

# M.Sc Geography

(Effective from the admitted batch of 2021-22)

## Scheme and Syllabus



**DEPARTMENT OF GEOGRAPHY  
COLLEGE OF SCIENCE AND TECHNOLOGY  
ANDHRA UNIVERSITY, VISAKHAPATNAM**

### M.Sc. Geography - Curriculum ( w.e.f Academic Year 2021-22 )

Semester	Paper Code	Core/ Elective	Title	Hours/ Week	Max. Marks			Credit points	Total credits
					Semester Exam	Internal Assessment	Total Marks		
FIRST	Gr 101	Core Paper 1	Geomorphology	4	80	20	100	4	
	Gr 102	Core paper 2	Economic Geography	4	80	20	100	4	
	Gr 103	Core Paper 3	Geography of India and Andhra Pradesh	4	80	20	100	4	
	Gr 104	Core Paper 4	Principles of Cartography	4	80	20	100	4	
	Gr 105	Practical 1	Map Analysis	3	100		100	2	
	Gr 106	Practical 2	Cartography	3	100		100	2	
				<b>Total Credits</b>				<b>600</b>	
SECOND	Gr 201	Core paper 1	Climatology and Oceanography	4	80	20	100	4	
	Gr 202	Core Paper 2	Geographical Thought	4	80	20	100	4	
	Gr 203	Core Paper 3	Urban Geography	4	80	20	100	4	
	Gr 204	Core Paper 4	Principals of Remote Sensing	4	80	20	100	4	
	Gr 205	Practical 1	Interpretation of Aerial Photographs	3	100		100	2	
	Gr 206	Practical 2	Climatic Data Analysis	3	100		100	2	
				<b>Total Credits</b>				<b>600</b>	
	Gr 301	Core Paper 1	Population Geography	4	80	20	100	4	
	Gr 302	Core Paper 2	Environmental Geography	4	80	20	100	4	
			<b>Any one of the Following</b>						

<b>THIRD</b>	Gr 303-A Gr 303-B Gr 303-C	Elelective Paper - 1	A Pedology & Hydrology B Applied Climatology C Geography of Health	4	80	20	100	4	
			<b>Any one of the Following</b>						
	Gr 304-A Gr 304-B Gr 304-C	Elective Paper- 2	A Disaster Management Studies B Geography of transportation C Cultural Geography	4	80	20	100	4	
	Gr 305	Practical 1	Quantitative Techniques In Geography	3	100		100	2	
	Gr 306	Practical 2	Image processing	3	100		100	2	
	Gr 307	MOOCs					100	4	
	Gr 408	Intellectual Property Rights (IPR)					50 *	2 *	
		<b>TOTAL</b>				<b>700</b>		<b>24</b>	
<b>FOURTH</b>	Gr 401	Core paper 1	Regional Planning And Development	4	80	20	100	4	
	Gr 402	Core paper 2	Geographic Information Systems	4	80	20	100	4	
			<b>Any one of the Following</b>						
	Gr 403- A Gr 403 -B Gr 403-C	Elelective Paper	A Agricultural Geography B Biogeography C Political Geography	4	80	20	100	4	
	Gr 404	<b>Project Work</b>	Dissertation & Viva-voce		75+25		100	4	
	Gr 405	Practical 1	Terrain Analysis	3	100		100	2	
	Gr 406	Practical 2	Geographic Information Systems	3	100		100	2	
	Gr 407	MOOCs					100	4	
	Gr 408	Value Added Course					50 *	2 *	
		<b>TOTAL</b>				<b>700</b>		<b>24</b>	
		<b>Grand Total</b>				<b>2600</b>		<b>88</b>	
		* Not to be considered for CGPA							

## **THE PROGRAMME :**

M.Sc. Geography is a two year programme spread over four semesters, and comprise 15 theory papers (courses) (4 credits per paper), 8 practicals ( 2 credits each) and a Project work (4 credits). Each semester comprises 4 theory papers and 2 practicals

The theory papers are grouped into Core (compulsory) and Elective papers. All theory papers in First and Second Semesters are Core papers and cover fundamentals of both physical and human Geography. Three Elective papers (2 in Third Semester & 1 in Fourth Semester) are offered in the final year of the programme. Students can elect any paper from the given list of options.

Project work is mandatory and students have to submit a dissertation based on assigned project work, at the end of Fourth Semester

Students have to pursue a MOOCs (4 credits) and a IPR/Value added course (2 credits) which are mandatory in both Third and Fourth Semesters. However the credits of IPR/Value added courses are not inclusive of CGPA.

## **PROGRAMME OUTCOMES (POs):**

M.Sc. Geography programme offered by the Department of Geography, College of Science and Technology, Andhra University aims to empower the students with:

- PO 1 Sound knowledge about the earth's physical and biospheres and their interactions.
- PO 2 Understanding of the philosophy of geography and the components of human geography - demographic, socio economic, political and geographic characteristics of the world and India in particular.
- PO 3 Understanding of the distribution of economic activity and resources, their utilization and sustainable management
- PO 4 Data analysis, map making and interpretation skills
- PO 5 Introduce the geospatial technologies and their applications.

## **PROGRAMME SPECIFIC OUTCOMES ( PSOs)**

**PSO1** In depth knowledge of the geographical facts, fundamental concepts, processes, interaction, principles, theories, distributions, trends and contemporary issues.

**PSO 2** Sound Understanding of the dynamic interrelationship between the components of human and physical geographies.

**PSO3** Enhance the ability to analyse the demographic characteristics, and the interface between population, environment and society and understand the need for appropriate policies for balancing the equilibrium.

## **LEARNING OUTCOMES:**

**LO1** Empowered with comprehensive geographic knowledge and analytical skills the students will be able to draw conclusions and generalize the spatial phenomena or distributional patterns.

**LO2** Will acquire better understanding of the physical environment and their interrelations, climate change and global warming consequences.

**LO3** Will acquire unique and advanced skills related to map making which includes acquisition, analysis, processing and representation of geographical information.

**LO4** Will be able to adapt holistic and integrated approaches, use appropriate tools and techniques for generating policies and plans for a sustainable development.

**LO5** Will have distinctive ability to apply the geographic knowledge and geospatial technologies to analyse and assess the vulnerability, frequency of occurrence, intensity, monitoring and management of natural hazards and disasters and also to assess the environmental impact (EIA) of developmental projects.

**M.SC. GEOGRAPHY**  
**Syllabus (w.e.f. Academic Year 2021-22)**

**FIRST SEMESTER**

<b>Core/ Elective</b>	<b>Title</b>
Core Paper 1	Geomorphology
Core paper 2	Economic Geography
Core Paper 3	Geography of India and Andhra Pradesh
Core Paper 4	Principles of Cartography
Practical 1	Map Analysis
Practical 2	Cartography

<b>PROGRAMME</b>	M.SC. GEOGRAPHY
<b>SEMESTER</b>	FIRST SEMESTER
<b>PAPER TITLE</b>	GEOMORPHOLOGY
<b>PAPER CODE</b>	GR 101
<b>CORE/ELECTIVE</b>	CORE PAPER
<b>MAXIMUM MARKS</b>	100
<b>CREDITS</b>	4

**COURSE OUTCOMES (COs):**

- CO1 Students will learn the fundamental concepts of Geomorphology.
- CO2 They acquire knowledge of the interior of earth, theories and concepts related to the dynamics of lithosphere and formation of first and second order landforms.
- CO3 They will have In depth understanding of endogenetic forces, processes and the related landforms
- CO4 Sound knowledge of Denudation, agents of erosion and the associated landforms.
- CO5 Will learn the application of geomorphic knowledge in various fields.

**COURSE SPECIFIC OUTCOMES (CSOs):**

- CSO1 Students will acquire sound knowledge of the geomorphic concepts, plate tectonics , drift of continents and origin of major landforms
- CSO2 They will be able to analyse the endogenetic and exogenetic processes and the consequences.
- CSO3 They will be able to analyse the terrain characteristics for various purposes.

**LEARNING OUTCOMES (LOs):**

- LO1 Students will be able to thoroughly understand the fundamental concepts, tectonic movements, establish the causes and effects of the geomorphic processes and explain the evolution of landforms.
- LO2 Students will be able to explain the formation and destruction of crustal blocks.
- LO3 Students will be able to apply the geomorphic knowledge to analyse the terrain, drainage and the landforms for undertaking various developmental, engineering and environmental projects including Environmental Impact Assessment (EIA).
- LO4 Students will be able to identify the location, occurrence, frequency and intensity of Catastrophic events - earthquakes, volcanic activity, landslides, avalanches etc.
- LO5 Students will be able to identify the location of potential land and mineral resources

<b>GR 101</b>	<b>GEOMORPHOLOGY</b>
<b>UNIT</b>	<b>CONTENTS</b>
UNIT-I	Fundamental concepts in Geomorphology Geological Timescale Interior structure of the Earth Cycle of erosion: Concepts of Davis and Penck
UNIT-II	Isostasy: Concepts of Airy and Pratt Continental Drift: Wegner's theory Mountain Building: Concepts of Daly and Holmes, Kober Plate Tectonics Seafloor spreading
UNIT-III	Holme's Thermal Convection Current Theory Endogenetic Movements: Folds & Faults Earthquakes Volcanism and Landforms
UNIT-IV	Types of rocks Processes of Denudation: Weathering Mass wasting Erosion Denudation Chronology : Etch plain, Peneplain, Pediplain,
UNIT -V	Landforms: Streams, Wind, Waves , Glaciers, Karst  Applied geomorphology : Terrain analysis Mineral and oil exploration, Engineering projects, Drainage network analysis

**Text Books:**

A.H. Strahler & A.N. Strahler. Modern Physical Geography, John Wiley and Sons, 1992  
W.D. Thornbury. Principles of Geomorphology, John Wiley & Sons, 1958  
Savindra Singh. Geomorphology. Prayag Pustak Bhawan, Allahabad, India, 2002

**References :**

A.K. Lobeck. Geomorphology, McGraw Hill Book Co. 1930.  
A. F. Fitty. Introduction to Geomorphology, Methuen & Co., London, 1971.  
Wooldridge, S.W. & Morgan, R.S. An outline of Geomorphology, London, 1969.  
J.A. Steers. The Unstable Earth, Lyell Book Dept, Ludhiana, 1961.  
Dayal, P. A text book of Geomorphology, Shukla Book Dept, Patna, 1976.  
Kale V. and Gupta, A. Elements of Geomorphology. Oxford University Press, Calcutta. 2001  
R.J. Chorley and B.A. Kennedy, physical Geography, Prentice Hall, 1971.



<b>PROGRAMME</b>	<b>M.SC. GEOGRAPHY</b>
<b>SEMESTER</b>	<b>FIRST SEMESTER</b>
<b>PAPER TITLE</b>	<b>ECONOMIC GEOGRAPHY</b>
<b>PAPER CODE</b>	<b>GR 102</b>
<b>CORE/ELECTIVE</b>	<b>CORE PAPER</b>
<b>MAXIMUM MARKS</b>	<b>100</b>
<b>CREDITS</b>	<b>4</b>
<p><b>COURSE OUTCOMES (COs):</b></p> <p>CO1 Students will know about the broad classification of economic geography and their dependency on the location of resources.</p> <p>CO2 Students will understand the importance of factors that govern location of activities</p> <p>CO3 They will acquire knowledge on Industrial location theories</p> <p>CO4 They will learn about role of transport and market in economic development.</p> <p>CO5 They will understand about the nexus between economic development and environment.</p>	
<p><b>COURSE SPECIFIC OUTCOMES (CSOs):</b></p> <p>CSO1 Students will be able to know about the variations in economic activities and its guiding factors</p> <p>CSO2 They will be able to analyse role of location and distribution of resources in successful operation of economic activities.</p> <p>CSO3 They will be able to determine interlink between different geographical forces that regulate economic activities</p>	
<p><b>LEARNING OUTCOMES (LOs):</b></p> <p>LO1 Students will be able to segregate different types of economy and their specific requirements for its successful operation.</p> <p>LO2 Students will be able to explain the role of transport cost on land use type.</p> <p>LO3 Students will be able to make a choice of location for profitable operation of industries.</p> <p>LO4 Students will be able to select the right mode of transport according to distance, time and cost.</p> <p>LO5 Students will be able to segregate activities that may result in deterioration/ improvement of the environment.</p>	

<b>GR 102</b>	<b>ECONOMIC GEOGRAPHY</b>
<b>UNIT</b>	<b>CONTENTS</b>
UNIT-I	Scope and content of economic geography Relation of economic Geography with other branches of social sciences Location of Economic activities: Primary, Secondary and Tertiary Spatial organization of Economic Activities
UNIT-II	Factors of location of Economic Activities: Physical, Social Economic and Cultural Concept and Techniques of Delimitation of Agricultural Regions Von Thunen's model and its validity in the modern world
UNIT-III	Classification of Industries Theories of Industrial location: Weber Losch Study of selected industries: Iron and Steel Industries Cotton Textile Industries
UNIT-IV	Transportation and transport cost Accessibility and connectivity Typology of Markets Market networks/systems : rural areas, urban areas
UNIT -V	Economic development of India Regional disparities Impact of green revolution on Indian economy Globalization and Indian economy Globalization and its impact on environment

**Text Books:**

Wheeler, J.O. et al. Economic Geography. John Wiley, New York, 1995.  
Berry, J.L. Geography of Market Centers and Retail Distribution. Prentice Hall, New York, 1967.  
Hartshorn, T.N. and Alexander, J.W. Economic Geography. Prentice Hall, New Delhi. 1988.

