methodology		
Unit – III	Preparation of research design: Definition and Types of Research. Statement of the Problem, literature review (at least ten nos.), formulation of objectives, hypotheses, methodology, design and references.	12
Unit – IV	Tools and techniques of data collection, construction of survey schedule, types of sampling, secondary sources of data; Final report writing	10
Unit-V	Formulation of research proposal for at least five different research problems covering: i) physical, ii) resource assessment / appraisal / management, iii) socio – economic, iv) cultural v) environmental, vi) demographical, vii) regional development, viii) settlement, ix) agricultural, x) watershed management, xi) any other related problems.	10

Suggested Readings:

Clendinning , J. Principles and use of Surveying Instruments. 2nd edition, Blockie.A 1958.
Hotine, Major M. The re-triangulation of Great Britain. Empire survey review 1935.
Mitra,R.P. and Ramesh A . Fundamentals of Cartography Revised Edition, Concept, Publication, New Delhi.
Monkhouse Maps and diagrams Methuen 1971.
Negi, Balbir Singh. Practical Geography Third revised Ed. Kedar Nath and Ram Nath, Meerut &Delhi, 1994-95.
Sandover,J.A. Plane Surveying. Arnold 1961.
Singh & Karanjta Map work and Practical Geography Central Book Dept Allahabad,1972.
Singh, R.L.and Dutt, P.K. Elements of Practical Geography, Students Friends, Allahabad, 1968.

Research Project

Programme: Under Graduate in Arts	Year: IV	Semester: VII Research Project
Subject: Geography		
Course Code: GEOG706Pr	**Course Title: Research Project**	
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 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 dissertation must be submitted to the Department one week before the commencement of the Theory Examinations. The size of the Dissertation normally ranges between 60 and 70 pages. The Research Project Dissertation will be evaluated by the external and internal examiners.		

Programme: Under Graduate in Arts	Year: IV	Semester: VII / VIII
Subject: Geography	Course Code (Minor): GEOG707T	Course Title: Climate Change and Adaptation

Outcome

This course will introduce the students to climate which is one of the important elements and supports the life system. Over a time period there is change in the climatic conditions for which human has to learn to adapt with new situation. This course will highlight the characteristics of climate change and adaptation.

Credit: 4

Max. Marks: 100

Internal Assessment Marks: 25: Assignment - I (10 Marks) Question paper will be prepared by the faculty member from the syllabus of his/her course taught for the Internal Assessment and written examination will be conducted.

Assignment - II (10 Marks) Seminar Presentation

A seminar topic will be provided to all students in advance by the faculty member from the syllabus of his/her course taught and students will be asked to give a ppt presentation for the Internal Assessment.

(5 Marks) Attendance and overall performance of the student during class room teaching and interaction.

Term End Exam: 75

Unit	Course Contents	Lectures
Unit – I	Atmosphere Composition of Earth's atmosphere, layering of atmosphere, solar and terrestrial radiation, variation with latitudes and seasons, inversion of temperature. Atmospheric pressure and winds, Pressure belts and winds, local winds and Jet streams.	14
Unit – II	Climate and Weather Definition of weather and climate, meteorology and climatology, Koeppen classification system climate change, Geological time scale, ice ages.	12
Unit – III	Greenhouse gases and Global warming Greenhouse gases and its sources, Global warming and Greenhouse gases policy issue, Effects and causes of global warming.	10
Unit – IV	Human ecology of climate change Anthropogenic activities responsible for climate change: Source activities (Burning of fossil fuel, Industrial activity, Urbanization, Agriculture, transportation), Environment and human health risk. Climate change and food security, History of IPCC and climate change convention	14
Unit – V	Climate Change and Adaptation Types of adaptation (Anticipator, reactive, human, natural), Methods of adaptation: Vulnerability and resilience: Concept, definition, methodology Sector –wise adaptation strategy (agriculture, forests, water resources, coastal resources, fisheries, human health), adaptation potential and challenges	10

M. Maslin (2004): Global Warming- A very short introduction, Oxford publication.
L.D. Danny Harvey Climate and Global Environmental Change , Prentice Hall publication
S.K.Das Climate Change- An Indian Perspective , Foundation books
Mark Maslin Global Warming- A very short introduction by, Oxford publication
John Oliver & John Hidore Climatology An Atmospheric Science (second edition) Indian edition
John Theodore Houghton Global Warming: the complete briefing
Jonathan Cowiea Climate change: Biological and Human aspects. Climate change policy
John T. Hardy Climate change: Causes, Effects and Solutions. Willey publication
Konrad Soyez and Hartmut Grabi, Climate change and technological options: basic facts, evaluation and practical solutions by SpringerWien New York publication
Joel B. Smith, Richard J. T. Klein, SaleemulHuq Climate change, adaptive capacity and development, Potsdam-InstitutfürKlimafolgenforschung
SaleemulHuq, Atiq Rahman Mainstreaming Adaptation to Climate Change in Least Developed Countries (Ldcs), International Institute for Environment and Development
P.R Shukla, Subodh Sharma, N.H. Ravindranath , Amit Garg and Sumana Bhattacharya, Climate Change and India: Vulnerability Assessment and Adaptation
Technologies, policies and measures for mitigating climate change- IPCC Technical paper I
Anil Markandya, Kirsten Halsnaes, Climate change and sustainable development By
Farhana Yamin Climate change and carbon markets - A Handbook of emission reduction mechanisms
Barry R. G. and Carleton A. M., 2001: Synoptic and Dynamic Climatology, Routledge, UK.
Barry R. G. and Corley R. J., 1998: Atmosphere, Weather and Climate, Routledge, New York.
Critchfield H. J., 1987: General Climatology, Prentice-Hall of India, New Delhi.
Lutgens F. K., Tarbuck E. J. and Tasa D., 2009: The Atmosphere: An Introduction to Meteorology,Prentice-Hall, Englewood Cliffs, New Jersey.
Oliver J. E. and Hidore J. J., 2002: Climatology: An Atmospheric Science, Pearson Education, New Delhi.
Trewartha G. T. and Horne L. H., 1980: An Introduction to Climate, McGraw-Hill.
Gupta L S (2000): Jalvayu Vigyan, Hindi MadhyamKaryanvayNidishalya, Delhi Vishwa Vidhyalaya, Delhi.
Lal, D S (2006): Jalvayu Vigyan, Prayag Pustak Bhavan, Allahabad

Eighth Semester

Programme: Under Graduate in Arts		Year: IV	Semester: VIII Paper-I
Subject: Geography	Course Code: GEOG801T	Course Title: Social and Cultural Geography	

Outcome:
It will make familiar with the basic concepts and development of Social and Cultural Geography. Student will understand the Social Identities and Social Issues in India and the processes in Cultural Geography

Credit . 4	**Max. Marks: 100** **Internal Assessment Marks: 25**. Assignment - I (10 Marks) Question paper will be prepared by the faculty member from the syllabus of his/her course taught for the Internal Assessment and written examination will be conducted. Assignment - II (10 Marks) Seminar Presentation A seminar topic will be provided to all students in advance by the faculty member from the syllabus of his/her course taught and students will be asked to give a ppt presentation for the Internal Assessment. (5 Marks) Attendance and overall performance of the student during class room teaching and interaction. **Term End Exam: 75**	
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.	10
Unit – II	Process: Cultural Landscape Evolution; Cultural Diffusion; Adaptation; Acculturation; Assimilation; and Resistance/ Cultural Resilience.	10
Unit – III	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.	14
Unit – IV	Races and Culture Concept of race. Basis of racial classification and their physical characteristics. Races of India. Griffith Taylor and C.S. 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	14
Unit – V	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	12

Suggested Readings:

Ahmad, A. (2012). Social Geography of India. Concept Publishing Company, New Delhi.

Maurya, S. D. (2011). Samajik Bhugol. Sharda Pushtak Bhawan, Allahabad.

Anderson, Jon. (2010). Understanding Cultural Geography Places and Traces. Routledge, London.

Vincent J. Del Casino, (2009). Social Geography- Critical Introduction to Geography. Wiley-Blackwell.

Johnston, R. J., Gregory, D., et.al. (eds.). (2005). The Dictionary of Human Geography, Blackwell Publishing.

Anderson, K. Domosh, M., Pile, S. & Thrift, N. (eds.). (2003). Handbook of Cultural Geography.,Sage Publications, London.

Ahmed, A. (1999). Social Geography. Rawat publications, Jaipur.

Massey, D. (1994). Space, Place and Gender. Polity Press, Cambridge.

Singh, K.S. (1993). People of India Vol I to **XI**. Oxford University Press, New Delhi.

Raza, M. and Ahmed, A. 1990. An Atlas of Tribal India. Concept Publishing Co, Delhi.

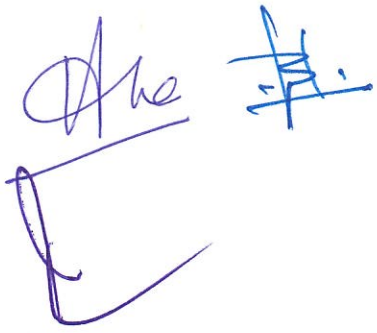
Sopher, D. (ed.). (1980). An Exploration of India: Geographical Perspectives on Society and Culture . Cornell Press, New York.

Jones, E. and Eyles, J. (1977). Introduction to Social Geography. Oxford University Press.

Knox, P.L. (1975). Social Well –being: A Spatial Perspective. Oxford, London.

Panikkar, K.M. (1959). Geographical Factors in Indian History. Bharatiya Vidya Bhavan, Bombay.

Subba Rao, B. (1958). Personality of India. MS University Press, Baroda.



Programme: Under Graduate in Arts		Year: IV	Semester: VIII Paper-II
Subject: Geography	**Course Code: GEOG802T**	**Course Title: Environmental Management and Sustainable Development**	

Outcome
This course will make to understand the physical and social environment of an area. It will also create the awareness about the sustainable management of deteriorating environment particularly with reference the Uttarakhand Himalaya.

Credit:4	**Max. Marks: 100** **Internal Assessment Marks: 25**: Assignment - I (10 Marks) Question paper will be prepared by the faculty member from the syllabus of his/her course taught for the Internal Assessment and written examination will be conducted. Assignment - II (10 Marks) Seminar Presentation A seminar topic will be provided to all students in advance by the faculty member from the syllabus of his/her course taught and students will be asked to give a ppt presentation for the Internal Assessment. (5 Marks) Attendance and overall performance of the student during class room teaching and interaction. **Term End Exam: 75**

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.	12
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).	14
Unit – III	Sustainable Development: Concepts of Sustainable Development; Need of Sustainable Development; Sustainable Mountain Agriculture and Livelihood.	10
Unit – IV	Environmental Management: Concept of Environmental Management; Approaches to Environmental Management; Integrated Watershed Management; Disaster Management	12
Unit – V	Environmental Management in Uttarakhand Himalaya: Environmental Changes – Causes & Consequences; Environmental Planning & Sustainable Development; Disaster Management; Climate, Change and Adaptation	12

Suggested Readings:

Ahmad,Y.J., G.K. Sammy (1985): Guidelines to EIA in Developing Countries.Hordder & Stoughton, London.

Brundland, G. (1988) Our Common Future, Report of the World Commission on Environment and Development, UN.

Carpenter R A (ed) (1983): Natural Systems for Development: what planners need to known Mc. Millan London.

Cheremisinoff, P.N. & A.C. Morresi (1977): Environment Assessment and Impact studies Handbook. An Arbor, Mich: Anarbor Science.

Goswami,D.C.& Pal,Anil Environment & Development HSRA, Bangalore

Wathern, Peter (1986): Enviromental Impact Assessment: Theory and Practice. Unwin & Hyman, London.

Pande G.C. & D.C. Pandey (1999) : Environmental Development and Management: Strategies and Policies (ed.), New Delhi.

Pal,A, & Goswami,D.C .Resource Environment & Development, HSRA, Bangalore

Programme: Under Graduate in Arts	Year:IV	Semester: VIII Paper-III
Subject: Geography	**Course Code: GEOG803T**	**Course Title: Remote Sensing**

Outcome

It will provide an introduction to the basic principles of Remote Sensing. Students will acquire the methods of visual and digital interpretations of satellite data. Finally, it will make familiar with the application of remote sensing technique in resource mapping.

Credit:4	**Max. Marks: 100** **Internal Assessment Marks: 25**: Assignment - I (10 Marks) Question paper will be prepared by the faculty member from the syllabus of his/her course taught for the Internal Assessment and written examination will be conducted. Assignment - II (10 Marks) Seminar Presentation A seminar topic will be provided to all students in advance by the faculty member from the syllabus of his/her course taught and students will be asked to give a ppt presentation for the Internal Assessment. (5 Marks) Attendance and overall performance of the student during class room teaching and interaction. **Term End Exam: 75**	
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.	10
Unit – III	Thermal and Microwave Remote Sensing: Types; Characteristics; utilization in Geographical studies	10
Unit – IV	Digital Image Processing: Restoration; Enhancement and Classification: supervised and unsupervised	14
Unit – V	Remote Sensing Applications: Application of Remote Sensing in terrain evaluation, land use and forest resource inventory.	12

Suggested Readings:

Lillesand, T.M. & Kiefer,R.W. Remote Sensing and Image interpretation, Jhon Wiley & Sons, New York,1987.

Wolf, P.R. Elements of Photogrammetry, McGraw Hill, New York, 1983.

Smith,H.T.V. Aerial Photographs and their Applications, Appleton Century Crafts, New York,1943.

American Society of Photogrammetry, Manual of Photogrammetry, Falls Church,1980

American Society of Photogrammetry, Manual of Remote Sensing, Falls Church,1983.

Lindren, D.T 1980. Landuse Planning and Remote Sensing, Niyheff, Dordrecht, 1985

Siogal,B.S. and A.R.Gsllespio (eds.) Remote Sensing in Geology, Wiley, New York,

Sprurr, S.H. Photogrammetry and Photo-Interpretation,Ronald Press, New York,1960

Avery, T.E.&Berlon,G.L. Interpretation of Aerial Photographs Burgess Minneapolies, 1985

Moffott.F.H. & Mikhail Photogrammetry, Harpor & Row, New York,1980

Stimson,A. Photometry and Radiometry for Engineers,Wiley, New York, 1974

Sabins, F.F.Jr. Remote Sensing Principles and Interpretation, Freeman, New York,1986

Basces, G.A. Digital Image Processing for Remote Sensing, Prentice Hall, 1984

Ekstrom, M.I. Digital Image Processing Techniques, Academic Press, New York,1984

Tomar, M.S. & M.R.Moslekar Aerial Photographs in Landuse and Forest Surveys, Jugal Kishor & Co.,Dehradun,1974

Curran, Paul J. Principle of Remote Sensing ,Longman Group,1985

Barrett,E.C. and L.F.Curties Photo Interpretation ,Mcmillan, New York,1982

Compbell, J. Introdution to Remote Sensing, Guilford, New York,1989

Hord. R.M. Digital Image Processing of Remotely Sensed Data Academic, New York

Luder, D. Aerial Photography Interpretation:Principles and Application, Mcgraw Hill, New York,1959

Pratt,W.K. Digital Image Processing Wiley, New York,1978

Rao,D.P.(eds.) Remote Sensing for Earth Resources, Association of Exploration Geophysicist, Hyderabad,1998

Programme: Under Graduate in Arts		Year: IV	Semester: VIII Paper- IV
Subject: Geography	Course Code: GEOG804T	Course Title: GIS AND GPS	

Outcome

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.

