# M. Sc. Geography

## Syllabus

## AFFILIATED COLLEGES

## Program Code: 32Q

**2023 – 2024 onwards**

# BHARATHIAR UNIVERSITY

**(A State University, Accredited with "A" Grade by NAAC,**
**Ranked 13th among Indian Universities by MHRD-NIRF,**
**World Ranking: Times -801-1000,Shanghai -901-1000, URAP - 982)**

**Coimbatore - 641 046, Tamil Nadu, India**

| **Program Educational Objective (PEOs)** | |
|---|---|
| The main qualification descriptors for the M.Sc., geography students are to develop thecritical evaluation and understanding. | |
| PEO1 | Appreciate the significance of geographical knowledge to everyday life. |
| PEO2 | Communicate mastery of geographic data, theories, philosophies, and concepts in oral, written, and visual forms, with ethical engagement and respect for diversity of individuals, groups, and cultures. |
| PEO3 | Demonstrate the skills in using geographical research tools including spatial statistics, cartography, remote sensing and GIS. |
| PEO4 | Studentshavetodemonstratetheirgeographicalknowledgeacquiredintheclassand apply the same in realworld. |
| PEO5 | Based on the field knowledge and advanced technologies, the students should be able to understand the on-going geographical problems in different regions and levels with appropriate pragmatic solutions. |

| **Program Specific Outcomes (PSOs)** | |
|---|---|
| After the successful completion of Geography program, the students are expected to | |
| PSO1 | Understand the relevance of geographical knowledge to everyday life. |
| PSO2 | Getting the ability to communicate geographic information utilizing both lecture and practical exercises. |
| PSO3 | Inculcate the ability to evaluate geographical problems effectively. |
| PSO4 | Recognize the skill development in Geographical studies programme as part of career avenues in various fields like teaching, research and administration. |
| PSO5 | Display an ability to read and understand maps and topographic sheets to look at the various aspects on the space. |

| **Program Outcomes (POs)** | |
|---|---|
| On successful completion of the M. Sc. Geography program | |
| PO1 | Compare and contrast the theories, philosophies, and concepts in the discipline of geography, including unifying themes of spatial patterns and structures, the interrelationship between people and places, and the interactions between nature and society. |
| PO2 | Recognize the skill development in Geographical studies programme as part of career avenues in various fields like teaching, research and administration. Cultivate ability to evaluate critically the wider chain of network of spatial aspects from global to local level on various time scales as well. |
| PO3 | An understanding of landscape at different levels needsto be discussed and understood for a thorough knowledge of spatial dimensions. To comprehend the dynamic dimensions of human and ecosystem relationships. |
| PO4 | Field based knowledge is essential to understand the ground reality, spatial patterns and processes. Use of statistical tools and techniques is essential for precise and objective geographic analysis and interpretation of complex phenomena. |
| PO5 | Identification of the critical problems and spatial issues form the core of the modern geography for various applications and decision making, including Resources, Environment & Disaster Management, Land Use Planning, and Urban and Regional Development together with Climate Change Mitigation and Adaptation, etc. |
| PO6 | Communication through models, maps, images and other geographical tools form the sound base for the dissemination of geographical information. |
| PO7 | Learning human perception behavior to acquire the geographical knowledge evolved over time is essential to improve decision making process. |
| PO8 | Demonstrate an advanced understanding of and ability to differentiate among the Various methodologies used in geographic research. |
| PO9 | Use of statistical tools and techniques is essential for precise and objective geographic analysis and interpretation of complex phenomena. |
| PO10 | There is a need to understand the specificities of the problems in specific areas for their in depth comprehension and solution. |

**BHARATHIAR UNIVERSITY: COIMBATORE 641 046**
**M. Sc. Geography Curriculum (University Affiliated colleges)**

*(For the students admitted during the academic year 2023 – 2024 onwards)*

***Scheme of Examination***

| Course Code | Title of the Course | Credits | Hours | | Maximum Marks | | |
|---|---|---|---|---|---|---|---|
| | | | Theory | Practical | CIA | ESE | Total |
| **FIRST SEMESTER** | | | | | | | |
| **13A** | Core I- Geomorphology | 4 | 6 | - | 25 | 75 | 100 |
| **13B** | Core II - Oceanography | 4 | 6 | - | 25 | 75 | 100 |
| **13C** | Core III - Geography of India | 4 | 6 | - | 25 | 75 | 100 |
| **13D** | Core IV - Cartography | 4 | 6 | - | 25 | 75 | 100 |
| **1EA** | Elective - Paper I Remote sensingand its applications in Geography | 4 | 6 | - | 25 | 75 | 100 |
| | **Total** | **20** | **30** | | **125** | **375** | **500** |
| **SECOND SEMESTER** | | | | | | | |
| **23A** | Core V - Climatology | 4 | 5 | - | 25 | 75 | 100 |
| **23B** | Core VI - Environmental Studies And Management | 4 | 5 | - | 25 | 75 | 100 |
| **23C** | Core VII - Geographical Thought | 4 | 5 | - | 25 | 75 | 100 |
| **23P** | Practical I -Techniques Of TerrainMapping | 4 | - | 5 | 40 | 60 | 100 |
| **23Q** | Practical II - Mapping Of Quantitative and Qualitative Data | 4 | - | 5 | 40 | 60 | 100 |
| **2EA** | Elective - Paper II Digital ImageProcessing | 4 | 5 | - | 25 | 75 | 100 |
| | **Total** | **24** | **20** | **10** | **150** | **450** | **600** |
| **THIRD SEMESTER** | | | | | | | |
| **33A** | Core VIII- Research Methodologyin Geography | 4 | 6 | - | 25 | 75 | 100 |
| **33B** | Core IX - Urban Geography | 4 | 6 | - | 25 | 75 | 100 |
| **33C** | Core X - Agricultural Geography | 4 | 6 | - | 25 | 75 | 100 |
| **33D** | Core XI - Geography of Population | 4 | 6 | - | 25 | 75 | 100 |
| **3EA** | Elective –Paper III-GIS and GPS | 4 | 6 | - | 25 | 75 | 100 |
| | **Total** | **20** | **30** | - | **125** | **375** | **500** |

| FOURTH SEMESTER | | | | | | | |
|---|---|---|---|---|---|---|---|
| **43A** | Core XII - Quantitative Techniques | 4 | 6 | - | 25 | 75 | 100 |
| **43B** | Core XIII - Disasters Mitigation andManagement | 4 | 6 | - | 25 | 75 | 100 |
| **43C** | Core XIV- Regional Planning and Development | 4 | 6 | - | 25 | 75 | 100 |
| **43P** | Practical III - Methods of Data Analysis | 4 | - | 6 | 40 | 60 | 100 |
| **4EP** | Elective Practical - Practical in Geo-informatics | 4 | 6 | 6 | 40 | 60 | 100 |
| **47V** | Project Work | 6 | - | - | - | 150 | 150 |
| | **Total** | **26** | **24** | **12** | **125** | **525** | **650** |
| | **Grand total** | **90** | **104** | **22** | **525** | **1725** | **2250** |

* Project report -120 marks; Viva-voce –30 marks.

## Guidelines for Project Report :

Phase I - Presentation of the project proposal with the aims, objectives, hypothesis, methodology, study area and chapterisation. This has to be presented which carries 40 marks.

Phase II – Includes Data source, Collections, Techniques to be adopted etc. to be presented carries 40 marks.

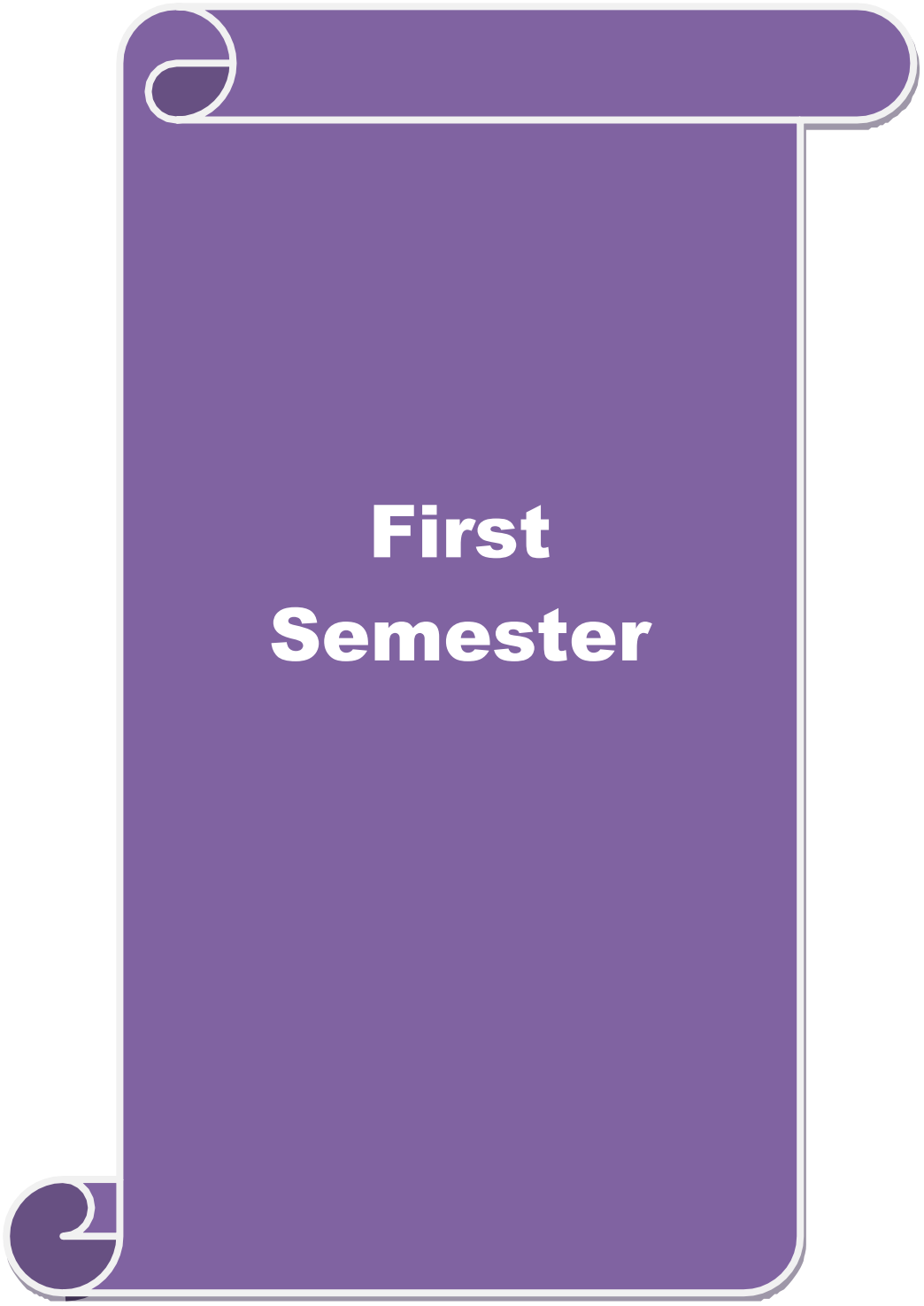
Phase III – Presentation of final report carrying 30 marks.