**References :**

Chatterjee, S.P. Economic Geography of Asia. Allied Book Agency, Calcutta, 1984.  
Chorley, R.J. and Haggett, P. (ed). Network Analysis in Geography, Arnold, 1969.  
Dreze, J. and Sen, A. India-Economic Development and social opportunity, Oxford University Press, New Delhi, 1996  
Eckarsley, R. (ed). Markets, the state and the Environment t. McMillan, London, 1995.  
Garnier, D.J. and Delobez. A Geography of Marketing. Longman, London, 1979.  
Hamilton, F.E.I. Spatial perspectives on industrial organization and decision making. John Wiley, New York, 1974.  
Hamilton, I. (ed) Resources and Industry. Oxford University press, New York, 199.  
Hurst, E. Transport Geography – Comments and Reading, McGraw Hill, New York, 1974.  
Morgan, W.B. and Muntion, R.J.C. Agricultural Geography, Methuen, London, 1977  
Pachuri, R.K. Energy and Economic Development in India. Praeger, New York, 1977.  
Robertson, D. (ed). Globalization and Environment. E. Elgar, Co., U.K., 2001.  
Rostow, W.W. The stages of Economic Growth. Cambridge University press, London, 1960.  
Sing, J. and Dillon, S.S. Agricultural Geography, McGraw Hill India, New Delhi, 1984.  
Symons, L. Agricultural Geography, Bell and Sons, London, 1972.

<b>PROGRAMME</b>	<b>M.SC. GEOGRAPHY</b>
<b>SEMESTER</b>	<b>FIRST SEMESTER</b>
<b>PAPER TITLE</b>	<b>GEOGRAPHY OF INDIA AND ANDHRA PRADESH</b>
<b>PAPER CODE</b>	<b>GR 103</b>
<b>CORE/ELECTIVE</b>	<b>CORE PAPER</b>
<b>MAXIMUM MARKS</b>	<b>100</b>
<b>CREDITS</b>	<b>4</b>
<b>COURSE OUTCOMES (COs):</b>	
<p>CO1 To provide insights into the physical settings of India.</p> <p>CO2 To educate students on natural vegetation and agricultural setup of the country.</p> <p>CO3 To impart knowledge of resources and industries of India.</p> <p>CO4 To provide in depth knowledge on the demographic and socio-economic aspects of India.</p> <p>CO5 To provide a comprehensive geographic knowledge of Andhra Pradesh State.</p>	
<b>COURSE SPECIFIC OUTCOMES (CSOs):</b>	
<p>CSO1 Students will learn about the physical, cultural as well as socio economic aspects of India and the State of Andhra Pradesh.</p> <p>CSO2 They will learn about the potential of resources and infrastructural strengths of the country and the State of Andhra Pradesh.</p>	
<b>LEARNING OUTCOMES (LOs):</b>	
<p>LO1 Students will be able to understand and analyze the distribution of various physical and cultural aspects of the country.</p> <p>LO2 They will be able to appraise the status of mineral resources, industrial development and infrastructural accomplishments of the country.</p> <p>LO2 They will be able to comprehend the potential strengths, limitations and challenges of the country and will be able to suggest appropriate measures through a holistic approach.</p>	

<b>GR 103</b>	<b>GEOGRAPHY OF INDIA AND ANDHRA PRADESH</b>	
<b>UNIT</b>	<b>CONTENTS</b>	
UNIT-I	India:	Location Major physiographic divisions Drainage Climate Soils
UNIT-II	Natural vegetation: Agriculture:  Irrigation:	Types, Distribution and Need for conservation. Types and Regions Distribution of Major food and commercial crops Green Revolution, Blue Revolution, White Revolution Sources - Tanks, Wells & Bore wells, Canals
UNIT-III	Energy Resources: Mineral Resources: Major industries:	Hydel , Thermal , Atomic, Solar, Wind Types of Minerals. Reserves and Distribution of Iron Ore, Manganese, Coal, Oil & Natural gas Iron and steel, Ship building, Cement, Cotton, Jute, Sugar
UNIT-IV	Population :  Urbanization in India Smart City Concept Transport :  India's foreign Trade:  Importance of Indian Ocean Boarder Conflicts	Distribution and Density , Growth Trends Problems of Over Population  Indian Railways, Road Ways, Water Ways and Airways Exports & Imports Problems and Prospects
UNIT -V	Andhra Pradesh :	Relief, Climate, Soils, Forests & Wild Life, Agriculture, Irrigation, Mineral Wealth , Power Resources, Industrial development, Population, Urbanization, Prospects of Tourism

**Text Books:**

D.R. Khullar        India A Comprehensive Geography, Kalyani Publishers, New Delhi,  
C.B. Mamoria. Economic and commercial geography of India, 1984.

**References:**

R.L. Singh. The Regional Geography of India, NGS IX, Banaras, 1968.  
O.H.K. Spate and Lear month. India and Pakistan, Methuen, London.  
C.B. Mamoria. Geography of India. Sivalal Agarwala & Co., Agra, 1975.  
Shrama and Cautinho. Economic and Commercial geography of India.  
Shrama, T.C. Technological change in Indian Agriculture, Rawat publication, Jaipur.  
Negi, B.S. Geography of India, Kedar Nath Ram Nath, New Delhi.  
Alam, S.M. Planning Atlas of Andhra Pradesh

<b>PROGRAMME</b>	M.SC. GEOGRAPHY
<b>SEMESTER</b>	FIRST SEMESTER
<b>PAPER TITLE</b>	PRINCIPLES OF CARTOGRAPHY
<b>PAPER CODE</b>	GR 104
<b>CORE/ELECTIVE</b>	CORE PAPER
<b>MAXIMUM MARKS</b>	100
<b>CREDITS</b>	4
<b>COURSE OUTCOMES (COs):</b>	
<p>CO1 To introduce the fundamental principles of Cartography</p> <p>CO2 To introduce the elements and theories of visual perception</p> <p>CO3 To expose the students to the principles of map design</p> <p>CO4 To provide insights into the processes of encode the geographic information into map symbols.</p> <p>CO5 To introduce the recent advances in cartography</p>	
<b>COURSE SPECIFIC OUTCOMES (CSOs):</b>	
<p>CSO2 Students will learn to process the data and to represent it in the form of symbols</p> <p>CSO2 They will learn to design and construct maps.</p> <p>CSO3 They will learn special cartographic techniques to represent a wide variety of Data.</p>	
<b>LEARNING OUTCOMES (LOs):</b>	
<p>LO1 They will acquire cartographic skills and will be able to construct maps on their own.</p> <p>LO2 They will be capable of representing various types of data such as terrain, weather &amp; climatic and Socio-economic using appropriate cartographic techniques.</p> <p>LO3 They acquire creative skills to make graphic representation more effective.</p>	

<b>GR 104</b>	<b>PRINCIPLES OF CARTOGRAPHY</b>
<b>UNIT</b>	<b>CONTENTS</b>
UNIT-I	History of Cartography Nature and Scope of Cartography Map Scales and Their Functions Geographic Coordinates Map Projections and their Functions
UNIT-II	Cartography as graphic means of Communication. Theory of Visual perception Visual variables Graphic elements: Clarity and legibility, Visual contrast, Figure- ground Balance Colour & Pattern
UNIT-III	Typography and Principles of Lettering Cartographic Generalization Compilation process and procedure Map design and layout Constraints and restrictions in Map design. Mechanics of Map Construction
UNIT-IV	Cartographic Symbolization. Cartographic techniques for various Purposes: Socio-economic Data Weather and Climatic data Physiographic Data
UNIT -V	Types of maps and their uses. Computer Assisted Cartography Cartography and GIS International Cooperation in Cartography



**Text Books:**

Misra, R.P. and Ramesh, A. Fundamentals of Cartography, McMillan Co., New Delhi.  
Robinson, A.H. and Sales, K.D. Elements of cartography, John Wiley & Sons Inc.

**References:**

Burrough, P.A. Principles of geographic information systems for Land Resource, Assessment, Oxford University Press, New York,  
Fraser Taylor D.R. Geographic information systems for Land Resource . Pergaman Press, Oxford, 1991. Monk House, E.J., Wilkinson, H.R. Maps and Diagrams, Methuen, London.  
Khan , Z.A. Text book of practical geography, Concept, New Delhi, 1998.  
Singh, R.L and Dutt, P.K. Elements of Practical Geography, Kalyani Publishers, New Delhi.  
Steers, J.A. Map Projections, University of London Press, London

<b>PROGRAMME</b>	<b>M.SC. GEOGRAPHY</b>
<b>SEMESTER</b>	<b>FIRST SEMESTER</b>
<b>PRACTICAL - 1</b>	<b>GR 105</b>
<b>PAPER TITLE</b>	<b>MAP ANALYSIS</b>
<b>COURSE OUTCOMES (COs):</b>	
CO1 Students will be introduced to basics of map analysis.	
CO2 They will learn about map types, scales, series and numbering methods.	
CO3 They are introduced to conventional symbols and the component of maps.	
<b>COURSE SPECIFIC OUTCOMES (COs):</b>	
COS1 Students will learn to interpret topographic and weather maps.	
COS2 They will be able to draw contours, profiles of topography.	
<b>LEARNING OUTCOMES (LOs):</b>	
LO1 Students will acquire skills to interpret topographic maps.	
LO2 They will be able to interpret and draw contours.	
LO3 They will be able to draw profiles to represent relief features.	
LO4 They will be able to interpret synoptic weather charts.	
<b>CONTENTS</b>	
<ol style="list-style-type: none"> <li>1. Introduction to Types of Maps and Scales.</li> <li>2. Map Series, Numbering Methods, Scales of the Map Series (Old &amp; New) Latitudinal and Longitudinal extents of International maps and topographical maps</li> <li>3. Interpretation of topographical maps – Indian and foreign.</li> <li>4. Representation of relief features by contours</li> <li>5. Profile drawing – Simple, Superimposed and Composites</li> <li>6. Weather maps.</li> </ol>	
References:	
<ol style="list-style-type: none"> <li>1. R.L. Singh. Elements of Practical Geography, Kalyani Publishers, New Delhi</li> <li>2. R.Singh &amp; Kanujia. Map work and practical geography, Central Book Depot, Allahabad</li> </ol>	

<b>PROGRAMME</b>	<b>M.SC. GEOGRAPHY</b>
<b>SEMESTER</b>	<b>FIRST SEMESTER</b>
<b>PRACTICAL - 2 PAPER CODE</b>	<b>GR 106</b>
<b>PAPER TITLE</b>	<b>CARTOGRAPHY</b>
<p><b>COURSE OUTCOMES (COs):</b></p> <p>CO1 Students will learn about various methods of representing map scales their relative advantages, conversions and construction.</p> <p>CO2 They will learn various types of map projections, their global properties and construction them.</p> <p>CO3 They learn about thematic mapping and special cartographic techniques to represent any geographic data.</p> <p>CO4 They learn to acquire data from various sources and classify.</p> <p>CO5 They learn to create base maps and design symbols and legends.</p> <p>CO6 They practically do all the exercises and will record.</p>	
<p><b>COURSE SPECIFIC OUTCOMES (CSOs) :</b></p> <p>CSO1 They learn and apply all the skills to create, compile and generate maps.</p> <p>CSO2 They will learn to measure, classify and differentiate qualitative &amp; quantitative data and into area, line and point spatial entities.</p> <p>CSO3 They learn special cartographic techniques to represent relief features, weather and climatic information and socio-economic data by doing them in the classroom.</p>	
<p><b>LEARNING OUTCOMES (LOs):</b></p> <p>LO1 Students will acquire skills to construct maps on their own.</p> <p>LO2 They acquire competence to process and classify various relief, socio-economic, weather and climatic data and will be able to represent them graphically with appropriate cartographic techniques</p> <p>LO3 They will be capable of creating maps with improved graphic efficiency.</p>	
<b>CONTENTS</b>	
<ol style="list-style-type: none"> <li>1. Scales: Methods of Representation, Conversions</li> <li>2. Map projections: Zenithal, Conical, Cylindrical, Conventional Map Projections</li> <li>3. Thematic mapping: Bar Graphs – Simple, &amp; Compound, Line Graphs – Simple &amp; Polygraph Dot Method, Proportional Circles, Sector Diagrams Choropleth Technique, Wind Roses, Isopleth Technique.</li> </ol>	
<b>References:</b>	
<ol style="list-style-type: none"> <li>1. Misra, R.P. and Ramesh, A. Fundamentals of cartography, Concept, New Delhi, 2002</li> <li>3. Singh, R.L. Map work and practical geography. Central Book Depot, Allahabad, 1979</li> <li>4. Steers, J.A. Map projections, University of London Press, 1965</li> </ol>	

**M.SC. GEOGRAPHY**  
**Syllabus (w.e.f. Academic Year 2021-22)**

**SECOND SEMESTER**

<b>Core/ Elective</b>	<b>Title</b>
Core paper 1	Climatology and Oceanography
Core Paper 2	Geographical Thought
Core Paper 3	Urban Geography
Core Paper 4	Principals of Remote Sensing
Practical 1	Interpretation of Aerial Photographs
Practical 2	Climatic Data Analysis

