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)

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

Any one of the Following
### THIRD

| Course   | Elective Paper - 1 | A Pedology & Hydrology  
|          |                   | B Applied Climatology  
|          |                   | C Geography of Health  
| Gr 303-A | 4                  | 80  
| Gr 303-B |                    | 20  
| Gr 303-C |                    | 100 

| Course   | Elective Paper - 2 | A Disaster Management Studies  
|          |                   | B Geography of transportation  
|          |                   | C Cultural Geography  
| Gr 304-A | 4                  | 80  
| Gr 304-B |                    | 20  
| Gr 304-C |                    | 100 

| Course   | Practical 1 | Quantitative Techniques in Geography  
| Gr 305   | 3           | 100  

| Course   | Practical 2 | Image processing  
| Gr 306   | 3           | 100  

| Course   | MOOCs  
| Gr 307   | 100  

| Course   | Intellectual Property Rights (IPR)  
| Gr 408   | 50  

**TOTAL**  
**700**  
**24**

### FOURTH

| Course   | Core paper 1 | Regional Planning And Development  
| Gr 401   | 4           | 80  
| Gr 402   | 4           | 80  

| Course   | Elective Paper | A Agricultural Geography  
|          |                | B Biogeography  
|          |                | C Political Geography  
| Gr 403-A | 4           | 80  
| Gr 403-B | 4           | 80  
| Gr 403-C | 4           | 80  

| Course   | Project Work | Dissertation & Viva-voce  
| Gr 404   | 75+25       | 100  

| Course   | Practical 1 | Terrain Analysis  
| Gr 405   | 3           | 100  

| Course   | Practical 2 | Geographic Information Systems  
| Gr 406   | 3           | 100  

| Course   | MOOCs  
| Gr 407   | 100  

| Course   | Value Added Course  
| Gr 408   | 50  

**TOTAL**  
**700**  
**24**

**Grand Total**  
**2600**  
**88**

*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

<table>
<thead>
<tr>
<th>Core/ Elective</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Paper 1</td>
<td>Geomorphology</td>
</tr>
<tr>
<td>Core paper 2</td>
<td>Economic Geography</td>
</tr>
<tr>
<td>Core Paper 3</td>
<td>Geography of India and Andhra Pradesh</td>
</tr>
<tr>
<td>Core Paper 4</td>
<td>Principles of Cartography</td>
</tr>
<tr>
<td>Practical 1</td>
<td>Map Analysis</td>
</tr>
<tr>
<td>Practical 2</td>
<td>Cartography</td>
</tr>
</tbody>
</table>

[DEPARTMENT OF GEOGRAPHY, COLLEGE OF SCIENCE & TECHNOLOGY, ANDHRA UNIVERSITY, VISAKHAPATNAM - 530003]
<table>
<thead>
<tr>
<th>PROGRAMME</th>
<th>M.S.C. GEOGRAPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMESTER</td>
<td>FIRST SEMESTER</td>
</tr>
<tr>
<td>PAPER TITLE</td>
<td>GEOMORPHOLOGY</td>
</tr>
<tr>
<td>PAPER CODE</td>
<td>GR 101</td>
</tr>
<tr>
<td>CORE/ELECTIVE</td>
<td>CORE PAPER</td>
</tr>
<tr>
<td>MAXIMUM MARKS</td>
<td>100</td>
</tr>
<tr>
<td>CREDITS</td>
<td>4</td>
</tr>
</tbody>
</table>

**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.
<table>
<thead>
<tr>
<th>UNIT</th>
<th>CONTENTS</th>
</tr>
</thead>
</table>
| 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:


References:

<table>
<thead>
<tr>
<th>PROGRAMME</th>
<th>M.S.C. GEOGRAPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMESTER</td>
<td>FIRST SEMESTER</td>
</tr>
<tr>
<td>PAPER TITLE</td>
<td>ECONOMIC GEOGRAPHY</td>
</tr>
<tr>
<td>PAPER CODE</td>
<td>GR 102</td>
</tr>
<tr>
<td>CORE/ELECTIVE</td>
<td>CORE PAPER</td>
</tr>
<tr>
<td>MAXIMUM MARKS</td>
<td>100</td>
</tr>
<tr>
<td>CREDITS</td>
<td>4</td>
</tr>
</tbody>
</table>

COURSE OUTCOMES (COs):

CO1    Students will know about the broad classification of economic geography and their dependency on the location of resources.
CO2    Students will understand the importance of factors that govern location of activities
CO3    They will acquire knowledge on Industrial location theories
CO4    They will learn about role of transport and market in economic development.
CO5    They will understand about the nexus between economic development and environment.

COURSE SPECIFIC OUTCOMES (CSOs):

CSO1   Students will be able to know about the variations in economic activities and its guiding factors
CSO2   They will be able to analyserole of location and distribution of resources in successful operation of economic activities.
CSO3   They will be able to determine interlink between different geographical forces that regulate economic activities

LEARNING OUTCOMES (LOs):

LO1    Students will be able to segregate different types of economy and their specific requirements for its successful operation.
LO2    Students will be able to explain the role of transport cost on land use type.
LO3    Students will be able to make a choice of location for profitable operation of industries.
LO4    Students will be able to select the right mode of transport according to distance, time and cost.
LO5    Students will be able to segregate activities that may result in deterioration/improvement of the environment.
<table>
<thead>
<tr>
<th>UNIT</th>
<th>CONTENTS</th>
</tr>
</thead>
</table>
| 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 |
<table>
<thead>
<tr>
<th><strong>Text Books:</strong></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>References:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>PROGRAMME</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>SEMESTER</td>
</tr>
<tr>
<td>PAPER TITLE</td>
</tr>
<tr>
<td>PAPER CODE</td>
</tr>
<tr>
<td>CORE/ELECTIVE</td>
</tr>
<tr>
<td>MAXIMUM MARKS</td>
</tr>
<tr>
<td>CREDITS</td>
</tr>
</tbody>
</table>

**COURSE OUTCOMES (COs):**

- **CO1** To provide insights into the physical settings of India.
- **CO2** To educate students on natural vegetation and agricultural setup of the country.
- **CO3** To impart knowledge of resources and industries of India.
- **CO4** To provide in depth knowledge on the demographic and socio-economic aspects of India.
- **CO5** To provide a comprehensive geographic knowledge of Andhra Pradesh State.

**COURSE SPECIFIC OUTCOMES (CSOs):**

- **CSO1** Students will learn about the physical, cultural as well as socio economic aspects of India and the State of Andhra Pradesh.
- **CSO2** They will learn about the potential of resources and infrastructural strengths of the country and the State of Andhra Pradesh.