**NOTE: The syllabus for the following papers furnished below to be followed for the candidates admitted from the Academic Year 2022-2023 onwards.**

| List of Elective papers (Colleges can choose of the paper as Electives) | |
|---|---|
| Elective – I | Elective - Paper I Remote sensingand its applications in Geography |
| Elective – II | Elective - Paper II Digital ImageProcessing |
| Elective – III | Elective –Paper III-GIS and GPS |
| Elective – IV | Elective Practical - Practical in Geo-informatics |

| SCHEME OF VALUATION | |
|---|---|
| **CORE PAPERS** | **ELECTIVE PAPERS** |
| CREDITS – 4; MARKS - 100 | CREDITS – 4; MARKS - 100 |
| **Marks Distribution:** | **Marks Distribution:** |
| Internal–25 Marks | Internal – 25 Marks |
| External – 75 Marks | External – 75 Marks |

| SCHEME OF VALUATION |
|---|
| **CORE PRACTICAL SUBJECT** |
| CREDITS – 4; MARKS - 100 |
| **Marks Distribution:** |
| Internal–25 Marks |
| External – 75 Marks |


First
Semester

| Course code | 13A | GEOMORPHOLOGY | L | T | P | C |
|---|---|---|---|---|---|---|
| Core/ Elective/ Supportive | | Core-I | 0 | 6 | 0 | 4 |
| Pre-requisite | | To understand the morphological changes | Syllabus version | | 2022-2023 | |

**Course Objectives:**

To understand about Landforms its origin and evolution.
To learn about the Geomorphic features in details.

**Course Outcomes:**

After the completion of course, the students will have ability to:

| | | |
|---|---|---|
| CO1 | Understand the effect of rotation of revolution the Earth, Understand Theory regarding of Origin of Continents and oceans | K2 |
| CO2 | Understand interior structure of the earth, Study the formation of Rocks | K1 |
| CO3 | Understand the work of internal and external forces and their associated Landforms. | K3 |
| CO4 | Study the erosional and depositional land forms of Rivers and Sea Waves. | K3 |
| CO5 | Understand the concept of mass Wasting Understand the Application of Geomorphology | K2 |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate;

| Unit- I | Geological time scale. | 18 hours |
|---|---|---|

Geomorphology – definition – scope – nature and content – development – recent trends.
Basic concepts in Geomorphology – geological time scale.

| Unit- II | Origin of the earth | 18 hours |
|---|---|---|

Origin of the earth – internal structure of the earth – rocks – types; igneous – sedimentary and metamorphic. Continental drift – Sea floor spreading- Plate tectonics – seismic and volcanic zones

| Unit- III | Geomorphic process | 18 hours |
|---|---|---|

Geomorphic process – endogenic – diastrophism — folds — faults – earthquake – volcanism. Exogenic process – Weathering – mass wasting – soils.

| Unit- IV | Gradational process | 18 hours |
|---|---|---|

Gradational process – Erosional and depositional landforms of fluvial – glacial – Aeolian – Coastal – Karst. Landforms evolution: fluvial cycle, arid cycle

| Unit- V | Climate and landforms | 18 hours |
|---|---|---|

Climate and landforms – effect of climate on land forms – ice ages.
Application of Geomorphology in Mineral exploration – Hydrology — Land use and Regional planning.

| | Total lecture hours | 90 |
|---|---|---|

**Text Books:**

1. Thornbury, W.D., (1984). Principles of Geomorphology, John Wiley and Sons, New York.

**Books For Reference:**

1. Strahler, A.N. and Strahler A.H., (1992). Modern Physical Geography, John and Wiley Sons, New York.
2. Dayal, P., (1995). Text Book of Geomorphology, Shukla Book Depot, Patna.
3. Savindra Singh, (2002). Geomorphology, Prayag Pustak Bhawan, Allahabad.

| | |
|---|---|
| 4 | Das Gupta, A and Kapoor, A.N., (2001). Principles of Physical Geography, S.C. Chand & Company Ltd, New Delhi. |
| 5 | Sharma, V.K., (1986). Earth Surface Process and forms, Tata McGraw Hill Publishing Company Ltd, New Delhi. |
| 6 | Bloom, Arthur L. (1998), Geomorphology, Pearson Education Pvt. Ltd. Singapore. |


| **Related Online Contents:** | |
|---|---|
| 1 | https://study.sagepub.com/sites/default/files/01_Gregory_Lewin(web)_Ch-01%20_1.pdf |
| 2 | https://en.wikipedia.org/wiki/Geomorphology |
| | |
| **Course Designed By: Dr. Suilkumar** | |

| **Mapping with Program Outcomes** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
| CO1 | S | S | S | S | S | S | S | S | S | S |
| CO2 | S | S | M | S | S | S | S | M | S | S |
| CO3 | S | M | S | S | L | S | M | S | S | S |
| CO4 | M | S | S | M | S | M | S | S | M | L |
| CO5 | S | S | S | S | S | S | S | S | S | S |

S- Strong: M- Medium: L- Low

| Course code | 13B | OCEANOGRAPHY | L | T | P | C |
|---|---|---|---|---|---|---|
| Core/ Elective/ Supportive | | Core-II | 0 | 6 | 0 | 4 |
| Pre-requisite | | Oceanography is the study of all aspects of the ocean | Syllabus version | | 2022-2023 | |

**Course Objectives:**

To understand the marine life and ecosystems to currents and waves, the movement of sediments, and seafloor geology.

**Course Outcomes:**

After the completion of course, the students will have ability to:

| | | |
|---|---|---|
| CO1 | Understand the meaning, nature and scope, modern trends in Oceanography | K2 |
| CO2 | Understand the ocean floor and relief of the ocean bottom. | K1 |
| CO3 | Understand the properties like temperature, density, salinity of ocean water. | K4 |
| CO4 | Understand the characteristics and properties of factors affecting on formation of sea waves. | K4 |
| CO5 | Get knowledge about distribution of lithogenous, biogenous, and hydrogenous sediments on Ocean floor. | K2 |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate;

| Unit- I | Scope of oceanography | 18 hours |
|---|---|---|

Nature and scope of oceanography— distribution of land and water; major features of ocean basins; continental margin and deep-ocean basins.

| Unit- II | Physical and chemical properties of sea water | 18 hours |
|---|---|---|

Physical and chemical properties of sea water; Interlink between atmospheric circulation and circulation patterns in the oceans; ELNINO and associated circulations Surface currents; thermohaline, Waves and tides.

| Unit- III | Marine biological environment | 18 hours |
|---|---|---|

Marine biological environment: bio—geochemical cycles in the ocean, biozones, food resources of the sea.

| Unit- IV | Marine Environments | 18 hours |
|---|---|---|

Major Marine Environments: Coastal,: estuaries, deltas, mangroves ,barrier Island, rocky coasts, reefs-formation of coral reefs Open: continental-shelf, continental - slope and deep, pelagic environment and floor of the ocean basins.

| Unit- V | Marine deposits | 18 hours |
|---|---|---|

Population, Transport and Trade: Population –Growth, density, distribution and problems. Transport: Land, water and air – Foreign trade.

| | Total lecture hours | 90 |
|---|---|---|

**Text Books:**

1 King, C.A.M. 1962. Oceanography for Geographers

| **Books For Reference:** | |
|---|---|
| 1 | Davis.Richard J.A. 1986: ―Oceanography - An Introduction to the Marine Environment. |
| 2 | Duxbury, C.A and Duxbury B. 2nd ed. 1996. : An Introduction to the world's Oceans - C.Brown. Iowa Curriculum Development Committee in Geography 91 |
| 3 | Gross, M.Grant, 1987: Oceanography, a View of the earth , Prentice - Hall Inc. New Jersy. |
| 4 | Sharma, T.C., (2003), India – An Economic & Commercial Geography, Vikas Publishing House Pvt. Ltd., New Delhi. |
| 5 | King, C.A.M. 1962. Oceanography for Geographers |
| 6 | Sharma, R.C. 1985.― The Oceans ―N.Delhi. |
| | |
| **Related Online Contents:** | |
| 1 | https://en.wikipedia.org/wiki/Oceanography |
| 2 | https://en.wikipedia.org/wiki/Physical_oceanography |
| | |
| **Course Designed By:Dr.Pannerselvam** | |

| **Mapping with Program Outcomes** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
| CO1 | S | S | S | S | S | S | S | S | S | M |
| CO2 | S | S | M | S | S | S | S | M | M | S |
| CO3 | S | M | S | S | L | S | M | L | S | S |
| CO4 | M | S | S | M | S | M | S | S | M | S |
| CO5 | S | S | M | S | L | S | S | M | S | M |

S- Strong: M- Medium: L- Low

| Course code | 13C | GEOGRAPHY OF INDIA | L | T | P | C |
|---|---|---|---|---|---|---|
| Core/ Elective/ Supportive | | Core - III | 0 | 6 | 0 | 4 |
| Pre-requisite | | To understand the physical division in India | Syllabus version | | 2022-2023 | |

**Course Objectives:**

To understand about the Location and extent - Physical features and Climate of India.
To obtain about Agriculture, Mineral, Industries and Population aspects in India.