<b>PROGRAMME</b>	<b>M.SC. GEOGRAPHY</b>
<b>SEMESTER</b>	<b>SECOND SEMESTER</b>
<b>PAPER TITLE</b>	<b>CLIMATOLOGY AND OCEANOGRAPHY</b>
<b>PAPER CODE</b>	<b>GR 201</b>
<b>CORE/ELECTIVE</b>	<b>CORE PAPER</b>
<b>MAXIMUM MARKS</b>	<b>100</b>
<b>CREDITS</b>	<b>4</b>
<p><b>COURSE OUTCOMES (COs):</b></p> <p>CO1 The course provides knowledge of the structure and composition of the atmosphere, solar radiation and its budget.</p> <p>CO2 The course provides knowledge of the distributional patterns of weather elements and their interrelations and influences on global climate</p> <p>CO3 The Course provides insights into the synoptic climatology and the causes and effects of climate change.</p> <p>CO4 The Course provides knowledge about the physical properties and physiographic features of the major oceans.</p> <p>CO5 The course provides knowledge of circulation of ocean waters and its effects on climate.</p>	
<p><b>COURSE SPECIFIC OUTCOMES (CSOs) :</b></p> <p>CSO1 Students will learn about the structure, composition, physical processes, energy interactions and dynamics of the earth's atmosphere.</p> <p>CSO2 Students will learn about the synoptic climatology and weather events.</p> <p>CSO3 Students will learn about climatic classification and global climates, changes and consequences.</p> <p>CSO4 Students will learn about the relief, physical properties, circulation of waters and resources of the oceans</p>	
<p><b>LEARNING OUTCOMES (LOs):</b></p> <p>LO1 Students will be able to analyse the energy exchange and its effects on the weather and climate of the earth.</p> <p>LO2 They will be able to understand and analyze daily as well as extreme weather events.</p> <p>LO3 They will be able to analyse the impact of climate change and global warming on all spheres of the Earth.</p> <p>LO4 The students will be able to comprehend the influences of ocean circulations on local, regional and global climates and economies.</p>	

<b>GR 201</b>	<b>CLIMATOLOGY AND OCEANOGRAPHY</b>
<b>UNIT</b>	<b>CONTENTS</b>
UNIT-I	Scope, and content of Climatology Origin of Earth Earth's planetary Relation to the sun Structure and composition of the atmosphere Solar Radiation and Heat budget
UNIT-II	Distributional patterns of weather elements : Temperature, Atmospheric Pressure, Wind, General circulation of the Atmosphere, Humidity, Precipitation. Classification of Clouds Monsoon Mechanism and Theories
UNIT-III	Synoptic Climatology Air masses and Fronts Cyclones and Anticyclones Climatic Classification: Koppen and Thornthwaite Climate Change and Global warming
UNIT-IV	Physical properties of sea water: Distribution of Temperature, Salinity Relief of Ocean basins: Continental shelf, Continental Slope Deep sea Plains, Trenches Submarine relief of: Atlantic Ocean, Indian Ocean, Pacific Ocean
UNIT -V	Movements of Ocean Water : Waves Tides Currents Sea Level Changes Marine Resources

**Text Books:**

H.J Critchfield. General Climatology, Prentice Hall of India, New Delhi, .  
D.S.Lal. Climatology, Chaitanya Publishing House, Allahabad, 1989.  
Sharma and Vatal. Oceanography for Geographers, Chaitanya Publishing House,  
Allahabad.

**References:**

G.T. Trewartha. An Introduction to climate, McGraw Hill Book Co., New York, 1954.  
B. Haurwitz and H.M. Austin, Climatology, McGraw Hill Book Co., New York, 1944.  
R.C.Barry & R.J. Chorley. Atmosphere, Weather & Climate  
Sverdrup, Johnson & Fleming. The Oceans. Prentice Hall Inc., New York, 1966.  
C.A.M. King Oceanography for Geographers. Edward Arnold Ltd., London, 1962.  
C.A.M. King. An Introduction to Oceanography. McGraw Hill Book Co., New York,  
1946.

<b>PROGRAMME</b>	<b>M.SC. GEOGRAPHY</b>
<b>SEMESTER</b>	<b>SECOND SEMESTER</b>
<b>PAPER TITLE</b>	<b>GEOGRAPHICAL THOUGHT</b>
<b>PAPER CODE</b>	<b>GR 202</b>
<b>CORE/ELECTIVE</b>	<b>CORE PAPER</b>
<b>MAXIMUM MARKS</b>	<b>100</b>
<b>CREDITS</b>	<b>4</b>

**COURSE OUTCOMES (COs):**

- CO1 Students will understand the wide field of geography.
- CO2 They will know about the use of different ideologies which helps in interpreting The interlinked components of the earth.
- CO3 Students will get acquaintance with the types of explanations geographers use.
- CO4 Students will be aware of the variety of methodological approaches and its dominance in different historic time periods.
- CO5 They will acquire knowledge about the dynamic nature of man-environment relationship over different time space spectrum.

**COURSE SPECIFIC OUTCOMES (CSOs):**

- CSO1 Students will be able to know the subject matter of geography and its philosophical viewpoints.
- CSO2 They will be aware about the concept of dualism, it's presence and relevance in geographical studies.
- CSO3 they will have sound knowledge about the types of explanations which can be used for formulation of theories or laws.

**LEARNING OUTCOME (LOs):**

- LO1 They will be able to describe entities and phenomena using different philosophy of geography
- LO2 They will understand the dualistic nature of geography and its applications
- LO3 They will know how to give scientific explanations while formulating a theory/laws/models.
- LO4 They will be able to apply any of the approaches in scientific writings
- LO5 They will enabled to use the knowledge of the geographers in the past and apply in the present and future context.



<b>GR 202</b>	<b>GEOGRAPHICAL THOUGHT</b>
<b>UNIT</b>	<b>CONTENTS</b>
UNIT-I	The field of geography Its place in the Classification of Sciences Geography as a Social Science Philosophy of Geography : (Distributions; Relationships, Interactions; Aerial Differentiation and Spatial Organization)
UNIT-II	Dualisms in Geography: Systematic & Regional Geography; Physical & Human Geography Systematic Geography & its Relation with- Systematic Sciences and Regional Geography The Myth and Reality about Dualisms Regional Geography: Concept of Region Regionalization and the Regional Method.
UNIT-III	Scientific Explanations Routes to Scientific Explanations (Inductive/Deductive) Types of Explanations (Cognitive Description; Cause & Effect; Temporal; Functional/Ecological Systems) Laws, Theories & Models,
UNIT-IV	Ideological Approaches: The quantitative Revolution Positivism Behaviorism Postmodernism
UNIT -V	Contribution of Ancient Geographers Medieval Geographers Modern Geographers Geography in the 20 <sup>th</sup> Century Changing Paradigms in Geography Future of Geography

**Text Books:**

Hussain, M. Evolution of Geographic Thought. Rawat Pub. Jaipur, 1984.  
Taylor (ed). Geography of the 20<sup>th</sup> century. Mathew, London

**References :**

Abler, Ronald, Adams, John S. Gould, Peter. Spatial Organization: The Geographer's View of the World. Prentice Hall, N.J., 1971.  
Ali, S.M. The Geography of Puranas. Peoples Publishing House, Delhi, 1966.  
Amedeo, Douglas. An introduction to scientific reasoning in Geography. John Wiley. U.S.A., 1971  
Dikshit, R.D.(ed) The Art & Science of Geography – Integrated Readings. Prentice Hall of India, New Delhi, 1994.  
Hartshorne, R. Perspectives on Nature of Geography. Rand McNally & Co., 1959  
Johnston, R.J. Philosophy and Human Geography. Edward Arnold, London, 1983.  
Johnston, R.J. The Future of Geography. Methuen, London, 1988  
Minshull, R. The Changing Nature of Geography. Hutchinson University Library, London, 1970.

<b>PROGRAMME</b>	<b>M.SC. GEOGRAPHY</b>
<b>SEMESTER</b>	<b>SECOND SEMESTER</b>
<b>PAPER TITLE</b>	<b>URBAN GEOGRAPHY</b>
<b>PAPER CODE</b>	<b>GR 203</b>
<b>CORE/ELECTIVE</b>	<b>CORE PAPER</b>
<b>MAXIMUM MARKS</b>	<b>100</b>
<b>CREDITS</b>	<b>4</b>
<b>COURSE OUTCOMES (COs):</b>	
CO1	Students will learn about the significance, evolution and functions of Urban Geography.
CO2	They will learn about the morphology and classification of urban areas.
CO3	They learn about the concepts theories and functions of central places.
CO4	They will learn about the patterns and trends of urbanization in the world and India.
CO4	They will learn about the problems associated with uraban areas.
<b>COURSE SPECIFIC OUTCOMES (CSOs):</b>	
CSO1	Students will learn about the evolution, morphology, functions and growth of urban areas
CSO2	This course introduces the concepts and theories causes and effects of Urbanization.
CSO3	The students will learn the and patterns, trends and problems of urbanization.
<b>LEARNING OOUTCOMES (LOs):</b>	
LO1	Students will be able to evaluate the structure, morphology, pattern and dimensions of changes of urban places and cities.
LO2	They will be able to comprehend the patterns and trends of urbanization.
LO3	They will be able to identify and analyse the prospects and problems of urbanisation over time and space.

<b>SEMESTER</b>	<b>SECOND SEMESTER</b>
<b>PAPER CODE/ TITLE</b>	<b>GR 203 URBAN GEOGRAPHY</b>
<b>CORE/ELECTIVE</b>	<b>CORE</b>
<b>UNIT</b>	<b>CONTENTS</b>
UNIT-I	Urban Geography: Definition, Nature, Scope Origin and Evolution of Urban Areas in: Ancient, Medieval and Modern Periods Urban Economic Base: Basic and Non-basic functions
UNIT-II	Internal Structure of Cities: Concentric Zone Theory Sector Theory Multi Nuclei Theory City Classification: Functional classification of Towns Urban Sprawl Rural - Urban Fringe City Region and Umland Central Business District (CBD)
UNIT-III	Primate City: Concept and Distribution Rank Size Rule with reference to World and India The Central Functions Central Place Theory Losch's Market Area Approach
UNIT-IV	Determinants of Urbanization Patterns and Trends in World Urbanization Patterns and Trends of Urbanization in India
UNIT -V	Urban Problems: Urban Housing Slums and Squatter Settlements Transport, Traffic Congestion Problems Urban Crime Urban renewal Urban Environmental problems : Solid waste

**Text Books:**

Carter: The study of Urban Geography. Edward Arnold Publishers, London, 1972.  
Berry. B.J.L and Horton. F.F: Geography Perspectives on urban systems. Prince Hall, Eaglewood Cliffs, New Jersey, 1970.

**References:**

Chorely, R.J.O. Hagget p (ed). Models in Geography. Methen, London, 1996.  
Dickinson, R.E: City and Region, Rutled, London, 1964  
Gibbs, J.P. Urban Research Methods. D. Van Nostrand Co. in Princenton, New Jersey, 1961.  
Jones. P.L. and Jones C.F (eds): American Geography, Inventory and prospect, Syracuse University Press, Syracuse, 1954.  
Kanda, A. Urban development and Urban research in India, Khama publication, 1992.  
Mayor, H.M. Kohn C.F.(eds). Readings in Urban Geography. UNIVERSITY OF Chicago Press.  
Rao . V.L.S.P. Urbanization in India spatial Dimensions. Concept Publishing Co New Delhi.  
Rao V.L.S.P: The structure of an Indian Metropolis: A study of Bangalore. Allied Publishers, Banglore.  
Singh K and Steinberg F (eds): Urban India In Crisis. New Age interns, New Delhi, 1998.  
Tewario, Vinod K. Jay A. Weinstein, VLS Prakasa Rao (Editors). Indian Cities. Ecological Perspectives Concept 1966.

<b>PROGRAMME</b>	<b>M.SC. GEOGRAPHY</b>
<b>SEMESTER</b>	<b>SECOND SEMESTER</b>
<b>PAPER CODE/TITLE</b>	<b>GR 204 PRINCIPLES OF REMOTE SENSING</b>
<b>CORE/ELECTIVE</b>	<b>CORE PAPER</b>
<b>MAXIMUM MARKS</b>	<b>100</b>
<b>CREDITS</b>	<b>4</b>

**COURSE OUTCOMES (COs):**

- CO1 To introduce the basic principles and components Remote Sensing.
- CO2 To impart knowledge about the principles, characteristics and interactions of electromagnetic radiation
- CO3 To develop the knowledge of the fundamentals of aerial photography and Photogrammetry.
- CO4 To develop the knowledge of modern platforms and sensors and their characteristics.
- CO5 To develop the skills of Digital Image processing and interpretation.
- CO6 To impart knowledge on various applications of remote sensing technology.

**COURSE SPECIFIC OUTCOMES (CSOs) :**

- CSO1 The students will understand the basic principles of remote sensing
- CSO2 They will thoroughly understand the concepts of image displacement, stereovision and image parallax and will learn to interpret the aerial photographs.
- CSO3 They will learn about various types of remote sensing and products, their relative advantages and applications.
- CSO4 They will learn digital image processing techniques and interpretation methods.

**LEARNING OUTCOMES (LOs):**

- LO1 Students will be able to comprehend the potential of Remote Sensing technology and its wide array of applications.
- LO2 They acquire the skills to interpret and analyse the aerial photos and calculation of height of the objects.
- LO3 They acquire competence to process, enhance and interpret the digital images.
- LO4 They will be able to integrate the output data with other geospatial technologies for further analysis.



**Text Books:**

Thomas M. Lillesand and Ralph W. Kiefer. Remote Sensing and image interpretation. John Wiley & Sons, New York, 1994.

Sabins, F.F. Remote Sensing Principles and interpretation. John Willey & Sons, New York, 1987.

Leuder, D. Aerial Photography Interpretation: principles and application. McGrahill, NewYork, 1959.

**References:**

Barret, E.C. and L.F. Curtis. Fundamentals of Remote Sensing and Air Photo interpretation, McMillan, New York, 1992.

Compbell, J. Introduction to remote sensing. Guilford, New York, 1989.