**LEARNING OUTCOMES (LOs):**

- **LO1** Students will be able to understand and analyze the distribution of various physical and cultural aspects of the country.
- **LO2** They will be able to appraise the status of mineral resources, industrial development and infrastructural accomplishments of the country.
- **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.
<table>
<thead>
<tr>
<th>UNIT</th>
<th>CONTENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT-I</td>
<td>India: Location Major physiographic divisions Drainage Climate Soils</td>
</tr>
<tr>
<td>UNIT-II</td>
<td>Natural vegetation: Types, Distribution and Need for conservation.</td>
</tr>
<tr>
<td></td>
<td>Agriculture: Types and Regions Distribution of Major food and commercial crops Green Revolution, Blue Revolution, White Revolution</td>
</tr>
<tr>
<td></td>
<td>Irrigation: Sources - Tanks, Wells &amp; Bore wells, Canals</td>
</tr>
<tr>
<td></td>
<td>Mineral Resources: Types of Minerals. Reserves and Distribution of Iron Ore, Manganese, Coal, Oil &amp; Natural gas</td>
</tr>
<tr>
<td></td>
<td>Major industries: Iron and steel, Ship building, Cement, Cotton, Jute, Sugar</td>
</tr>
<tr>
<td></td>
<td>Urbanization in India Smart City Concept</td>
</tr>
<tr>
<td></td>
<td>Transport: Indian Railways, Road Ways, Water Ways and Airways</td>
</tr>
<tr>
<td></td>
<td>India’s foreign Trade: Exports &amp; Imports Problems and Prospects</td>
</tr>
<tr>
<td></td>
<td>Importance of Indian Ocean Boarder Conflicts</td>
</tr>
</tbody>
</table>
**Text Books:**

D.R. Khullar  
India A Comprehensive Geography, Kalyani Publishers, New Delhi,  

**References:**

O.H.K. Spate and Lear month. India and Pakistan, Methuen, London.
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.
<table>
<thead>
<tr>
<th>PROGRAMME</th>
<th>M.SC. GEOGRAPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMESTER</td>
<td>FIRST SEMESTER</td>
</tr>
<tr>
<td>PAPER TITLE</td>
<td>PRINCIPLES OF CARTOGRAPHY</td>
</tr>
<tr>
<td>PAPER CODE</td>
<td>GR 104</td>
</tr>
<tr>
<td>CORE/ELECTIVE</td>
<td>CORE PAPER</td>
</tr>
<tr>
<td>MAXIMUM MARKS</td>
<td>100</td>
</tr>
<tr>
<td>CREDITS</td>
<td>4</td>
</tr>
</tbody>
</table>

**COURSE OUTCOMES (COs):**

- **CO1** To introduce the fundamental principles of Cartography
- **CO2** To introduce the elements and theories of visual perception
- **CO3** To expose the students to the principles of map design
- **CO4** To provide insights into the processes of encode the geographic information into map symbols.
- **CO5** To introduce the recent advances in cartography

**COURSE SPECIFIC OUTCOMES (CSOs):**

- **CSO2** Students will learn to process the data and to represent it in the form of symbols
- **CSO2** They will learn to design and construct maps.
- **CSO3** They will learn special cartographic techniques to represent a wide variety of Data.

**LEARNING OUTCOMES (LOs):**

- **LO1** They will acquire cartographic skills and will be able to construct maps on their own.
- **LO2** They will be capable of representing various types of data such as terrain, weather & climatic and Socio-economic using appropriate cartographic techniques.
- **LO3** They acquire creative skills to make graphic representation more effective.
<table>
<thead>
<tr>
<th>UNIT</th>
<th>CONTENTS</th>
</tr>
</thead>
</table>
| 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:

Robinson, A.H. and Sales, K.D. Elements of cartography, John Wiley & Sons Inc.

References:

Steers, J.A. Map Projections, University of London Press, London.
<table>
<thead>
<tr>
<th>PROGRAMME</th>
<th>M.SC. GEOGRAPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMESTER</td>
<td>FIRST SEMESTER</td>
</tr>
<tr>
<td>PRACTICAL - 1</td>
<td>GR 105</td>
</tr>
<tr>
<td>PAPER TITLE</td>
<td>MAP ANALYSIS</td>
</tr>
</tbody>
</table>

**COURSE OUTCOMES (COs):**

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.

**COURSE SPECIFIC OUTCOMES (COs):**

COS1 Students will learn to interpret topographic and weather maps.
COS2 They will be able to draw contours, profiles of topography.

**LEARNING OUTCOMES (LOs):**

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.

**CONTENTS**

1. Introduction to Types of Maps and Scales.
2. Map Series, Numbering Methods, Scales of the Map Series (Old &New)
   Latitudinal and Longitudinal extents of International maps and topographical maps
3. Interpretation of topographical maps – Indian and foreign.
4. Representation of relief features by contours
5. Profile drawing – Simple, Superimposed and Composites

References:

2. R.Singh & Kanujia. Map work and practical geography, Central Book Depot, Allahabad
<table>
<thead>
<tr>
<th>PROGRAMME</th>
<th>M.SC. GEOGRAPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMESTER</td>
<td>FIRST SEMESTER</td>
</tr>
<tr>
<td>PRACTICAL - 2</td>
<td></td>
</tr>
<tr>
<td>PAPER CODE</td>
<td>GR 106</td>
</tr>
<tr>
<td>PAPER TITLE</td>
<td>CARTOGRAPHY</td>
</tr>
</tbody>
</table>

**COURSE OUTCOMES (COs):**

CO1  Students will learn about various methods of representing map scales their relative advantages, conversions and construction.

CO2  They will learn various types of map projections, their global properties and construction them.

CO3  They learn about thematic mapping and special cartographic techniques to represent any geographic data.

CO4  They learn to acquire data from various sources and classify.

CO5  They learn to create base maps and design symbols and legends.

CO6  They practically do all the exercises and will record.

**COURSE SPECIFIC OUTCOMES (CSOs):**

CSO1 They learn and apply all the skills to create, compile and generate maps.

CSO2 They will learn to measure, classify and differentiate qualitative & quantitative data and into area, line and point spatial entities.

CSO3 They learn special cartographic techniques to represent relief features, weather and climatic information and socio-economic data by doing them in the classroom.

**LEARNING OUTCOMES (LOs):**

LO1  Students will acquire skills to construct maps on their own.

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.

LO3  They will be capable of creating maps with improved graphic efficiency.