**Course Outcomes:**

After the completion of course, the students will have ability to:

| | | |
|---|---|---|
| CO1 | Understand the about the physiographic division of India. | K2 |
| CO2 | Examine and understand the types of vegetation of India | K1 |
| CO3 | Understand the India Drainage system of India Rivers. | K3 |
| CO4 | Understand the variation in industrial development in India. | K3 |
| CO5 | population distribution variation and growth in India | K2 |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate;

| Unit- I | Location and Extent | 18 hours |
|---|---|---|

Location, division, soil, Climatic, drainage, natural vegetation, classification of resources.

| Unit- II | Agriculture | 18 hours |
|---|---|---|

Agricultural and water resources – food crops – rice – wheat – cash crop – cotton – sugarcane – tea – coffee – tobacco. Role of green revolution in Indian agriculture. Water resources irrigation – types and multipurpose projects.

| Unit- III | Minerals | 18 hours |
|---|---|---|

Mineral and Industrial resources – Classification of mineral resources – distribution of iron ore, mica, manganese, and bauxite – power resources – coal petroleum. Industries – iron and steel, sugar, cement, cotton textiles, engineering and chemical industries.

| Unit- IV | Population | 18 hours |
|---|---|---|

Population – growth, distribution and density, Population problems and policy, transport – land, water and air. – India's foreign trade.

| Unit- V | Scientific technology | 18 hours |
|---|---|---|

Development of scientific technology in India. – India as an emerging economic power – India's role in Asia and world – SAARC, G77, N-5, G15, NAM.

| | Total lecture hours | 90 |
|---|---|---|

**Text Books:**

1. Gopal Singh, (1970), A Geography of India, Atnaram & sons, New Delhi.
2. Khullar, D. R., (2010), India – A Comprehensive Geography, Kalyani Publishers, New Delhi.

| **Books For Reference:** | |
|---|---|
| 1 | Majid Hussain (2008), Geography of India, Tata McGraw Hill Publishing company Ltd., New Delhi. |
| 2 | Pal, Saroj K. (2003), Physical Geography of India – A study in Regional Earth Sciences, Orient Longman Pvt. Ltd. Kolkata. |
| 3 | Singh, R.L., (1977), India - A Regional Geography, NGSI, Varanasi. |
| 4 | Sharma, T.C., (2003), India – An Economic & Commercial Geography, Vikas Publishing House Pvt. Ltd., New Delhi. |
| 5 | Krishnan, M.S. (1982), Geology of India and Burma, CBS Publishers, New Delhi. |
| 6 | Mathur, S.M. (1982), Physical Geology of India, National Book Trust, India, New Delhi. |
| | |
| **Related Online Contents:** | |
| 1 | https://en.wikipedia.org/wiki/Geography_of_India |
| 2 | https://www.cs.mcgill.ca/~rwest/wikispeedia/wpcd/wp/g/Geography_of_India.htm |
| | |
| **Course Designed By: Dr.J.Ganesan** | |

| **Mapping with Program Outcomes** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
| CO1 | S | S | S | S | S | S | S | S | S | M |
| CO2 | S | S | M | S | S | S | S | M | M | S |
| CO3 | S | M | S | S | L | S | M | L | S | S |
| CO4 | M | S | S | M | S | M | S | S | M | S |
| CO5 | S | S | M | S | L | S | S | M | S | M |

S- Strong: M- Medium: L- Low

| Course code | 13D | CARTOGRAPHY | L | T | P | C |
|---|---|---|---|---|---|---|
| Core/ Elective/ Supportive | | Core -IV | 0 | 6 | 0 | 4 |
| Pre-requisite | | To analyze the map making techniques | Syllabus version | | 2022-2023 | |

**Course Objectives:**

The course provides the basic concepts, techniques of cartography. After completion of course the students will understand the art and science of map making.

**Course Outcomes:**

After the completion of course, the students will have ability to:

| | | |
|---|---|---|
| CO1 | Read and prepare the maps. | K2 |
| CO2 | Comprehend location and spatial aspects of the earth surface. | K1 |
| CO3 | Use and importance of maps for regional development and decision-making. | K3 |
| CO4 | Understand the types of maps and uses. | K3 |
| CO5 | Development of the cartography knowledge form the yearly period. | K2 |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate;

| Unit- I | Scope of Cartography | 18 hours |
|---|---|---|

Meaning and scope of Cartography – Historical development – maps – Types of maps – Base map – Compilation and Generalization of maps.

| Unit- II | Map design and layout | 18 hours |
|---|---|---|

Map design and layout – Lettering and Toponomy – Tools and Techniques – Map construction and reproduction – Developing process – Photographic and printing.

| Unit- III | Symbolization | 18 hours |
|---|---|---|

Symbolization and processing data – Statistics database- Cartometry – use of diagram on maps – Point – Line and Area, Volume symbols – Qualititative and Quantitative maps.

| Unit- IV | Mapping data | 18 hours |
|---|---|---|

Mapping the geological structure and relief and terrain data – Mapping the climatological and Hydrological data – Mapping the socio economic data.

| Unit- V | Computers cartography | 18 hours |
|---|---|---|

Recent development in the field of Cartography – Computers and Cartography – Digital Cartography – 3d Cartography.

| | Total lecture hours | 90 |
|---|---|---|

**Text Books:**


1. Misra, R.P. and Ramesh, A., (2002), Fundamentals of Cartography, Concept Publication Company, New Delhi.
2. Robinson, A.H., (1984), Elements of Cartography, John Wiley, London.


**Books For Reference:**


1. Monkhouse, F.J. and Wilkinson, H.R., (1989), Maps and Diagrams, B.I.Publications, New Delhi.
2. Sethu Rakkayi, S., (2014), Puvippadaviyaloor arimugam, Sree Meenakshi Offsets, Madurai.
3. Keates, J. S., (1982), Understanding Maps, Longman, London and New York.
4. Erwin Raiz, (1948), General Cartography, McGraw Hill Company., New York
5. Lawrence, G.R.P., (1979), Cartographic Methods, Methuen, London.

| **Related Online Contents:** | |
|---|---|
| 1 | https://en.wikipedia.org/wiki/Cartography |
| 2 | https://en.wikipedia.org/wiki/Cartographic_design |
| | |
| **Course Designed By:S. Ravichandran** | |

| **Mapping with Program Outcomes** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
| CO1 | S | S | S | S | S | S | S | S | S | S |
| CO2 | S | S | M | S | M | S | S | M | L | M |
| CO3 | S | M | S | S | S | M | M | S | S | S |
| CO4 | M | S | S | M | S | S | S | S | M | S |
| CO5 | S | S | S | S | L | S | M | S | S | M |

S- Strong: M- Medium: L- Low

| Course code | 1EA | REMOTE SENSING AND ITS APPLICATIONS IN GEOGRAPHY | L | T | P | C |
|---|---|---|---|---|---|---|
| Core/ Elective/Supportive | | Elective- I | 0 | 6 | 0 | 4 |
| Pre-requisite | | Basic knowledge in satellite system | Syllabus version | | 2022-2023 | |

**Course Objectives:**

To understand about the history and types of remote sensing.
To obtain about aerial, satellite remote sensing and recent developments.