Curran, Paul J. Principles of Remote Sensing. Longman, London, 1985.

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



<b>PROGRAMME</b>	<b>M.SC. GEOGRAPHY</b>
<b>SEMESTER</b>	<b>SECOND SEMESTER</b>
<b>PRACTICAL -1</b>	<b>GR 205</b>
<b>PAPER TITLE</b>	<b>INTERPRETATION OF AERIAL PHOTOGRAPHS</b>
<p><b>COURSE OUTCOMES (COs):</b></p> <p>CO1 Students are introduced to stereoscopes and stereoscopic vision</p> <p>CO2 They will be introduced to the equipment like stereograms, stereopairs, fiducial marks and principle points, floating marks and marginal information.</p> <p>CO3 They will learn the elements of interpretation, reading, analysis and interpretation of aerial photographs.</p> <p>CO4 They will learn to use mirror stereoscope, stereo meters and aerosketch meters.</p>	
<p><b>COURSE SPECIFIC OUTCOMES (CSOs) :</b></p> <p>CSO1 The students will learn to identify objects and identify their distributional patterns and associations on the aerial photographs.</p> <p>CSO2 They will learn to interpret cultural as well as natural aspects and learn to classify the land use and land cover.</p>	
<p><b>LEARNING OUTCOMES (LOs):</b></p> <p>LO1 The students will be able to interpret the cultural and natural objects and distributions on the aerial photographs</p> <p>LO2 They will be able to determine radial displacement, tilt displacement, photobase and parallax of the principle points.</p>	
<b>CONTENTS</b>	
<ol style="list-style-type: none"> <li>1. Testing of spectroscopic vision – Exercises with lense stereoscope.</li> <li>2. Oblique photographs</li> <li>3. Stereogram, landforms, drainage, urban, rural, agricultural and industry</li> <li>4. Stereo pairs: Landforms, drainage, urban, rural, agricultural and industry</li> <li>5. Land sat Imageries</li> <li>6. Use of Mirror stereoscope.</li> <li>7. Use of stereo meter.</li> <li>8. Use of aero-sketchmaster.</li> </ol>	
<p><b>References:</b></p> <p>American society of photogrammetry. Manual of remote sensing ASP, Falls Church, V.A., 1983.</p> <p>Lattman&amp;Ray. Aerial Photographs in field Geology. Holt. Reinhart&amp;Winston, New York 1965.</p> <p>Francis.H.,Moffitt: Photogrammetry, International Text Books Co. Scranton, Pennsylvania, 1959.</p> <p>Leuder, D.R Aerial photographic interpretation. McGraw Hill, New York,1960.</p>	

<b>PROGRAMME</b>	<b>M.SC. GEOGRAPHY</b>
<b>SEMESTER</b>	<b>SECOND SEMESTER</b>
<b>PRACTICAL -2</b>	<b>GR 206</b>
<b>PAPER TITLE</b>	<b>CLIMATIC DATA ANALYSIS</b>
<b>COURSE OUTCOMES (COs):</b>	
CO1	Students will be familiarised with the data types needed for analysing climate.
CO2	Students will be taught to handle real time or historic data related to different climatic elements
<b>COURSE SPECIFIC OUTCOMES (CSOs):</b>	
CSO1	Students will learn methods of mapping and analyse climatic data
<b>LEARNING OUTCOMES (LOs):</b>	
LO1	Students will learn to create different types of diagrams and charts.
LO2	They will be able to interpret climatic characteristics by looking at different charts/map outputs such as climograph, hythergraph, ergograph, water balance etc.
<b>CONTENTS</b>	
<ol style="list-style-type: none"> <li>1. Rainfall data analysis Mean annual and seasonal –intensity-rainfall Variability</li> <li>2. Monthly mean precipitation and temperature - Global stations and Indian drain stations</li> <li>3. Wind rose diagrams</li> <li>4. Thermal continantality</li> <li>5. Water balance computation and graphical representation humidity and aridity indices- Moisture index-Moisture adequacy.</li> <li>6. Drought climatology –drought frequency histogram –climatic shifts</li> <li>7. Graphs-Climograph, Hydrograph and Ergo graph</li> <li>8. Urban heat islands and temperature inversions</li> </ol>	
<b>References:</b>	
<p>H.J.Critchfield.General Climatology.Prentice Hall of India. New Delhi-1975  B.Haurwitz J.M.Austin Climatology. McGrew Hill Book Co.New York, 1944  I.A Ramadas, Crops and Weather in India, ICAR, New Delhi.  J.R.Mathur, climatology: Fundamentals and Applications. McGraw Hill, New York, 1974</p>	

**M.SC. GEOGRAPHY**  
**Syllabus (w.e.f. Academic Year 2021-22)**  
**THIRD SEMESTER**

<b>Core/ Elective</b>	<b>Title</b>
Core Paper 1	Population Geography
Core Paper 2	Environmental Geography
	<b>Any one of the Following</b>
Eleective Paper - 1	A Pedology & Hydrology B Applied Climatology C Geography of Health
	<b>Any one of the Following</b>
Elective Paper- 2	A Disaster Management Studies B Geography of transportation C Cultural Geography
Practical 1	Quantitative Techniques In Geography
Practical 2	Image processing
MOOCs	
Intellectual Property Rights (IPR)	

<b>PROGRAMME</b>	<b>M.SC. GEOGRAPHY</b>
<b>SEMESTER</b>	<b>THIRD SEMESTER</b>
<b>PAPER TITLE</b>	<b>POPULATION GEOGRAPHY</b>
<b>PAPER CODE</b>	<b>GR 301</b>
<b>CORE/ELECTIVE</b>	<b>CORE PAPER</b>
<b>MAXIMUM MARKS</b>	<b>100</b>
<b>CREDITS</b>	<b>4</b>
<b>COURSE OUTCOMES (COs):</b>	
<p>CO1 To educate students about the understanding of the interface between society, population, ecology and geography.</p> <p>CO2 To educate them about the factors effecting the growth and distribution of population.</p> <p>CO3 To introduce various theories of population.</p> <p>CO4 To provide insights into various components of population growth and the influential factors.</p> <p>CO5 To provide insights into population policies, problems and measures of control.</p>	
<b>COURSE SPECIFIC OUTCOMES (CSOs):</b>	
<p>CSO1 To make them familiar about the factors that determines demographic characteristics of a place.</p> <p>CSO2 To enhance their ability to comprehend the objectives behind comprehensive plans and policies related to population in developing and developed countries.</p>	
<b>LEARNING OUTCOMES (LOs):</b>	
<p>LO1 Students will be able to understand the population characteristics of a place and its dependency on several geophysical, environmental and socio-economic and political factors.</p> <p>LO2 They will be able to analyse population dynamics of any place.</p> <p>LO3 They will be able to understand the need for appropriate population policies to maintain equilibrium in demand-supply of resources.</p>	

<b>GR 301</b>	<b>POPULATION GEOGRAPHY</b>
<b>UNIT</b>	<b>CONTENTS</b>
UNIT-I	Nature and Scope of Population Geography Interface Between Society: Population, Ecology and Geography Population Geography and its Relation with Other Social Sciences Sources of Data and Methodology of Studying Population Geography
UNIT-II	World Population: Distribution and Composition India's Population: Composition and Distribution Factors Affecting the Growth and Distribution of Population.
UNIT-III	Malthus Theory of Population and his Contribution Demographic transition theory Theory of optimum population.
UNIT-IV	Components of Population Growth: Fertility, Mortality and Migration Factors affecting - Fertility, Mortality and Migration.
UNIT -V	Population policies : Developed countries and Developing countries India's population policy Population Explosion and Measures of Control Population Dividend

**Text Books:**

Asha, A. Bhende & Tara Kanitkar. Principles of population studies, Himalaya Publishing House. Bombay, 1978

J.I. Clarke. Population Geography, Pergamon Press, 1965.

**References :**

UNESCO. Determinants and consequences of population trends, 1953.

W.S. Thompson. "Population", National Book Trust, New Delhi, 1967.

Zelinsky, W. Prologues to population Geography, Prentice Hall, Englewood Cliffe, M.J., 1966.

Garnier, J.D. Geography of population, Longman and Green, 1968.

Agarwala, S.N. India's population: Facts, problems and policy, Meerut, Meenakshi Prakasam, 1967.

Chandrasekhar, S. India's population: Facts, problems and policy, Meerut, Meenakshi Prakasam, 1967.

<b>PROGRAMME</b>	<b>M.SC. GEOGRAPHY</b>
<b>SEMESTER</b>	<b>THIRD SEMESTER</b>
<b>PAPER TITLE</b>	<b>ENVIRONMENTAL GEOGRAPHY</b>
<b>PAPER CODE</b>	<b>GR 302</b>
<b>CORE/ELECTIVE</b>	<b>CORE PAPER</b>
<b>MAXIMUM MARKS</b>	<b>100</b>
<b>CREDITS</b>	<b>4</b>
<b>COURSE OUTCOMES (COs):</b>	
<p>CO1 Expose to various concepts and components of the ecosystem and the bio-geochemical cycles.</p> <p>CO2 To provide insights into the, biotic regions, resources, ecological imbalance and biodiversity.</p> <p>CO3 To provide understanding on relationship between man and his environment.</p> <p>CO4 Expose to the contemporary environmental problems.</p> <p>CO5 To provide insights in to the international cooperations, environmental policies, programmes, planning and management aspects.</p>	
<b>COURSE SPECIFIC OUTCOMES (CSOs)</b>	
<p>CSO1 Students will learn about the concepts, components and processes of ecosystem, resources and their conservation and man and environment relationship.</p> <p>CSO2 They will learn about the contemporary environmental problems and anthropogenic interventions.</p> <p>CSO3 They will learn about the earth summits, legislation, planning and management for a sustainable environment.</p>	
<b>LEARNING OUTCOMES:</b>	
<p>LO1 Students will be able to comprehend the environmental concepts, processes, and the relationship between man and his environment.</p> <p>LO2 They will be able to analyse the environmental problems and the anthropogenic interventions.</p> <p>LO3 They will be able to comprehend the environmental laws, protection and choose problem specific conservation measures and plans for sustainable environmental management.</p>	

<b>GR 302</b>	<b>ENVIRONMENTAL GEOGRAPHY</b>
<b>UNIT</b>	<b>CONTENTS</b>
UNIT-I	Environmental Geography: Nature and Scope Relationship with Other Sciences. Ecosystem : Concepts and Components Energy and nutrients in the ecosystem Bio - Geochemical Cycles.
UNIT-II	Major Biotic Regions of the World. Resources use and Ecological Imbalance with Reference to Soils, Forests and Energy Resources. Biodiversity and its Conservation.
UNIT-III	Man and Environment Relationship: Population growth and Environment Human settlements and Environment Industrial Environment Urban Environment. Carrying Capacity of the Earth Man's impact on Physical & Social Environments. Land Resources and Food Security
UNIT-IV	Emerging Environmental Issues: Environmental Degradation Environmental pollution Ozone Depletion Green House Gases Global Warming. Environmental Quality – Environmental Impact Assessment.
UNIT -V	International Co-operations: The Stockholm Conference The Earth Summits Environmental laws in India Environmental planning and management. Environmental programs.



**Text Books:**

Savindra Singh. Environmental geography. Prayag Pustak Bhavan, Allahabad  
Bernard J. Nebel. Environmental Science – The way the world works. Prentice Hall,  
Englewood Cliff, NJ 07632.

**References:**

The State of India's environment 1982 & 1984 – A citizen's report. Centre for Science  
and environment, New Delhi.  
Robinson, H. Biogeography, ELBS, London, 1978.  
Swarup, R.V., Mishra, S.N., Janchari, V.P. Encyclopediao of ecology, environment and  
pollution control.  
K.M. Agrawal, P.K., Sikdar, S.C. Deb. A Text book of Environment. Macmillan India  
Limited.  
Nag, P., Kumar, V.K. and Singh, J. Geography of Environment.  
Strahler, A.N. and Strahler, A.H. Geography and Man's Environment. John Wiley and Sons,  
New Delhi.  
Daniel B. Botkin, Edward A. Keller. Environmental Science (Earth as a living planet)  
John Wiley Sons Inc., New York.  
Chandana, R.C. Environment. Kalyani Publishers, Ansari Road, New Delhi.

