NATIONAL EDUCATION POLICY-2020

Common Minimum Syllabus for all Uttarakhand State Universities and Colleges

Syllabus Proposed
2023-24

Sri Dev Suman Uttarakhand University
Badshahithol, Tehri (Garhwal)

पाठ्यक्रम निर्माण समिति, उत्तराखण्ड
Curriculum Design Committee, Uttarakhand

क्र0 सं0	नाम एवं पद	
1	**प्रो0 एन0 के0 जोशी** कुलपति, श्रीदेव सुमन उत्तराखण्ड विश्वविद्यालय, टिहरी	**अध्यक्ष**
2	कुलपति, कुमाऊँ विश्वविद्यालय, नैनीताल	**सदस्य**
3	**प्रो0 जगत सिंह बिष्ट** कुलपति, सोबन सिंह जीना विश्वविद्यालय, अल्मोड़ा	**सदस्य**
4	**प्रो0 सुरेखा डंगवाल** कुलपति, दून विश्वविद्यालय, देहरादून	**सदस्य**
5	**प्रो0 ओ0 पी0 एस0 नेगी** कुलपति, उत्तराखण्ड मुक्त विश्वविद्यालय, हल्द्वानी	**सदस्य**
6	**प्रो. एम0 एस0 एम0 रावत** सलाहकार–रूसा, रूसा निदेशालय, देहरादून	**सदस्य**
7	**प्रो0 के0 डी0 पुरोहित** सलाहकार–रूसा, रूसा निदेशालय, देहरादून	**सदस्य**

NATIONAL EDUCATION POLICY-2020

Common Minimum Syllabus
for all Uttarakhand State Universities and Colleges for BA of Higher Education

PROPOSED STRUCTURE OF 4th YEAR UG
GEOGRAPHY SYLLABUS

2023

Curriculum Design Committee, Uttarakhand

Sr.No.	Name & Designation	
1	Prof. N.K. Joshi Vice-Chancellor , Kumaun University Nainital	Chairman
2	Prof. O.P.S. Negi Vice-Chancellor , Uttarakhand Open University	Member
3	Prof. P. P. Dhyani Vice-Chancellor , Sri Dev Suman Uttarakhand University	Member
4	Prof. N.S. Bhandari Vice-Chancellor, Soban Singh Jeena University Almora	Member
5	Prof. Surekha Dangwal Vice-Chancellor, Doon University, Dehradun	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. 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

Geography
NEP Graduation Programme (BA) 4th Year

Year	Sem.	Course/Paper	Credit	Geography Minor	Research Project	Credit	Total Credits
Fourth Year	I	GEOG701T Geomorphology	4	GEOG707M Climate Change and Adaptation(T)	GEOG706Pr Project	4	52
		GEOG702T Natural Resource Management	4				
		GEOG703T Climatology	4				
		GEOG704T Soil Geography	4				
		GEOG705P Surveying and Research Methodology	4				
	II	GEOG801T Social and Cultural Geography	4		GEOG806Pr 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: I** **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: 25 Internal Assessment 75 Term End Exam.	

Unit	Course Content	No. of 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
Uni t – 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 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.
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).
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: I 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: 25 Internal Assessment 75 Term End Exam.	

Unit	Course Content	No. of Lectures
Unit – I	Basic Framework: Concept, Definition, Classification of natural resources, Process of resource development.	10
Uni t – 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
Highsmith, R.M.(Jr.) Case Studies in World Geography
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
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: I 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: 25 Internal Assessment 75 Term End Exam.	

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
Uni t – 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 MadhyamKaryanvayNidishalya, 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, PrayagPustak Bhawan, Allahabad

Programme: Under Graduate in Arts	Year: IV	Semester: I 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: 25 Internal Assessment 75 Term End Exam.	

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: I Practical
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: I 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: I / II
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.

Credits: 04	Max. Marks: 25 Internal Assessment 75 Term End Exam.

Unit	Course Contents	No. of 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

Suggested Readings

J. Oliver and J. Hidore (2001): Climatology-An Atmospheric Science (second edition).
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

Second Semester

Programme: Under Graduate in Arts	**Year: IV**	**Semester: II** **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		
Credits: 04	Max. Marks: 25 Internal Assessment 75 Term End Exam.	

Unit	Course Content	No. of 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
Uni t – II	PROCESSES: 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: II 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.		
Credits: 04	Max. Marks: 25 Internal Assessment 75 Term End Exam.	

Unit	Course Content	No. of 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.

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.

Programme: Under Graduate in Arts	Year:IV	Semester: II 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.		
Credits: 04	Max. Marks: 25 Internal Assessment 75 Term End Exam.	

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: II Paper- IV
Subject: Geography		
Course Code: GEOG804T	**Course Title: GIS AND GPS Applications**	
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.		
Credits: 04	Max. Marks: 25 Internal Assessment 75 Term End Exam.	

Unit	Course Content	No. of 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: II Practical
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: II 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.