Credit:4	**Max. Marks: 100** **Internal Assessment Marks: 25**: Assignment - I (10 Marks) Question paper will be prepared by the faculty member from the syllabus of his/her course taught for the Internal Assessment and written examination will be conducted. Assignment - II (10 Marks) Seminar Presentation A seminar topic will be provided to all students in advance by the faculty member from the syllabus of his/her course taught and students will be asked to give a ppt presentation for the Internal Assessment. (5 Marks) Attendance and overall performance of the student during class room teaching and interaction. **Term End Exam: 75**

Unit	Course Content	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.	12
Unit – III	Global Positioning System: Basic Concepts; GPS - Components and Basic Facts; Components of a GPS; GPS Positioning Types; Accuracy of GPS; Reference station; GPS Applications.	14
Unit – IV	GPS Applications: Application of GPS in resource mapping, Map Updating, Cadastral Mapping, Micro Level Surveying etc.	10
Unit – V	GIS Applications: Application of GIS in Geographical studies with special reference Natural Resource Management, Urban Management, Environmental Management, Agricultural Planning, Emergency Response System and Decision Support System.	10

Suggested Readings:

Aroneff, S. Geographic Information System: A Management Perspective, DDL Publication, Otawa, 1989

Burrough,P.A. Principles of Geographic Information System for Land Resources Assessment, Oxford University Press, New York, 1986

Fraser Taylor, D.R. Geographic Information System, Pergamon Press Oxford, 1991

Maquire, D.J.M.F. Goodchild Geographic information Systems: Principles and Application, Taylor & Francis, Washngton,1991

Mark S. Monmonier Computer-assisted Cartography- prentice Hall, Englewood Cliff, New Jersey

Peuquet D.J. & D.F.Marble Introductory Reading in Geographic Information System, Taylor & Francies, Washngton, 1990

Star J. and J.E. Estes Geographic Information Sytems : An Introduction: Prentice Hall, Engleweed Cliff, New Jersey,1994

Programme: Under Graduate in Arts		Year: IV	Semester: VIII Practical Paper V
Subject: Geography			
Course Code: GEOG805P	Course Title: Satellite Data Interpretation and GIS Mapping		
Outcome After completing this course, student is expected: To understand aerial photographs & Satellite Data and elements of image interpretation. To known about various sources of remote sensing data acquisition. To learn a few techniques of digital data interpretation. To have some exposure of GIS technique			
Credits: 04	Max. Marks: 100 (Evaluation will be made by both Internal and external Examiners) Internal Assessment : 25 (10-Viva Voce + 10-Record Book + 5-Attendance) Term End Exam : 75 (Theory and Practical).		
Unit	Course Content		No. of Lectures
Unit – I	Base Map Preparation		10
Uni t – II	Visual interpretation of Aerial Photograph and Satellite Data		12
Unit – III	Satellite Data and False Colour composite (FCC). Image Enhancement: Linear Contrast Stretch and Non-Linear Contrast Stretch, Spatial Filtering, Digital Image Classification: Supervised and Unsupervised Classification		14
Unit – IV	Delineation of drainage basin, Map layout Preparation		12
Unit – V	Map Overlay analysis and buffer zone delineation		12

Suggested Readings:

Kumar, D.; Singh, R.B. and Kaur, R. (2019). Spatial Information Technology for Sustainable Development Goals. Springer Nature, Switzerland.

Peter, J.G.,Teunissen and Oliver, M. (Eds.) (2019). Springer Handbook of Global NavigationSatellite Systems. Springer Nature, Switzerland:

Gupta, R.P. (2018). Remote Sensing Geology (3rd Edition). Springer Nature, Switzerland.

Kron, G. (2017). Global Navigation Satellite Systems: Signal, Theory & Applications. Wilmington: Scitus Academics.

Chuveico, E. (2016). Fundamentals of Satellite Remote Sensing — An Environmental Approach (2 nd Edition). CRC Press, Roca Raton.

Chaunial, D.D. (2016). Principles of Remote Sensing and Geographical Information System (In Hindi), Sharda Pustak Bhawan, Allahabad.

Scott, M. (2015). Global Navigation Satellite Systems and Their Applications. Springer, New York.

Heywood, I.; Cornelius, S. and Carver, S. (2011). An Introduction to Geographic Information Systems (4 th Edition). Pearson Education, New Delhi.

Longley, P.A.; Goodchild, M.; Maguire, D.J. and Rhind, D.W. (2010). Geographic Information Systems and Science (3rd Edition). John Wiley, New Jersey:

DeMers, M. (2009). Fundamentals of Geographic Information Systems (4th Edition). John Wiley,New Jersey.

Sabins, F.F. (2007). Remote Sensing: Principles and Interpretation (3rd Edition). Waveland Press, Long Grove.

Chang, K-t. (2006). Introduction to Geographic Information Systems. Tata McGraw Hills, New Delhi.

Lillesand, T.M.; Kiefer, R.W. and Chipman, J.W. (2004). Remote Sensing and Image Interpretation (5th Edition). John Wiley India, New Delhi.

Joseph, George (2003). Fundamental of Remote Sensing, University's Press (India) Pvt. Ltd.,Hyderabad.

Burrough, P.A. and McDonnell, R.A. (1998). Principles of Geographic Information Systems.Oxford University Press, Oxford

Research Project

Programme: Under Graduate in Arts	Year: IV	Semester: VIII Research Project
Subject: Geography		
Course Code: GEOG806Pr	**Course Title: Research Project**	
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 will learn how to collect data and write a report based on the data analysis		
Credits: 04	Max. Marks: 100 (Evaluation by External & Internal Examiners) 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 dissertation must be submitted to the Department one week before the commencement of the Theory Examinations. The size of the Dissertation normally ranges between 60 and 70 pages. The Research Project Dissertation will be evaluated by the external and internal examiners.		

NATIONAL EDUCATION POLICY-2020

Comman Minimum Syllabus for University Campus and all Affiliated Colleges of Sri Dev Suman Uttarakhand University

STRUCTURE OF

MA/MSc ONE YEAR

GEOGRAPHY

SYLLABUS

2023-2024

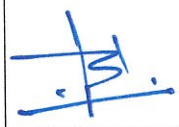
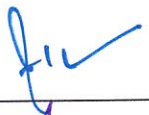
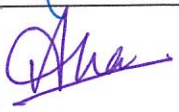
Curriculum Design Committee, Uttarakhand

Sr.No.	Name & Designation
1	Prof. N.K. Joshi Vice-Chancellor , Sri Dev Suman Uttarakhand University,Tehri Chairman
2	Vice-Chancellor, Kumaun University Nainital Member
3	Prof. Surekha Dangwal Vice-Chancellor, Doon University, Dehradun
4	Prof. Jagat Singh Bisht Vice-Chancellor, Soban Singh Jeena University Almora
5	Prof. O.P.S. Negi Vice-Chancellor , Uttarakhand Open University
6	Prof. M.S.M. Rawat Advisor, Rashtriya Uchchatar Shiksha Abhiyan, Uttarakhand
7	Prof. K. D. Purohit Advisor, Rashtriya Uchchatar Shiksha Abhiyan, Uttarakhand

Syllabus Preparation Committee

S.NO.	Name	Designation	Department Affiliation
1	Dr. R.C. Joshi	Professor & Head	Department of Geography D.S.B. Kumaun University, Nainital
2	Dr. D.C. Goswami	Professor, Head & Dean of Arts Faculty	Department of Geography Sri Dev Suman Uttarakhand University, Campus- Rishikesh
3	Dr. Jyoti Joshi	Associate Professor & Head	Department of Geography Soban Singh Jeena Almora University, Almora
4	Dr. Kritika Bora	Guest Faculty	Department of Geography D.S.B. Kumaun University, Nainital

SRI DEV SUMAN UTTARAKHAND UNIVERSITY
Badshahithaul, Tehri Garhwal (Uttarakhand)
Members of Board of Studies Geography

S.N.	Name of the Members	Designation	Nominated As	Signature
1.	Dr. D.C. Goswami	Professor, Head & Dean of Arts,	Chairman	
2.	Dr. T.B. Singh	Professor	Member	
3.	Dr. A.P. Dubey	Professor	Member	
4.	Dr. Aruna P. Sutradhar	Associate Professor	Member	
5.	Dr. R.C. Joshi	Professor, Head Kumaun University, Nainital	Member	
6.	Prof. Janki Panwar	Principal	G.P.G.C. Kotdwar	
7.	Prof. Loveny R. Rajvanshi	Principal	G.P.G.C. Jaiharikhal	
8.	Prof. K.L. Talwar	Principal	G.D.C. Chakrata	
9.	Nedesak, Uttarakhand Bhasa Sansthan	Nedesak	Rajpur Road, Dehradun	

Proposed Syllabus
NEP Post Graduate Programme in Geography
(M.A. One year PG Programme for those who have completed four years NEP Graduation Programme)

Year	Sem	Course/Paper			Credit	Research Project	Credit	Total Credits
		GEOG901T Disaster Management			4	GEOG908Pr Project	4	
First Year	I	GEOG902T Integrated Watershed Management			4			48
		*Optional-I	Physical Geography Stream	GEOG903T Fluvial Geomorphology	4			
				GEOG904T Hydrology	4			
		*Optional-II	Human Geography Stream	GEOG905T Urban Geography	4			
				GEOG906T Regional Planning and Development	4			
		GEOG907P Quantitative Technique			4			
	II	GEOG1001T Biogeography			4	GEOG1008 Pr Project	4	
		GEOG1002T Geography of Uttarakhand			4			
		*Optional-I	Physical Geography Stream	GEOG1003T Glacial and Periglacial Geomorphology	4			
				GEOG1004T Aeolian Geomorphology	4			
		*Optional-II	Human Geography Stream	GEOG1005T Population Geography	4			
				GEOG1006T Geography of Tourism	4			
		GEOG1007P Map Projection, Geological Map and Field Survey			4			

T=Theory, P= Practical, Pr=Project

*Out of Two Optional streams student has to choose one optional stream of his/her choice. Each stream includes twopapers.

First Semester

Programme: Post Graduate in Arts/Science	Year: I	Semester: I Paper-I
Subject: Geography		
Course Code: GEOG901T	**Course Title: Disaster Management**	
Course Outcome: This course will develop the skill of understanding about natural calamities and disaster and, also realize the consequences aswell as preparedness. It will also give an exposure about the natural and manmade disasters of Uttarakhand		
Credits: 04	Max. Marks: 25 Internal Assessment (IS10+P/S10+P5) 75 Term End Exam.	

Unit	Course Content	No. of Lectures
Unit – I	Fundamentals of Disaster Management: The significance of disaster, Disaster threat, National disaster management policy, Majorrequirements for coping with disaster, Disaster and disaster management cycle,	12
Uni t – II	Long term Measures: Prevention, Mitigation, Preparedness, Disaster and development, Disaster legislature, Counterdisaster resources, Disaster management plans, Utilization of resources.	12
Unit – III	Response to Disaster Impact: Response; Search, Rescue and Evacuation, Logistic; Incident command system.	10
Unit – IV	Major Post impact Factors: Recovery, Post disaster review and damage assessment, Relief, Rehabilitation and Restructuring	12
Unit – V	Regional Pattern of Disaster Management: International disaster assistance, Leadership in disaster, Organization, Disaster scenario ofUttarakhand, Disaster management system in Uttarakhand.	14

Suggested Reading:

Bhargava, Gopal (1992): Environmental Challenges and Ecological Disaster, Mittal Publication, New DelhiKapur, A. (2010) Vulnerable India: A Geographical Study of Disasters, Sage Pub. New Delhi,

Muhammad Z Mamun and A T M Nurul Amin, Densification: A Strategic Plan to Mitigate River bank Erosion Disaster inBangladesh, The University Press Limited (UPL), 1999

Sahni, Pardeep et.al. (eds.) 2002, Disaster Mitigation Experiences and Reflections, Prentice Hall of India, New Delhi. Modh, S. (2010) Managing Natural Disaster: Hydrological, Marine and Geological Disasters, Macmillan, Delhi.Singh, R.B. (2005) Risk Assessment and Vulnerability Analysis, IGNOU, New Delhi.

Singh, R. B. (ed.), (2006) Natural Hazards and Disaster Management: Vulnerability and Mitigation, Rawat Publications, New DelhiGovernment of India. (1997) Vulnerability Atlas of India. New Delhi, Building Materials & Technology Promotion Council, Ministry of Urban Development, Government of India

Feilden, B. 1987, "Between Two Earthquakes; Cultural Property in Seismic Zones", ICCROM and Getty Conservation Institute, Online Bibliography for Museum Emergency Programme; http://gcibibs.getty.edu/asp/ accessed on 25 August 2008

Stovel, H. 1998, "Risk Preparedness: A Management Manual for World Cultural Heritage", Rome, ICCROM

Jigyasu, R. & Masuda, K. 2005, "Proceedings; Cultural Heritage Risk Management", World Conference on Disaster Reduction Kyoto; Research Center for Disaster Mitigation of Urban Cultural Heritage, Ritsumeikan; Kyoto, Japan

Menegazzi, C. 2004, "Cultural Heritage Disaster Preparedness and Response", Proceedings of the International Symposium held atSalar Jung Museum, Hyderabad, India, 23-27 November 2003, ICOM Paris http://icom.museum/disaster_preparedness_book/copyright.pdf accessed on 15 August 2008

Spenneman, D. & Look, D. (eds.) 1998, "Disaster Management Programs for Historic Sites", US National Park Service, Western Chapter of the Association of Preservation Technology, California and the Johnstone Centre, Charles Sturt University, Albery, Proceedings of a Symposium organized by the U.S. NationalPark Service, Western Regional Office, San Francisco, in collaboration with the Western Chapter of the Association for Preservation Technology, and held on 27-29 June, 1997 in San Francisco

UNESCO-WHC 1983, "Desirability of adopting an international instrument on the Protection of the cultural heritage against natural disasters and their consequences", Report of the Director General; http://unesdoc.unesco.org/images/0005/000560/056088eo.pdf accessed on 15 August 2008

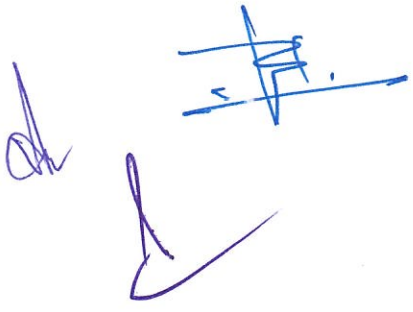
UNESCO-WHC 2008, "Policy Document on the Impacts of Climate Change on World Heritage Properties", UNESCO Paris document/ "Case Studies on Climate Change and World Heritage", 2007,UNESCO: Paris http://unesdoc.unesco.org/images/0015/001506/150600e.pdf

Michalski S. 2004, "Care and Preservation of Collections", in Running a Museum, A Practical Handbook (ed. P. Boylan),ICOM, Paris. p. 51 - 91

Waller R. 2003, Canadian Museum of Nature", Gutenberg Studies in Conservation 13, Gutenberg Act UniversitatisGothoburgensis.