**CONTENTS**

1. Scales: Methods of Representation, Conversions
2. Map projections: Zenithal, Conical, Cylindrical, Conventional Map Projections

**References:**

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

SECOND SEMESTER

<table>
<thead>
<tr>
<th>Core/ Elective</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core paper 1</td>
<td>Climatology and Oceanography</td>
</tr>
<tr>
<td>Core Paper 2</td>
<td>Geographical Thought</td>
</tr>
<tr>
<td>Core Paper 3</td>
<td>Urban Geography</td>
</tr>
<tr>
<td>Core Paper 4</td>
<td>Principals of Remote Sensing</td>
</tr>
<tr>
<td>Practical 1</td>
<td>Interpretation of Aerial Photographs</td>
</tr>
<tr>
<td>Practical 2</td>
<td>Climatic Data Analysis</td>
</tr>
<tr>
<td>PROGRAMME</td>
<td>M.S.C. GEOGRAPHY</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------------</td>
</tr>
<tr>
<td>SEMESTER</td>
<td>SECOND SEMESTER</td>
</tr>
<tr>
<td>PAPER TITLE</td>
<td>CLIMATOLOGY AND OCEANOGRAPHY</td>
</tr>
<tr>
<td>PAPER CODE</td>
<td>GR 201</td>
</tr>
<tr>
<td>CORE/ELECTIVE</td>
<td>CORE PAPER</td>
</tr>
<tr>
<td>MAXIMUM MARKS</td>
<td>100</td>
</tr>
<tr>
<td>CREDITS</td>
<td>4</td>
</tr>
</tbody>
</table>

**COURSE OUTCOMES (COs):**

CO1  The course provides knowledge of the structure and composition of the atmosphere, solar radiation and its budget.

CO2  The course provides knowledge of the distributional patterns of weather elements and their interrelations and influences on global climate.

CO3  The Course provides insights into the synoptic climatology and the causes and effects of climate change.

CO4  The Course provides knowledge about the physical properties and physiographic features of the major oceans.

CO5  The course provides knowledge of circulation of ocean waters and its effects on climate.

**COURSE SPECIFIC OUTCOMES (CSOs):**

CSO1  Students will learn about the structure, composition, physical processes, energy interactions and dynamics of the earth's atmosphere.

CSO2  Students will learn about the synoptic climatology and weather events.

CSO3  Students will learn about climatic classification and global climates, changes and consequences.

CSO4  Students will learn about the relief, physical properties, circulation of waters and resources of the oceans

**LEARNING OUTCOMES (LOs):**

LO1  Students will be able to analyse the energy exchange and its effects on the weather and climate of the earth.

LO2  They will be able to understand and analyze daily as well as extreme weather events.

LO3  They will be able to analyse the impact of climate change and global warming on all spheres of the Earth.

LO4  The students will be able to comprehend the influences of ocean circulations on local, regional and global climates and economies.
<table>
<thead>
<tr>
<th>UNIT</th>
<th>CONTENTS</th>
</tr>
</thead>
</table>
| 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, .
Sharma and Vatal. Oceanography for Geographers, Chaitanya Publishing House,
Allahabad.

References:

<table>
<thead>
<tr>
<th>PROGRAMME</th>
<th>M.SC. GEOGRAPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMESTER</td>
<td>SECOND SEMESTER</td>
</tr>
<tr>
<td>PAPER TITLE</td>
<td>GEOGRAPHICAL THOUGHT</td>
</tr>
<tr>
<td>PAPER CODE</td>
<td>GR 202</td>
</tr>
<tr>
<td>CORE/ELECTIVE</td>
<td>CORE PAPER</td>
</tr>
<tr>
<td>MAXIMUM MARKS</td>
<td>100</td>
</tr>
<tr>
<td>CREDITS</td>
<td>4</td>
</tr>
</tbody>
</table>

**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 enable to use the knowledge of the geographers in the past and apply in the present and future context.
<table>
<thead>
<tr>
<th>UNIT</th>
<th>CONTENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT-I</td>
<td>The field of geography</td>
</tr>
<tr>
<td></td>
<td>Its place in the Classification of Sciences</td>
</tr>
<tr>
<td></td>
<td>Geography as a Social Science</td>
</tr>
<tr>
<td></td>
<td>Philosophy of Geography: (Distributions; Relationships,</td>
</tr>
<tr>
<td></td>
<td>Interactions; Aerial Differentiation and Spatial Organization)</td>
</tr>
<tr>
<td>UNIT-II</td>
<td>Dualisms in Geography: Systematic &amp; Regional Geography;</td>
</tr>
<tr>
<td></td>
<td>Physical &amp; Human Geography</td>
</tr>
<tr>
<td></td>
<td>Systematic Geography &amp; its Relation with Systematic Sciences and</td>
</tr>
<tr>
<td></td>
<td>Regional Geography</td>
</tr>
<tr>
<td></td>
<td>The Myth and Reality about Dualisms</td>
</tr>
<tr>
<td></td>
<td>Regional Geography: Concept of Region</td>
</tr>
<tr>
<td></td>
<td>Regionalization and the Regional Method.</td>
</tr>
<tr>
<td>UNIT-III</td>
<td>Scientific Explanations</td>
</tr>
<tr>
<td></td>
<td>Routes to Scientific Explanations (Inductive/Deductive)</td>
</tr>
<tr>
<td></td>
<td>Types of Explanations (Cognitive Description; Cause &amp; Effect;</td>
</tr>
<tr>
<td></td>
<td>Temporal; Functional/Ecological Systems)</td>
</tr>
<tr>
<td></td>
<td>Laws, Theories &amp; Models,</td>
</tr>
<tr>
<td>UNIT-IV</td>
<td>Ideological Approaches:</td>
</tr>
<tr>
<td></td>
<td>The quantitative Revolution</td>
</tr>
<tr>
<td></td>
<td>Positivism</td>
</tr>
<tr>
<td></td>
<td>Behaviorism</td>
</tr>
<tr>
<td></td>
<td>Postmodernism</td>
</tr>
<tr>
<td>UNIT -V</td>
<td>Contribution of Ancient Geographers</td>
</tr>
<tr>
<td></td>
<td>Medieval Geographers</td>
</tr>
<tr>
<td></td>
<td>Modern Geographers</td>
</tr>
<tr>
<td></td>
<td>Geography in the 20th Century</td>
</tr>
<tr>
<td></td>
<td>Changing Paradigms in Geography</td>
</tr>
<tr>
<td></td>
<td>Future of Geography</td>
</tr>
</tbody>
</table>
Text Books:


References:

<table>
<thead>
<tr>
<th>PROGRAMME</th>
<th>M.SC. GEOGRAPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMESTER</td>
<td>SECOND SEMESTER</td>
</tr>
<tr>
<td>PAPER TITLE</td>
<td>URBAN GEOGRAPHY</td>
</tr>
<tr>
<td>PAPER CODE</td>
<td>GR 203</td>
</tr>
<tr>
<td>CORE/ELECTIVE</td>
<td>CORE PAPER</td>
</tr>
<tr>
<td>MAXIMUM MARKS</td>
<td>100</td>
</tr>
<tr>
<td>CREDITS</td>
<td>4</td>
</tr>
</tbody>
</table>

**COURSE OUTCOMES (COs):**

- **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 urban areas.

**COURSE SPECIFIC OUTCOMES (CSOs):**

- **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.