**Course Outcomes:**

After the completion of course, the students will have ability to:

| | | |
|---|---|---|
| CO1 | Appreciate the development and uses of aerial and satellite remote sensing system and navigation satellite systems in India and other nations; | K2 |
| CO2 | Understand the basics of EMR and energy interaction in atmosphere and on earth surface features; | K1 |
| CO3 | Importance of satellite types and functions | K3 |
| CO4 | Understand Indian satellite remote sensing development and achievement. | K3 |
| CO5 | Understand the remote sensing application and its uses. | K2 |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate;

| Unit- I | Over view of Remote Sensing | 18 hours |
|---|---|---|

Over view of Remote Sensing and Remote Sensing Systems – EMR and its characteristics – Interaction of EMR with atmosphere and earth features – atmospheric windows – types of remote sensing – platforms – sensors – errors and corrections – Ground Truth Verification.

| Unit- II | Aerial Remote Sensing | 18 hours |
|---|---|---|

Aerial Remote Sensing : History – Aerial cameras – films – photographs -
elements of photographs: marginal information and scale – measurement of scale
- stereo model – relief displacement – measurement of height – elements of photo interpretation .

| Unit- III | Remote sensing satellites | 18 hours |
|---|---|---|

Remote sensing satellites – LANDSAT – SPOT – ERS – JRS – IKONOS – QUICK BIRD – orbiting characteristics – resolution and sensor characteristics – other remote sensing satellites.

| Unit- IV | Remote Sensing in India | 18 hours |
|---|---|---|

Indian Remote Sensing satellites – resolution and scanning characteristics - Satellite data products.

| Unit- V | Applications of Remote Sensing | 18 hours |
|---|---|---|

Applications of Remote Sensing in Geography: Geomorphology – Land use / Land cover agriculture – water resources – urban planning – environmental assessment.

| | Total lecture hours | 90 |
|---|---|---|

**Text Books:**


1. Lillesand, T.M. and Ralph W. Keifer (2002), Remote Sensing and Image Interpretation, John Wiley & Sons, Inc., New York.
2. Sabins, Jr. (1978), Remote Sensing: Principles and Interpretation, Freeman and Co, San Francisco.
3. Curran, P.J., (1985), Principles of Remote sensing, English Language book society Longmans, London.

| **Books For Reference:** | |
|---|---|
| 1 | AnjiReddy, M., (2004), Geoinformatics for Environmental Management, BS Publications, Hyderabad. |
| 2 | Chanrda, A.M. and S.K. Ghosh (2006), Remote Sensing and Geographical Information System, Narosa Publishing House, New Delhi. |
| 3 | Joseph, George (2003), Fundamental of Remote Sensing, University's Press (India) Pvt. Ltd., Hyderabad. |
| 4 | Kumar, S., (2003), Basics of Remote sensing and GIS, Laxmi publications, New Delhi. |
| | |
| **Related Online Contents:** | |
| 1 | https://tudip.com/blog-post/what-is-remote-sensing-and-its-applications/ |
| 2 | https://www.slideshare.net/RashmiYadav45/remote-sensing-and-its-application |
| | |
| **Course Designed By:A.Suresh** | |

| **Mapping with Program Outcomes** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
| CO1 | S | S | S | S | S | S | S | S | S | S |
| CO2 | S | S | M | S | S | S | S | M | S | S |
| CO3 | S | M | S | S | M | S | M | S | S | M |
| CO4 | M | S | S | M | S | M | S | S | M | S |
| CO5 | S | S | S | S | L | S | S | M | S | S |

S- Strong: M- Medium: L- Low

# Second Semester

| Course code | 23A | CLIMATOLOGY | L | T | P | C |
|---|---|---|---|---|---|---|
| Core/ Elective/ Supportive | | Core- V | 0 | 5 | 0 | 4 |
| Pre-requisite | | Basic knowledge of daily weather report observations | Syllabus version | | 2022-2023 | |

**Course Objectives:**

To understand about Atmosphere and its properties and Functions
To learn about the Atmospheric Pressure, Wind, Cloud and Classification.

**Course Outcomes:**

After the completion of course, the students will have ability to:

| | | |
|---|---|---|
| CO1 | Understand the elements of weather and climate and its impacts at different scales. | K2 |
| CO2 | Understand heat balance. | K1 |
| CO3 | Understand the climate change and monsoon conditions of the world. | K3 |
| CO4 | Understand the foundational concepts of climate change and its impacts. | K3 |
| CO5 | To understand the climatic changes from the world. | K2 |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate;

| | | |
|---|---|---|
| **Unit- I** | **Recent trends in Applied Climatology** | **18 hours** |

Nature – Scope and Development – Recent trends in Applied Climatology – importance.

| | | |
|---|---|---|
| **Unit- II** | **Heat balance** | **18 hours** |

Heat balance – General circulation of the atmosphere – Monsoon – Mechanism of Indian monsoon – Climatic classification – Climatic changes in the past.

| | | |
|---|---|---|
| **Unit- III** | **Climate and agricultural relations** | **18 hours** |

Applied Climatology – Climate and agricultural relations – Water balance – Agro climate – Agro Climatic classification – droughts – Crop calendar.

| | | |
|---|---|---|
| **Unit- IV** | **Impact of climate** | **18 hours** |

Impact of climate on industries and health – Climatic perception – urban climate – Climate – Human comfort zone.

| | | |
|---|---|---|
| **Unit- V** | **Weather data** | **18 hours** |

Weather information and forecasting – weather data – method of collection – Types of forecasting – Role of meteorological departments and satellite in weather forecasting – application of weather forecasting.

| | | |
|---|---|---|
| | **Total lecture hours** | **90** |

**Text Books:**


| | |
|---|---|
| 1 | Lal, D.S., (1990). Climatology, Chatianya Publishing House, Allahabad. |
| 2 | Tewartha, G.T., (1980). Introduction to Climate, Tata McGraw Hill, New York. |
| 3 | Critch field, H.J., (1987). General Climatology, Prentice Hall of India Pvt. Ltd, New Delhi. |


**Books For Reference:**


| | |
|---|---|
| 1 | Siddhartha, K., (2005). Atmosphere, Weather and Climate, Kisalaya Publications Pvt. Ltd., New Delhi. |
| 2 | Richmond W. Longley (1970). Elements of Meteorology, John Willey & sons inc, New York. |
| 3 | Savindra Singh, (2002). Physical Geography, Prayag Pustak Bhawan, Allahabad |

| **Related Online Contents:** | |
|---|---|
| 1 | https://en.wikipedia.org/wiki/Climatology |
| 2 | https://www.environmentalscience.org/climatology |
| | |
| **Course Designed By:B.Sasikumar** | |

| **Mapping with Program Outcomes** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
| CO1 | S | S | S | S | S | S | S | S | S | S |
| CO2 | S | S | M | S | S | S | S | M | S | S |
| CO3 | S | M | S | S | M | S | M | S | S | M |
| CO4 | S | S | S | M | S | S | S | S | L | S |
| CO5 | S | S | S | S | L | S | M | S | S | M |

S- Strong: M- Medium: L- Low

| Course code | 23B | ENVIRONMENTAL STUDIES AND MANAGEMENT | L | T | P | C |
|---|---|---|---|---|---|---|
| Core/ Elective/Supportive | | Core-VI | 0 | 5 | 0 | 4 |
| Pre-requisite | | Basic knowledge in Environmental problem | Syllabus version | | 2022-2023 | |

**Course Objectives:**

To develop a world population that is aware of and concerned about the environment and its associated problems and which has the knowledge, Skills, attitudes , motivations and commitment to work individually and collectively towards solutions of current problems and prevention.

**Course Outcomes:**

After the completion of course, the students will have ability to:

| | | |
|---|---|---|
| CO1 | Understand the dynamic interactive relationship between man and environment. | K2 |
| CO2 | Have sound understanding on distribution, utilization and management of natural Resources at global level. | K1 |
| CO3 | Assess of different aspects of flora and fauna provinces. | K3 |
| CO4 | Familiarize the dynamics of climate and related theories. | K3 |
| CO5 | Understand of Vegetation as an index of climate. | K2 |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate;

| Unit- I | Scope of Environmental studies | 18 hours |
|---|---|---|

Nature and Scope of Environmental studies – Role of Geography – Man and Environment relationship – Changing nature of the concepts – Determination – Possibilism – Marxian view on environment – Concept of Ecosystem.

| Unit- II | Ecosystem | 18 hours |
|---|---|---|

Ecosystem – structure – Classification – Biomass – Functioning of the ecosystem – food web – food pyramid – nutrient cycles – natural disruptions of the ecosystem – natural hazards – floods, drought and others – human interference on ecosystem – population growth and its impact.

| Unit- III | Green revolution | 18 hours |
|---|---|---|

Man's modification of the biosphere – agriculture – Green revolution – HYV and pesticides – man's impact on land – mining – soils – coastal areas.

| Unit- IV | Industrial environments | 18 hours |
|---|---|---|

Human settlements and environments – industrial environments – emerging environmental problems – Urban environment – Pollution. Environmental degradation – emerging environmental issues – environment and health.

| Unit- V | Environmental quality | 18 hours |
|---|---|---|

Eco cries – Environmental management and planning – Environmental quality – Environmental law and protection – Environmental impact assessment – need for interdisciplinary approach.

| | Total lecture hours | 90 |
|---|---|---|

**Text Books:**


1. Odum .E.P. (1971), Fundamental of Ecology, W.B.Sunders Co, Philadelphia.
2. Peter Hagett (2001), Geography - A. Modern Synthesis, Prentice Hall, London.
3. Savindra Singh (1991), Environmental Geography, Kalyan Publications, New Delhi.

| **Books For Reference:** | |
|---|---|
| 1 | Paul R. Ehrlich, Anne H. Ehrlich, and John P. Holdren (1977), Ecoscience: Population, Resources, Environment, Edition3, W. H. Freeman Publishers. |
| 2 | Batel, B. (1980) Management of Environment, Wiby Eastern Ltd., New Delhi |
| 3 | Savindra Singh Environmental Geography, Kalyan Publications, New Delhi |
| 4. | Saxena Environmental Geography. |
| 5. | Strabler, J.Man's environment, Hamilton publication Co California. |
| | |
| **Related Online Contents:** | |
| 1 | https://ncert.nic.in/ncerts/l/jesc116.pdf |
| 2 | https://www.ugc.ac.in/oldpdf/modelcurriculum/env.pdf |
| | |
| **Course Designed By:P.Umasankar** | |

| **Mapping with Program Outcomes** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
| CO1 | S | S | S | S | S | S | S | S | S | S |
| CO2 | S | S | M | S | S | S | S | M | S | S |
| CO3 | S | M | S | S | L | S | M | S | S | M |
| CO4 | M | S | S | M | S | M | S | S | M | S |
| CO5 | S | S | S | S | S | S | S | L | S | S |

S- Strong: M- Medium: L- Low

| Course code | 23C | GEOGRAPHICAL THOUGHT | L | T | P | C |
|---|---|---|---|---|---|---|
| Core/ Elective/ Supportive | | Core- VII | 0 | 5 | 0 | 4 |
| Pre-requisite | | To understand the geographical ideas | Syllabus version | | 2022-2023 | |

**Course Objectives:**

Understood in the discipline of geography encompasses the development of geographic knowledge in particular places, times, and contexts.