Programme: Post Graduate in Arts/Science	Year: I	Semester: I Paper-II
Subject: Geography		
Course Code: GEOG902T	**Course Title: Integrated Watershed Management**	
Course Outcome: It will impart the knowledge about the significance of the watershed as an important unit for the planning and implementation of thedevelopmental programme.		
Credits: 04	Max. Marks: 25 Internal Assessment(IS10+P/S10+P5) 75 Term End Exam.	

Unit	Course Content	No. of Lectures
Unit – I	Conceptual Base: Concept, Scope and Significance: Approaches of Watershed Management, Drainage of WatershedManagement.	10
Uni t – II	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 – III	Environmental Status and Hazards: Environmental Health Status: Physical properties (Viz, Temperature, Rainfall, Soil etc.) and Human Habitat of the Watershed; Impact of Environmental and Anthropogenic Interferences on the Status and Quality of the Watershed; Major Natural Hazards: Landslides, Erosion, Floods, Droughts, Sedimentation,Disruption of Hydrological Cycle etc.	14
Unit – IV	Functioning of Ecosystem: Impact of Agriculture, Mining and Quarrying, Deforestation, Livestock, Frequent Construction of Roads onEcosystems Functioning of Watershed with particular reference to Uttarakhand Himalaya; Environmental Impact Assessment (EIA).	12
Unit – V	Watershed Management: Watershed Management: Techniques and Methods, Land and Soil Conservation, Run-off Control,Sustainable Environment Management Plan for Local Resources.	10



Suggested Readings:

C.S.E.; The State of India's Environment-Citizens Report, Centre for Science and Environment. (CSF), NewDelhi, 1982

Valdiya, K.S.; Environmental Geology: Indian Cntext, T.M.H.,New Delhi, 1987.

Dassman, R.F.; Environmental Conservation, John Wiley & Sons, New York,1976

Edington, J.M. & Edington.M.A.;Ecology and environmental Planning, Chapman and Hall, London, 1977

Harvey, B. and Hallet, J.D.; Introductory Analysis, Macmillan, London,1977

Thomas, W.L.(ed.); Man's role in changing the Face of the Earth, University of Chicago Press, Chicago, 1956Simmons, I.G.,The Ecology of Natural Resources, Edward Arnold, London, 1974

Whittaker, R.H.;Communities and Ecosystems ,2nd Edn. Collier-Macmillan, London, 1975

Singh, L.R. et.al.(eds.); Environmental Management, Allahabad Geographical Society, Dept. of Geography, University ofAllahabad, 1983

Singh, Savindra; Environmental Geography, Allahabad, 1991(both in English & Hindi) latest edn.

Optional - I Physical Geography Stream

(Out of Two Optional streams student has to choose one optional stream of his/her choice. Each stream includes two papers)

Programme: Post Graduate in Arts/Science	**Year: I**	**Semester: I** **Paper III (Physical Geography Stream)**
Subject: Geography		
Course Code: GEOG903T (Physical Geography Stream)	**Course Title Fluvial Geomorphology**	
Course Outcome: It will provide an understanding of the fluvial forms and processes. This course also will make familiar with the evolution ofdrainage pattern hydraulic geometry and sediment load of river.		
Credits: 04	Max. Marks: 25 Internal Assessment (IS10+P/S10+P5) 75 Term End Exam.	

Unit	Course Content	No. of Lectures
Unit – I	Fluvial Geomorphology and Geography; hydrological cycle and subcycle; drainage pattern evolution;limits of drainage development; channel changes with time.	10
Unit – II	Fundamentals of river mechanics: - types of flow and flow discrimination; forces acting in channels; Lowregimes; sediment load of streams. sediment transport; competent velocity; lift force; critical tractive force	12
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.	12
Unit – IV	Drainage basin as a fundamental geomorphic unit. Drainage basin - form and process; drainage basinmorphometry; morphometric interrelations.	12
Unit – V	Applied fluvial geomorphology; human adjustment to flood plain, alluvial fans and deltaic environments (case studies). Effects of reservoirs on fluvial systems Remote sensing and GIS application to fluvialenvironments.	14

Suggested Readings:

Chorley R.J. (ed) Introduction of Fluvial Processes Methuen & Co., London, 1973.
Coates D.R. and Vitek J.I. Thresholds in Geomorphology. George Allen Unwin, London 1980
Gregory K.J. River Channel Changes' John Wiley & Sons, New York, 1977.
Gregory K.J. and Walling, D.E.: Drainage Basin: Forms and Process- A Geomorphological Approach. John Wiley & Sons, New York, 1985.
Kingston D. Fluvial Forms and Processes Edward Arnold, London, 1984.
Leopold C.B. et.al.: Fluvial Processes in Geomorphology; Freeman, London 1964.
Morisawa M.(ed.) Fluvial Geomorphology. George Allen & Unwin, 1981.
Gleick, P.H. (ed.): Water in Crisis Oxford University Press, New York 1993.
Morisawa M: Streams - Their Dynamics and Morphology' McGraw Hill, New York,1968.

Programme: Post Graduate inArts/Science	Year: I	Semester: I Paper IV (Physical Geography Stream)
Subject: Geography		
Course Code: GEOG904T (Physical Geography Stream)	**Course Title: Hydrology**	
Course Outcome: Water is an integral part of all living things in the world. Hence it is necessary to make the students to understand thesignificance of a systematic study on fresh water resources and occurrence, flow, storage and utilization.		
Credits: 04	Max. Marks: 25 Internal Assessment (IS10+P/S10+P5) 75 Term End Exam.	

Unit	Course Content	No. of Lectures
Unit – I	**Conceptual Base:** Concepts and scope of hydrology, Elements of hydrological cycle: precipitation - intensity andduration; evaporation; infiltration, surface runoff, Man's interference on hydrological cycle	10
Unit – II	**Underground Hydrosphere:** Hydrological properties of rocks. Structure of the underground hydrosphere - Vadose and phreatic Zones, Types of aquifer, Underground water classification, Recharge and discharge of ground water.	12
Unit – III	**Ground Water Movements and Drainage Basin Characteristics** Hydraulic conductivity, Darcy's law, Porosity, Permeability, Transmissibility, Drainage basincharacteristics : human impact on hydrological system , morphometric analysis	12
Unit – IV	**Flow Measurements and Hydrograph:** Channel flow measurement, Hydrograph analysis; Water quality , Surface water resources of India.	12
Unit – V	**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.	14

Suggested Readings:

Chorley, R.J. (ed.) (1969): Water Earth and Man, Methuen, London.
Dakshinamurthy, et.al. (1973) : Water, Resources of India and Their Utilization in Agriculture, IARI, New Delhi.Govt. of India, Ministry of Agriculture (1972), Report of the Irrigation Commission,Vol. 1 to IV, New Delhi. Govt. of India, Ministry of Agriculture (1974), Report of National Commission on Agriculture, Parts IV &V, New Delhi. Govt. of India, Ministry of Energy and Irrigation (Dept. of Irrigation, 91980),Rashtriya Barh Ayog, Report- National Commission on Floods, Vol. I & II.
Gregory, K.J. and Walling De (1973)) : Drainage Basin Form and Processes,Edward Arnold, London.
Jackson, P.J. (1977) : Climate, Water and Agriculture in the Tropics, London.
Law, B.C. (ed.) (1968) : Mountains and Rivers of India, 21, G.C. National Committee for Geography, Calcutta.Linslay, R.K. et.al. (1958) : Hydrology for Engineers, Mc Graw Hill. Rao, K.L. : India's Water Wealth, Orient Longman.
David Knighton (1984) : Fluvial Forms and Processes, Edward Arnold, London
Jones, J.A.A : Global Hydrology: Processes, Resources and Environmental Management, Longman,London,1997.
Matter , J.R., Water Resources. Distribution, Use and Management, John Wiley, Marylane,1984.Singh, R.A. and Singh, S.R.: Water Management: Principles and Practices. Tara Publication, Varanasi, 1972.
Todd, D.K.: Ground Water Hydrology, John Wiley, New York,1959.

Optional - II Human Geography Stream

(Out of Two Optional streams student has to choose one optional stream of his/her choice. Each stream includes two papers)

Programme: Post Graduate in Arts/Science	**Year: I**	**Semester: I Paper-III**
Subject: Geography		
Course Code: GEOG905T (Human Geography Stream)		**Course Title: URBAN GEOGRAPHY**
Course Outcome: Students will understand the process of urbanization, origin, growth and classification of Urban Settlements with relevant theoriesand models. Finally will have an exposure to examine the contemporary urban issues and suggest new urban planning and urbanpolicy.		
Credits: 04		Max. Marks: 25 Internal Assessment (IS10+P/S10+P5) 75 Term End Exam.

Unit	Course Content	No. of Lectures
Unit – I	Nature and scope of urban geography, different approaches and recent trends in urban geography; attributes of urban places during ancient, medieval and modern period; origin and growth of urban settlements: bases and process of urbanization and development; classification of urban settlements on the basis of size and function; urban systems: Urban growth and theories. Central Place Theory of Christaller and Losch; contributions of Indian scholars to the studies of urban settlements	14
Uni t – II	Urban economic base: Basic and non-basic functions, input-output models, concept of dualism; colonial and postcolonial structure, metropolitan city and changing urban function; role of informal sector in urban economy.	10
Unit – III	Organization of urban space: urban morphology and landuse structure: city core, commercial, industrial and residential areas; cores-country variations; city-region relations, modern urban landscape;. morphology of urbansettlements and its comparison with western urban settlements; urban expansion, umland and periphery	12
Unit – IV	Contemporary urban issues: urban poverty, urban renewal, urban sprawl, slums; transportation, housing, urban infrastructure; urban finance; environmental pollution: air, water, noise, solid waste, urban crime, issues ofenvironmental health.	12
Unit – V	Urban policy and planning: development of small and medium sized towns, planning for new wards, city planning, green belts, garden cities, urban policy; contemporary issues in urban planning; globalization and urban planning in the Third World, urban landuse planning, Concept of Smart cities.	12

Suggested Readings:

Alam, S.M.: Hyderabad - Secunderabad Twin Cities Asia Publishing House, Bombay, 1964.

Berry, B.J.L. and Horton F.F. Geographic Perspectives on Urban Systems, Prentice Hall, Englewood Cliffs, New Jersey, 1970.Carter: The Study of Urban Geography, Edward Arnold Publishers, London, 1972.

Chorley, R.J.O., Haggett P. (ed.) : Models in Geography, Methuen, London, 1966.Dickinson, R.E.: City and Region, Routledge, London, 1964

Dwyer, D.J. (ed.) The City as a Centre of Change in Asia, University of Hong Kong Press, Hongkong, 1971.Gibbs J.P.: Urban Research Methods D. Van Nostrand Co. Inc. Princeton, New Jersey, 1961.

Hall P. : Urban and Regional Planning, Routledge, London, 1992.

Hauser, Philip M. and Schnore Leo F. (ed.) : The Study of Urbanisation, Wiley, New York, 1965.

James, P.E. and Jones C.F. (eds.) : American Geography, Inventory and Prospect, Syracuse University Press, Syracuse, 1954.Kundu, A. : Urban Development and Urban Research in India, Khanna Publication, 1992.

Meyor, H.M. Kohn C.F. (eds.) : Readings in Urban Geography, University of Chicago Press, Chicago, 1955.Mumford, L : Culture of Cities, McMillan & Co., London, 1958.

Nangia, Sudesh Delhi Metropolitan Region: A study in settlement geography, Rajesh Publication, 1976.

Rao V.L.S.P. : Urbanisation in India: Spaial Dimensions. Concept Publishing Co. New Delhi Concept, New Delhi.Rao VL.S.P.: The Structure of an Indian Metropolis: A study of Bangalore Allied Publishers Bangalore,1979.

Singh K and Steinberg F. (eds.) : Urban India in Crisis, New Age Interns, New Delhi, 1998.Smailes A.E.: The Geography of Towns, Hutchinnson, London, 1953.

Tewari, Vinod K, Jay A. Weinstein, VLS Prakasa Rao (editors) Indian Cities:Ecological Perspectives Concept 1986.Singh O P Nagriya Bhugol

Programme: Post Graduate in Arts/Science	Year: I	Semester: I Paper-IV
Subject: Geography		
Course Code: GEOG906T (Human Geography Stream)	**Course Title: Regional Development and Planning: Concepts, Principles and Techniques**	

Course Outcome:
It will be helpful to understand and evaluate the concept of region in geography and its role and relevance in regional planning.
Students will identify the issues relating to the development of the region through the process of spatial organization of variousattributes and their inter relationship.

Credits: 04	Max. Marks: 25 Internal Assessment (IS10+P/S10+P5) 75 Term End Exam.

Unit	Course Content	No. of Lectures
Unit – I	Geography and its role in regional development and planning: Concept, Scope & purpose of Regionalplanning, Types of regions: formal and functional; growth and development.	10
Uni t – II	Regional Planning: Planning process - sectoral, temporal and spatial dimensions; short-term and longterm perspective planning, Indicators of development and their data sources	14
Unit – III	Regional development theories : Economic growth doctrines and their impact on regional growth theories: F. Perroux, W. Isard, A. Losch;Western concerns: Paradigm shift from regional resource development to spatial planning of economic development for the third world; G. Myrdal, A.O. Hisrchman	10
Unit – IV	Regional Planning Strategies : Urban industrial growth strategies and diffusion of modernization; Regional planning in Five Year Plans; Spatial aspects of sectoral development: agriculture, industry andinfrastructure.	12
Unit – V	Schemes of regionalization for planning: V. Nath, L.S. Bhat, P. Sengupta and Galina Sdyasuk; territorial production and complexes. Regional development planning; the state and regional development in India.	14

Suggested Readings:

Bernstein, H. (1979) : Sociology of Development versus Sociology of Underdevelopment in D. Lehmann (ed.), DevelopmentTheory : Four Critical Studies, Cass, London.

Berry, B.J.L. (1972) : Hierarchical Diffusion : The Basis of Development Filtering and Spread in a System of Growth Centres in N.N.Hansen (ed.), Growth in Regional Economic Development, Macmilan, London

Bhat, L.S. (1972) Regional Planning in India, Indian Statistical Institute, Calcutta.

Bhat, L.S. (2003) Micro Planning: A Case Study of Karnal

Area, KB Publications, New Delhi.Brookfield, H.C. (1975)

:Interdependent Development, Methuen, London.

Carney, J. Hudson, R. and Lewis, J. (eds.) (1980) : Regions in Crisis, Croom Helm, London.

Dewar, D. et. Al. (eds.) (1986): Regional Development and Settlement

Policy, Allen and Unwin, Boston.Dube, K.K. and Singh, M.B. (1986):

Pradeshik Niyojan. Tara Book Agency, Varanasi.

Forbes, D.K. (1984) : The Geography of Underdevelopment : A Critical Survey,

Croom Helm, London. Friedmann, J. (1966): Regional Development Policy : A

Case Study of Venezuela, MIT Press, Cambridge, Mass.