<b>PROGRAMME</b>	<b>M.SC. GEOGRAPHY</b>
<b>SEMESTER</b>	<b>THIRD SEMESTER</b>
<b>PAPER TITLE</b>	<b>PEDOLOGY AND HYDROLOGY</b>
<b>PAPER CODE</b>	<b>GR 303 -A</b>
<b>CORE/ELECTIVE</b>	<b>ELECTIVE PAPER -1</b>
<b>MAXIMUM MARKS</b>	<b>100</b>
<b>CREDITS</b>	<b>4</b>
<p><b>COURSE OUTCOMES (COs):</b></p> <p>CO1 Students are introduced to the basics of soil science.</p> <p>CO2 They will learn about the factors and processes of formation, world patterns, classification and taxonomy of soils.</p> <p>CO3 They will learn about the types, distribution, degradation and conservation and management of soils in India.</p> <p>CO4 They will learn about the elements of hydrological cycle and water balance.</p> <p>CO5 They will learn about the surface waters and ground waters in India.</p> <p>CO6 They will learn the applications of remote sensing in water resources management.</p>	
<p><b>COURSE SPECIFIC OUTCOMES (CSOs) :</b></p> <p>CSO1 Students will learn pedology from geographic perspective, covering from the processes of formation to degradation, conservation and management of soils.</p> <p>CSO2 They learn the elements and computation of water balance.</p> <p>CSO3 They learn about the distribution of surface and ground water resources, their conservation and management practices.</p> <p>CSO4 They will learn applications of remote sensing technology for water resources management.</p>	
<p><b>LEARNING OUTCOMES (LOs):</b></p> <p>LO1 Students will be able to understand the characteristics of soils, their distribution, suitability for agriculture, conservation and management practices.</p> <p>LO2 They will be able to comprehend the components and processes of hydrological cycle and will be able to analyse the water balance elements to resolve hydrological problems.</p> <p>LO3 The students will be able to analyse satellite imagery for management of water resources, assessment of potential ground water zones, monitoring of floods etc.</p>	

<b>GR 303 -A</b>	<b>PEDOLOGY AND HYDROLOGY</b>
<b>UNIT</b>	<b>CONTENTS</b>
UNIT-I	Soil: Concept and Definition Soil Individual or Polypedon Soil Science: Fertility, Chemistry, Physics Microbiology, Soil Conservation Pedology: Genesis, Survey, Classification  Regolith Composition of Soil
UNIT-II	Factors and Processes of Soil Formation Soil profiles Classification of Soils-Zonal, Azonal and Intra Zonal, World patterns Soil Taxonomy: A Comprehensive System
UNIT-III	Soils of India Soil Degradation Conservation and Management of Arable Lands Soil Suitability
UNIT-IV	Elements of Hydrological cycle: Evaporation Condensation Precipitation - Intensity and Duration Infiltration and Runoff Water balance elements and analysis Nature and Distribution of Surface waters in India Flood analysis.
UNIT -V	Ground water : Occurrences and Types Movement, Quality and quantity Nature and distribution of ground water in India. Water conservation Application of Remote sensing in hydrological studies

**Text Books:**

A.N. Strahler. Physical Geography, Wiley Eastern Pvt. Ltd., New Delhi, 1965  
Chorley, R.J.(ed), Water, Earth and Man , Methuen, London,1967.  
J. Sehgal. A Text Book of Pedology:Concepts and Applications.Kalyabi Publishers, Noida, 2018

**References:**

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 Soil, Hutchinson, London, 1973.  
Fothy, 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  
Chorley, R.J.(ed), Introduction to Physical Hydrology, Methuen, London-1969  
Dakshina Murty,C.,et al., Water resources of India and their utilization in agriculture, Indian agricultural Research Institute, New Delhi,1973  
Jone, J.A.A, Global Hydrology: Processes, Resources and Environmental Management, Longman, London,1997  
Matter, J.R.Water Resources, Distribution, Use and management, JohnWiley, Marylane, 1984.  
Toddu, D.K., Groundwater Hydrology, John Wiley, New York-1959

<b>PROGRAMME</b>	<b>M.SC. GEOGRAPHY</b>
<b>SEMESTER</b>	<b>THIRD SEMESTER</b>
<b>PAPER TITLE</b>	<b>APPLIED CLIMATOLOGY</b>
<b>PAPER CODE</b>	<b>GR 303 -B</b>
<b>CORE/ELECTIVE</b>	<b>ELECTIVE PAPER -1</b>
<b>MAXIMUM MARKS</b>	<b>100</b>
<b>CREDITS</b>	<b>4</b>
<b>COURSE OUTCOMES (COs):</b>	
CO1	Expose the students to the applications of climatic knowledge in various fields for betterment of the society and global environment.
CO2	To provide insights in to the development water resources, agriculture and animal production using the climatic knowledge.
CO3	To provide insights into the influence of climate on man and his endeavors.
CO4	To provide insights into the climate change, global warming, environmental implications, climatic hazards and disasters.
CO5	To provide insights into the climate and its variability in India
CO6	Expose the students to handle and analyse climatic data.
<b>COURSE SPECIFIC OUTCOMES (CSOs) :</b>	
CSO1	Students will learn the applied aspects of climatology with respect to water resources, agriculture and animal husbandry, human health & comfort
CSO2	They will learn about the climate change and its implications and about the climate induced hazards and disasters
CSO3	They will learn about the characteristics of climate in India and its variability over space and time.
<b>LEARNING OUTCOMES (LOs):</b>	
LO1	Students will be able to appreciate the significance of application of climatic knowledge for management of the water resources, improvement of agriculture and animal production and for improvement of human comfort and health conditions .
LO2	Students will be able to comprehend and analyze the climate change and its implications, occurrence and distribution of climatic hazards and disasters.
LO3	Student will be able to collect, analyse and interpret climatic data and generate climatic information..

<b>GR 303 -B</b>	<b>APPLIED CLIMATOLOGY</b>
<b>UNIT</b>	<b>CONTENTS</b>
UNIT-I	Hydrological Climatology and development of water resources. Water balance computation and Applications. Climate – agriculture and animal production
UNIT-II	Climate and Man: Human comfort, health and efficiency. Climate and human diseases. Climate and Housing. Urban Climate : Heat islands, Air pollution.
UNIT-III	Weather and climate modification. Theories of climate change: Evidences, Possible causes. Global warming and Environmental impacts.
UNIT-IV	Climatic Hazards & Disasters: Cyclones, Floods & Droughts, Heat waves and Cold Waves.
UNIT -V	Climate of India. Indian Monsoon Western disturbances. ENSO events. Data collection, archiving, accessing, interpretation and generation of climatic information. Applications of Remote Sensing for climatic studies.

**TEXT BOOKS:**

Griffiths John F: Applied Climatology. Oxford University Press, New York.

Thompson R D and Perry A (ed): Applied Climatology. Principles and Practice, Routledge, London, 1997

Robinson P J and Henderson S: Contemporary Climatology. Henlow

**REFERENCES:**

Barry R G & Chorley P J: Atmosphere, Weather and Climate. Routledge, London and New York

Critchfield J H: General Climatology. Prentice Hall, New Delhi

Das P K: Monsoons. National Book Trust, New Delhi

Lal D S: Climatology. Chaitanya Publications, Allahabad

<b>PROGRAMME</b>	<b>M.SC. GEOGRAPHY</b>
<b>SEMESTER</b>	<b>THIRD SEMESTER</b>
<b>PAPER TITLE</b>	<b>GEOGRAPHY OF HEALTH</b>
<b>PAPER CODE</b>	<b>GR 303 -C</b>
<b>CORE/ELECTIVE</b>	<b>ELECTIVE PAPER -1</b>
<b>MAXIMUM MARKS</b>	<b>100</b>
<b>CREDITS</b>	<b>4</b>
<p><b>COURSE OUTCOMES (COs):</b></p> <p>CO1 Expose the students to the significance , origin and development and approaches of study of geography of Health.</p> <p>CO2 They will learn about impact of various geographic factors on human health.</p> <p>CO3 They will learn about the classification of diseases and the distributional patterns of major diseases.</p> <p>CO4 They will learn about the causes, origin and dispersal of major diseases.</p> <p>CO5 They will learn about the health care planning, policies and programmes.</p>	
<p><b>COURSE SPECIFIC OUTCOMES (CSOs):</b></p> <p>CSO1 Expose the students to the impacts of geographical, socio-economic and environmental factors on human health .</p> <p>CSO2 Acquaint the students to the classification, ecology, etiology and diffusion of major diseases.</p> <p>CSO3 To impart knowledge on health care planning and programs at world and national levels.</p>	
<p><b>LEARNING OUTCOMES (LOs):</b></p> <p>LO1 Students will be able to understand the basic concepts and issues of human health.</p> <p>LO2 They will acquire sound knowledge on the geographical factors and distribution of major diseases, deficiency disorders and problems of mal-nutrition.</p> <p>LO3 They will be able to comprehend the significance of health care planning , policies and ongoing immunization and disease eradication programmes for a healthy society.</p>	



<b>GR 303 -C</b>	<b>GEOGRAPHY OF HEALTH</b>
<b>UNIT</b>	<b>CONTENTS</b>
UNIT-I	Geography of Health: Nature, Scope and Significance Origin and Development Its Distinction from Medical Science. Approaches to the Study
UNIT-II	Geographical Factors Affecting Human Health:  Physical factors: Relief, Climate, Soils and Vegetation. Social factors: Population Density, Literacy, Social customs and Poverty . Economic factors: Food and Nutrition Occupation and Standard of Living. Environmental factors: Urbanization and Congestion, Water , Air, Noise pollution and Solid Waste.
UNIT-III	Classification of Diseases: Genetic, Communicable and Non-Communicable, Occupational and Deficiency Diseases. WHO Classification of Diseases. Patterns of World Distribution of Major Diseases.
UNIT-IV	Ecology, Etiology and Transmission of Major Diseases: Cholera, Malaria, Tuberculosis, Hepatitis, Leprosy, Cardiovascular, Cancer, AIDS and STDS. Diffusion of Diseases and Causes Deficiency Disorders and Problems of Mal-Nutrition in India.
UNIT -V	Health Care Planning: (i) International Level – WHO, UNICEF, Red Cross (ii) National Level Government and NGOs. Health Care Planning and Policies; Availability, Accessibility and Utilization of Health Care Services: Primary Health Care Inequalities in Health Care Services in India Family Welfare Immunization, National Disease Eradication and Health Care Programs.

**Text Books:**

Scochin, A.A. Fundamentals of Medical Geography. Dept. of. Army. M.J.5264, Washington D.C.1968.

Hazra, J. (ed). Health care planning in developing countries. University of Calcutta, 1997.

May, J.M. Studies in Disease Ecology, Hafner Pub., New – York, 1961

**References :**

Cliff, A and Haggett. P. Atlas of Disease Distribution. Basil Black well, Oxford, 1989.  
Digby, A and Stewart, L. (eds). Gender, Health and Welfare. Routledge, New York, 1996.

Learmonth, A.T. A., Patterns of Disease arid Hunger. A study in Medical Geography. David & Charles, Victoria, 1978.

May, J.M. The World Atlas of Diseases Nat. Book Trust, New Delhi, 1970.

Mc. Glashan, N.D. Medical Geography, Methuen, London, 1972.

Narayan, K.V. Health and Development – Inter Sectoral Linkags in India. Rawat Pub., Jaipur, 1977.

Philips, D.R. Health and Health care in the Third World. Longman, London, 1990.

Pyle, G. Applied Medical Geography, Winston Halsted Press, Silver Springs, Md, U.S.A., 1979.

Rais, A. and Learmonth, A.T.A. Geographical Aspects of Health and Diseases in India.

Shannon, G.M. et al. The geography of AIDS. Guilford Press, New York, 1987.

Smith, D. Human Geography – A Welfare Approach. Arnold Heeinemann, London, 1997.

Scochin, A.A. Fundamentals of Medical Geography. Dept. of. Army. M.J.5264, Washington D.C.1968.

Stamp, L.D. The Geography of Life and Death. Cornell University, Ithaca, 1964.

<b>PROGRAMME</b>	<b>M.SC. GEOGRAPHY</b>
<b>SEMESTER</b>	<b>THIRD SEMESTER</b>
<b>PAPER TITLE</b>	<b>DISASTER MANAGEMENT STUDIES</b>
<b>PAPER CODE</b>	<b>GR 304 - A</b>
<b>CORE/ELECTIVE</b>	<b>ELECTIVE</b>
<b>MAXIMUM MARKS</b>	<b>100</b>
<b>CREDITS</b>	<b>4</b>
<b>COURSE OUTCOMES (COs):</b>	
CO1	Students will be learn about the concepts of hazards. They will be familiar with hazards caused by geophysical forces.
CO2	Students will understand the atmospheric conditions and occurrence of meteorological hazards.
CO3	They will acquire knowledge on vulnerability of coastal areas with different types of hazards
CO4	They will learn about anthropogenic hazards.
CO5	They will understand about role of geospatial techniques in mitigating hazards
<b>COURSE SPECIFIC OUTCOMES (CSOs):</b>	
CSO1	Students will be acquainted with various types of hazards, their catastrophic nature.
CSO2	They will be informed about various pre-during-post management and mitigations strategies to reduce loss of lives and damage to properties.
CSO3	Students will be able understand the application of geospatial techniques in risk assessment.
<b>LEARNING OUTCOMES (LOs):</b>	
LO1	They will know the Dos and Don'ts during geophysical disasters.
LO2	Students will be able to take better pre-disaster, during disaster and post disaster Actions to combat meteorological disasters.
LO3	Students will be able to identify coastal risk zones by assessing the local conditions.
LO4	Students will be able to make right decisions and respond properly during the time of anthropogenic hazards
LO5	Students will be able to apply geospatial techniques in assessing risk of various types.

<b>GR 304 -A</b>	<b>DISASTER MANAGEMENT STUDIES</b>
<b>UNIT</b>	<b>CONTENTS</b>
UNIT-I	<p>Definition and concept of Hazards            Classification of hazards            Climate change causes and implications            Natural hazards: Earthquakes; volcanic activity, landslides, land subsidence and avalanches; forest fires.</p>
UNIT-II	<p>Climatic hazards : Droughts and desertification            Drought preparedness and monitoring,            Floods: flood control and management            Thunderstorms, tornadoes, cyclones,            Heat waves, cold waves,            Hail storms.</p>
UNIT-III	<p>Coastal hazards: coastal erosion.            Storm surge            Tsunamis; origin, propagation and devastation.            Sea level changes</p>
UNIT-IV	<p>Human induced disasters: Urban and industrial disasters            Air pollution and Acid rains            Global warming and Ozone depletion,            Siltation and wetland degradation            Epidemics.</p>
UNIT -V	<p>Risk assessment for disasters            Disaster preparedness and management for various hazards            Geo – spatial technologies for disaster management;            Remote sensing applications in disaster management.</p>

**Text Books:**

Hewitt, K., regions of risk: a geographical introduction to disasters, Longman, London, 1997.