**LEARNING OUTCOMES (LOs):**

- **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.
<table>
<thead>
<tr>
<th>SEMESTER</th>
<th>SECOND SEMESTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAPER CODE/TITLE</td>
<td>GR 203 URBAN GEOGRAPHY</td>
</tr>
<tr>
<td>CORE/ELECTIVE</td>
<td>CORE</td>
</tr>
<tr>
<td>UNIT</td>
<td>CONTENTS</td>
</tr>
</tbody>
</table>
| 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:


References:

Dickinson, R.E: City and Region, Rutled, London, 1964
Kanda, A. Urban development and Urban research in India, Khama publication, 1992.
PROGRAMME | M.SC. GEOGRAPHY  
SEMESTER | SECOND SEMESTER  
PAPER CODE/TITLE | GR 204 PRINCIPLES OF REMOTE SENSING  
CORE/ELECTIVE | CORE PAPER  
MAXIMUM MARKS | 100  
CREDITS | 4  

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.
<table>
<thead>
<tr>
<th>UNIT</th>
<th>CONTENTS</th>
</tr>
</thead>
</table>
| UNIT-I | Remote Sensing Definition and Principles  
The basic components of remote sensing system  
Electromagnetic Radiation:  
  Electromagnetic Spectrum  
  Concept of Black Body, Laws of Radiation  
  Energy Interactions with: Atmosphere & Earth’s Surface Features  
  Atmospheric windows  
  Spectral Signatures and Reflectance Patterns |
| UNIT-II| Fundamentals of Aerial Photography  
  Types and scales of Aerial Photographs  
  Photo Mosaics  
  Photogrammetry:  
    Geometry of vertical Photographs  
    Image displacement - Radial, Relief, Tilt  
    Stereoscopy, Parallax Measurement |
| UNIT-III| Equipment & Elements of Interpretation  
  Techniques of Interpretation  
  Application of aerial photographic techniques: Agriculture, Forests  
  Urban and Regional planning |
| UNIT-IV| Modern Remote Sensing Platforms  
  Types and Orbits & Modes of Scanning  
  Resolution of Sensors: Spectral, Spatial, Temporal, Radiometric  
  Characteristics of Scanners of: IRS, LANDSAT, SPOT  
  Visual image interpretation.  
  Digital image processing: Image Rectification, Image Enhancement  
  Image Classification, Accuracy Assessment |
| UNIT-V | Global Positioning System  
  Application of Remote Sensing techniques  
  Land information systems  
  Integrating of Remote Sensing and GIS Technologies |
Text Books:


References:

<table>
<thead>
<tr>
<th>PROGRAMME</th>
<th>M.SC. GEOGRAPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMESTER</td>
<td>SECOND SEMESTER</td>
</tr>
<tr>
<td>PRACTICAL -1</td>
<td>GR 205</td>
</tr>
<tr>
<td>PAPER TITLE</td>
<td>INTERPRETATION OF AERIAL PHOTOGRAPHS</td>
</tr>
</tbody>
</table>

**COURSE OUTCOMES (COs):**

- **CO1** Students are introduced to stereoscopes and stereoscopic vision.
- **CO2** They will be introduced to the equipment like stereograms, stereopairs, fiducial marks and principle points, floating marks and marginal information.
- **CO3** They will learn the elements of interpretation, reading, analysis and interpretation of aerial photographs.
- **CO4** They will learn to use mirror stereoscope, stereo meters and aerosketch meters.

**COURSE SPECIFIC OUTCOMES (CSOs):**

- **CSO1** The students will learn to identify objects and identify their distributional patterns and associations on the aerial photographs.
- **CSO2** They will learn to interpret cultural as well as natural aspects and learn to classify the land use and land cover.

**LEARNING OUTCOMES (LOs):**

- **LO1** The students will be able to interpret the cultural and natural objects and distributions on the aerial photographs.
- **LO2** They will be able to determine radial displacement, tilt displacement, photobase and parallax of the principle points.

**CONTENTS**

2. Oblique photographs
3. Stereogram, landforms, drainage, urban, rural, agricultural and industry
4. Stereo pairs: Landforms, drainage, urban, rural, agricultural and industry
5. Land sat Imageries
6. Use of Mirror stereoscope.
7. Use of stereo meter.
8. Use of aero-sketchmaster.

**References:**

<table>
<thead>
<tr>
<th>PROGRAMME</th>
<th>M.SC. GEOGRAPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMESTER</td>
<td>SECOND SEMESTER</td>
</tr>
<tr>
<td>PRACTICAL -2</td>
<td>GR 206</td>
</tr>
<tr>
<td>PAPER TITLE</td>
<td>CLIMATIC DATA ANALYSIS</td>
</tr>
</tbody>
</table>

**COURSE OUTCOMES (COs):**

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

**COURSE SPECIFIC OUTCOMES (CSOs):**

CSO1  Students will learn methods of mapping and analyse climatic data

**LEARNING OUTCOMES (LOs):**

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.

**CONTENTS**

1. Rainfall data analysis Mean annual and seasonal –intensity-rainfall Variability
2. Monthly mean precipitation and temperature - Global stations and Indian drain stations
3. Wind rose diagrams
4. Thermal continantality
6. Drought climatology –drought frequency histogram –climatic shifts
7. Graphs-Climograph, Hydrograph and Ergo graph
8. Urban heat islands and temperature inversions

**References:**

I.A Ramadas, Crops and Weather in India, ICAR, New Delhi.
# M.Sc. Geography

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

**Third Semester**

<table>
<thead>
<tr>
<th>Core/Elective</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Paper 1</td>
<td>Population Geography</td>
</tr>
<tr>
<td>Core Paper 2</td>
<td>Environmental Geography</td>
</tr>
<tr>
<td><strong>Any one of the Following</strong></td>
<td></td>
</tr>
</tbody>
</table>
| Elective Paper - 1 | A Pedology & Hydrology  
B Applied Climatology  
C Geography of Health |
| **Any one of the Following** | |
| 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) |
PROGRAMME | M.SC. GEOGRAPHY
SEMESTER | THIRD SEMESTER
PAPER TITLE | POPULATION GEOGRAPHY
PAPER CODE | GR 301
CORE/ELECTIVE | CORE PAPER
MAXIMUM MARKS | 100
CREDITS | 4

COURSE OUTCOMES (COs):

CO1  To educate students about the understanding of the interface between society, population, ecology and geography.
CO2  To educate them about the factors effecting the growth and distribution of population.
CO3  To introduce various theories of population.
CO4  To provide insights into various components of population growth and the influential factors.
CO5  To provide insights into population policies, problems and measures of control.

COURSE SPECIFIC OUTCOMES (CSOs):

CSO1 To make them familiar about the factors that determines demographic characteristics of a place.
CSO2 To enhance their ability to comprehend the objectives behind comprehensive plans and policies related to population in developing and developed countries.