Friedmann, J. and Weaver, C. (1979) : Territory and Function : The Evolution of Regional

Planning , London, Arnold.Gore, Charles (1984) : Regions in Question, Methuen, London

and New York.

Hall, P. (1981) : Urban and Regional Planning, Allan and Unwin, Boston.

Hansen, N.N. (1972) : Growth Centres in Regional Economic Development, Macmillan, London.

Kitching, G. (1982) : Development and underdevelopment in Historical Perspective : Population,

Nationalism and Industrialization,Methuen, New York.

Kuklinski, A. (ed. (1975): Regional Development and planning, Sythoff, London.

Mabogunje, A.L. (1980): The Development Process: A Spatial Perspective, Hutchinson, London.

Mishra, R.P., K.V. Sundaram and V.L.S.P. Rao (1974): Regional Development Planning in

India , Viking, Delhi. 17.Mishra, R.P. (1969) Regional Planning. University of Mysore,

Mysore.

Mishra, R.P. (2002) Regional Planning, Concepts, Techniques, Policies and Case Studies, Concept Publishing

Chandana, R. C. (2005) Regional Development and Planning. Kalyani Publishers, New Delhi.

Stohr, W.B. and Taylor, D.R.F. (1981): Development from above or Development from Below, John Wiley, Chichester.

Programme: Post Graduate in Arts/Science	Year: I	Semester: I Practical
Subject: Geography		
Course Code: GEOG907P	**Course Title: Quantitative Technique**	

Course Outcome:
Students will identify the basic statistical procedures to be applied to various themes in geography. It will also train the studentsto handle these statistical techniques towards analysing the geographical problems

Credits: 04	(Max. Marks: 100 (Evaluation will be made by both Internal and externalExaminers) Internal Assessment: 25 (10-Viva Voce + 10-Record Book + 5-Attendance) Term End Exam 75 (Theory and Practical)

Unit	Course Content	No. of Lectures
Unit – I	Basics of Statistics Definitions of statistics, Importance and use of statistical techniques in geography, Types and sourcesof statistical data in geography, Formation of frequency distribution table, Graphical representation of frequency distribution using Histogram, O give curve, Cumulative percentage curve	10
Uni t – II	Measures of Statistics Measures of central tendency: Mean, Median and Mode. Measures of position: Estimation of quartiles, deciles and percentiles; Measures of dispersion: Absolute measurements- Mean deviation,Quartile deviation, and Standard deviation; Relative measurements: Coefficient of mean deviation, Coefficient of quartile deviation, Coefficient of variations, Index variability and Relative variability	10
Unit – III	Analysis of Statistical Relationship Skewness: Karl Pearson's and Bowley's methods; Kurtosis; Correlation analysis: Spearman's rankorder correlation and Pearson product moment correlation, Kendall rank correlation coefficient; Regression analysis: Simple and Multiple Regression; Least square method	10
Unit – IV	Probability Distribution Probability: Theory of probabilities-law of addition and multiplication-probabilities of distribution: normal, binomial, Poisson-sampling: basic concepts, sample units and design, sampling frame andprocedures, standard error and sample size, testing the adequacy of samples	10
Unit – V	Hypothesis Testing: Needs and types of hypotheses-goodness of fit and significance and confidence levels-parametric and non-parametric procedures: contingency tables, Chi-square test, binomial test,t-test.	10

Suggested Reading:

Alvi, Z. (1995): Statistical Geography: Methods and Applications, Rawat Publications, Jaipur Cole, J.P. & King, C.A.M. (1968): Quantitative Techniques in Geography. John Wiley & sons Inc.New York.

Elhance, D.N. (1972): Fundamentals of statistics, Kitab Mahal, Allahabad.

Gregory, S. (1968): Statistical methods and the geographer. Longman, London.

Gupta, C.B. (1978); An introduction to statistical Methods, Vikas Pub.House,New Delhi.Hemawati: Statistical Methods for Geographers.

Hoel P.G.: Elementary Statistics, Wiley, New York.

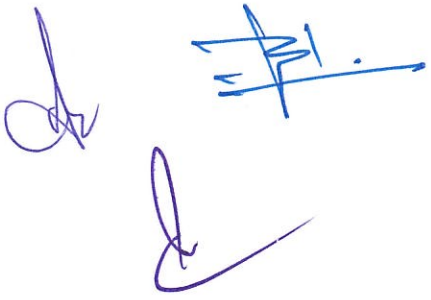
King, L.J. (1991): Statistical Analysis in geography. Prentice Hall, Englewood Cliff N.J.David Unwin, Introductory Spatial Analysis, Methuen, London, 1981.

Gregory, S. Statistical Methods and the Geographer, Longman, London, 1978.

Hammond R and P.S. McCullagh Quantitative Techniques in Geography: An Introduction, Clarendan Press, Oxford, 1974.John P.Cole and Cuchlaine A. M. King, Quantitative Geography, John Wiley, London, 1968.

Johnston R. J., Multivariate Statistical Analysis in Geography, Longman, London. 1973.Koutsoyiannis, Theory of Econometrics, Mcmillan, London, 1973.

Maurice Yeats, An Introduction to Quantitative Analysis in Human Geography, McGraw Hill, New York, 1974.Peter Haggett, Andrew D. Cliff, & Allan Frey, Location Methods Vol. I and II, Edward Arnold, London, 1977.



Research Project

Programme: Post Graduate in Arts/Science	Year: I	Semester: I Research Project
Subject: Geography		
Course Code: GEOG908Pr	**Course Title: Research Project**	
Course Outcome: To learn how to select a Research Proposal based on research gap found during the literature survey or field observations mdae. Preparation of synopsis/outline will be also learned. Finally 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 interest with the help of their respective supervisors allotted to them by the Head of 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 60 and 70 pages.The Research Project Dissertation will be evaluated by the external and internal examiners.

Second Semester

Programme: Post Graduate in Arts/Science	Year: I	Semester: II Paper-I
Subject: Geography		
Course Code: GEOG1001T	**Course Title: BIOGEOGRAPHY**	
Course Outcome: Student will understand the interrelationships among the living organisms within the environment and the importance ofconservation of biosphere and biodiversity.		
Credits: 04	Max. Marks: 25 Internal Assessment(IS10+P/S10+P5) 75 Term End Exam.	

Unit	Course Content	No. of Lectures
Unit – I	Fundamental Concepts: Concept, Scope, Significance and Development of Biogeography;Environment, Habitats and Plant-animal Association.	10
Uni t – II	Plant Geography & Plant Succession: Elements of Plant Geography, Distribution of Forests and Major Plant Communities. Plant successions in newly formed landforms. Examples from flood plains and glacial fore fields.	12
Unit – III	Zoogeography & Biodiversity: Zoogeography and its environmental relationship; Physical factors influencing world distribution ofanimals and their actual world distribution; classification & distribution of animals; faunal regions; biomes and their types; Bio-diversity and its depletion through natural and man-induced causes.	14
Unit – IV	Climate Change: Temporal Perspectives: Paleo botanical and Paleo climatological records of environmental Changes. Impact of ClimateChange on Flora and Fauna with special reference to Uttarakhand Himalaya.	12
Unit – V	Biotic Resource Management: National Forest and Wildlife Policy of India. Conservation of biotic resources. Bioinformatics,Protected Areas and their management with special reference to National Parks, Wildlife Sanctuaries and Biosphere Reserves of Uttarakhand.	12

Suggested Reading:

Agarwal, D.P. (1992) : Man and Environment in India Through Ages, Books and Books.Bradshaw, M.J. (1979): Earth and Living Planet, ELBS, London

Cox, C.D. and Moore, P.D. (1993): Biogeography: An Ecological and Evolutionary, 5th Edn., Blackwell.

Gaur, R. (1987): Environment and Ecology of Early Man in Northern India, R.B. Publication, Corporation.Hoyt, J.B. (1992): Man and the Earth, Prentice Hall, U.S.A.

Hugget, R.J. (1998): Fundamentals of Biogeography, Routledge, U.S.A.

Illies, J. (1974): Introductory to Zoogeography, Mcmillan, London.

Khoshoo, T.N. and Sharma, M. (eds.) (1991): Indian Geosphere – Biosphere Har – Anand Publication, Delhi.Lapedes, D.N. (ed.) (1974) : Encyclopedia of Environmental Science, McGraw Hill.

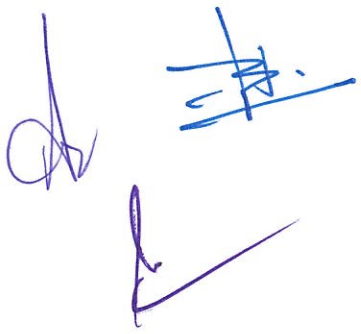
Mathur, H.S. (1998) : Essentials of Biogeography, Anuj Printers, Jaipur.

Pears, N. (1985) : Basic Biogeography, 2nd Edn. Longman, London.

Simmon, I.G. (1974) : Biogeography, Natural and Cultural, Longman, London.

Tivy, J. (1992) :Biogeography : A Study of Plants in Ecosphere, 3rd Edn., Oliver and Boyd, U.S.A

Tiwari, P.C. and Bhagwati Joshi (1997): Wildlife in the Himalayan Foothills of Uttar Pradesh: Conservation and Management, NewDelhi



Programme: Post Graduate in Arts/Science	Year: I	Semester: II Paper-II
Subject: Geography		
Course Code: GEOG1002T	**Course Title: Geography of Uttarakhand**	
Course Outcome: Students will identify the basic physical and socio-economic background of Uttarakhand for the planning and utilization of itsresources for sustainable development.		
Credits: 04	Max. Marks: 25 Internal Assessment (IS10+P/S10+P5) 75 Term End Exam.	

Unit	Course Content	No. of 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 Languagesand Dialects, Settlements: Types and Patterns	12
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.	12
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,	12
Unit – V	Future Prospects and Development Plans: Prospects of Tourism, Sustainable Development Plan for Uttarakhand Himalaya, EnvironmentalHazards and Management in Uttarakhand Himalaya.	14

Suggested Readings:

Valdiya, K.S. : Land and People, 1988
Bose, S.C.: Land and People of the Himalaya, Calcutta,1968
Singh O.P.(ed.) : The Himalaya: Nature, Man and Culture, 1983
Joshi, S.C. et.al : Kumaun Himalaya, Nainital, 1983
Singh,O.P. & Pande,R.K.: Human Habitat in the Mountain (1998)
Joshi, S.C.: Uttaranchal: Environment & Development, 2001
Saklani,P.S.(ed.): Tectonic Geology of the Himalaya, 1978
Singh, R.L.: India: A Regional Geography, 1971
Nityanand & K.Kumar : The Holy Himalaya

Optional - I Physical Geography Stream

(Out of Two Optional streams student has to choose one optional stream of his/her choice. Each stream includes two papers)

Programme: Post Graduate in Arts/Science	**Year: I**	**Semester: II Paper: III**
Subject: Geography		
Course Code: GEOG1003T(Physical Geography Stream)	**Course Title: Glacial and Periglacial Geomorphology**	
Course Outcome: It will make familiar with the geomorphic processes and resultant landforms of the glacial and periglacial area. It will also makeunderstand about the sensitiveness of the periglacial environment to heat budget		
Credits: 04	Max. Marks: 25 Internal Assessment(IS10+P/S10+P5) 75 Term End Exam.	

Unit	Course Content	No. of Lectures
Unit – I	Theoretical Base: Definition of Glacial Geomorphology; Ice Age; Causes of ice ages; Pleistocene Glaciation; onset andretreat.	12
Unit – II	Erosional Proceeses and Landforms: Erosional process; glacial erosion, development of erosional landforms; superglacial, englacial andbasal .	10
Unit – III	Depositional Proceeses and Landforms: Deposional processes: processes-stratified and non stratified; forms of Moraines; glaciofluvial andglacio-lacustrine environment.	12
Unit – IV	Periglacial Processes: Periglacial process: frozen ground phenomenon – identifical ,depth variations, classification anddistribution; mechanism of frost action.	12
Unit – V	Periglacial Landforms and Human adaptation: Periglacial landforms;frost action and landforms-mass wasting and landforms, adaptation of humanbeings to periglacial environment.	14

Suggested Readings:

Brown, R.J.E.: Permafrost in Canada. University of Toronto Press, Toronto, 1970.

Carson MA. and Kirkby M.J., Hillslope Form and Process, Cambridge University Press, 1972.

Coates, D.R.(ed.), Glacial Geomorphology, State University of New York,1974, New York, 1974.Dixon,

J.C. and Abrahams, A.D. (eds.), :Periglacial Geomorphology. John Wiley, New York, 1992.

Drewry, D., Glacial Geological Processes, Edward Arnold, London, 1986.

Embleton, C. and King, C.A.M., Glacial and Periglacial Geomorphology, Edward Arnold, London, 1968.

Embleton, C. and Thormes, J. (eds.), Process in Geopmorphology, Arnold - Hesnemann, New Delhi, 1980.

Hails, J.R. (ed.): Applied Geomorphology Elsevier Sci. Amsterdam, 1977.

Pewe, T.L.(ed.):. The Periglacial Environment. Mc. Gill- Queen's University Press, Montreal 1969

Peterson, W.S.B., The Physics of Glaciers. Pergamon Press, Oxford 1969.

Price, L.W., The Periglacial Environment, Permafrost and Man., Commission on College Geography,Resource Paper No. 14, Washington, D.C,1972.

Ritter, D.F. Craig, R. and Miller, J.P., Process of Geomorphology. , W.C. Brown Dubuque, 1995.

Slymaker, O. (ed.), Steepland Geomorphology., John Wiley, London, 1995.

Sugden, D.E. and John, B.S. Glaciers and Landscape. Edward Arnold, London, 1976.

Vander Veen, C.J., Fundamentals of Glacier Dynamics., A.A. Balkemma, Rotterdam, 1999.

Wright, A.E and Mosley, P.(eds), Ice Ages: Ancient and Modern., Seel House Press, Liverpool,1975.

Programme: Post Graduate in Arts/Science	Year: I	Semester: II Paper: IV
Subject: Geography		
Course Code: GEOG1004T (Physical Geography Stream)		**Course Title: Aeolian Geomorphology**
Course Outcome: It will make aware about the environments which is sensitive to aridity, bio-mass and human interferences. This course will alsomake familiar with the aeolian processes and their resulting landforms.		
Credits: 04	Max. Marks: 25 Internal Assessment (IS10+P/S10+P5) 75 Term End Exam.	

Unit	Course Content	No. of Lectures
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 thewind 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.	12
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 anddust yielding systems, gross spatial patterns of production and removal; deposition: loess, types, palaeo - environmental significance.	12
Unit – III	Forms of wind deposition: sand ripples, obstacle dunes; dune-classification schemes;morphodynamics of the crescentic, longitudinal and complex dunes	10
Unit – IV	Plaeo—environments : Introduction; sediment movement in the past; relic and active dunes; datingaeolion deposits; pre-leistocene sand dunes; Pleistocene and Holocene dunes; Aeolinites - composition and distribution.	12
Unit – V	Applied Aeolian Geomorphology : Introduction; wind erosion on agricultural fields; controls of dust; Management of coastal dunes and dunes in semi -arid areas; desertification and its controls withspecial reference to India. Remote sensing and GIS applications in aeolian settings.	14

Suggested Readings:

Abrahams, A.D. and Parsons, A.J. (eds.), Geomorphology of Desert Environments Chapman & Hall, London, 1994.