**Course Outcomes:**

After the completion of course, the students will have ability to:

| | | |
|---|---|---|
| CO1 | Understand the historical development of geographical thought according to Greek, Roman, Indian, German, French, British and American school. | K2 |
| CO2 | Understand the dualisms in geography such as determinism and possibilism, systematic Vs regional and physical Vs human geography | K1 |
| CO3 | Understand recent trends, scientific methods, quantitative revolution and computer application in geography. | K3 |
| CO4 | Understand the definition, need, and signification of applied geography | K3 |
| CO5 | As commonly understood in the discipline of geography encompasses the development of geographic knowledge in particular places, times, and contexts. | K2 |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate;

| Unit- I | Pre history of Geographical thoughts | 18 hours |
|---|---|---|

Pre history of Geographical thoughts – Greeks, Roman and Arab. Impacts of exploration and discoveries in Geographical development.

| Unit- II | Traditions in Geography | 18 hours |
|---|---|---|

Four traditions in Geography: Man – Land. Area studies, Spatial and Earth sciences.

| Unit- III | Geographical thoughts | 18 hours |
|---|---|---|

Major Geographical thoughts: America – Davis – Bowman – Hortshone, British – Mackinder, Herbertson, Roxby. German – Humbolt, Ritter, Penck. France Vidal de la Blache, Jean Brunches, Albert Demangeon. Indian R.L. Singh, R.P. Mishra. A. Ramesh, R. Vidhyananthan,

| Unit- IV | Dualism in Geographical studies | 18 hours |
|---|---|---|

Determinism Vs possibilism, 2. Physical Vs Human, 3. Systematic Vs Regional, 4. Ideographic VS Nomothetic, 5. Quantitative Vs Qualititative, 6. Visual Vs Digital.

| Unit- V | Trends in Geography | 18 hours |
|---|---|---|

Recent trends in Geography; Quantitative revolution paradigms in Geography – Systems approach – interdisciplinary research and GIS.

| | Total lecture hours | 90 |
|---|---|---|

**Text Books:**

1. Majid Husain (2011)Evolution of Geographical Thought.

| **Books For Reference:** | |
|---|---|
| 1 | Freeman.R (1970) Hundred year of Geography, Hutchinson. London. |
| 2 | Ha.vey.(1969) Explanations in Geography, Edward Arnold Publications, London. |
| 3 | Wayne, Davis K.D. (1972) Conceptual Revolution in Geography, University of London press, London. |
| 4 | Hussain.M Evolution of Geographical Thought. |
| | |

| **Related Online Contents:** | |
|---|---|
| 1 | https://www.sciencedirect.com/topics/earth-and-planetary-sciences/geographical-thought |
| 2 | https://lotusarise.com/evolution-of-geographical-thought-notes/ |
| | |
| **Course Designed By:G.Lisha** | |

| **Mapping with Program Outcomes** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
| CO1 | S | S | S | S | S | S | M | S | M | S |
| CO2 | S | S | M | S | S | S | S | M | S | S |
| CO3 | S | M | S | S | M | S | M | S | S | M |
| CO4 | S | S | S | M | S | S | S | S | M | S |
| CO5 | S | S | S | S | L | S | S | S | S | L |

S- Strong: M- Medium: L- Low

| Course code | 23P | TECHNIQUES OF TERRAIN MAPPING | L | T | P | C |
|---|---|---|---|---|---|---|
| Core/ Elective/ Supportive | | Practical-I | 0 | 0 | 5 | 4 |
| Pre-requisite | | To understand the different methods include contours, slope, aspect, hill shade and view shed. | Syllabus version | | 2022-2023 | |

**Course Objectives:**

To understand about the map scale and Statement and Representative Fraction.
To learn about Enlargement and Reduction of Maps, Contours, Slope and Drainage Basin.

**Course Outcomes:**

After the completion of course, the students will have ability to:

| | | |
|---|---|---|
| CO1 | Topographical Information;- International Series, South East Asia Series, Indexing, Classification and interpretation of topographical sheets ,profiles | K2 |
| CO2 | Morphometric Analysis;- Hypsometric curve,Altimetric curve,histogram,Clinograph,Slope Analysis,Wentworths Method | K1 |
| CO3 | Analyze the real world physical features form the toposheets. | K3 |
| CO4 | Construction of the elevation of the mountain prepares toposheets. | K3 |
| CO5 | Graphs and Diagrams;-Traingular Diagram,Ergogeaph,Rainfall ,dispersion diagram Proportional Circle,Spheres and Cubes | K2 |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate;

| | | |
|---|---|---|
| **Unit- I** | **Profiles** | **18 hours** |

Representing relief – Profiles – Simple, Serial, Superimposed projected and Composite profiles.

| | | |
|---|---|---|
| **Unit- II** | **Slope analysis** | **18 hours** |

Thalweg – Slope analysis – Wentworth, Smith, Robinson methods.

| | | |
|---|---|---|
| **Unit- III** | **Frequency curve** | **18 hours** |

Drawing of altimetric frequency curve – Hypsographic, Clinographic curve.

| | | |
|---|---|---|
| **Unit- IV** | **Drainage Basin Analysis** | **18 hours** |

Drainage Basin Analysis – Morphometry – Stream orders – Bifurcation ratio, drainage density, Shape of the basin.

| | | |
|---|---|---|
| **Unit- V** | **Record** | **18 hours** |

Record – 20 Marks

| | | |
|---|---|---|
| | **Total lecture hours** | **90** |

**Text Books:**


1. Monk house, F.J. and Wilkinson, H.R., (1989), Maps and Diagrams, B.I.Publications, New Delhi.
2. Sethu Rakkayi, S., (2014), Puvippadaviyaloor arimugam, Sree Meenakshi Offsets, Madurai.
3. Singh, R. L., (2005), Elements of Practical Geography, Kalyani Publishers, New Delhi.
4. Gopal singh, (1996), Map work and practical geography, Vikas Publishing House Pvt. Ltd.,

| **Books For Reference:** | |
|---|---|
| 1 | Khullar, (1997), Practical Geography, Educational Publishers, New Delhi. |
| 2 | Goudie Andrew (1976) Geomorphological Techniques George Alien and Unwin. Boston. |
| 3 | Pijushkanti Saha and Partha Basu, (2010), Advanced Practical Geography, Books and Allied Pvt. Ltd, Kolkata. |
| | |

| **Related Online Contents:** | |
|---|---|
| 1 | https://www.sciencedirect.com/topics/earth-and-planetary-sciences/terrain-analysis |
| 2 | https://saylordotorg.github.io/text_essentials-of-geographic-information-systems/s12-04-surface-analysis-terrain-mappi.html |
| | |
| **Course Designed By:Dr. J. Ganesan** | |

| **Mapping with Program Outcomes** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
| CO1 | S | S | S | S | L | S | S | S | S | M |
| CO2 | S | S | M | S | S | S | S | M | M | S |
| CO3 | S | M | S | S | L | S | M | S | S | M |
| CO4 | M | S | S | M | S | M | S | S | M | S |
| CO5 | S | M | M | S | L | S | S | M | S | S |

S- Strong: M- Medium: L- Low

| Course code | 23Q | MAPPING OF QUALITATIVE AND QUANTITATIVE DATA | L | T | P | C |
|---|---|---|---|---|---|---|
| Core/ Elective/ Supportive | | Practical-II | 0 | 0 | 5 | 4 |
| Pre-requisite | | To understand the mapping techniques and prepare the map for suitable data | Syllabus version | | 2022-2023 | |

**Course Objectives:**

To understand about the map scale and Statement and Representative Fraction.
To learn about Enlargement and Reduction of Maps, Contours, Slope and Drainage Basin.