LEARNING OUTCOMES (LOs):

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.
LO2 They will be able to analyse population dynamics of any place.
LO3 They will be able to understand the need for appropriate population policies to maintain equilibrium in demand-supply of resources.
<table>
<thead>
<tr>
<th>UNIT</th>
<th>CONTENTS</th>
</tr>
</thead>
</table>
| 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 |
<table>
<thead>
<tr>
<th>Text Books:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>References:</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNESCO. Determinants and consequences of population trends, 1953.</td>
</tr>
<tr>
<td>Garnier, J.D. Geography of population, Longman and Green, 1968.</td>
</tr>
<tr>
<td>PROGRAMME</td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>SEMESTER</td>
</tr>
<tr>
<td>PAPER TITLE</td>
</tr>
<tr>
<td>PAPER CODE</td>
</tr>
<tr>
<td>CORE/ELECTIVE</td>
</tr>
<tr>
<td>MAXIMUM MARKS</td>
</tr>
<tr>
<td>CREDITS</td>
</tr>
</tbody>
</table>

**COURSE OUTCOMES (COs):**

- **CO1** Expose to various concepts and components of the ecosystem and the biogeochemical cycles.
- **CO2** To provide insights into the, biotic regions, resources, ecological imbalance and biodiversity.
- **CO3** To provide understanding on relationship between man and his environment.
- **CO4** Expose to the contemporary environmental problems.
- **CO5** To provide insights into the international cooperations, environmental policies, programmes, planning and management aspects.

**COURSE SPECIFIC OUTCOMES (CSOs)**

- **CSO1** Students will learn about the concepts, components and processes of ecosystem, resources and their conservation and man and environment relationship.
- **CSO2** They will learn about the contemporary environmental problems and anthropogenic interventions.
- **CSO3** They will learn about the earth summits, legislation, planning and management for a sustainable environment.

**LEARNING OUTCOMES:**

- **LO1** Students will be able to comprehend the environmental concepts, processes, and the relationship between man and his environment.
- **LO2** They will be able to analyse the environmental problems and the anthropogenic interventions.
- **LO3** They will be able to comprehend the environmental laws, protection and choose problem specific conservation measures and plans for sustainable environmental management.
<table>
<thead>
<tr>
<th>UNIT</th>
<th>CONTENTS</th>
</tr>
</thead>
</table>
| 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

References:

Swarup, R.V., Mishra, S.N., Janchari, V.P. Encyclopedia of ecology, environment and pollution control.
Nag, P., Kumar, V.K. and Singh, J. Geography of Environment.
<table>
<thead>
<tr>
<th>PROGRAMME</th>
<th>M.SC. GEOGRAPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMESTER</td>
<td>THIRD SEMESTER</td>
</tr>
<tr>
<td>PAPER TITLE</td>
<td>PEDOLOGY AND HYDROLOGY</td>
</tr>
<tr>
<td>PAPER CODE</td>
<td>GR 303 -A</td>
</tr>
<tr>
<td>CORE/ELECTIVE</td>
<td>ELECTIVE PAPER -1</td>
</tr>
<tr>
<td>MAXIMUM MARKS</td>
<td>100</td>
</tr>
<tr>
<td>CREDITS</td>
<td>4</td>
</tr>
</tbody>
</table>

**COURSE OUTCOMES (COs):**

- **CO1** Students are introduced to the basics of soil science.
- **CO2** They will learn about the factors and processes of formation, world patterns, classification and taxonomy of soils.
- **CO3** They will learn about the types, distribution, degradation and conservation and management of soils in India.
- **CO4** They will learn about the elements of hydrological cycle and water balance.
- **CO5** They will learn about the surface waters and ground waters in India.
- **CO6** They will learn the applications of remote sensing in water resources management.

**COURSE SPECIFIC OUTCOMES (CSOs):**

- **CSO1** Students will learn pedology from geographic perspective, covering from the processes of formation to degradation, conservation and management of soils.
- **CSO2** They learn the elements and computation of water balance.
- **CSO3** They learn about the distribution of surface and ground water resources, their conservation and management practices.
- **CSO4** They will learn applications of remote sensing technology for water resources management.

**LEARNING OUTCOMES (LOs):**

- **LO1** Students will be able to understand the characteristics of soils, their distribution, suitability for agriculture, conservation and management practices.
- **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.
- **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.
<table>
<thead>
<tr>
<th>UNIT</th>
<th>CONTENTS</th>
</tr>
</thead>
</table>
| **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:


References:

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
<table>
<thead>
<tr>
<th>PROGRAMME</th>
<th>M.SC. GEOGRAPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMESTER</td>
<td>THIRD SEMESTER</td>
</tr>
<tr>
<td>PAPER TITLE</td>
<td>APPLIED CLIMATOLOGY</td>
</tr>
<tr>
<td>PAPER CODE</td>
<td>GR 303 -B</td>
</tr>
<tr>
<td>CORE/ELECTIVE</td>
<td>ELECTIVE PAPER -1</td>
</tr>
<tr>
<td>MAXIMUM MARKS</td>
<td>100</td>
</tr>
<tr>
<td>CREDITS</td>
<td>4</td>
</tr>
</tbody>
</table>

**COURSE OUTCOMES (COs):**

CO1  Expose the students to applications of climatic knowledge in various fields for betterment of the society and global environment.

CO2  To provide insights into the development of 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.

**COURSE SPECIFIC OUTCOMES (CSOs):**

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.

**LEARNING OUTCOMES (LOs):**

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 Students will be able to collect, analyse and interpret climatic data and generate climatic information.
<table>
<thead>
<tr>
<th>UNIT</th>
<th>CONTENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT-I</td>
<td>Hydrological Climatology and development of water resources. Water balance computation and Applications. Climate – agriculture and animal production</td>
</tr>
</tbody>
</table>
TEXT BOOKS:
Robinson P J and Henderson S: Contemporary Climatology. Henlow

REFERENCES:
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
<table>
<thead>
<tr>
<th>PROGRAMME</th>
<th>M.SC. GEOGRAPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMESTER</td>
<td>THIRD SEMESTER</td>
</tr>
<tr>
<td>PAPER TITLE</td>
<td>GEOGRAPHY OF HEALTH</td>
</tr>
<tr>
<td>PAPER CODE</td>
<td>GR 303 -C</td>
</tr>
<tr>
<td>CORE/ELECTIVE</td>
<td>ELECTIVE PAPER -1</td>
</tr>
<tr>
<td>MAXIMUM MARKS</td>
<td>100</td>
</tr>
<tr>
<td>CREDITS</td>
<td>4</td>
</tr>
</tbody>
</table>

**COURSE OUTCOMES (COs):**

CO1 Expose the students to the significance, origin and development and approaches of study of geography of Health.
CO2 They will learn about impact of various geographic factors on human health.
CO3 They will learn about the classification of diseases and the distributional patterns of major diseases.
CO4 They will learn about the causes, origin and dispersal of major diseases.
CO5 They will learn about the health care planning, policies and programmes.

**COURSE SPECIFIC OUTCOMES (CSOs):**

CSO1 Expose the students to the impacts of geographical, socio-economic and environmental factors on human health.
CSO2 Acquaint the students to the classification, ecology, etiology and diffusion of major diseases.
CSO3 To impart knowledge on health care planning and programs at world and national levels.