Goudie,A and Hegde : Palaeo-geography and Pre-history of Indian Desert, Academic Press, London,1980.

Baumont, P.: Drylands-Environment, Management and Development, Routledge, New York,1993.

Bagnold, R.A. The Physics of Blown Sand and Desert Dunes, Methuen, London, 1941.

Cook, R.U.,

Waren, A. and Goudie, A.S. Desert Geomorphology, London, UCL Press, London, 1993.

Embleton, C. and Thornes, J. (eds.), Process in Geomorphology, Arnold -Heinemann, New Delhi, 1980.

Greeley, R and Iversen, J.D., Wind as a Geological Process. Cambridge University Press, Cambridge, 1985.

Lancaster, N: Geomorphology of Desert Dunes Routledge, New York,1995.

Livingstone I. and Warren, A. Aeolian Geomorphology ,Adison Wesley, Longman, Essex, 1996.

Mckee, E.D. (ed.) A Study of Global Sand Seas, Castel House, Kent, 1980.

Nickling, W.G. (ed.) Aeolian Geomorphology. Allen & Unwin, Boston, 1986.

Singhvi, A.K. and Derbyshire, E.(eds.) Palaeo—environmental Reconstruction in Arid Lands, Oxford & IBH, New Delhi, 1999.

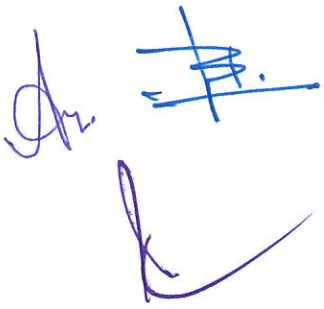
Tchakerian, V.P. (ed.) Desert Aeolian Process ,Chapman & Hall, London, 1995.

Optional - II Human Geography Stream

(Out of Two Optional streams student has to choose one optional stream of his/her choice. Each stream includes two papers)

Programme: Post Graduate in Arts/Science	Year: I	Semester: II Paper: III
Subject: Geography		
Course Code: GEOG1005T (Human Geography Stream)	**Course Title Population Geography**	
Course Outcome: It will introduce to the students about the complex dimensions of population. Students will also understand and evaluate the association between demographic and socio-economic attributes of population and the resultant levels of social well- being andeconomic development.		
Credits: 04	Max. Marks: 25 Internal Assessment (IS10+P/S10+P5) 75 Term End Exam	

Unit	Course Content	No. of Lectures
Unit – I	Population Geography: Scope and Objectives; development of Population Geography as a field of specialization; Population Geography and Demography sources of populationdata, their level of reliability, and problems of mapping of population data	12
Unit – II	Population distribution: density and growth - theoretical issues; Classical and modern theories inpopulation distribution and growth; World patterns and their determinants; India -: population distribution, density and growth profile, Concepts of under population and over population.	12
Unit – III	Population composition: age and sex; family and households; literacy and education; religion, casteand tribes; rural and urban; urbanization; occupational structure; gender issues; Population composition of India	12
Unit – IV	Population dynamics: Measurements of fertility and mortality. Migration: national and internationalpatterns; India's population dynamics.	10
Unit – V	Population and development: population- resource regions and levels of population and socio- economic development; population policies ; Human Development Index and its components; population and environment; implications for the future.	14



Suggested Readings:

Bilasborrow, Richard E and Daniel Hogan, Population and Deforestation in the Humid Tropics, International Union for the ScientificStudy of Population, Belgium 1999.

Bogue, D.J. Principles in Demography, John Wiley, New York 1969.

Bose, Ashish et. al. : Population in India's Development (1947-2000); Vikas Publishing

House, New Delhi 1974. Chandna, R.C. Geography of Population; concept, Determinants and

Patterns. Kalyani Publishers, New York 2000.

Clarke, John I., Population Geography, Pergamon Press, Oxford 1973.

Crook, Nigel Principles of Population and Development. Pergmon Press, New York 1997.

Daugherty, Helen Gin, Kenneth C.W. Kammeyir, An Introduction to Population (Second Edition), The Guilford Press, New York,London 1998.

Garnier, B.J. Geography of Population Longman, London 1970.

Kochhar, Rajesh, The Vedic People: Their History and Geography Orient Longman Ltd., New Delhi 2000.Mamoria C.B. India's Population Problem, Kitab Mahal New Delhi 1981.

Mitra, Asok, India's Population: Aspects of Quality and Control. Vol. I & II, Abhinar Publications, New Delhi 1978.Premi M.K., India's Population: Heading Towards a Billion, B.R. Publishing Corporation,1991.

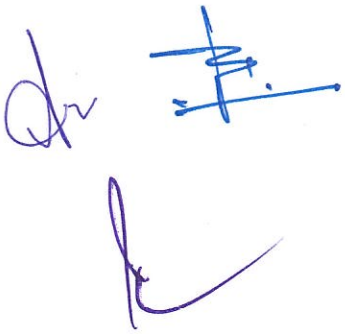
Srinivasan K. and M.Vlassoff. Population Development Nexus in India: Challenges for the New Millennium. Tata McGraw -Hill, NewDelhi 2001.

Srinivasan, K. Basic Demographic Techniques and Applications Sage Publications, New Delhi 1998.Sundaram K.V. and Sudesh Nangia, (ed.) Population Geography, Heritage, Publications, Delhi 1986.

UNDP: Human Development Report. Oxford University Press, Oxford 2000.

United Nations, Methods for Projections of Urban and Rural Populations, No. VIII, New York 1974.Woods R. Population Analysis in Geography. Longman, London1979.

Zelinsky Wilbur, A Prologue to Population Geography, Prentice Hall, 1966



Programme: Post Graduate in Arts/Science	Year: I	Semester: II Paper: IV
Subject: Geography		
Course Code: GEOG1006T (Human Geography Stream)	**Course Title: Geography of Tourism**	
Course Outcome: Students will have an exposure of the tourism scenario and different techniques to analyse the various techniques used in tourism Industry.		
Credits: 04	Max. Marks: 25 Internal Assessment (IS10+P/S10+P5) 75 Term End Exam	

Unit	Course Content	No. of Lectures
Unit – I	**Introduction and the Concept:** Definition, Scope, Nature, Significance and Development of Geography of Tourism; Geography of Tourism as Applied Geography; The Tourist Phenomenon; Concept of Man, Environment and Tourism : The Interrelated Phenomena.	12
Unit – II	**Measurements and Dimensions of Tourism:** Basic concept and Need of Tourism Phenomena; Tourist: the Connotation; Types of Tourist Statistics; Methods of Measurement; The Importance of Measurement; The Organization of Tourism, The National Tourism Organization; Dimensions of World Tourism; International Tourist Movements.	14
Unit – III	**Resort Towns and Morphology:** Analysis of Splendor Resources; Accommodation : Early History, Classification and Gradation, Attributes of Resort Towns, Morphology and Shape of Resort Towns, Parks and Wildlife Sanctuaries, Cultural, Social and Historical Attractions with special reference to Uttarakhand Himalaya.	14
Unit – IV	**Tourist Industry and Environment:** Transport and Tourism, Spatial Interaction Determinants and Pattern, Tourism Marketing; Tourism Promotion; Social and Economic significance of Travel and Tourism; Domestic and Foreign Travel.	10
Unit – V	**Planning and Management:** Eco- friendly Tourism, Environmental Consequences of Tourism, Tourism Planning and Management with special reference to India and Uttarakhand State. .	10

Suggested Readings:

Arvil, R.(1967): Man and Environment Crisis and Strategy of Choice, Penguin, Harmondsworth, 1967.

Berril, N.J.(1967): Inheriting the Earth- The Story of Man and Changing Planet, Forwcett, Greenwich, Connecticut, 1967.

Bhargava, Gopal (1992): Environmental Challenges and Ecological Disaster, Mittal Publication, New Delhi.

Botkin, D.B. (1982) : Environmental Studies, Charles, E. Meril and Keller, Edward, A. Publishing Co. Columus, Ohio.

C.S.E. (1984) : The State of India's Environment : A Citizens Report, Centre for Science and Environment, New Delhi.

Chada, S.K. (1993) : Fragile Environment, Anmol Publication, NewDelhi.

Darlington, P.J. (1957) : Zoo-Geography : The Geographical Distribution of Animals, Wiley, New York.

Dasman, R.F. (1972) : Environmental Conservation, John Wiley and Sons, NewYork.

Detwyler, J.R. (1975) : Man's Impact on Environment, John Wiley and Sons, New York.

Khusoo, T.N.: Environmental Management Policies and Issues.

Knowles, R. and Wareing, J Economic and Social Geography.

Marsh, C..P. (1967): Man and Nature, Morvad.

Odum, E.P. : Fundamentals of Ecology, Prentice Hall.

Rustomji, N.K. and Ramble Charles (1990) : Himalayan Environment and Culture, Indus Publishing Company, New Delhi.

Robinson, H. (1976) : A Geography of Tourism, Macdonald & Evans Ltd., Estober, Plymouth.

Bhatia, A.K. (1983) : Tourism Development: Principles andPractices,Sterling Publishers Pvt. Ltd., NewDelhi.

Cosgrove, I. and Jackson, R. (1972) ; The Geography of Recreation and Leisure,

Programme: Post Graduate in Arts/Science	Year: I	Semester: II Paper: Practical
Subject: Geography		
Course Code: GEOG1007P	**Course Title: Map Projection, Geological Map and Field Study TripPart A: Map Projection and Preparation of Geological Maps Part B: Field Study Trip and Preparation of Report**	

Course Outcome:
Student will understand the significance of the projection in correct map making process with reference to the shape, size and
area. Another important output is to learn the preparation of the geological cross-section on the bases of contour and GeologicalMap

Credits: 04	(Max. Marks: 100 (Evaluation will be made by both Internal and external Examiners) Internal Assessment: 25 (10-Viva Voce + 10-Record Book + 5-Attendance) Term End Exam: 75 (50-Theory and Practical+25- Field Survey)

Unit	Course Content	No. of Lectures
Part A		
Unit – I	Map Projection: Meaning and classification; Principles, merits, demerits.	08
Unit – II	Construction (with emphasis on mathematical methods) and use of the following projections: Gall's, Mercator's, Bonne's,Polyconic, Gnomomic, Stereographicand Orthographic Zenithal Projections.	14
Unit – III	Identification of Rocks and Minerals, Rock Types and their characteristics, Structure (Fold, Fault andThrust), Unconformity; Dip and strike	10
Unit – IV	Preparation of Geological cross-section of folded and faulted structure	10
Unit – V	Preparation of Geological cross-section of thrusted and unconformity area.	08
Part B		

Part B: Field Study Trip and Preparation of Report
The course is based on supervised field work carried out by the fourth semester students for about one week. One region (if possible, based on the optional paper offered by the department) will be selected every year within Uttarakhand/any part of India. Observations will be made regarding various aspects such as different landforms, drainage, vegetation, agriculture, industries, transport and communication, settlement, environmental problems etc. The information thus collected will be submitted by the students in the form of the field survey diary and field report for evaluation.

Research Project

Programme: Post Graduate in Arts/Science	Year: I	Semester: II Research Project
Subject: Geography		
Course Code: GEOG1008Pr	**Course Title: Research Project**	
Outcome To learn how to select a Research Proposal based on research gap found during the literature survey or field observations mdae. Preparation of synopsis/outline will be also learned. Finally will learn how to collect data and write areport 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 interest with the help of their respective supervisors allotted to them by the Head of 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 60 and 70 pages. The Research Project Dissertation will be evaluated by the external and internal examiners.		

NATIONAL EDUCATION POLICY-2020

Department of Geography

Post Graduate Diploma in Disaster Management

(SIX MONTHS COURSE)

Sri Dev Suman Uttarakhand University,

Pt. L.M.S. Campus Rishikesh.

STRUCTURE OF POST GRADUATE DIPLOMA COURSE IN DISASTER MANAGEMENT

SYLLABUS

2023-2024

Curriculum Design Committee, Uttarakhand

Sr.No.	Name & Designation
1.	Prof. N.K. Joshi Vice-Chancellor, Sri Dev Suman Uttarakhand University,Tehri Chairman
2.	Vice- Chancellor,Kumaun University,Nainital Member
3.	Prof. Jagat Singh Bisht Vice-Chancellor, Soban Singh Jeena University Almora Member
4.	Prof. Surekha Dangwal Vice-Chancellor, Doon University, Dehradun Member
5.	Prof. O.P.S. Negi Vice-Chancellor, Uttarakhand Open University Member
6.	Prof. M.S.M. Rawat Advisor, Rashtriya Uchchatar Shiksha Abhiyan, Uttarakhand Member
7	Prof. K. D. Purohit Advisor, Rashtriya Uchchatar Shiksha Abhiyan, Uttarakhand Member

Syllabus Preparation Committee

S.N	Name	Designation	Department Affiliation
1	Dr. D.C. Goswami	Professor, Head & Dean of Arts,	Department of Geography Sri Dev Suman Uttarakhand University, Campus- Rishikesh
2	Dr. T.B. Singh	Professor	Department of Geography Sri Dev Suman Uttarakhand University, Campus- Rishikesh
3	Dr. A.P.Dubey	Professor	Department of Geography Sri Dev Suman Uttarakhand University, Campus- Rishikesh
4	Dr. Aruna P. Sutradhar	Associate Professor	Department of Geography Sri Dev Suman Uttarakhand University, Campus- Rishikesh

SRI DEV SUMAN UTTARAKHAND UNIVERSITY
Badshahithaul, Tehri Garhwal (Uttarakhand)
Members of Board of Studies Geography

S.N.	Name of the Members	Designation	Nominated As	Signature
1.	Dr. D.C. Goswami	Professor, Head & Dean of Arts,	Chairman	
2.	Dr. T.B. Singh	Professor	Member	
3.	Dr. A.P. Dubey	Professor	Member	
4.	Dr. Aruna P. Sutradhar	Associate Professor	Member	
5.	Dr. R.C. Joshi	Professor, Head Kumaun University, Nainital	Member	
6.	Prof. Janki Panwar	Principal	G.P.G.C. Kotdwar	
7.	Prof. Loveny R. Rajvanshi	Principal	G.P.G.C. Jaiharikhal	
8.	Prof. K.L. Talwar	Principal	G.D.C. Chakrata	
9.	Nedesak, Uttarakhand Bhasa Sansthan	Nedesak	Rajpur Road, Dehradun	

S.N.	TOPIC
1.	Title of the course:**Post Graduate Diploma in Disaster management**
2.	Department: Geography Department
3.	Minimum admission eligibility: Graduation
4.	Selection mode: Merit based
5.	Duration: Six month
6.	Credit: 03 (02theory and 01 Practical/field work)
7.	Teaching days: 90
8.	Teaching hours: 45Hours
9.	Maximum number of students intake: 30
10.	Maximum number of students to run the course: 15
11.	Fee (one time): Rs. 8000/-
12.	Exam fee (one time): Rs. 1000/-
13.	Exam pattern: 200 marks theory, 100 marks practical/field work (End semester 80 marks, Sessional 20 marks)
14.	Exam hours: 02 theory, 02 hoursPractical/field work
15.	Minimum attendance for appearing in examination: 75%
16.	Minimum marks for passing exam: 40% in theory and practical separately.
17.	**Objectives of the course:** 1-The Diploma Course in Disaster Management To acquaint the Students of all Types of Disasters, their Causes ,Affects and Methods to Mitigate the Effects of Disaster. 2- To Make them Employable in this particular field. 3-To Provide students with Knowledge of the policies and laws of disaster management in India.
18.	**Job prospects of the Course**: The Certificate holder can get employment in various disaster mitigation and management agencies/Department, NGO's Military/Paramilitary, Police, Home guard and Civil defense department as well as in disaster management department, state/central government.
19.	**Course outcomes:** The natural and man-made disasters often involve a fatal combination of forces of natural and human errors. Disasters strike with sudden violence, tearing bodies, destroying lives, families and infrastructures. India has a dubious history of being hit by at least one major disaster every year. This alarming regularity calls of some strategies to mitigate the effects of disasters by taking into account disaster preparedness measures and also by emphasizing upon systematic post-disaster rehabilitation activities. Thus to be effective, disaster management needs to be implemented as a comprehensive and continuous activity and not as post-disaster specially built mainly as a strategy to individual disaster circumstances and effects.Sri Dev Suman Uttarakhand University can play a crucial role in providing education in the field of disaster management. by virtue of being an apex body of higher learning is most suitably placed at exercising leadership in promoting and re-enforcing education, information and awareness in the field of disaster management. The Diploma Programs in Disaster Management aims at providing knowledge to the learners in the areas of disaster preparedness, prevention, mitigation, relief, reconstruction and rehabilitation.