**Course Outcomes:**

After the completion of course, the students will have ability to:

| | | |
|---|---|---|
| CO1 | Post graduate student to prepare the scale and mapping knowledge. | K2 |
| CO2 | To understand the student learn map prepare and modify the scale. | K1 |
| CO3 | Analyze the real world physical features form the toposheets. | K3 |
| CO4 | Construction of the elevation of the mountain prepares toposheets. | K3 |
| CO5 | To understand the scale divisions and toposheet knowledge. | K2 |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate;

| | | |
|---|---|---|
| **Unit- I** | **Data** | **18 hours** |

Data – Source types of data – Sampling types – Qualitative and Quantitative symbols.

| | | |
|---|---|---|
| **Unit- II** | **Graphs** | **18 hours** |

Preparations of graphs – Simple graph semi log – Triangular graph – Lorenz curve.

| | | |
|---|---|---|
| **Unit- III** | **Maps** | **18 hours** |

Distributional maps – Isopleths, Choropleth, Dasymetric map – flow map.

| | | |
|---|---|---|
| **Unit- IV** | **Agricultural and Land use data** | **18 hours** |

Mapping of agricultural and Land use data – Crop concentration and Diversification – Ranking of Crops by Quantitative and Qualititative symbols – Crop combination.

| | | |
|---|---|---|
| **Unit- V** | **Record** | **18 hours** |

Record – 20 Marks

| | | |
|---|---|---|
| | **Total lecture hours** | **90** |

**Text Books:**


1. Monk house, F.J. and Wilkinson, H.R., (1989), Maps and Diagrams, B.I.Publications, New Delhi.
2. Sethu Rakkayi, S., (2014), Puvippadaviyaloor arimugam, Sree Meenakshi Offsets, Madurai.
3. Singh, R. L., (2005), Elements of Practical Geography, Kalyani Publishers, New Delhi.
4. Gopal singh, (1996), Map work and practical geography, Vikas Publishing House Pvt. Ltd.,


**Books For Reference:**


1. Khullar, (1997), Practical Geography, Educational Publishers, New Delhi.
2. Goudie Andrew (1976) Geomorphological Techniques George Alien and Unwin. Boston.
3. Pijushkanti Saha and Partha Basu, (2010), Advanced Practical Geography, Books and Allied Pvt. Ltd, Kolkata.

| **Related Online Contents:** | |
|---|---|
| 1 | https://www.edrawmind.com/article/understanding-quantitative-vs-qualitative-research-with-mind-maps.html |
| 2 | https://www.esri.com/about/newsroom/arcuser/understanding-statistical-data-for-mapping-purposes/ |
| | |
| **Course Designed By:Dr. Sunilkumar** | |

| **Mapping with Program Outcomes** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
| CO1 | S | S | S | S | L | S | S | S | S | M |
| CO2 | S | S | M | S | S | S | S | M | M | S |
| CO3 | S | M | S | S | L | S | M | S | S | M |
| CO4 | M | S | S | M | S | M | S | S | M | S |
| CO5 | S | M | M | S | L | S | S | M | S | S |

S- Strong: M- Medium: L- Low

| Course code | 3EA | Digital Image Processing | L | T | P | C |
|---|---|---|---|---|---|---|
| Core/ Elective/ Supportive | | Elective-II | 0 | 0 | 5 | 4 |
| Pre-requisite | | To analyze the satellite images processing for various objects in earth surface | Syllabus version | | 2022-2023 | |

**Course Objectives:**

Objective of image processing is to transform an image into digital form and perform certain operations on it in order to obtain specific models or to extract useful information from the image.

**Course Outcomes:**

After the completion of course, the students will have ability to:

| | | |
|---|---|---|
| CO1 | Understand the need for image transforms different types of image transforms and their properties. | K2 |
| CO2 | Develop any image processing application. | K1 |
| CO3 | Learn different techniques employed for the enhancement of images. | K3 |
| CO4 | Understand the need for image compression and to learn the spatial and frequency domain techniques of image compression. | K3 |
| CO5 | learn different feature extraction techniques for image analysis and recognition | K2 |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate;

| Unit- I | Image processing | 18 hours |
|---|---|---|

Introduction to digital image processing – data encoding and decoding – digital image formats – characteristics – softwares – raster and vector file formats.

| Unit- II | Image Pre-processing | 18 hours |
|---|---|---|

Image Pre-processing: radiometric correction and geometric correction – noise removal – Image enhancement techniques: Contrast manipulation – grey level threshold – level slicing and linear and non-linear contrast stretching.

| Unit- III | Image transformation | 18 hours |
|---|---|---|

Image transformation: Spatial ratioing - PC transformation - HIS
Transformation – NDVI, PVI, and TC etc., filtering: low pass, high pass, and edge Enhancement and detection filters and Fourier domain filtering.

| Unit- IV | Image Classification | 18 hours |
|---|---|---|

Image Classification: Unsupervised classification – Supervised classification - classification stages – minimum distance to means classifier, Gauss maximum likelihood classifier – classification accuracy

| Unit- V | Digital Elevation Model | 18 hours |
|---|---|---|

Digital Elevation Model – Satellite stereo image generation – 3D visualization techniques – microwave data processing – hyper spectral data processing.

| | Total lecture hours | 90 |
|---|---|---|

**Text Books:**

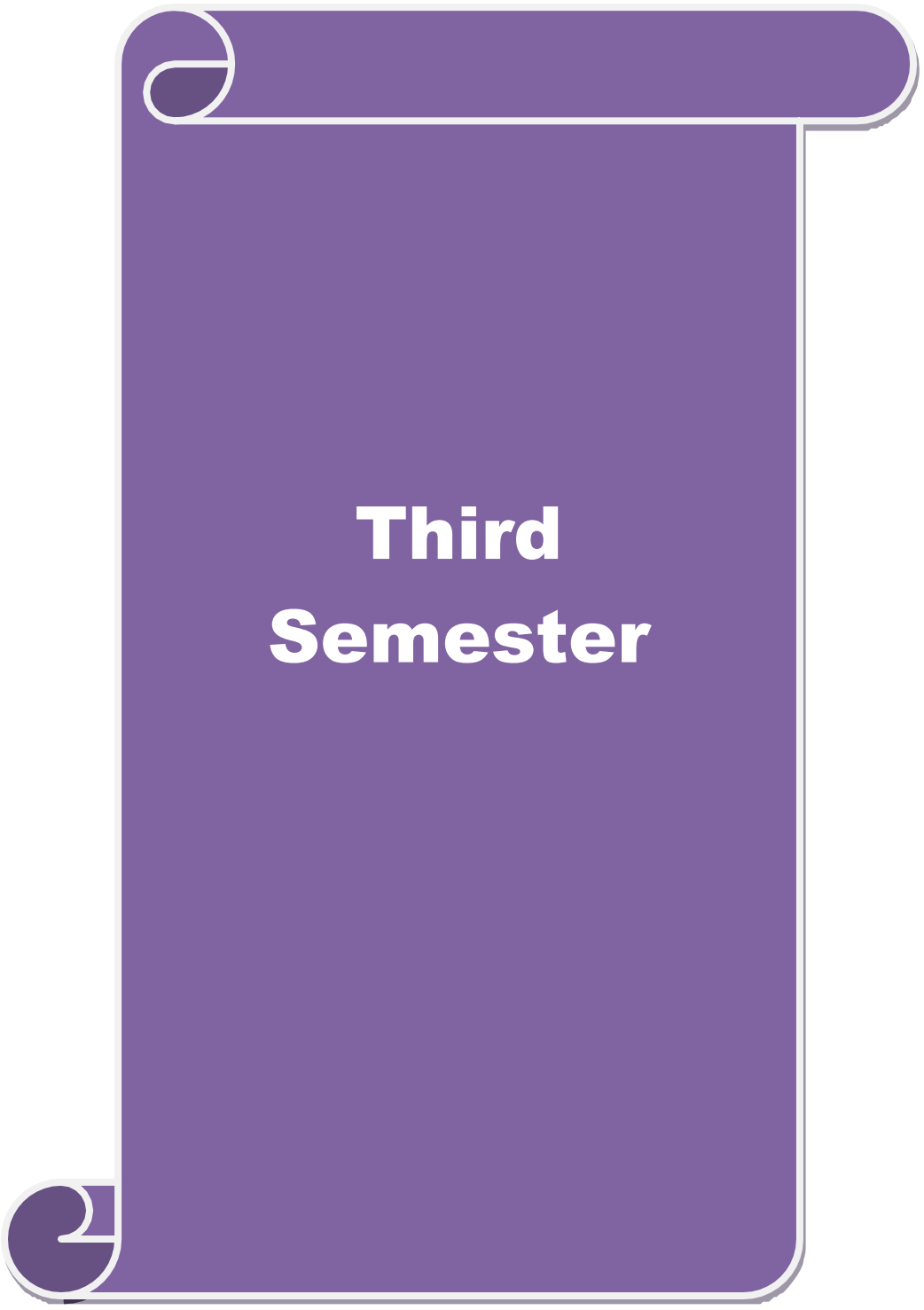

| | |
|---|---|
| 1 | Lillesand, T.M., (1994): Remote Sensing and Image Interpretation, John Wiley and Sons, New York. |
| 2 | R. C.Gonzalez, R.E.Woods," Digital Image processing", Pearson edition, Inc3/e,2008. |
| 3 | A.K.Jain," Fundamentals of Digital Image Processing", PHI,1995 |

| **Books For Reference:** | |
|---|---|
| **1** | Jenson, John R., (1986): Introductory Digital Image Processing, Prentice Hall, New Jersey. |
| **2** | Schowengerdt R.A., (1997): Remote Sensing – Models and Methods forDigital Image Processing, Academic Press, Chestnuthill, (U.S.A). |
| **3** | R.C.Gonzalez & R.E. Woods; "Digital Image Processing with MATLAB", Prentice Hall, 2003. |
| | |

| **Related Online Contents:** | |
|---|---|
| **1** | https://www.bharathuniv.ac.in/colleges1/downloads/courseware_ece/course_outcome/core_elective_3/BEC007%20-CO-%20DIGITAL%20IMAGE%20PROCESSING.pdf |
| **2** | https://www.mmit.edu.in/images/CourseObjectives/E-TC/BE/ETC_BE_SEM-I_DIP.pdf |
| | |
| **Course Designed By:A. Suresh** | |

| **Mapping with Program Outcomes** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
| CO1 | S | S | S | S | L | S | S | S | S | M |
| CO2 | S | S | M | S | S | S | S | M | M | S |
| CO3 | S | M | S | S | L | S | M | S | S | M |
| CO4 | M | S | S | M | S | M | S | S | M | S |
| CO5 | S | M | M | S | L | S | S | M | S | S |

S- Strong: M- Medium: L- Low


Third
Semester

| Course code | 33A | RESEARCH METHODOLOGY IN GEOGRAPHY | L | T | P | C |
|---|---|---|---|---|---|---|
| Core/ Elective/ Supportive | | Core-VIII | 0 | 6 | 0 | 4 |
| Pre-requisite | | To understand the feature problems analyze in geographical field | Syllabus version | | 2022-2023 | |

**Course Objectives:**

To gain up knowledge of a phenomena or to accomplish new experiences into it. Discover the solution of the problems.