**LEARNING OUTCOMES (LOs):**

LO1 Students will be able to understand the basic concepts and issues of human health.
LO2 They will acquire sound knowledge on the geographical factors and distribution of major diseases, deficiency disorders and problems of mal-nutrition.
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.
<table>
<thead>
<tr>
<th>UNIT</th>
<th>CONTENTS</th>
</tr>
</thead>
</table>
| **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.  
Economic factors: Food and Nutrition Occupation and Standard of Living.  
| **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:


### References:

PROGRAMME | M.SC. GEOGRAPHY  
SEMESTER | THIRD SEMESTER  
PAPER TITLE | DISASTER MANAGEMENT STUDIES  
PAPER CODE | GR 304 - A  
CORE/ELECTIVE | ELECTIVE  
MAXIMUM MARKS | 100  
CREDITS | 4  

COURSE OUTCOMES (COs):

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.

COURSE SPECIFIC OUTCOMES (CSOs):

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 lines and damage to properties.

CSO3 Students will be able understand the application of geospatial techniques in risk assessment.

LEARNING OUTCOMES (LOs):

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


References:

Chakraborty, S.C, Natural hazards and disaster management, pragatishilprakashak, Kolkata, 2007.
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.
<table>
<thead>
<tr>
<th>PROGRAMME</th>
<th>M.SC. GEOGRAPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMESTER</td>
<td>THIRD SEMESTER</td>
</tr>
<tr>
<td>PAPER TITLE</td>
<td>GEOGRAPHY OF TRANSPORTATION</td>
</tr>
<tr>
<td>PAPER CODE</td>
<td>GR 304-B</td>
</tr>
<tr>
<td>CORE/ELECTIVE</td>
<td>ELECTIVE</td>
</tr>
<tr>
<td>MAXIMUM MARKS</td>
<td>100</td>
</tr>
<tr>
<td>CREDITS</td>
<td>4</td>
</tr>
</tbody>
</table>

**COURSE OUTCOMES (COs):**

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.

**COURSE SPECIFIC OUTCOMES (CSOs):**

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.

**LEARNING OUTCOMES (LOs):**

LO1 Students will be able compare regional economies based on availability of transport development factors.

LO2 They 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.
<table>
<thead>
<tr>
<th>UNIT</th>
<th>CONTENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT-I</td>
<td>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.</td>
</tr>
<tr>
<td>UNIT-II</td>
<td>Modes of transport: Roads, Railways, Roads, Airways and Waterways, Their characteristics and relative significance. Major shipping routes.</td>
</tr>
</tbody>
</table>
| 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 |
### References:


### Text Books:

<table>
<thead>
<tr>
<th>PROGRAMME</th>
<th>M.SC. GEOGRAPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMESTER</td>
<td>THIRD SEMESTER</td>
</tr>
<tr>
<td>PAPER TITLE</td>
<td>CULTURAL GEOGRAPHY</td>
</tr>
<tr>
<td>PAPER CODE</td>
<td>GR 304 -C</td>
</tr>
<tr>
<td>CORE/ELECTIVE</td>
<td>ELECTIVE PAPER</td>
</tr>
<tr>
<td>MAXIMUM MARKS</td>
<td>100</td>
</tr>
<tr>
<td>CREDITS</td>
<td>4</td>
</tr>
</tbody>
</table>

**COURSE OUTCOMES (COs):**

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.

**COURSE SPECIFIC OUTCOMES (CSOs):**

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.

**LEARNING OUTCOMES (LOs):**

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 able to understand cultural settings of India.
<table>
<thead>
<tr>
<th>UNIT</th>
<th>CONTENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT-III</td>
<td>Evolution of races. Classification of races. Geography of ethnic groups and tribal groups. Patterns of Folk and popular culture.</td>
</tr>
<tr>
<td>UNIT-IV</td>
<td>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.</td>
</tr>
<tr>
<td>UNIT -V</td>
<td>Cultural Setting of India: Racial, linguistic, Caste, Religious diversities. Special studies of major tribes of India.</td>
</tr>
</tbody>
</table>
Text books

References:
<table>
<thead>
<tr>
<th>PROGRAMME</th>
<th>M.SC. GEOGRAPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMESTER</td>
<td>THIRD SEMESTER</td>
</tr>
<tr>
<td>PRACTICAL -1</td>
<td>GR 305</td>
</tr>
<tr>
<td>PAPER TITLE</td>
<td>QUANTITATIVE TECHNIQUES IN GEOGRAPHY</td>
</tr>
</tbody>
</table>

**COURSE OUTCOMES (COs):**
- 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.

**COURSE SPECIFIC OUTCOMES (CSOs):**
- 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.

**LEARNING OUTCOMES (LOs):**
- 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.

**CONTENTS**

1. Questionnaire formulation and collection of primary data
2. Processing of data: Classification and tabulation
3. Representation of statistical data
4. Statistical measures of central tendency – Mean, Median, Mode, Quartiles, Deciles and percentiles.
5. Measures of dispersion – Range, Mean deviation, standard deviation and Quartile deviation.
6. Interpolation and extrapolation
7. Time series
8. Correlation

**References:**
<table>
<thead>
<tr>
<th>PROGRAMME</th>
<th>M.SC. GEOGRAPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMESTER</td>
<td>THIRD SEMESTER</td>
</tr>
<tr>
<td>PRACTICAL -2</td>
<td>GR 306</td>
</tr>
<tr>
<td>PAPER TITLE</td>
<td>IMAGE PROCESSING</td>
</tr>
</tbody>
</table>

**COURSE OUTCOMES (COs):**

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.

**COURSE SPECIFIC OUTCOMES (CSOs):**

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.

**LEARNING OUTCOMES (LOs):**

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.

**CONTENTS**

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, overlay, Field work.

**References:**

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

## Fourth Semester

<table>
<thead>
<tr>
<th>Paper Code</th>
<th>Core/Elective</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gr 401</td>
<td>Core paper 1</td>
<td>Regional Planning And Development</td>
</tr>
<tr>
<td>Gr 402</td>
<td>Core paper 2</td>
<td>Geographic Information Systems</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Any one of the Following</strong></td>
</tr>
<tr>
<td>Gr 403- A</td>
<td>Elective Paper</td>
<td>A Agricultural Geography</td>
</tr>
<tr>
<td>Gr 403 -B</td>
<td></td>
<td>B Biogeography</td>
</tr>
<tr>
<td>Gr 403-C</td>
<td></td>
<td>C Political Geography</td>
</tr>
<tr>
<td>Gr 404</td>
<td>Project Work</td>
<td>Dissertation &amp; Viva-voce</td>
</tr>
<tr>
<td>Gr 405</td>
<td>Practical 1</td>
<td>Terrain Analysis</td>
</tr>
<tr>
<td>Gr 406</td>
<td>Practical 2</td>
<td>Geographical Information Systems</td>
</tr>
<tr>
<td>Gr 407</td>
<td>MOOCs</td>
<td></td>
</tr>
<tr>
<td>Gr 408</td>
<td>Value Added Course</td>
<td></td>
</tr>
<tr>
<td>PROGRAMME</td>
<td>M.SC. GEOGRAPHY</td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>----------------</td>
<td></td>
</tr>
<tr>
<td>SEMESTER</td>
<td>FOURTH SEMESTER</td>
<td></td>
</tr>
<tr>
<td>PAPER TITLE</td>
<td>REGIONAL PLANNING AND DEVELOPMENT</td>
<td></td>
</tr>
<tr>
<td>PAPER CODE</td>
<td>GR 401</td>
<td></td>
</tr>
<tr>
<td>CORE/ELECTIVE</td>
<td>CORE PAPER</td>
<td></td>
</tr>
<tr>
<td>MAXIMUM MARKS</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>CREDITS</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

**COURSE OUTCOMES (COs):**

CO1  Students will understand the concept of region and approaches to study it.
CO2  Students will know difference of demographic characteristics in different types of Region.
CO3  The students will acquire knowledge about theoretical aspects of regional development.
CO4  Students will be exposed to different approaches to target regional development.
CO5  Students will be familiar with difference in the focus of planning for different regions.