	Budget allotment (Tentative): i. Honorarium to Principal/Director: Rs. 250/- per month (for six month) ii. Honorarium to coordinator: Rs. 1000/- per month (for six month) iii. Honorarium to Resource person: Rs. 400/- per hour iv. Honorarium to Lab Assistant/assistant: Rs.2500 (for six month) v. Honorarium to peon: Rs. 700/- (for six month) vi. Honorarium to sweeper: Rs. 400/- (for six month) vii. Stationary, computer and printing works: 7000/- viii. Lab accessories, teaching aids, study materials etc.: 10000/- ix. The remaining money may be utilized for creating infrastructure and purchasing books for the course.

Professional Course Syllabus
Six Months P.G. Diploma Programme In
Disaster Management

Sem	Course/Paper	Credit	Total Credits
I	**GEO-PGDDM101 Disaster Management -I** **Course Title: Disaster Management: An Introduction to Disaster & Hazards**	3	
I	**GEO-PGDDM 102 Disaster Management –II** **Course Title: Disaster Management: Understanding Natural Disaster**	3	
II	**GEO-PGDDM 103 Disaster Management –III** **Course Title: Disaster Management: Stages of Disaster Management**	3	
II	**GEO-PGDDM 104 Disaster Management –IV** **Course Title: Disaster Management: Planning, Policy & Management**	3	**12**

Every U G Student has to choose one Vocational(Skill Enhancement)Course in First four semester

Professional Course Syllabus
Post Graduate Diploma Course In Disaster Management

Paper I

Programme: Post Graduate Diploma Course In Disaster Management		Paper-I
Subject: Post Graduate Course In Disaster Management		
Course Code: GEOG -PGDDM101	**Course Title: Disaster Management: An Introduction to Disaster & Hazards**	
Course Outcome: This course will develop the skill of understanding about natural calamities and disaster and, also realize the consequences aswell as preparedness. It will also give an exposure about the natural and manmade disasters of Uttarakhand		
Credits: 03	Max. Marks: 25 Internal Assessment (IS10+P/S10-P5) 75 Term End Exam.	

Unit	Course Content	No. of Lectures
Unit – I	Meaning, Concept and Significance of Disasters, Hazards, Vulnerability and Resilience.	10
Uni t – II	Natural and human induced Causes of Disaster	10
Unit – III	Risk and Vulnerabilities analyses of disasters	10
Unit – IV	Global, National and local Scenario of Disaster Management. Training & Drills, Case Studies	15

Professional Course Syllabus
Post Graduate Diploma Course In Disaster Management

Paper II

Programme: Post Graduate Diploma Course In Disaster Management		Paper-II
	Subject: Post Graduate Diploma Course In Disaster Management	
Course Code: GEOG PGDDM102	**Course Title: Disaster Management: Understanding Natural Disaster**	
Course Outcome: This course will develop the skill of understanding about natural calamities and disasters and, shall make aware regarding various types of disasters and their impacts on natural landscape and society.		
Credits: 03	Max. Marks: 25 Internal Assessment (IS10+P/S10+P5) 75 Term End Exam.	

Unit	Course Content	No. of Lectures
Unit – I	**Various types of disasters; Natural Disasters-** Earthquake,Cyclone,DroughtLandslides,Volcanic eruption	10
Uni t – II	**Natural Disasters-** Avalanches, Cloud burst, Cyclone, Tsunami, Storm	10
Unit – III	Extreme heat, Cold waves, Climate change, Global warming,Sea level rise	10
Unit – IV	**Human Induced Disaster**: Nuclear, chemical and Biological Disaster, Building fire, Forest fire, Coal and oil fire, Water, Air and Industrial Pollution, Road, Rail, Air & Sea Accidents and Epidemic, Pandemic.	15

Paper III

Programme: Post Graduate Diploma Course In Disaster Management		IPaper-III
Subject: Post Graduate Diploma Course In Disaster Management		
Course Code: GEOG PGDDM103	**Course Title: Disaster Management: Stages of Disaster Management**	
Course Outcome: This course will develop the skill of understanding about natural calamities and disasters and, shall make aware regarding various aspects of its management..		
Credits: 03	Max. Marks: 25 Internal Assessment (IS10+P/S10+P5) 75 Term End Exam.	

Unit	Course Content	No. of Lectures
Unit – I	Management of Disasters:Disasters Preparedness and Prevention	10
Uni t – II	Disasters- Mitigation ,Response and Recovery	10
Unit – III	Role of Central, state, District and Local Bodies in Disaster Risk Reduction	10
Unit – IV	Field Work : Field study of a disaster prone or disastrous area and its impact analysis	15

Paper IV

Programme: Post Graduate Diploma Course In Disaster Management		Paper-IV
Subject: Post Graduate Diploma Course In Disaster Management		
Course Code: GEOG PGDDM104	**Course Title: Disaster Management: Planning, Policy & Management**	
Course Outcome: This course will develop the skill of understanding about Management skill regarding pre,during and post disaster management.		
Credits: 03	Max. Marks: 25 Internal Assessment (IS10+P/S10+P5) 75 Term End Exam.	

Unit	Course Content	No. of Lectures
Unit – I	Disaster Mapping. Use of GIS and Remote Sensing techniques Disaster Management Act and Policy	10
Uni t – II	Search, Rescue, Evacuation and Logistic Management, Relief (water, food, sanitation, shelter, health and waste management),	10
Unit – III	Long and Short Term Counter Disaster Planning.A 4 page note shall be prepared by the student on Long and Short Term Counter Disaster Planning on any specific disaster.	10
Unit – IV	Damage assessment, Rehabilitation, Reconstruction. Project Report based on the topic allotted by the coordinator	15

Suggested Reading:

Bhargava, Gopal (1992): Environmental Challenges and Ecological Disaster, Mittal Publication, New Delhi

Kapur, A. (2010) Vulnerable India: A Geographical Study of Disasters, Sage Pub. New Delhi,

Muhammad Z Mamun and A I M Nurul Amin, Densification: A Strategic Plan to Mitigate River bank Erosion Disaster inBangladesh, The University Press Limited (UPL), 1999 .

Sahni, Pardeep et.al. (eds.) 2002, Disaster Mitigation Experiences and Reflections, Prentice Hall of India, New Delhi. Modh, S. (2010) Managing Natural Disaster: Hydrological, Marine and Geological Disasters, Macmillan, Delhi.Singh, R.B. (2005) Risk Assessment and Vulnerability Analysis, IGNOU, New Delhi.

Singh, R. B. (ed.), (2006) Natural Hazards and Disaster Management: Vulnerability and Mitigation, Rawat Publications, New DelhiGovernment of India. (1997) Vulnerability Atlas of India. New Delhi, Building Materials & Technology Promotion Council, Ministry of Urban Development, Government of India

Feilden, B. 1987, "Between Two Earthquakes; Cultural Property in Seismic Zones", ICCROM and Getty Conservation Institute, Online Bibliography for Museum Emergency Programme; http://gcibibs.getty.edu/asp/ accessed on 25 August 2008

Stovel, H. 1998, ICCROM "Risk Preparedness: A Management Manual for World Cultural Heritage", Rome,

Jigyasu, R. & Masuda, K. 2005, "Proceedings; Cultural Heritage Risk Management", World Conference on Disaster Reduction Kyoto; Research Center for Disaster Mitigation of Urban Cultural Heritage, Ritsumeikan; Kyoto, Japan

Menegazzi, C. 2004, "Cultural Heritage Disaster Preparedness and Response", Proceedings of the International Symposium held atSalar Jung Museum, Hyderabad, India, 23-27 November 2003, ICOM Paris http://icom.museum/disaster_preparedness_book/copyright.pdf accessed on 15 August 2008

Spenneman, D. & Look, D. (eds.) 1998, "Disaster Management Programs for Historic Sites",

US National Park Service, Western Chapter of the Association of Preservation Technology, California and the Johnstone Centre, Charles Sturt University, Albery, Proceedings of a Symposium organized by the U.S. NationalPark Service, Western Regional Office, San Francisco, in collaboration with the Western Chapter of the Association for Preservation Technology, and held on 27-29 June, 1997 in San Francisco

UNESCO-WHC 1983, "Desirability of adopting an international instrument on the Protection

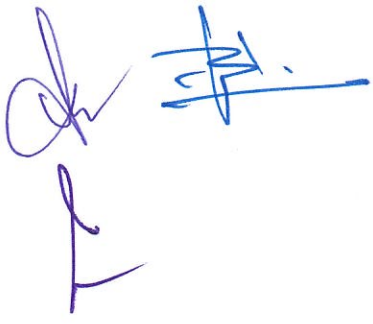
of the cultural heritage against natural disasters and their consequences", Report of the Director General; http://unesdoc.unesco.org/images/0005/000560/056088eo.pdf accessed on 15 August 2008

UNESCO-WHC 2008, "Policy Document on the Impacts of Climate Change on World

Heritage Properties", UNESCO Paris document/ "Case Studies on Climate Change and World Heritage", 2007,UNESCO: Paris http://unesdoc.unesco.org/images/0015/001506/150600e.pdf

Michalski S. 2004, "Care and Preservation of Collections", in Running a Museum, A Practical Handbook (ed. P. Boylan),ICOM, Paris. p. 51 - 91

Waller R. 2003, Canadian Museum of Nature", Gutenberg Studies in Conservation 13, Gutenberg Act UniversitatisGothoburgensis.



NATIONAL EDUCATION POLICY-2020

PG Diploma in GIS

(P.G. Department of Geography)

SRI DEV SUMAN UTTARAKHAND UNIVERSITY
Pt. Lalit Mohan Sharma Campus, Rishikesh

Syllabus
2023-2024

Curriculum Design Committee, Uttarakhand

Sr.No.	Name & Designation
1	Prof. N.K. Joshi, Vice-Chancellor Sri Dev Suman Uttarakhand University, Tehri Chairman
2	Vice-Chancellor , Kumaun University Nainital Member
3	Prof. Jagat Singh Bisht Vice-Chancellor, Soban Singh Jeena University Almora Member
4	Prof. Surekha Dangwal Vice-Chancellor, Doon University, Dehradun Member
5	Prof. O.P.S. Negi Vice-Chancellor , Uttarakhand Open University Member
6	Prof. M.S.M. Rawat Advisor, Rashtriya Uchchatar Shiksha Abhiyan, Uttarakhand Member
7	Prof. K. D. Purohit Advisor, Rashtriya Uchchatar Shiksha Abhiyan, Uttarakhand Member

Course Preparation Committee

S.N.	Name	Designation	Department	Affiliation
1.	Dr.D.C. Goswami	Professor, Head & Dean of Arts	Geography	Sridev Suman Uttarakhand University Campus-Rishikesh
2.	Dr. T.B. Singh	Professor	Geography	Sridev Suman Uttarakhand University Campus-Rishikesh
3.	Dr. A.P.Dubey	Professor	Geography	Sridev Suman Uttarakhand University Campus-Rishikesh
4.	Dr. Aruna P. Sutradhar	Associate Professor	Geography	Sridev Suman Uttarakhand University Campus-Rishikesh

SRI DEV SUMAN UTTARAKHAND UNIVERSITY
Badshahithaul, Tehri Garhwal (Uttarakhand)
Members of Board of Studies Geography

S.N.	Name of the Members	Designation	Nominated As	Signature
1.	Dr. D.C. Goswami	Professor, Head & Dean of Arts,	Chairman	
2.	Dr. T.B. Singh	Professor	Member	
3.	Dr. A.P. Dubey	Professor	Member	
4.	Dr. Aruna P. Sutradhar	Associate Professor	Member	
5.	Dr. R.C. Joshi	Professor, Head Kumaun University, Nainital	Member	
6.	Prof. Janki Panwar	Principal	G.P.G.C. Kotdwar	
7.	Prof. Loveny R. Rajvanshi	Principal	G.P.G.C. Jaiharikhal	
8.	Prof. K.L. Talwar	Principal	G.D.C. Chakrata	
9.	Nedesak, Uttarakhand Bhasa Sansthan	Nedesak	Rajpur Road, Dehradun	

Semester-wise Titles of the Papers in PG Diploma in GIS

Year	Semester	Course Code	Paper Title	Theory/ Practical/Project	Credits
I	I	GIS 101	**Basic Computer Information and Statistics** Term End Exam:75 Marks Internal Assessment: 25 Marks, Marks Total: 100	Theory	4
		GIS 102	**Principles of Aerial Photographs and Photogrammetry** Term End Exam:75 Marks Internal Assessment: 25 Marks, Marks Total. 100	Theory	4
		GIS 103	**Principles of Remote Sensing** Term End Exam:75 Marks Internal Assessment: 25 Marks, Marks Total: 100	Theory	4
		GIS 104	**Digital Image Processing** Term End Exam:75 Marks Internal Assessment: 25 Marks, Marks Total: 100	Theory	4
		GIS 105	**Earth Positioning System** Term End Exam:75 Marks Internal Assessment: 25 Marks, Marks Total: 100	Theory	4
		GIS 106	**PRACTICAL** Term End Exam:75 Marks Internal Assessment: 25 Marks, Marks, Total: 100	Practical	4
II	II	GIS 201	**Geographic Information System** Term End Exam:75 Marks Internal Assessment: 25 Marks, Marks, Total: 100	Theory	4
		GIS 202	**Computer Cartography** Term End Exam:75 Marks Internal Assessment: 25 Marks, Marks Total: 100	Theory	4
		GIS 203	**Advanced Remote Sensing & GIS** Term End Exam:75 Marks Internal Assessment: 25 Marks, Marks Total: 100	Theory	4
		GIS 204	**Research Methodology and Application of Remote Sensing and GIS Techniques in Research** Term End Exam:75 Marks Internal Assessment: 25 Marks, Marks Total: 100	Theory	4
		GIS 205	**Practical** Term End Exam:75 Marks Internal Assessment: 25 Marks, Marks Total: 100	Practical	4
		GIS 206	**Project Oriented Dissertation** 1. Project Evaluation: 25 2. Project Presentation: 25 3. Project Viva Voice: 50		4

Subject: Diploma in GIS

Course outcomes:

1. Understand the Geographical Information system.
2. Learn about the use of Geographical Information system.
3. Plate tectonics and related movements.
4. Understand the basics of Statistics.
5. Understand the concept of Remote Sensing.