**Course Outcomes:**

After the completion of course, the students will have ability to:

| | | |
|---|---|---|
| CO1 | Examining the introduction of research, motivation in research, types of research, significance of research, research process and criteria of good research. | K2 |
| CO2 | To understand the research problems, selecting research problems, literature review and to study the hypothesis, its types, sources, formation of hypothesis and utility of hypothesis in scientific research. | K1 |
| CO3 | To understand the research design, need, features basic principal and developing of research plan, and sampling design and its basic types, steps, characteristics of sampling design. | K3 |
| CO4 | Study about type's data and methods of data collection and study the processing and analysis of data using different statistical methods. | K3 |
| CO5 | Understand the interpretation and report writing, techniques, precaution of interpretation, layout of research report, types of reports and oral presentation mechanics of writing a research report. | K2 |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate;

| Unit- I | Geographical Research | 14 hours |
|---|---|---|

Geographical Research: Objectives – Need - Significance – Types and Methods of Research – Conceptual Models.

| Unit- II | Research Planning | 14 hours |
|---|---|---|

Research Planning: Selection of the Problem – Hypothesis: Types and Testing - Logic in Research: Facts, Themes, Concepts, Theories and their implications

| Unit- III | Research Design | 15 hours |
|---|---|---|

Research Design: Need, Importance and Features – Major concepts – Literature Review – Sampling: Types and Techniques – Data Collection: Methods and Techniques.

| Unit- IV | Process of Data | 14 hours |
|---|---|---|

Process of Data: Preparation - Editing – Coding – Tabulation – Classification – Statistical Analysis - Maps and Diagrams.

| Unit- V | Report Writing | 15 hours |
|---|---|---|

Report Writing: Types and Planning - Organization of the Thesis: Preliminaries - Text - Foot notes - References and Bibliography – Appendices - Drafting and Final. evaluation – Preparation of Abstract, Research Papers and Publication - Research Proposals –Role of Information Technology – Plagiarism

| | Total lecture hours | 72 |
|---|---|---|

**Text Books:**

| | |
|---|---|
| 1 | Research Methodology in Geography Hardcover – 1 January 2014 |
| 2 | Research Methods in Geography: A Critical Introduction: 7 (Critical Introductions to Geography) Paperback – 13 April 2010 by John Paul Jones III (Editor), Basil Gomez. |

| **Books For Reference:** | |
|---|---|
| 1 | Research Methodology in Geography, K.L.Narasimha Murthy |
| 2 | Research Methodology in Geography: (a Text Book) Front Cover K. L. Narasimha Murthy. |
| | |

| **Related Online Contents:** | |
|---|---|
| 1 | https://www.indeed.com/career-advice/career-development/research-methodology |
| 2 | https://gradcoach.com/what-is-research-methodology/ |
| | |
| **Course Designed By:Dr. Pannerselvam** | |

| **Mapping with Program Outcomes** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
| CO1 | S | S | S | S | S | S | S | S | S | S |
| CO2 | S | S | M | S | S | S | S | M | S | S |
| CO3 | S | M | S | S | M | S | M | S | S | M |
| CO4 | S | S | S | M | S | S | S | S | L | S |
| CO5 | S | S | S | S | L | S | M | S | S | M |

S- Strong: M- Medium: L- Low

| Course code | 33B | URBAN GEOGRAPHY | L | T | P | C |
|---|---|---|---|---|---|---|
| Core/ Elective/ Supportive | | Core -IX | 0 | 6 | 0 | 4 |
| Pre-requisite | | To understand the urban development and land functions in cities | Syllabus version | | 2022-2023 | |

**Course Objectives:**

Urban studies are based on the study of the urban development of cities. This includes studying the history of city development from an architectural point of view, to the impact of urban design on community development efforts.

**Course Outcomes:**

After the completion of course, the students will have ability to:

| | | |
|---|---|---|
| CO1 | Nature and scope of urban geography approaches | K2 |
| CO2 | Bases and process of urbanization. | K1 |
| CO3 | Urban expansion .umland periphery [fringe] | K3 |
| CO4 | Understand political systems, states, territory, and borders. Understand the basic elements of culture. Understand the types and levels of economic activities. Understand urban structure and development. | K3 |
| CO5 | Economic, political and social aspects within cities are also important in urban geography. | K2 |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate;

| Unit- I | Urbanization | 15 hours |
|---|---|---|

Nature – Scope and development of Urban Geography – Urbanization factors of Urban growth – world urbanization – urbanization in India.

| Unit- II | Urban demography | 15 hours |
|---|---|---|

Urban demography – Population density models – age and sex structure – Occupational structure – Economic base – Basic and Non basic function – Functional classification.

| Unit- III | Urban land use | 14 hours |
|---|---|---|

Urban land use – Types – Models – Social area analysis – CBD delimitation – Urban ecology – Quality of urban life.

| Unit- IV | Urban expansion | 14 hours |
|---|---|---|

Urban expansion – Vertical and horizontal – urban sprawl – Rural urban fringe – Suburbs – City region – Umland demarcation.

| Unit- V | Hierarchy of urban centers | 14 hours |
|---|---|---|

Hierarchy of urban centers – rank size rule – Christaller's central place concepts – Urban problems – Slums – Pollution – Water supply, transport planning.

| | Total lecture hours | 72 |
|---|---|---|

**Text Books:**

| | |
|---|---|
| 1 | Urban Geography A Textbook Paperback – 1 January 2008 by R.B.MANDAL (Author) |
| 2 | Urban Geography Hardcover – Illustrated, 30 November 2006 by L.N. Verma |

| **Books For Reference:** | |
|---|---|
| **1** | Northam R.M (1975) Urban Geography, John Wiley Sons, New York. |
| **2** | Carter.H.(1972) The study of Urban Geography, Edward Arnold, London. |
| **3** | Urban Geography Hardcover – Illustrated, 30 November 2006 by L.N. Verma |
| **4** | Misra R.P & K.V.Sundaram(1971) Regional planning and Development, University of Mysore, Mysore. |
| **5** | |
| | |
| **Related Online Contents:** | |
| **1** | https://en.wikipedia.org/wiki/Urban_geography |
| **2** | https://www.tandfonline.com/toc/rurb20/current |
| | |
| **Course Designed By:S. Ravichandran** | |

| **Mapping with Program Outcomes** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
| CO1 | S | S | S | M | S | S | S | S | M | S |
| CO2 | M | S | M | S | L | M | S | M | S | M |
| CO3 | S | M | S | S | L | S | L | S | S | M |
| CO4 | M | S | S | M | S | M | S | S | M | S |
| CO5 | S | M | S | S | S | S | M | S | S | S |

S- Strong: M- Medium: L- Low

| Course code | 33C | AGRICULTURAL GEOGRAPHY | L | T | P | C |
|---|---|---|---|---|---|---|
| Core/ Elective/ Supportive | | Core-X | 0 | 6 | 0 | 4 |
| Pre-requisite | | Analyze the spatial variations, distribution and location of agricultural activities on the earth's surface and the factors responsible for them. | Syllabus version | | 2022-2023 | |

**Course Objectives:**

Agricultural geography is defined as the study of the geographical and location attributes, patterns, and processes of crop and animal farming, and related subjects such as farm land, farm-associated human geographers, environmental issues, and theoretical works on the location of agricultural activities.