Schneid, T and Collins, L. Disaster management and preparedness, Lewis Publishers, Washington, DC, 1998.

**References :**

Burton, Kates, R.W and White, G.F, Environment as hazard, 2<sup>ND</sup> edition, Guilfordpress, New York, 1993

Chakraborty, S.C, Natural hazards and disaster management, pragatishilprakashak, Kolkata, 2007.

Bryant Edwards (2005): Natural Hazards, Cambridge University Press, U.K.

Roy, P.S., Van Westen, C.J. Jha, V.K. Lakhera, R.C and Champathi RAY, P.K., Natural disaster and their Mitigation: Remote sensing and geographical information system perspectives, IIRS, Dehra Dun, Govt. of India, 2003

Rajib Shaw and RR.Krsihna Murthy (eds), 2009. Disaster management : Global challenges and local solutions, University Press, Hyderabad.

B. Murthy, Disaster management: text and case studies, publishers: deep publications.

Bergman E.F., Renwick W.H., and VasanthaKumaran T., 2008: Introduction to Geography: People, Places and Environment, Pearson Education Inc.,

<b>PROGRAMME</b>	<b>M.SC. GEOGRAPHY</b>
<b>SEMESTER</b>	<b>THIRD SEMESTER</b>
<b>PAPER TITLE</b>	<b>GEOGRAPHY OF TRANSPORTATION</b>
<b>PAPER CODE</b>	<b>GR 304 -B</b>
<b>CORE/ELECTIVE</b>	<b>ELECTIVE</b>
<b>MAXIMUM MARKS</b>	<b>100</b>
<b>CREDITS</b>	<b>4</b>
<b>COURSE OUTCOMES (COs):</b>	
CO1	Students will learn about the transport functions and pattern of movement of people and commodities.
CO2	Students will know various aspects of transport network and its flow and urban transport.
CO3	Students will acquire knowledge of different modes of transportation and their relative significance.
CO4	Students will be aware of theories related to transport network and its significance in Spatial interactions and pattern of movements
CO5	Students will understand the development and planning of National Highways and Railways in India and their role in regional development.
<b>COURSE SPECIFIC OUTCOMES (CSOs):</b>	
CSO1	Students will know about modes of transportation, their distribution, and its linkages with economic development.
CSO2	Students will be aware of theories related to structures of transport network/route system.
CSO3	Students will be familiar about various policies related to transport development and planning.
<b>LEARNING OUTCOMES (LOs):</b>	
LO1	Students will be able compare regional economies based on availability of transport development factors
LO2	The will be able to decide the best transport based on distance and weight.
LO3	They will be able to assess regional variations in accessibility and interactions.
LO4	They will be able to apply methods to determine network efficiency.
LO5	They will be able to relate transportation policies and development regions of India.

<b>GR 304 -B</b>	<b>GEOGRAPHY OF TRANSPORTATION</b>
<b>UNIT</b>	<b>CONTENTS</b>
UNIT-I	Nature, Scope, Significance and development of Transport Geography. Factors associated with the development of transport system: Physical, economic, social, cultural and institutional. The role of transportation in the development of regional economies.
UNIT-II	Modes of transport: Roads, Railways, Roads, Airways and Waterways, Their characteristics and relative significance. Major shipping routes.
UNIT-III	Urban Transport: Profile of urban transport facilities, traffic in towns, transport services and urban land use pattern, role of intermediary transport modes. Growth and problems Of urban transport. Problem of accessibility: The transport network Network structure, Network shape and location Regional variations in its density, Methods of measurement Transport and spatial processes Traffic flow and regional interaction
UNIT-IV	Theories related to freight route structure. Graph theory and Network Geometry: Concept of topology, Topological measurement of network efficiency. Bases of spatial interaction, complementarities, intervening opportunities and transferability. Patterns of movement: Type, patterns of movement and transport modes. Transport network: Function, pattern of movement, geometry and transport development.
UNIT -V	Transport policy, development and planning in India. National highway development and planning in India. Indian Railways

**Text Books:**

Bamford, C.G. and Robinson, H. (1978) Geography of Transport, Macdonald and Evans, London.

Raza, M. and Agrawal Y.P. :Transport Geography of India, Concept, New Delhi, 1985.

**References:**

Chorley R.J. & Hagett P.: Models in Geography Methuen & Co. London. 1967.

Hurst, M.E.(ed.): Transportation Geography, McGraw-Hill, 1974.

Hagget, F and Chorley, R.J. Network Analysis', Edward Arnold, London, 1968.

Hay, A.: Transport Economy, MacMillan, London, 1973.

Hoyle, B.S.(ed): Transport and Development, MacMillan, London, 1973.

Taffe, E.J. & Gauthier (Jr.) H.L. Geography of Transportation, Prentice-Hall, Englewood Cliffs, N.J. 1973.

White H.P. and Senior, M.L. Transport Geography, Longman, London, 1983



<b>PROGRAMME</b>	<b>M.SC. GEOGRAPHY</b>
<b>SEMESTER</b>	<b>THIRD SEMESTER</b>
<b>PAPER TITLE</b>	<b>CULTURAL GEOGRAPHY</b>
<b>PAPER CODE</b>	<b>GR 304 -C</b>
<b>CORE/ELECTIVE</b>	<b>ELECTIVE PAPER</b>
<b>MAXIMUM MARKS</b>	<b>100</b>
<b>CREDITS</b>	<b>4</b>
<p><b>COURSE OUTCOMES (COs):</b></p> <p>CO1 Students will be able to identify different cultural groups of the world.  CO2 Students will be able to understand the role of language and religion in nation building.  CO3 Students will know about major races, tribes and their cultural uniqueness.  CO4 Students will be familiar with the role of language and religion in political, social and economic spheres.  CO5 Students will know about tribes of India, languages, and religious groups.</p>	
<p><b>COURSE SPECIFIC OUTCOMES (CSOs):</b></p> <p>CSO1 Students will get exposed to the subject matter of cultural geography.  CSO2 The course will make them familiarize with cultural setups of ethnic groups and their lifestyle.  CSO3 The course will acquaint students about major language and religious groups.</p>	
<p><b>LEARNING OUTCOMES (LOs):</b></p> <p>LO1 They will learn the process of cultural evolution and diffusion.  LO2 They will understand variations in ethnic landscape and culture.  LO3 They will know the unique identity of races and associated cultures.  LO4 They will be able to understand the diffusion process of languages and religion  LO5 They will be able to understand cultural settings of India</p>	

<b>GR 304 -C</b>	<b>CULTURAL GEOGRAPHY</b>
<b>UNIT</b>	<b>CONTENTS</b>
UNIT-I	The Nature and Scope of Cultural Geography. Theories of cultural evolution, Cultural diffusion. Cultural changes.
UNIT-II	Ethnic landscape and cultural ecology. Cultural realms of the world: Polar, Arid, African, Oriental, Pacific, American cultures
UNIT-III	Evolution of races. Classification of races. Geography of ethnic groups and tribal groups. Patterns of Folk and popular culture.
UNIT-IV	World's Major Languages The development and Diffusion of Languages. Origin and diffusion of the world's major religions. Political, economic and social impact of religion.
UNIT -V	Cultural Setting of India: Racial, linguistic, Caste, Religious diversities. Special studies of major tribes of India.

**Text books**

Bergam, E. F., Renwick, W.H., and Kumaran T. V.: Introduction to Geography-People, Places and Environment, Pearson Education, New Delhi, 2005.

Singh L.R.: Fundamentals of Human Geography, Sharda Pustak Bhawan, Allahabad, 2009

**References:**

Ahmad, Aijazuddin: Social Geography, Rawat Publication, New Delhi, 1999.

Bose, N.K.: Tribal life in India, NBT, New Delhi, 1971.

Broek, J.C. and Webb, J.W: A Geography of Mankind, McGraw hill, New York, 1978.

Crang, Mike: Cultural Geography, Routledge Publications, London, 1998.

Hussain, M. Geography of India, Tata McGraw-Hill, New Delhi, 2012.

Hussain, M. Human Geography, Rawat Publications, Jaipur and New Delhi, 2011.

Hutchinson and Smith, D: Ethnicity, Oxford University Press, Oxford, 1996.

Jordon and Lester G: The Human Mosaic, Harper and Row, New York, 1979.

Mukherjee, A. B. and Aijazuddin, A: India: Culture Society and Economy, Inter-India Publication, New Delhi, 1985.

Sopher, D. E.: Exploration of India: Geographical Perspectives on Society and Culture, Longman, London, 1980.

<b>PROGRAMME</b>	<b>M.SC. GEOGRAPHY</b>
<b>SEMESTER</b>	<b>THIRD SEMESTER</b>
<b>PRACTICAL -1</b>	<b>GR 305</b>
<b>PAPER TITLE</b>	<b>QUANTITATIVE TECHNIQUES IN GEOGRAPHY</b>
<b>COURSE OUTCOMES (COs):</b>	
CO1 Students will learn the procedures to create questionnaire and collect primary data.	
CO2 Students will be able to organize data in the required form.	
CO3 Students will know how to derive values for different statistical tendencies.	
CO4 Students will learn to assess linear and moving average trends from data	
<b>COURSE SPECIFIC OUTCOMES (CSOs):</b>	
CSO1 Students will be given an insight of applications and computational procedures of different statistical operations.	
CSO2 Students will be able to choose appropriate statistical tools as per the requirements.	
<b>LEARNING OUTCOMES (LOs):</b>	
LO1 Students will learn to create questionnaires.	
LO2 They will be able to classify and tabulate data.	
LO3 They will be able to measure central tendencies from data.	
LO4 They will be able to measure dispersions from data.	
LO5 They will be able to perform correlation and regression analysis.	
<b>CONTENTS</b>	
<ol style="list-style-type: none"> <li>1. Questionnaire formulation and collection of primary data</li> <li>2. Processing of data: Classification and tabulation</li> <li>3. Representation of statistical data</li> <li>4. Statistical measures of central tendency – Mean, Median, Mode, Quartiles, Deciles and percentiles.</li> <li>5. Measures of dispersion – Range, Mean deviation, standard deviation and Quartile deviation.</li> <li>6. Interpolation and extrapolation</li> <li>7. Time series</li> <li>8. Correlation</li> </ol>	
<b>References:</b>	
Rao, A.B. Essentials of statistics, Continental Prakasan, Poona, 1972	
C.B. Gupta. An Introduction to statistical methods. Vikas publishing House Pvt. Ltd., New Delhi.	
S.P. Gupta. Practical statistics. S. Chand Co.Ltd. Ramnagar, New Delhi.	
Gregory, G. Statistical methods in Geography, Longman & Green Co., London, 1963.	
Pet. Devies. Data descripti8on and presentation. Oxford University Press, London, 1974.	

<b>PROGRAMME</b>	<b>M.SC. GEOGRAPHY</b>
<b>SEMESTER</b>	<b>THIRD SEMESTER</b>
<b>PRACTICAL -2</b>	<b>GR 306</b>
<b>PAPER TITLE</b>	<b>IMAGE PROCESSING</b>
<b>COURSE OUTCOMES (COs):</b>	
CO1	Students will knowledge of interpretation keys and elements for object recognition.
CO2	They will learn to identify different land use land cover classes and present it as map.
CO3	They will learn to apply pre-processing tools to make image ready for analysis.
CO4	They will learn to execute image enhancement tools to make object recognition easy.
<b>COURSE SPECIFIC OUTCOMES (CSOs):</b>	
CSO1	The course will equip students with interpretation elements and keys.
CSO2	They will be given the knowledge to identify objects in the images visually as well as digitally.
CSO3	Students will be given exposure to image processing and image enhancement tools.
<b>LEARNING OUTCOMES (LOs):</b>	
LO1	Students will be able to identify objects on the images.
LO2	Students will be proficient with image processing software.
LO3	Students will be able to process and interpret the digital image.
LO4	Students will be able to classify images to generate thematic maps.
LO5	Students will be able to create map outputs with all its components.
<b>CONTENTS</b>	
1.	Visual Interpretation – Elements, Keys
2.	Land use, land cover mapping
3.	Digital analysis – Image data formats, multispectral data, False Colour Composite, submap extraction, Statistics extraction, image registration
4.	Image enhancement – Contrast stretching, Edge enhancement, Spatial Filtering, Band rationing
5.	Image classification – supervised, un- supervised
6.	Creating base map, over lay, Field work.
<b>References:</b>	
Curran, Paul J. Principles of Remote Sensing. Long man, London, 1985.	
Thomas M, Lillesand and Ralph W. Kiefer. Remote sensing and Image interpretation. John Willey & Sons, New York, 1994.	
M. Anji Reddy. Remote Sensing and geographical Information systems, boo Ionics, Hyderabad.	
Gautam, N.C. et al . Space Technology and geography, NRSA, Hyderabad, 1994.	