Paper Code: GIS 101
Basic Computer Information and Statistics
Term End Exam:75 Marks Internal Assessment: 25 Marks Marks Total: 100

Credits: 4	Core Compulsory
Max. Marks: 25+75	Min. Passing Marks:
Total No. of Lectures-Tutorials-Practical (in hours per week): L-T-P:4-0-0	

Unit	Topics	No. of Lectures
I	**Computer Components** Computers and its Generations, Hardware Components of a Computer Processor, Main memory, Secondary Memory, Input Devices, Output devices, Storage Devices.	12
II	**Software Component** Software/Program, Application Software; Operating System - OS Functions, Types of OS – Windows, Unix/Linux, Solaris. Local Area Network, File Management,	12
III	**Internet** Information Technology, Communication and its Types, Significance of Communication in the Modern World, Global Village and Information Revolution, Internet and World Wide Web, Browsing, Advantage and Limitation in Information Revolution, Computer Viruses and Management.	12
IV	**DBMS** Introduction; databases, database management system - structure, types of DBMS; application of DBMS in GIS; data management using MS-Excel, SQL.	10
V	**Basics of Statistics** Introduction to Statistics; Characteristics of Statistical Data; Statistical Methods; Collections of data primary and secondary data sources, Measurement of Central Tendency- Mean, Mode, Median, Geometric mean and Harmonic Mean; Measures of variations - Range, Quintile deviations, Mean deviation, Standard deviation and variance, Coefficient of variations, Theory of Sampling, Hypothesis; Correlation Analysis; Regression Analysis.	14

Suggested Readings:

- Dennis P. Curtin, Kim Foley, Kunal Sen & Cathleen Morin, Information Technology- The Braking Wave, Tata McGraw Hill Ed., 1999.
- Rajaraman V., Fundamentals of Computer, Prentice Hall of India, New Delhi, 1999.
- Alex Leon., Fundamentals of Information Technology, Leon Techno Publications, Chennai, 1999.
- Subhash Metha, Understanding and Using Internet, Global Business Press, New Delhi, 1996

Suggested Continuous Evaluation Methods: Assignment / Class Test / Quiz (MCQ) / Seminar/ Presentations

Suggested equivalent online courses:.....

Paper Code: GIS 102
Principles of Aerial Photographs and Photogrammetry
Term End Exam: 75 Marks Internal Assessment: 25 Marks Marks Total: 100

Credits: 4	Core Compulsory
Max. Marks: 25+75	Min. Passing Marks:

Total No. of Lectures-Tutorials-Practical (in hours per week): L-T-P:4-0-0

Unit	Topics	No. of Lectures
I	**Aerial photography** Introduction to aerial photography – Basic information and specifications of aerial photographs; Planning and execution of photographic flights Basic; Geometric Characteristics of Aerial Photographs- Types of Aerial Photograph, Flight Strips, Nadir Line, End Lap; Side Lap,Stereoscopic Coverage and Stereopairs, Intervalometer, Air Base and Base Height Ratio; Types of Aerial Camera.	16
II	**Photogrammetry** Definitions and Development of Photogrammetry; Classifications of Photogrammetry; Uses of Photogrammetry; Soft-Copy Photogrammetry- Interior Orientation, Exterior Photogrammetry, Aero-Triangulation.	14
III	**Photographic Scale** Concept of Photographic Scale; Methods for Determining Photo Scale; Scale of a Vertical Photograph over Flat Terrain; Scale of a Vertical Photograph over variable Terrain; Other methods for determining scale of Vertical Photographs; Scale of Tilted Photograph.	16

IV	**Stereo Photogrammetry** Stereo Photogrammetry: Model deformation & Rectification, Relief displacement, vertical exaggeration, Triangulation, Control & Mapping.	14

Suggested Readings:

- American Society of Photogrammetry, 1983: Manual of Remote Sensing (2nd Edition), ASP Falls Church, Virginia.
- Aerial photographic interpretation, Lueder, D.R., McGraw Hill Book Co., 1959 Elements of Photogrammetry, Paul R. Wolf, McGraw-Hill, 2000
- Digital Elevation Model Technologies and Applications: The DEM user Manual,
- David F. Maune (ed), American Society for Photogrammetry and Remote Sensing, Bethesda, MaryLand, USA, 2001.
- Drury S.A, 1990: A Guide to Remote Sensing - Interpreting Images of Earth, Oxford Science Publications, Oxford.
- Lecture notes, 1st module, PRS division IIRS Dehradun.2007
- Leica Photogrammetry Suite – Orthobase and Orthobase Pro User Guide, Leica Geosystems, GIS & Mapping, Atlanta, USA, 2003.
- Lillisand, T.M. And P.W.Kiefer, 1986: Remote Sensing And Image Interpretation, John Wiley & Sons, New York
- Manual Photogrammetry, McGlone, C., Edward, M. and Bethel, J, American Society For
- Photogrammetry and Remote Sensing, Bethesda, MaryLand, USA. 2005.
- Paul R.Wolf, Elements of Photogrammetry, McGraw-Hill Science, 2001.

Suggested Continuous Evaluation Methods: Assignment / Class Test / Quiz (MCQ) / Seminar/ Presentations

Suggested equivalent online courses:.....

Paper Code: GIS 103
Principles of Remote Sensing
Term End Exam:75 Marks Internal Assessment: 25 Marks Marks Total: 100

Credits: 4	Core Compulsory
Max. Marks: 25+75	Min. Passing Marks:

Total No. of Lectures-Tutorials-Practical (in hours per week): L-T-P:4-0-0

Unit	Topics	No. of Lectures
I	**Concepts of Remote Sensing:** Introduction; Definition and Scope; Stages of Remote Sensing data acquisition; Process of Remote Sensing data analysis; T y p e of Remote Sensing- Active and passive remote sensing; Advantages and Limitations of Remote Sensing.	12
II	**Electromagnetic energy:** Introduction; Electromagnetic energy- Electromagnetic spectrum, Radiation Principal's; EMR interaction with Atmosphere- scattering, Absorption and Atmospheric Windows; EMR interaction with earth surface features - reflection, absorption, emission and transmission; Spectral response pattern - vegetation,soil, water bodies.	14
III	**Remote Sensing Platforms and Sensors:** Platforms – Types and their characteristics; Satellites and their characteristics – Geo-stationary andsun-synchronous; Earth Resources	14

	Satellites- LANDSAT, SPOT, IRS, IKONOS, QUICKBIRD satellite series; Meteorological satellites – INSAT, NOAA, GOES; Sensors – Types and their characteristics, Across track (whiskbroom) and Along track (pushbroom) scanning; Optical mechanical scanners –MSS, TM, LISS, WiFS, PAN; Concept of Resolution – Spatial, Spectral, Temporal, Radiometric	
IV	**Image Interpretation** Introduction; Fundamental of Visual Image Interpretation; Elements of Image Interpretation; Image Interpretation strategies; Image Interpretation keys.	10
V	**Remote Sensing Data Requirement and Ground Investigation** Remote Sensing Data Products and their procurement, Ground Truth Collection –Spectral Signatures, Commonly used Ground Truth equipment's - use of Radiometers, Display Forms – Computer printouts, Thematic maps.	10

Suggested Readings:

- Jensen, J.R. 2000, Remote Sensing of the Environment: An Earth resource Perspective. Prentice Hall.
- Joseph George,2003, Fundamentals of remote sensing. Universities Press
- Lillesand, T.M., and Kieffer, R.M., 1987, Remote Sensing and Image Interpretation, John Wiley.
- Sabbins, F.F., 1985, Remote sensing Principles and interpretation. W.H.Freeman and company
- American society for Photogrammetry and Remote Sensing, 1999, Remote Sensing for the Earth Sciences,Manual of Remote Sensing,3rd ed.,vol. 3, Wiley,New York.
- Avery, T.E., and G.L. Berlin,1992, Fundamentals of Remote Sensing and Airphoto Interpretation,5th ed.,Macmillan, New York.
- Campbell, J.B., 1996, Introduction to Remote Sensing, 2nded., Guilford, New York.
- Curran, Paul J., (1985); Principles of Remote Sensing, Longman, London & New York.
- Drury, S.A., Images of the Earth: A Guide to Remote Sensing,2nd ed.,Oxford University Press,Oxford.
- Elachi,C., 1987, Introduction to the Physics and Techniques of Remote Sensing, Wiley, New York.
- Jensen, J.R., (2004); Remote Sensing of the Environment: An Earth Resource Perspective,Pearson Education.
- Joseph, G., 2003: Fundamentals of Remote Sensing, Universities Press, Hyderabad.
- Lillesand, T. and Kiefer, R., 1999: Remote Sensing and Image Interpretation, Wiley, London.
- Mather, P.M. (1999). Computer processing of remotely sensed images: an introduction, Wiley, Chichester.
- Sabins, F.F,Jr., (1997): Remote Sensing: Principles and Interpretation,3rd ed., W.H. Freeman, New York.
- Star, J.L., J.E. Estes, and K.C. McGwire,1997, Integration of GIS and Remote Sensing, Cambridge University Press.

Suggested Continuous Evaluation Methods: Assignment / Class Test / Quiz (MCQ) / Seminar/ Presentations

Suggested equivalent online courses:.....

Paper Code: GIS 104

Digital Image Processing

Term End Exam:75 Marks Internal Assessment: 25 Marks Marks Total: 100

Credits: 4	Core Compulsory
Max. Marks: 25+75	Min. Passing Marks:

Total No. of Lectures-Tutorials-Practical (in hours per week): L-T-P:4-0-0

Unit	Topics	No. of Lectures

I	**Fundamentals of Digital Image** Concepts about digital image and its characteristics, Spectral, Spatial, Radiometric and Temporal resolution, Visual vs. Digital methods, Image data storage and retrieval, Visual and Digital Satellite Image Interpretation, Elements of Image Interpretation, Development of Interpretation Keys, Image restoration and Noise removal, Radiometric and Geometric correction technique, Interpolation methods – linear and nonlinear transformation for geometric corrections	16
II	**Image Enhancement** Image enhancement Techniques - an overview; Image reduction and magnification; Contrast Enhancement - Linear and nonlinear; Band Rationing; Spatial filtering and Edge enhancement; Density slicing; Multi image manipulation – addition, subtraction; Principal Component Analysis; Enhancement by using colours – advantages, Types of colour enhancements; BGR – coding and generation of FCC's; Image transformation-Intensity Hue Saturation (HIS)	16
III	**Image Classification** Principles of Image Classification-Image space, Feature space, Image classification; Image Classification process- Preparation for image classification, supervised image classification, unsupervised image classification, classification algorithms; Fuzzy classification; classification based on Object-oriented Image Segmentation	14
IV	**Accuracy Assessment** Concept of Accuracy Assessment; Source of Errors in remote sensing derived thematic products; Error Matrix; Sampling consideration; Evaluation of Error Matrices; Kappa Analysis;	14

Suggested Readings:

- Jahne, B. 1991 Digital Image Processing New York: Springer-Verlag.
- Jain, A.K. 1989, Fundamentals of Digital Image Processing, Englewood Cliffs, NJ, Prentice Hall.
- Jonson, J.R. 1996, Introductory Digital Image Processing, Printice-Hall, Inc.
- Lillsand, R.M. and R.W. Kiefer, 1999, Remote Sensing and Image Interpretation, 4th Ed., New York: Wiley.
- Mathur, P.M. 1999, Computer Processing of Remotely Sensed Images: an introduction, Wiley, Chichester.
- Mullar J.P. 1986, Digital Image Processing in Remote Sensing, Taylor & Francis.
- Pratt, W.K., 1991, Digital Image Processing 2nd ed., New York Wiley.
- Richards, J.A, 1986, Remote Sensing Digital Image Analysis, New York: Springer-Verlag.
- Russ, J.C. 1992, Image Processing Handbook. Boca Raton, FL: CRC Press.
- Schowengerdt, R.A., 1983, Techniques for image processing and classification in Remote Sensing, New York: Academic Press

Press.

Suggested Continuous Evaluation Methods: Assignment / Class Test / Quiz (MCQ) / Seminar/ Presentations

Suggested equivalent online courses:.....

Paper Code: GIS 105
Earth Positioning System
Term End Exam: 75 Marks Internal Assessment: 25 Marks Total: 100 Marks

Credits: 4	Core Compulsory
Max. Marks: 25+75	Min. Passing Marks:
Total No. of Lectures-Tutorials-Practical (in hours per week): L-T-P:4-0-0	

Unit	Topics	No. of Lectures
I	**Introduction** Introduction; History of Navigation and Positioning; Objectives, Types of Earth's, Positioning System- GPS, GALILEO, GLONASS and GAGAN; Comparison of Main Parameters for GPS, GLONASS GALILEO and GAGAN.	12
II	**Datum, Coordinate Systems and Map Projections** Basics Geodesy, Geoid/ Datum/Ellipsoid-Definition and Basic Concepts; Datum Transformations;Map Projections.	12
III	**Fundamentals of Positioning Systems** GPS Components – space segment, control segment, user segment; GPS Receiver and its Types -;GPS Errors. GPS Positioning Modes: GPS point positioning, GPS relative positioning; RTK GPS, Factor affecting GPS accuracy	14
IV	**Differential Positioning System (DGPS):** Components, Function and applications. Differential RTK, Differential Real Time, Wide Area Augmentation System (WAAS).	12
V	**Applications of GPS** Route Navigation, Forestry and Natural Resources, GPS Tracking, Utility, Mapping, Civil Engineering, Cadastral Surveying and Seismic Applications	10

Suggested Readings:

- N.K. Agrawal, (2004), Essentials of GPS, Spatial Network Pvt. Ltd.
- Sathish Gopi, (2000) , GPS and Surveying using GPS
- Leica A., (2003), GPS Satellite Surveying, John Wiley & Sons, Use New York
- Terry- Karen Steede, (2002), Integrating GIS and the Global Positioning System, ESRI Press

Suggested Continuous Evaluation Methods: Assignment / Class Test / Quiz (MCQ) / Seminar/ Presentations
Suggested equivalent online courses:…….