**COURSE SPECIFIC OUTCOMES (CSOs):**

CSO1  The course will make students understand the concept of region, its appropriateness and applicability in development planning.
CSO2  It will provide an insight of about regional disparities/imbalance and the applicability of growth poles and growth foci models in reducing disparities.
CSO3  The course will familiarise students about the importance of region specific development strategies.

**LEARNING OUTCOMES (LOs):**

LO1  Students will be able to distinguish different types of regions and levels of development.
LO2  Students will be able to relate hierarchy in development plan and difference in demographic characteristics..
LO3  Students will be able to identify problems and prospects of different types of regions.
LO4  Students will be able to identify problems in execution of plans.
LO5  Students will understand the importance of balanced regional development.
<table>
<thead>
<tr>
<th>UNIT</th>
<th>CONTENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UNIT-I</strong></td>
<td>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</td>
</tr>
</tbody>
</table>
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

References:

Misra, R.P: and Others (Editors) Regional development planning in India – A strategy, Institute of development studies, Mysore, 1974.
NangiaSudesh, Delhi Metropolitan Region Rajesh publication, Delhi, 1976.
Tarlok Singh India’s Development Experience, McMillan New Delhi, India, 1947.
RazaMoonis (Editor) Regional development Heritage Publishers Delhi, 1988.
<table>
<thead>
<tr>
<th>PROGRAMME</th>
<th>M.SC. GEOGRAPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMESTER</td>
<td>FOURTH SEMESTER</td>
</tr>
<tr>
<td>PAPER TITLE</td>
<td>GEOGRAPHIC INFORMATION SYSTEMS</td>
</tr>
<tr>
<td>PAPER CODE</td>
<td>GR 402</td>
</tr>
<tr>
<td>CORE/ELECTIVE</td>
<td>CORE PAPER</td>
</tr>
<tr>
<td>MAXIMUM MARKS</td>
<td>100</td>
</tr>
<tr>
<td>CREDITS</td>
<td>4</td>
</tr>
</tbody>
</table>

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


References:

ESRI. Understanding GIS – Redlands, USA: ESRI.
<table>
<thead>
<tr>
<th>programme</th>
<th>M.S.C. GEOGRAPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>semester</td>
<td>FOURTH SEMESTER</td>
</tr>
<tr>
<td>paper title</td>
<td>AGRICULTURAL GEOGRAPHY</td>
</tr>
<tr>
<td>paper code</td>
<td>GR 403 - A</td>
</tr>
<tr>
<td>core/elective</td>
<td>ELECTIVE PAPER</td>
</tr>
<tr>
<td>maximum marks</td>
<td>100</td>
</tr>
<tr>
<td>credits</td>
<td>4</td>
</tr>
</tbody>
</table>

COURSE OUTCOMES (COs):

- **CO1** Students will learn about the significance of agricultural geography, various approaches to study the discipline and the determinants of agriculture.
- **CO2** Students will learn about location, classification and typology of agriculture.
- **CO3** Students will learn about agricultural land use and regionalisation.
- **CO4** Students will be exposed to broad aspects of Indian agriculture.
- **CO5** Students will be exposed to the contemporary issues associated with agriculture.

COURSE SPECIFIC OUTCOMES (CSOs):

- **CSO1** Students will learn about the location theory, classification of agricultural systems, typology and agricultural regionalisation.
- **CSO2** To provide insights into the salient features, problems and prospects of Indian agriculture.
- **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.

LEARNING OUTCOMES (LOs):

- **LO1** The students will be able to understand and analyse the role of physical and socio-economic determinants on agriculture.
- **LO2** The students will be able to comprehend and analyse the development and transformation of agriculture in India, policies, specific problems & prospects, and implications of Green Revolution.
- **LO3** The students will be able to comprehend and address the contemporary issues associated with agriculture.
<table>
<thead>
<tr>
<th>GR 403 - A</th>
<th>AGRICULTURAL GEOGRAPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT</td>
<td>CONTENTS</td>
</tr>
<tr>
<td>UNIT-I</td>
<td>Agricultural geography: Nature, Scope, Significance and Development</td>
</tr>
<tr>
<td></td>
<td>Approach to the study of Agricultural Geography: Commodity Approach, Regional Approach, Systematic Approach</td>
</tr>
<tr>
<td></td>
<td>Determinants of agriculture: Physical, Socio-economic and Institutional, Technological</td>
</tr>
<tr>
<td>UNIT-II</td>
<td>Von Thunen’s model of agricultural location: Whittlesey’s classification of agricultural systems. Agricultural Typology. International Commission of the IGU.</td>
</tr>
<tr>
<td>UNIT-III</td>
<td>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</td>
</tr>
<tr>
<td>UNIT-IV</td>
<td>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.</td>
</tr>
<tr>
<td>UNIT -V</td>
<td>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</td>
</tr>
</tbody>
</table>
**Text Books:**

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

**References:**

Majid Husain, Sytamic agricultural geography, Rawat publications, New Delhi. 1996.
<table>
<thead>
<tr>
<th>PROGRAMME</th>
<th>M.SC. GEOGRAPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMESTER</td>
<td>FOURTH SEMESTER</td>
</tr>
<tr>
<td>PAPER TITLE</td>
<td>BIOGEOGRAPHY</td>
</tr>
<tr>
<td>PAPER CODE</td>
<td>GR 403 - B</td>
</tr>
<tr>
<td>CORE/ELECTIVE</td>
<td>ELECTIVE PAPER</td>
</tr>
<tr>
<td>MAXIMUM MARKS</td>
<td>100</td>
</tr>
<tr>
<td>CREDITS</td>
<td>4</td>
</tr>
</tbody>
</table>

**COURSE OUTCOMES (COs):**

- **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.

**COURSE SPECIFIC OUTCOMES (CSOs):**

- **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 into the biosphere reserves and biodiversity hotspots in India and conservation and management of biotic resources.