**M.SC. GEOGRAPHY**  
**Syllabus (w.e.f. Academic Year 2021-22)**

**FOURTH SEMESTER**

<b>Paper Code</b>	<b>Core/ Elective</b>	<b>Title</b>
Gr 401	Core paper 1	Regional Planning And Development
Gr 402	Core paper 2	Geographic Information Systems
		<b>Any one of the Following</b>
Gr 403- A Gr 403 -B Gr 403-C	Elelective Paper	A Agricultural Geography B Biogeography C Political Geography
Gr 404	<b>Project Work</b>	Dissertation & Viva-voce
Gr 405	Practical 1	Terrain Analysis
Gr 406	Practical 2	Geographical Information Systems
Gr 407	MOOCs	
Gr 408	Value Added Course	

<b>PROGRAMME</b>	<b>M.SC. GEOGRAPHY</b>
<b>SEMESTER</b>	<b>FOURTH SEMESTER</b>
<b>PAPER TITLE</b>	<b>REGIONAL PLANNING AND DEVELOPMENT</b>
<b>PAPER CODE</b>	<b>GR 401</b>
<b>CORE/ELECTIVE</b>	<b>CORE PAPER</b>
<b>MAXIMUM MARKS</b>	<b>100</b>
<b>CREDITS</b>	<b>4</b>
<p><b>COURSE OUTCOMES (COs):</b></p> <p>CO1 Students will understand the concept of region and approaches to study it.</p> <p>CO2 Students will know difference of demographic characteristics in different types of Region.</p> <p>CO3 The students will acquire knowledge about theoretical aspects of regional development.</p> <p>CO4 Students will be exposed to different approaches to target regional development.</p> <p>CO5 Students will be familiar with difference in the focus of planning for different regions.</p>	
<p><b>COURSE SPECIFIC OUTCOMES (CSOs):</b></p> <p>CSO1 The course will make students understand the concept of region, its appropriateness and applicability in development planning.</p> <p>CSO2 It will provide an insight of about regional disparities/imbalance and the applicability of growth poles and growth foci models in reducing disparities.</p> <p>CSO3 The course will familiarise students about the importance of region specific development strategies.</p>	
<p><b>LEARNING OUTCOMES (LOs):</b></p> <p>LO1 Students will be able to distinguish different types of regions and levels of development.</p> <p>LO2 Students will be able to relate hierarchy in development plan and difference in demographic characteristics..</p> <p>LO3 Students will be able to identify problems and prospects of different types of regions</p> <p>LO4 Students will be able to identify problems in execution of plans.</p> <p>LO5 Students will understand the importance of balanced regional development.</p>	

<b>GR 401</b>	<b>REGIONAL PLANNING AND DEVELOPMENT</b>
<b>UNIT</b>	<b>CONTENTS</b>
UNIT-I	<p>Concept of Region:          Planning in India: Goals and Achievements          Planning: Ideology, Objectives, challenges and opportunities.          The system approach – Economic regions,          Environmental region,          Administrative regions,          Multi - level planning regions</p>
UNIT-II	<p>Regional Patterns and Imbalance.          Regional Structure of Population Distribution and Population Density,          Rural Urban Ratio.          Regional Structure of Economic Development          History of Planning Regions (Macro, Meso and Micro level).          Identification of Planning Regions in India.          Regional Planning at the State Level.</p>
UNIT-III	<p>The Process of Regional Development: Theoretical Foundation.          A new Approach to Regional Development – Growth Pole Hypothesis.          Inadequacies and Modified Version of the Growth Pole          Trends in Regional Development Planning.</p>
UNIT-IV	<p>An Operational Design for New Approach.          Choice of Lower Level Growth Foci: State or District Level          Choice of Higher Level Growth Foci: National Level          Problems in the Implementation of Plans.</p>
UNIT - V	<p>Planning for Agricultural Region.          Planning for Industrial Region.          Metropolitan Regional Planning.          Development of Backward Areas.          Planning for Tribal Region.</p>



**Text Books:**

Misra, R.P.: Regional planning: concepts, techniques and polices, University of Mysore, Mysore, 1969.

Chorley, R.J. and Hagget, P. Models in Geography, Methuen, London, 1967

Regional development planning in India (A new Strategy) By – R.P. Mishra ,K.V.Sundaram, V.L. PrakashRao.

**References :**

Abler, R., et al. Spatial Organization: The Geographer's View of the World. Prentice Hall, Englewood Cliffs, N.J., 1971.

Bhat, L.S.: Regional Planning in India, Statistical Publishing Society, Calcutta, 1973.

Bhat, L.S. et al. Micro-Level Planning: A Case Study of Karnal Area, Haryana. K.B. Publications, New Delhi, 1976.

Christaller, W. Central Places in Southern Germany. Translated by C.W.Baskin, Prentice Hall, Englewood Cliffs, New Jersey, 1966.

Indian Council of Social Science Research. Survey of Research in Geography., Popular Prakashan, Bombay, 1972.

Kundu, A. and Raza, Moonis. Indian Economy – The Regional Dimension Spectrum Publishers, New Delhi, 1982.

Misra, R.P: and Others (Editors) Regional development planning in India – A strategy, Institute of development studies, Mysore, 1974.

Misra, A.: Levels of regional development, Census of India, Vol.I., Part I A(1) and (ii), New Delhi, 1965.

NangiaSudesh, Delhi Metropolitan Region Rajesh publication, Delhi, 1976.

Sudaram, K.V. (ed): Geography and planning, Essay in Hanour of V.L.S. PrakasaRao, Concept publishing Co., New Delhi, 1985.

Tarlok Singh India's Development Experience, McMillan New Delhi, India, 1947.

RazaMoonis (Editor) Regional development Heritage Publishers Delhi, 1988.

Misra, R.P. et al., Multi – Level planning heritage publishers, Delhi, 1980.

<b>PROGRAMME</b>	<b>M.SC. GEOGRAPHY</b>
<b>SEMESTER</b>	<b>FOURTH SEMESTER</b>
<b>PAPER TITLE</b>	<b>GEOGRAPHIC INFORMATION SYSTEMS</b>
<b>PAPER CODE</b>	<b>GR 402</b>
<b>CORE/ELECTIVE</b>	<b>CORE PAPER</b>
<b>MAXIMUM MARKS</b>	<b>100</b>
<b>CREDITS</b>	<b>4</b>

**COURSE OUTCOMES (COs):**

- CO1 Students will know organisation of geographical data in GIS and the challenges.
- CO2 Students will know the complete procedure of GIS analysis
- CO3 Students will be sensitive to the principles of cartography and its applications in GIS
- CO4 Students will be aware of remotely sensed data, and its usage in GIS
- CO5 Students will be acquainted with various applications of GIS

**COURSE SPECIFIC OUTCOMES (CSOs):**

- CSO1 The course will give acquaintance with the concept of spatial and non-spatial datasets and their organization in computer environment.
- CSO2 They will get insight of database models, data quality and accuracy issues to be considered in GIS.
- CSO3 The integration of GIS, with other spatial techniques, such as cartography, remote sensing, and GPS will broaden the understanding of students.

**LEARNING OUTCOMES (LOs):**

- LO1 They will be able to acquire and handle spatial and non –spatial data in computer environment.
- LO2 Students will be able to make a choice between raster or vector datasets according to the required analysis.
- LO3 Students will be able to distinguish the appropriateness of scale and selection of points, lines and polygons.
- LO4 They will be able to know the potential of combining other geospatial techniques in GIS
- LO5 Students will learn to use GIS for various applications.

<b>GR 402</b>	<b>GEOGRAPHIC INFORMATION SYSTEMS</b>
<b>UNIT</b>	<b>CONTENTS</b>
UNIT-I	<p>GIS: Development and Definitions of GIS            Computer Environment of Hardware and Software            Trends in GIS            General Database Concept: Spatial and Non-Spatial Data            Database Management Systems            Geographic Data Sources            Sources of Error and Data Quality</p>
UNIT-II	<p>Data structure – Raster and Vector and their Capabilities            Data Conversions            Relational Database Model            Data Compression of Spatial Objects            GIS Functioning: Data Capture, Digitizing and Scanning,            Preprocessing            Data Manipulation ,Analysis</p>
UNIT-III	<p>GIS and Cartography: Mapping concepts            Common coordinate system            Coordinate system and geocoding            UTM grids            Computer assisted cartography</p>
UNIT-IV	<p>GIS and Remote Sensing: digital processing            Classification            Integration of GIS and Remote Sensing            Use of GPS            GIS and digital elevation models– concepts of DTM, DEM and TIN</p>
UNIT -V	<p>GIS and applications: GIS as a decision making tool            Land information system            Resource management applications            Facility management applications            Urban GIS            Environmental GIS.</p>

**Text Books:**

- Burrough P.A. Principles of Geographic information systems for Land Resource Assessment. Oxford University Press, New York, 1986.
- Fraser Taylor D.R. Geographic Information Systems. Pergamon Press, Oxford, 1991

**References :**

- Maquire D.J., M.F. Goodchild and D.W. Rhind (eds). Geographic information Systems: Principles and Application. Taylor & Francis, Washington, 1991
- Mark S. Monmonier. Computer –assisted Cartography. Prentice – Hall, Englewood Cliff, New Jersey, 1982.
- Peuquet D.J. and D.F. Marble. Introductory Reading in Geographic Information Systems. Taylor & Francis, Washington, 1990.
- Star, J. and J. Estes. Geographic Information Systems: An Introduction. Prentice Hall, Englewood Cliff, New Jersey, 1994
- ESRI. Understanding GIS – Redlands, USA: ESRI
- Anji Reddy, M. Remote Sensing and Geographical Information Systems. Book Syndicate, Hyderabad, 2000

<b>PROGRAMME</b>	<b>M.SC. GEOGRAPHY</b>
<b>SEMESTER</b>	<b>FOURTH SEMESTER</b>
<b>PAPER TITLE</b>	<b>AGRICULTURAL GEOGRAPHY</b>
<b>PAPER CODE</b>	<b>GR 403 - A</b>
<b>CORE/ELECTIVE</b>	<b>ELECTIVE PAPER</b>
<b>MAXIMUM MARKS</b>	<b>100</b>
<b>CREDITS</b>	<b>4</b>
<p><b>COURSE OUTCOMES (COs):</b></p> <p>CO1 Students will learn about the significance of agricultural geography, various approaches to study the discipline and the determinants of agriculture.</p> <p>CO2 Students will learn about location, classification and typology of agriculture.</p> <p>CO3 Students will learn about agricultural land use and regionalisation.</p> <p>CO4 Students will be exposed to broad aspects of Indian agriculture</p> <p>CO5 Students will be exposed to the contemporary issues associated with agriculture</p>	
<p><b>COURSE SPECIFIC OUTCOMES (CSOs) :</b></p> <p>CSO1 Students will learn about the location theory, classification of agricultural systems, typology and agricultural regionalisation.</p> <p>CSO2 To provide insights into the salient features, problems and prospects of Indian agriculture.</p> <p>CSO3 To provide insights into the contemporary issues such as globalisation of agriculture, advanced farming practices, food Security, poverty alleviation and sustainable development of agriculture etc.</p>	
<p><b>LEARNING OUTCOMES (LOs):</b></p> <p>LO1 The students will be able to understand and analyse the role of physical and socio-economic determinants on agriculture.</p> <p>LO2 The students will be able to comprehend and analyse the development and transformation of agriculture in India, policies, specific problems &amp; prospects, and implications of Green Revolution.</p> <p>LO3 The students will be able to comprehend and address the contemporary issues associated with agriculture.</p>	

<b>GR 403 - A</b>	<b>AGRICULTURAL GEOGRAPHY</b>
<b>UNIT</b>	<b>CONTENTS</b>
UNIT-I	<p>Agricultural geography: Nature, Scope, Significance and Development</p> <p>Approach to the study of Agricultural Geography: Commodity Approach , Regional Approach, Systematic Approach</p> <p>Determinants of agriculture: Physical, Socio-economic and Institutional, Technological</p>
UNIT-II	<p>Von Thunen’s model of agricultural location: Whittlesey’s classification of agricultural systems. Agricultural Typology. International Commission of the IGU.</p>
UNIT-III	<p>Agricultural Land Use and Crop Regions: Land holding and Land tenure systems Land Use Classification, Land Capability classification Cropping Patterns, Crop Combination, Crop Concentration, Crop Diversification, Crop Specialization, Agriculture Efficiency</p>
UNIT-IV	<p>Salient features of Indian Agriculture Agricultural Transformation in India After Independence Agricultural Regions of India and their characteristics Agricultural Typology of India Green Revolution: Impact and Consequences Specific Problems of Indian Agriculture. Agricultural Policy in India.</p>
UNIT -V	<p>Contemporary Issues: Globalization and Agriculture Food, Nutrition and Hunger Food security and Food Aid Programs Role of Irrigation, Fertilizers, Insecticides, Pesticides, Technological Knowhow Sustainable Agricultural Development and Poverty alleviation</p>

**Text Books:**

Jasbir Singh and Dillon, S.S. Agricultural geography, Tata Mc. Graw Hill, New Delhi. 1988.

Mohammad Shafi. Agricultural geography, Dorling Kindersley (India) Pvt Ltd, Delhi. 2006

**References:**

Ali Mohammad: Studies in Agricultural Geography, Rajesh Publications, New Delhi.

Bayliss Smith, T.P. The ecology of Agricultural systems. Cambridge University Press, London, 1987.

Berry, B.J.L. etal. The geography of Economic Systems. Prentice Hall, New YORK, 1976.

Brown, L.R. The changing World Food prospects – The Nineties and Beyond. World Watch Institute, Washington D.C;1990.

Dyson, T. Populaton and Food – Global trends and future prospects, Routiedge, London, 1996.

Gregor, H.P. Geography of agriculture. Prentice Hall, New York, 1970.

Grigg, D.B. The agricultural systems of the world, Cambridge Universiy Press, New York, 1974

Majid Husain, Sytamic agricultural geography, Rawat publications, New Delhi. 1996.

Mandal, R.B. Land Utilisation, theory and practical concept. New Delhi. 1982.

Mannion, A.M. agriculture and Environmetal change, John Willey, London, 1995.

Morgan, W.B. agriculture in the third World – Aspatial analysis Westview Press, Boulder, 1978

Sauer C.O Agricultural Origins and Dispersals, M.I.T. Press, Mass, U.S.A., 1969.