Paper Code: GIS 106
PRACTICAL
Term End Exam: 75 Marks Internal Assessment: 25 Marks Total: 100 Marks

Credits: 4	Core Compulsory
Max. Marks: 25+75	Min. Passing Marks:
Total No. of Lectures-Tutorials-Practical (in hours per week): L-T-P:4-0-0	

Unit	Topics	No. of Lectures
I	1. Familiarization with Image Processing software. 2. Visualization; Import and export of Toposheet and satellite data to various formats. 3. Georeferencing of data- image to image, image to maps 4. Layer Stacking of Multispectral Imagery	16
II	5. Creating subset of image. 6. Resolution merge and Mosaic. 7. Displaying individual pixel value and image information. 8. Image enhancement techniques- image contrast, histogram equalization and density slicing.	14
III	9. Band Rationing; Filtering techniques; Principal Component Analysis. 10. Classification – supervised and unsupervised. 11. Recoding of Pixels 12. Accuracy Assessment 13. Change detection.	16
IV	14.Determination of Latitude, Longitude and height by GPS. 15. Collection of Waypoints through GPS. 16.Tracking through GPS. 17. Downloading handheld GPS data into software.	14
	Distribution of Marks of Practical Examination (i) Mid-term Lab work……25 Marks (ii)Annual Lab Work…… 25 Marks (iii)Record Book…….…… 25 Marks (iv)Viva –Voice…… 25 Marks	
Suggested Continuous Evaluation Methods: Assignment / Class Test / Quiz (MCQ) / Seminar/ Presentations		
Suggested equivalent online courses:…….		

Paper Code: GIS 201
Digital Image Processing
Term End Exam:75 Marks Internal Assessment: 25 Marks Marks
Total: 100
Term End Exam: 75 Marks Internal Assessment: 25 Marks Total: 100 Marks

Credits: 4	Core Compulsory
Max. Marks: 25+75	Min. Passing Marks:
Total No. of Lectures-Tutorials-Practical (in hours per week): L-T-P:4-0-0	

Unit	Topics	No. of Lectures
I	**Introduction to GIS** Basic concepts: Definition and history, Components of GIS, Recent trends and applications of GIS; Data structure and formats, Spatial data models – Raster and vector, Data base design- editing and topology creation in GIS, Linkage between spatial and non-spatial data, Data inputting in GIS. Rectification, Transformation Methods; Root Mean Square (RMS) Error.	12
II	**Data Types and Data Models** Data Types; Spatial Data; Non-Spatial Data, Data Input; Existing GIS Data, Metadata; Conversion of Existing Data, Creating New Data, Data Models; Vector Data Model; Raster Data Model; Integration and Comparison of Vector and Raster Data Models.	10
III	**Spatial Data Editing** Types of Digitizing Errors, Causes for Digitizing Errors; Topological Editing and Non-topological Editing; Other Editing Operations; Editing Using Topological Rules.	8
IV	**Attribute Data and Data Exploration** Attribute Data in GIS, Attribute Data Entry, Manipulation of Fields and Attribute Data, Data Exploration; Attribute Data Query, Raster Data Query, Map- Based Data Manipulation,	10
V	**Spatial Analysis** Spatial Data: Definition, Analysis, Processes & Steps, Software and Tools, Geodatabase Model, Role of Databases in GIS, Creating, Editing and Managing, Classification scheme of Vector- Based and Raster-Based GIS Operation Raster- Based Techniques: Methods of reclassification, overlay analysis, Digital Terrain Analysis and Modeling-TIN and DEM, Surface representation and analysis, Slope and Aspect, Geographic Visualization Data Classification, Map Comparison,	10
VI	**Geo Statistical Analysis Techniques:** Introduction to Spatial Interpolation: Control Points, Global Method-Trend surface analysis,	10

	regression model, local methods- Thiessen polygons, density estimation, Inverse Distance weighted Interpolation, Kriging- Ordinary Kriging and Universal Kriging, GIS and decision support system,Introduction to AHP, basic principal of AHP. Principal and components of multiple criteria decision making	
	Suggersted Readings: □ kang-tsung Chang (2007), 'Introduction to Geographic Information Systems' Tata MCGraw Hill, New Delhi. □ C.P.Lo and Albert K.W. Yeung (2006) "Concepts and Techniques of Geographic information Systems" Prentice Hall of India, New Delhi □ Burrough, Peter A. and Rachael McDonnell, (1998), 'Principles of Geographical Information Systems' Oxford University press, New York. □ Magwire, D.J. Goodchild, M.F. and Rhind, D.M., (2005), 'Geographical Information Systems: Principles and Applications', Longman Group, U.K. □ Burrough, P.A., 1986, Geographical Information System for land Resources System, Oxford Univ. Press, UK. □ Fotheringham, S.; Rogerson, P. (ed.), 1994. Spatial analysis and GIS. Taylor and Francis, London, UK. □ Laurini, Robert and Dierk Thompson, 1992, Fundamentals of Spatial Information Systems, Academics Press, ISBN 0-12-438380-7. □ Maguire,D.J.; Goodchild, M.F.; Rhind,D.W. 1991.Geographical information System, Longman, London,UK □ Siddiqui, M.A.; 2006, Introduction to Geographical Information System, Sharda Pustak Bhavan, Allahabad. □ Siddiqui, M.A.; 2011, Concepts and Techniques of Geoinformatics, Sharda Pustak Bhavan, Allahabad.	
Suggested Continuous Evaluation Methods: Assignment / Class Test / Quiz (MCQ) / Seminar/ Presentations		
Suggested equivalent online courses:.....		

Paper Code: GIS 202
Computer Cartography
Term End Exam: 75 Marks Internal Assessment: 25 Marks Total: 100 Marks

Credits: 4	Core Compulsory
Max. Marks: 25+75	Min. Passing Marks:
Total No. of Lectures-Tutorials-Practical (in hours per week): L-T-P:4-0-0	

Unit	Topics	No. of Lectures
I	**Introduction** Introduction to cartography: nature and scope, Significance of Computer Mapping, Mapping in a Digital Age. Categories & Characteristics of maps, Study of different	16

	types of maps, Basics of Map scales, Component of Map, Conventional mapping VS Digital Mapping	
II	**Toposheet** Survey of India national series maps Interpretation of topographic maps, Indexing and Numbering of topographical maps,	14
III	**Map Generalization** Concepts and Definition of Map Generalization, Factors Influencing, Generalization, Different operation in Generalization; Semantic Generalization; Geometric Generalization	14
IV	**Map Design** Fundamentals of Cartographic Design, Colour, Pattern, lettering, compilation, border information, aesthetics, Generalization: Semantic & Geometric, Symbolization, dot, isopleth and choropleth mapping, Multivariate and dynamic mapping, Map production, methods of map printing	16
	Suggested Readings: □ Robinson, A. H., 1995. Elements of Cartography, 6th ed. New York: Wiley □ Jones, Christopher. 1997. Geographical Information Systems and Computer Cartography, Addison Wesley Longman Limited, Edinburgh Gate, England □ Dent, Borden, D., Torguson, Jeff, and Thomas W. Hodler, 2008. Cartography, Thematic Map Design, 6th ed., McGraw-Hill Higher Education, Toronto. □ Peterson, Gretchen N. 2014. GIS Cartography, A Guide to Effective Map Design, 2nd ed., CRC Press, Taylor & Francis Group, New York. □ Keates, J.S., (2008) : Cartographic Design and Production, London, Longman □ Ramesh, P.A., (2004): Fundamentals of Cartography, Concept Publishing Co., New Delhi □ Rampal, K.K., (2004): Mapping and Compilation, Concept Publishing Co., New Delhi. □ Anson, R.W. & Ormeling, F.J., (2008), Basic Cartography, Vol. 1, 2nd ed., Elsevier Applied Science Publishers, London. □ Robinson A.H. & Morrison J.L. \, (1995) Elements of Cartography, John Wiley & Sons □ Singh, R.L & Dutt. P.K., (2008), :Elements of Practical geography", Students Friends Allahabad □ Peterson, M.P., (1995) "Interactive and Animated Cartography" Upper Sadde River, NJ: Prentice Hall.	

Suggested equivalent online courses:.....

Paper Code: GIS 203
Advanced Remote Sensing & GIS
Term End Exam: 75 Marks Internal Assessment: 25 Marks Total: 100 Marks

Credits: 4	Core Compulsory
Max. Marks: 25+75	Min. Passing Marks:

Total No. of Lectures-Tutorials-Practical (in hours per week): L-T-P:4-0-0		
Unit	**Topics**	**No. of Lectures**
I	Thermal Remote Sensing, Microwave Remote Sensing, Radar Environment Considerations, LIDAR, Hyperspectral, Application of Advance Remote Sensing.	14
II	**Web GIS** Concepts and Principles of Web GIS; Definition and History of Web GIS; Significance of Web GIS; Transferred Geo data, Interactive Web Maps, Internet Map Services, Web GIS Architectures, Web GIS development, Requirement Analysis, Conceptual design, Web GIS system Integration, Open Source GIS; Web Based Geo Portal, India Geoportal; State Geoportal and District Geoportal. Vehicle Tracking System, Mobile mapping, Location Based Services, Intelligent transportation systems	16
III	**GIS Modeling** Concepts and Principles of GIS Model, Types of GIS models, Modeling Process, Application of GIS Molding.	14
IV	**Mobile GIS** Mobile GIS- Concepts, Portable PCs Personal digital assistance (PDAs) or Palm Top, Mobile Phone, Arc GIS Mobile, Characteristics of Mobile GIS, Benefits of Mobile GIS, Mobile Applications.	16
	Suggested Readings: ☐ Richards, J. A., Jia, X. (2000): Remote Sensing and Digital Image Processing, Springer, Verlag Berlin ☐ Chand, B., Majumdar, D. D. (2001): Digital Image Processing Analysis Prentice-Hall of India, New Delhi ☐ Jensen, J. R. (2005): Introductory Digital Image Processing, Prentice Hall, New Jersey ☐ Lillesand, T. M., Kiefer, R. W., Chipman, J. W. (2008): Remote Sensing and Image Interpretation, John Wiley & Sons, New Delhi ☐ Sabins, F. F. (1996): Remote Sensing: Principles Interpretation, W.H. Freeman Company, New York ☐ Navalgund, R. R. Ray, S. S. (2011): Hyperspectral Data, Analysis Techniques Application, Indian Society of Remote Sensing, Dehradun ☐ Demers, M. N. (2000): Fundamentals of Geographic Information Systems, John Wiley & Sons, New Delhi ☐ Burrough, P. A. and McDonnell, R. A. (2000): Principles of Geographical Information Systems, Oxford University Press, New York ☐ Malczewski, J. (1999): GIS Multi-criteria Analysis, John Wiley & Sons, New York ☐ Chang, K. T. (2008): Introduction to Geographic Information Systems, Avenue of the Americas, McGraw-Hill, New York ☐ Williams, J. (1995): Geographic Information from Space: Processing Applications of Geocoded Satellite Images, John & Wiley Sons, New Delhi ☐ Environmental Systems Research Institute, Inc. (1998): Understanding GIS: The ARC/INFO Method, ESRI Press, Redlands	

Suggested equivalent online courses:.....

Paper Code: GIS 204
Research Methodology and Application of Remote Sensing and GIS Techniques in Research
Term End Exam: 75 Marks Internal Assessment: 25 Marks Total: 100 Marks

Credits: 4	Core Compulsory
Max. Marks: 25+75	Min. Passing Marks:
Total No. of Lectures-Tutorials-Practical (in hours per week): L-T-P:4-0-0	

Unit	Topics	No. of Lectures
I	**Brief description of research,** Concepts and Principles of research, Objectives of research; Types of research; Significance of research; Definition of research problem, Technique involved in defining a problem Identification of problems of regional and local level. .	8
II	**Research and Sampling Design** Meaning of Research Design; Basic Principles of Experimental Designs; Important Concepts Relating to Research Design; Implications of a sample design; Basic step of sample design; Type of sample design.	8
III	**Data Collection** Collection of primary data; collection of secondary data; Types of data collection; Advantage and limitation of case study; Reporting of results, References.	8
IV	**Research Project Proposal and Report Writing** Writing of proposals, Objectives of project, Research questions, Scope of project, Brain storming sessions, Review of similar studies and present level of research, Time scheduling (PERT), Financial estimates, Submission of proposal; Significance of Report Writing; Mechanics of Writing a Research Report	10
V	**Fundamental Remote Sensing Application in Land and Water Resources** Emergence of Remote Sensing technology in application areas; Remote sensing in mapping Land use / land cover classification and monitoring; Forest resources management; Principles and approaches of crop inventory and crop production forecasting; Soil classification as per soil taxonomy; Hydrological Cycle-Types of precipitation and the analysis.	8
VI	**Application in Climate Change and Disaster Management** Concept of climate and weather, Climatic classification, Mapping of	8

Paper Code: GIS 205
Practical
Term End Exam: 75 Marks Internal Assessment: 25 Marks Total: 100 Marks

Credits: 4	Core Compulsory
Max. Marks: 25+75	Min. Passing Marks:

Total No. of Lectures-Tutorials-Practical (in hours per week): L-T-P:4-0-0

Unit	Topics	No. of Lectures
I	1. Geodatabase creation 2. Spatial data Integration (Digitization) – point, line, polygon. 3. Non-Spatial Data Integration.	16
II	4. Editing of Spatial & Non-Spatial data. 5. Building Topology; Data Query. 6. Texture & Object based classification & Modeling.	16
III	7. Raster Data calculations. 8. Accuracy assessment. 9. Mapping and editing.	16
IV	10. Cartographic Symbolization, Generalization of Maps. 11. Types of Maps. 12. Map Design or Layout, Map Production.	12

Distribution of Marks of Practical Examination
(i) Lab Work.....50 Marks (Time-2 hours)
(ii) Record Book.....25 Marks
(iii)Viva –Voice.....25 Marks
Suggested equivalent online courses:.....

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Paper Code: GIS 206
Project Oriented Dissertation

Credits: 4	Core Compulsory
1. Project Evaluation: 25 2. Project Presentation: 25 3. Project Viva Voice: 50	Min. Passing Marks:

Total No. of Lectures-Tutorials-Practical (in hours per week): L-T-P:4-0-0

Unit	Topics	No. of Lectures
	The Subject/ topic of the project work, related to the problems will be allotted to each student in the beginning of the 2nd Semester. The students, in consultation with their respective supervisors, may give their choice of preference of problem/ topic/ area. However, the decision of the Head/ Course Coordinator shall be final. Each student will be required to work independently on the problem assigned including literature consultation, data collection, fieldwork and/ or training, laboratory investigations, report writing etc., under the guidance of his/ her supervisor. The students will have to submit to the department three typed (bound) copies of his/ her work, in the form of Project Report. After the evaluation, a copy a which will be returned to the concerned supervisor and the student separately. The Project topic should consist of the following: □ Relevance of the problem to be studied and its aims and objectives, □ Review of Literature □ Methodology adopted to study such problem □ Data acquisition / collection □ Field work □ Data processing □ Results and interpretation □ Limitation of work □ Finding and Conclusion	60
	presentation: - On satisfactory completion of the Project, each student is required to defend his/ her thesis through a power point presentation in front of an external expert and faculty and students which will be followed by Viva-Voce. This should be a substantial piece of research work, which both reinforces the skills learned in the taught component of the course and provides a genuine opportunity to undertake valuable- research.	

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