**LEARNING OUTCOMES (LOs):**

- **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.
<table>
<thead>
<tr>
<th>UNIT</th>
<th>CONTENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT-III</td>
<td>Zoogeographical regions of the world. Environmental Adaptation. Animal dispersal and Migration</td>
</tr>
<tr>
<td>UNIT-IV</td>
<td>The aquatic fauna. Marine biological resources. Major fishing grounds of the world</td>
</tr>
<tr>
<td>UNIT -V</td>
<td>Biosphere reserves and Biodiversity hotspots in India. National Forest Policy of India. Conservation and Management of Biotic Resources</td>
</tr>
</tbody>
</table>
## References:


## Text Books:

<table>
<thead>
<tr>
<th>PROGRAMME</th>
<th>M.SC. GEOGRAPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMESTER</td>
<td>FOURTH SEMESTER</td>
</tr>
<tr>
<td>PAPER TITLE</td>
<td>POLITICAL GEOGRAPHY</td>
</tr>
<tr>
<td>PAPER CODE</td>
<td>GR 403 -C</td>
</tr>
<tr>
<td>CORE/ELECTIVE</td>
<td>ELECTIVE PAPER</td>
</tr>
<tr>
<td>MAXIMUM MARKS</td>
<td>100</td>
</tr>
<tr>
<td>CREDITS</td>
<td>4</td>
</tr>
</tbody>
</table>

**COURSE OUTCOMES (COs):**

- **CO1** Students will get insight of nature of political geography, the approaches to study it and its recent trends.
- **CO2** Students will gain knowledge of concepts of terminologies like state, nation, frontiers and boundary.
- **CO3** Students will get exposure to relate international relations and its impact on nation.
- **CO4** Students will learn the border related issues and conflicts
- **CO5** Students will understand the importance of equity to assure national progress.

**COURSE SPECIFIC OUTCOMES (CSOs):**

- **CSO1** Students will be able to understand the importance of political power and decisions in shaping geographical space.
- **CSO2** Students will understand the role of political, cultural and economic factors in nation or State progress.
- **CSO3** They will realize the importance of congenial relations and harmony any equitable distribution of resources to achieve national progress.

**LEARNING OUTCOMES (LOs):**

- **LO1** Students will be able to apply different approaches to handle multi-faceted political issues.
- **LO2** Students will be able to use locational, morphological and demographic concepts in shaping state/nation.
- **LO3** Students will be able to evaluate political cultural and economic ties with other countries to pursue national interests.
- **LO4** They will be able to suggest measures to tackle border issues by due regard of people, border, common interests and rights.
- **LO5** Students will be able to value ideas of unity in diversity, cross cultural tolerance etc.
<table>
<thead>
<tr>
<th>UNIT</th>
<th>CONTENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT-II</td>
<td>Nation and State: Concept and evolution. Locational, Morphological and Demographic Components. Frontiers and Boundaries. Elements of Spatial Structure of the State.</td>
</tr>
</tbody>
</table>
**Text Books:**

**References:**
Sukhwal, B.L. Modern Political Geography of India, Sterling Publishers, New Delhi, 1968.
Deshpande, C.D.: India-A Regional Interpretation, Northern Book Centre, New Delhi, 1992.
<table>
<thead>
<tr>
<th>PROGRAMME</th>
<th>M.SC. GEOGRAPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMESTER</td>
<td>FOURTH SEMESTER</td>
</tr>
<tr>
<td>CODE</td>
<td>GR 404</td>
</tr>
<tr>
<td>PROJECT</td>
<td>DISSERTATION &amp; VIVA-VOCE</td>
</tr>
<tr>
<td>MAXIMUM MARKS</td>
<td>100</td>
</tr>
<tr>
<td>CREDITS</td>
<td>4</td>
</tr>
</tbody>
</table>

**PROJECT OUTCOME:**

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.

**LEARNING OUTCOMES:**

LO1  The Students will acquire the skills to address the problems through a systematic approach.
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.
LO3  They will be able to analyze the data using various analytical techniques and tools.
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.
COURSE OUTCOMES (COs):
CO1 Students will learn to recognise and represent various geomorphic features.
CO2 Students will learn about different types of slopes and their characteristics.
CO3 Students will learn about the characteristics and measurements of drainage basin.
CO4 Students will learn different types of elevation models.

COURSE SPECIFIC OUTCOMES (CSOs):
CSO1 Students will learn various types of geomorphic features and different methods of representation and analysis.
CSO2 Students will learn to recognise, represent, interpret and analyse the characteristics of drainage basin, slopes and terrain.

LEARNING OUTCOMES (LOs):
LO1 Students will acquire skills to represent terrain features through graphs and profiles.
LO2 They will be able to determine the slope of the terrain and establish its relation with area and altitude.
LO3 They will be able to carry out morphometric analysis of drainage basin and can draw conclusions.
LO4 They will be able to create digital elevation models and their applications in geographic studies.

CONTENTS
1. Methods of Representation of relief – Profiles – Geological cross sections
2. Morphometry of drainage basin
3. Slope analysis – Wentworth and Smith methods
4. Altimetric frequency Analysis
5. Hypsometric Analysis
6. Clinometric Analysis
7. Relative relief Analysis
8. Digital Elevation Model representation

References:
Peter Toyne and Peter Newby, T. Techniques in physical geography, Mac Millan, London, 1972
<table>
<thead>
<tr>
<th>PROGRAMME</th>
<th>M.SC. GEOGRAPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMESTER</td>
<td>FOURTH SEMESTER</td>
</tr>
<tr>
<td>PRACTICAL -2</td>
<td>GR 406</td>
</tr>
<tr>
<td>PAPER TITLE</td>
<td>GEOGRAPHIC INFORMATION SYSTEMS</td>
</tr>
</tbody>
</table>

**COURSE OUTCOMES (COs):**

CO1 Students will learn about data creation and storage in GIS workspace.

CO2 They will learn the use of base map and geo-referencing.

CO3 They will know how to create shape files, digitize, edit etc.

CO4 They will be familiar with overlaying operations.

**COURSE SPECIFIC OUTCOMES (CSOs):**

CSO1 Students will be enabled with basic hands-on skills to handle GIS datasets in software.

CSO2 Clearer understanding to students about coordinate systems, their transformations and usage.

CSO3 Students will get acquainted about spatial analysis.

**LEARNING OUTCOMES (LOs):**

LO1 Students will be able to work with points, lines and polygons shape files.

LO2 Students will be able to perform spatial analysis.

LO3 Students will learn to join non-spatial/attribute data to spatial features

LO4 They will be able to create terrain models in GIS.

LO5 Students will come to know about the basic procedure to be followed in GIS work.

**CONTENTS**

1. Creation of workspace
2. Base map and geo-reference
3. Creation of shape files: point, line, polygon
4. Digitization, editing and topology building
5. Attribute table: join, add field
6. Overlay and Boolean operations
7. Digital Elevation Models

**References:**


Mishra, H.C. GIS handbook, GIS India Hyderabad, 1996.