Noor Mohammad: Perspective in agricultural geography, Vol.1 to 5, Cocept, New Delhi. 1981.

<b>PROGRAMME</b>	<b>M.SC. GEOGRAPHY</b>
<b>SEMESTER</b>	<b>FOURTH SEMESTER</b>
<b>PAPER TITLE</b>	<b>BIOGEOGRAPHY</b>
<b>PAPER CODE</b>	<b>GR 403 - B</b>
<b>CORE/ELECTIVE</b>	<b>ELECTIVE PAPER</b>
<b>MAXIMUM MARKS</b>	<b>100</b>
<b>CREDITS</b>	<b>4</b>
<b>COURSE OUTCOMES (COs):</b>	
CO1	Students will learn about the environment, habitat, plant and animal associations and distribution in time and space.
CO2	They will learn about major biomes of the world , their characteristics .
CO3	They will learn about geographical regions, dispersal, migration and adaptations of animals.
CO4	Student will learn about marine environment and its resources.
CO5	They will learn about the biodiversity, biotic resources, their conservation and management.
<b>COURSE SPECIFIC OUTCOMES (CSOs) :</b>	
CSO1	To impart knowledge on the environment , plant and animal associations, their geographical regions, adaptations and migrations.
CSO2	To impart knowledge of the marine biotic resources and fishing grounds.
CSO3	To provide insights in to the biosphere reserves and biodiversity hotspots in India and conservation and management of biotic resources
<b>LEARNING OUTCOMES (LOs):</b>	
LO1	Students will be able to understand and analyse the complex relations between and among the ecological factors and plant and animal species.
LO2	Students will be able to understand and analyse the characteristics of major biomes, zoogeographical regions and marine fauna.
LO3	Students have in depth understanding of biosphere reserves and biodiversity hotspots and well acquainted with conservation and management practices.



<b>GR 403 - B</b>	<b>BIOGEOGRAPHY</b>
<b>UNIT</b>	<b>CONTENTS</b>
UNIT-I	Scope and development of Biogeography. Environment, Habitat and Plant-animal association. Plants and their environment - Physiographic, Climatic, Edaphic, Anthropogenic factors. Plant Dispersal and floristic regions. Community development and succession.
UNIT-II	Major Biomes of the World: Forests – Tropical Rainforests, Monsoon Forests, Thorny Forests, Sclerophyll woodlands, Deciduous Forests, Coniferous forests. Grasslands: Tropical grasslands, Temperate Grasslands. Deserts and Tundras.
UNIT-III	Zoogeographical regions of the world. Environmental Adaptation. Animal dispersal and Migration
UNIT-IV	The aquatic fauna. Marine biological resources. Major fishing grounds of the world
UNIT -V	Biosphere reserves and Biodiversity hotspots in India. National Forest Policy of India. Conservation and Management of Biotic Resources

**Text Books:**

Mathur H.S. (2003): Essential of Biogeography, Pointer publishers, Jaipur, India.  
Huggett R J(1990): Fundamentals of Biogeography. Routledge, USA  
Robinson, H. Biogeography, ELBS, London, 1978.

**References:**

Agarwal D P (1992): Man and Environment in India through Ages. Book & Books.  
Bradshaw M.J. (1979): Man and Living Planet, ELBS, London  
Cox, C D & Moore P D (1993): Biogeography: An Ecological and Evolutionary Approach. Blackwell  
Hoyt J B (1992): Man and the Earth. Prentice Hall, USA  
Illies J (1974): Zoogeography. Macmillan, Londong.

<b>PROGRAMME</b>	<b>M.SC. GEOGRAPHY</b>
<b>SEMESTER</b>	<b>FOURTH SEMESTER</b>
<b>PAPER TITLE</b>	<b>POLITICAL GEOGRAPHY</b>
<b>PAPER CODE</b>	<b>GR 403 -C</b>
<b>CORE/ELECTIVE</b>	<b>ELECTIVE PAPER</b>
<b>MAXIMUM MARKS</b>	<b>100</b>
<b>CREDITS</b>	<b>4</b>
<p><b>COURSE OUTCOMES (COs):</b></p> <p>CO1 Students will get insight of nature of political geography, the approaches to study it and its recent trends.</p> <p>CO2 Students will gain knowledge of concepts of terminologies like state, nation, frontiers and boundary.</p> <p>CO3 Students will get exposure to relate international relations and its impact on nation.</p> <p>CO4 Students will learn the border related issues and conflicts</p> <p>CO5 Students will understand the importance of equity to assure national progress.</p>	
<p><b>COURSE SPECIFIC OUTCOMES (CSOs):</b></p> <p>CSO1 Students will be able to understand the importance of political power and decisions in shaping geographical space.</p> <p>CSO2 Students will understand the role of political, cultural and economic factors in nation or State progress.</p> <p>CSO3 They will realize the importance of congenial relations and harmony any equitable distribution of resources to achieve national progress.</p>	
<p><b>LEARNING OUTCOMES (LOs):</b></p> <p>LO1 Students will be able to apply different approaches to handle multi-faceted political issues.</p> <p>LO2 Students will be able to use locational, morphological and demographic concepts in shaping state/nation.</p> <p>LO3 Students will be able to evaluate political cultural and economic ties with other countries to pursue national interests.</p> <p>LO4 They will be able to suggest measures to tackle border issues by due regard of people, border, common interests and rights.</p> <p>LO5 Students will be able to value ideas of unity in diversity, cross cultural tolerance etc.</p>	

<b>GR 403 - C</b>	<b>POLITICALGEOGRAPHY</b>
<b>UNIT</b>	<b>CONTENTS</b>
UNIT-I	History, Development and Nature of Political Geography. Methodological Approaches: Power analysis Genetic/historical Factual Morphological Functional Regional. Recent Trends in Political Geography.
UNIT-II	Nation and State: Concept and evolution. Locational, Morphological and Demographic Components. Frontiers and Boundaries. Elements of Spatial Structure of the State.
UNIT-III	Global Strategic views- (Heartland and Rim land theories). Geography of International Relations. Political, Economic and Cultural Blocs. Geography of Federalism.
UNIT-IV	International boundary of India and related issues. Cross border terrorism. Geopolitics of Indian Ocean Realm. Geopolitics of SAARC countries.
UNIT -V	Geographical basis of Indian federalism. Structure of Indian federation. Emergence of New States. Federal India: Unity in Diversity. Interstate Issues and conflicts (water, forest, minerals).

**Text Books:**

Dikshit, R.D. Political geography: the discipline and its dimensions, Tata McGraw-Hill, New Delhi, 1997.

Adhikari, S.: Political Geography, Rawat Publications, Jaipur, 1997

**References:**

Hussain, M. Geography of India, Tata McGraw-Hill, New Delhi, 2012.

Alexander, L.M. World Political Patterns, Ran McNally, Chicago, 1963.

De Blij, H.J. and Glassner, Martin, Systematic Political Geography, John Wiley, New York, 1968.

Dikshit, R.D. Political Geography: A Contemporary Perspective, Tata McGraw Hill, New Delhi, 1996.

Sukhwai, B.L. Modern Political Geography of India, Sterling Publishers, New Delhi, 1968.

Taylor, Peter, Political Geography, Longman, London, 1985.

Prescott, J.R.V.: The Geography of Frontiers and Boundaries, Aldine, Chicago.

Deshpande, C.D.: India-A Regional Interpretation, Northern Book Centre, New Delhi, 1992.

<b>PROGRAMME</b>	<b>M.SC. GEOGRAPHY</b>
<b>SEMESTER</b>	<b>FOURTH SEMESTER</b>
<b>CODE</b>	<b>GR 404</b>
<b>PROJECT</b>	<b>DISSERTATION &amp; VIVA-VOCE</b>
<b>MAXIMUM MARKS</b>	<b>100</b>
<b>CREDITS</b>	<b>4</b>
<p><b>PROJECT OUTCOME:</b></p> <p>Expose to a specific issue related to geography, which involves acquiring both primary and secondary data, carrying out field work, spatial data handling, analysis and report writing.</p>	
<p><b>LEARNING OUTCOMES:</b></p> <p>LO1 The Students will acquire the skills to address the problems through a systematic approach.</p> <p>LO2 They will be able to choose an appropriate methodology, identify the sources to acquire secondary data, and plan to conduct field work for collecting primary samples/data, observe phenomena and design questionnaires for field surveys.</p> <p>LO3 They will be able to analyze the data using various analytical techniques and tools.</p> <p>LO4 They will be able to generate thematic maps required for the study, will understand the basic concepts of report writing starting from framing the hypothesis, objectives, analysis description and deriving conclusions</p>	

<b>PROGRAMME</b>	<b>M.SC. GEOGRAPHY</b>
<b>SEMESTER</b>	<b>FOURTH SEMESTER</b>
<b>PRACTICAL -1</b>	<b>GR 405</b>
<b>PAPER TITLE</b>	<b>TERRAIN ANALYSIS</b>
<p><b>COURSE OUTCOMES (COs):</b></p> <p>CO1 Students will learn to recognise and represent various geomorphic features.</p> <p>CO2 Students will learn about different types of slopes and their characteristics.</p> <p>CO3 Students will learn about the characteristics and measurements of drainage basin.</p> <p>CO4 Students will learn different types of elevation models.</p>	
<p><b>COURSE SPECIFIC OUTCOMES (CSOs) :</b></p> <p>CSO1 Students will learn various types of geomorphic features and different methods of representation and analysis.</p> <p>CSO2 Students will learn to recognise, represent, interpret and analyse the characteristics of drainage basin, slopes and terrain.</p>	
<p><b>LEARNING OUTCOMES (LOs):</b></p> <p>LO1 Students will acquire skills to represent terrain features through graphs and profiles.</p> <p>LO2 They will be able to determine the slope of the terrain and establish its relation with area and altitude.</p> <p>LO3 They will be able to carryout morphometric analysis of drainage basin and can draw conclusions.</p> <p>LO4 They will be able to create digital elevation models and their applications in geographic studies.</p>	
<b>CONTENTS</b>	
<ol style="list-style-type: none"> <li>1. Methods of Representation of relief – Profiles – Geological cross sections</li> <li>2. Morphometry of drainage basin</li> <li>3. Slope analysis – Wentworth and Smith methods</li> <li>4. Altimetric frequency Analysis</li> <li>5. Hypsometric Analysis</li> <li>6. Clinometric Analysis</li> <li>7. Relative relief Analysis</li> <li>8. Digital Elevation Model representation</li> </ol>	
<p><b>References:</b></p> <p>Singh R.L. Map work and practical geography. Central Book Depot, Allahabad, 1972.</p> <p>Khan, Z.A. Text Book of practical geography, Concept, New Delhi, 1998.</p> <p>John Bygott, An introduction to Map work and practical geography, University tutorial Press Ltd., London, 1974.</p> <p>Monk House, F.J.H.R. and Wilkinson. Maps and diagrams, Methuen and Co., London, 1984.</p> <p>Peter Toyne and Peter Newby, T. Techniques in physical geography, Mac Millan, London, 1972</p> <p>Gregory, K.J. and Walling, D.E. Drainage basin form and process. Arnold, London, 1973.</p>	

<b>PROGRAMME</b>	<b>M.SC. GEOGRAPHY</b>
<b>SEMESTER</b>	<b>FOURTH SEMESTER</b>
<b>PRACTICAL -2</b>	<b>GR 406</b>
<b>PAPER TITLE</b>	<b>GEOGRAPHIC INFORMATION SYSTEMS</b>
<p><b>COURSE OUTCOMES (COs):</b></p> <p>CO1 Students will learn about data creation and storage in GIS workspace.</p> <p>CO2 They will learn the use of base map and geo-referencing.</p> <p>CO3 They will know how to create shape files, digitize, edit etc.</p> <p>CO4 They will be familiar with overlaying operations.</p>	
<p><b>COURSE SPECIFIC OUTCOMES (CSOs):</b></p> <p>CSO1 Students will be enabled with basic hands-on skills to handle GIS datasets in software.</p> <p>CSO2 Clearer understanding to students about coordinate systems, their transformations and usage.</p> <p>CSO3 Students will get acquainted about spatial analysis.</p>	
<p><b>LEARNING OUTCOMES (LOs):</b></p> <p>LO1 Students will be able to work with points, lines and polygons shape files.</p> <p>LO2 Students will be able to perform spatial analysis.</p> <p>LO3 Students will learn to join non-spatial/attribute data to spatial features</p> <p>LO4 They will be able to create terrain models in GIS.</p> <p>LO5 Students will come to know about the basic procedure to be followed in GIS work.</p>	
<p><b>CONTENTS</b></p> <ol style="list-style-type: none"> <li>1. Creation of workspace</li> <li>2. Base map and geo-reference</li> <li>3. Creation of shape files: point, line, polygon</li> <li>4. Digitization, editing and topology building</li> <li>5. Attribute table: join, add field</li> <li>6. Overlay and Boolean operations</li> <li>7. Digital Elevation Models</li> </ol>	
<p><b>References:</b></p> <p>Michael G. Goodchild and Karen K. Kemp. Introduction to GIS, Santa Barbara, NCGIA, 1990</p> <p>ESRI. Arc/Info User's guide, Redlands, USA, 1992.</p> <p>Burrough, P.A. and Rachael A.McDonnell. Principles of Geographic Information Systems. Oxford University Press, New York, 1988.</p> <p>Mishra, H.C. GIS handbook, GIS India Hyderabad, 1996</p> <p>Star J. and J.Estes: Geographic Information Systems: An introduction. Prentice Hall, Englewood Cliff, New Jersey, 1994</p>	