**Course Outcomes:**

After the completion of course, the students will have ability to:

| | | |
|---|---|---|
| CO1 | Understand about the introduction to agriculture, nature, scope, significance and Development of agriculture geography, study approaches applied in agriculture. | K2 |
| CO2 | Understand the influence of physical, Economic and Technological factors on agriculture patterns. | K1 |
| CO3 | To understand the agricultural system its meaning and concept, whittlesey‟s classification of agricultural system, types of agricultural, study the types of agricultural in respect of area, salient features and their problems. | K2 |
| CO4 | Understand the agricultural regionalization and modes in agricultural geography and their classification of agricultural models and some theories. | K2 |
| CO5 | Understand definition and characteristics of arid and semi-arid regions and study about droughts and famines, role of irrigation and dry farming. | K2 |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate;

| Unit- I | Agricultural Systems of the world's | 18 hours |
|---|---|---|

Scope and content – Approaches – origin and Development of Agriculture major agricultural Systems of the world's (Whitlessey).

| Unit- II | Determinants of agriculture | 18 hours |
|---|---|---|

Determinants of agriculture – Physical, Socio, Economic, Institutional and technological determinants; models in agricultural Geography; Von Thunen's model, O.L. of Jonsasson's model.

| Unit- III | Agricultural data | 18 hours |
|---|---|---|

Agricultural data sources and analysis; sources – types of data – land use survey – sampling and land use data – remote sensing in land use studies.

| Unit- IV | land capability classification | 18 hours |
|---|---|---|

Rationalization and classification: land capability classification – crop region – concentration and diversification, crop combination regions – Weaver, Doi and Rafiullah methods.

| Unit- V | Agricultural productivity | 18 hours |
|---|---|---|

Agricultural productivity – Green revolution – Salient features and impact on land use – agricultural regions of India.

| | Total lecture hours | 90 |
|---|---|---|

**Text Books:**

| | |
|---|---|
| 1 | An Introduction to Agricultural Geography Paperback – Import, 5 January 1995 by David Grigg. |
| 2 | Systematic Agricultural Geography (English, Paperback, Husain Majid) |

| **Books For Reference:** | |
|---|---|
| **1** | Husian.M (1979) Agricultural Geography, Inter India publication, New Delhi,. |
| **2** | Mohamkand N. (1981) Perspective Agricultural Geography, Voll. Concepts publishing company.New Delhi. |
| **3** | Morgan, W.B. & Munton R.J.C (1971) Agricultural Geography, Methuen, London. |
| **4** | Agricultural Geography (Perfect Binding, Dr. Mukesh Mishra) |
| **5** | Agricultural Geography 2nd ed. Paperback – 1 January 2021<br>by Husain Majid |
| | |

| **Related Online Contents:** | |
|---|---|
| **1** | https://en.wikipedia.org/wiki/Agricultural_geography |
| **2** | https://www.studysmarter.co.uk/explanations/human-geography/agricultural-geography/ |
| | |
| **Course Designed By:Dr.J.Ganesan** | |

| **Mapping with Program Outcomes** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
| CO1 | S | S | S | S | S | S | S | S | S | S |
| CO2 | S | S | M | S | M | S | S | M | L | M |
| CO3 | S | M | S | S | S | M | M | S | S | S |
| CO4 | M | S | S | M | S | S | S | S | M | S |
| CO5 | S | S | S | S | L | S | M | S | S | M |

S- Strong: M- Medium: L- Low

| Course code | 33D | POPULATION GEOGRAPHY | L | T | P | C |
|---|---|---|---|---|---|---|
| Core/ Elective/ Supportive | | Core-XI | 0 | 6 | 0 | 4 |
| Pre-requisite | | To understand the Population geography is a division of human geography that focuses on the study of people, their spatial distributions, their characteristics, and their density. | Syllabus version | | 2022-2023 | |

**Course Objectives:**

It is the study of the ways in which spatial variations in the distribution, composition, migration, and growth of populations are related to the nature of places.

**Course Outcomes:**

After the completion of course, the students will have ability to:

| | | |
|---|---|---|
| CO1 | Examine and understand the various factors responsible for World Population growth and Distribution. | K2 |
| CO2 | To understand the fundamental Concepts Related to Population such as density, over, Optimum & under population, fertility, mortality and population for future Perspectives. | K1 |
| CO3 | Demography and population studies focus on human populations, especially on births (fertility), deaths (mortality), and movements between territories (migration). | K2 |
| CO4 | Employment or Human Power: Population census helps the government to know the rate or level of unemployment in a particular area or country. | K4 |
| CO5 | The scope of population education can be divided into demography, determines of population change, consequences of population growth, human sexuality, planning for the future. | K4 |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate;

| Unit- I | Population Geography | 18 hours |
|---|---|---|

Population Geography; Scope and Development of Population Geography – sources of population data and problems.

| Unit- II | Population distribution | 18 hours |
|---|---|---|

Population distribution; density and growth – theoretical issues; classical and modem theories in population growth – Malthus, Optimum theory, Ricardo and demographic transition world patterns and their determinants; India – population distribution, density and growth profile, concepts of under population and over population.

| Unit- III | Population composition | 18 hours |
|---|---|---|

Population composition; age and sex; family and households; literacy and education; religion, caste and tribe; rural and urban; urbanization; occupational structure; gender issues; population composition of India.

| Unit- IV | Population dynamics | 18 hours |
|---|---|---|

Population dynamics; measurements of fertility and mortality. Migration – causes and consequences – national and international patterns.

| Unit- V | Population and development | 18 hours |
|---|---|---|

Population and development; population policies in developed and less developed countries; Human Development Index and its components; India's population policies; population and environment; implications for future.

| | Total lecture hours | 90 |
|---|---|---|

**Text Books:**

| | |
|---|---|
| 1 | Population Geography Tools and Issues, Fourth Edition k. Bruce new bold |
| 2 | A Geography of Population, World patterns, John Wiley & sons. New York. |

| | |
|---|---|
| **Books For Reference:** | |
| 1 | Delhi 4 .Beaujeau Garnier .J (1966), Geography of Population, Longman Group, London. |
| 2 | B.N.Ghosh (1985), Fundamentals of population geography, sterling publishing, New Delhi. |
| 3 | Chandha, R.C (1986), A Geography of population, Concepts, patterns, Kalyani publishers, New Delhi. |

| | |
|---|---|
| **Related Online Contents:** | |
| 1 | https://en.wikipedia.org/wiki/Population |
| 2 | https://en.wikipedia.org/wiki/Population_density |
| | |
| **Course Designed By:P. Umasankar** | |

| **Mapping with Program Outcomes** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
| CO1 | S | S | S | S | S | S | S | S | S | S |
| CO2 | S | S | M | S | S | S | S | M | S | M |
| CO3 | S | M | S | S | S | S | M | S | S | S |
| CO4 | M | S | S | M | S | M | S | S | L | M |
| CO5 | S | S | M | S | L | S | S | S | S | S |

S- Strong: M- Medium: L- Low

| Course code | 3EA | GIS AND GPS | L | T | P | C |
|---|---|---|---|---|---|---|
| Core/ Elective/ Supportive | | Elective-III | 0 | 6 | 0 | 4 |
| Pre-requisite | | To analyze the maximize the efficiency of decision making and feature planning. | Syllabus version | | 2022-2023 | |

**Course Objectives:**

Global Positioning Systems or GPS are used to find the exact location of things.
Geographic Information Systems or GIS are used to record information on to maps. Both GPS and GIS are useful in managing land in the high country.

**Course Outcomes:**

After the completion of course, the students will have ability to:

| | | |
|---|---|---|
| CO1 | Improved Communication. Through the creation of rich maps and hi-tech communication systems, GIS has greatly assisted in improving communication | K2 |
| CO2 | Improved Decision Making. | K1 |
| CO3 | GPS uses satellites that orbit Earth to send information to GPS receivers that are on the ground. The information helps people determine their location. | K3 |
| CO4 | GIS stands for Geographical Information System. GIS is a software program that helps people use the information that is collected from the GPS satellites. | K3 |
| CO5 | Geographic information system (GIS) is a computer system for capturing, storing, checking, and displaying data related to positions on Earth's surface. | K2 |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate;

| Unit- I | GIS | 18 hours |
|---|---|---|

Geographic Information System – development – fundamentals – scope – Components – spatial data – attribute data – data structures – data input and Editing – data management – methods of data output.

| Unit- II | Spatial entities | 18 hours |
|---|---|---|

Spatial entities – raster and vector data models – characteristics – merits and Demerits – compact data structures – linking spatial and attribute data - database management – GIS database application and development.

| Unit- III | Data analysis | 18 hours |
|---|---|---|

Data analysis: measurements – queries – reclassification – buffering and neighbourhood analysis – overlay analysis – surface and network analysis – spatial modeling. GIS and GPS data integration – basics – latest developments – integration of GIS data and remote data: principles and applications.

| Unit- IV | GPS | 18 hours |
|---|---|---|

Principles of GPS – GPS segments – satellite constellation – receivers – Measurements – errors and biases – GPS surveying – application of GPS.

| Unit- V | GIS and GPS | 18 hours |
|---|---|---|

GIS and GPS data integration – basics – latest developments – integration of GIS data and remote data: principles and applications.

| | Total lecture hours | 90 |
|---|---|---|

**Text Books:**

| | |
|---|---|
| 1 | Basic Concept of Remote Sensing, GPS and GIS Paperback – 1 January 2020 by Shivam Pandey (Author) |
| 2 | Textbook of Remote Sensing and Geographical Information Systems Paperback – 29 July 2022 by Kali Charan Sahu (Author) |

| **Books For Reference:** | |
|---|---|
| 1 | Remote Sensing: Principles and Applications Paperback – 1 January 2008 by B C Panda (Author) |
| 2 | Physical Principles of Remote Sensing Hardcover – Illustrated, 29 November 2012 by W. G. Rees (Author) |
| 3 | Basics Of Remote Sensing And Gis Paperback – 1 January 2016 by S. Kumar (Author) |

| **Related Online Contents:** | |
|---|---|
| 1 | https://en.wikipedia.org/wiki/Geographic_information_system |
| 2 | https://en.wikipedia.org/wiki/Global_Positioning_System |
| | |
| **Course Designed By:A. Suresh** | |

| **Mapping with Program Outcomes** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
| CO1 | S | S | S | S | S | S | S | S | S | S |
| CO2 | S | S | M | S | S | S | S | M | S | M |
| CO3 | S | M | S | S | S | S | M | S | S | S |
| CO4 | M | S | S | M | S | M | S | S | L | M |
| CO5 | S | S | M | S | L | S | S | S | S | S |

S- Strong: M- Medium: L- Low

# Fourth Semester

| Course code | 43A | QUANTITATIVE TECHNIQUES IN GEOGRAPHY | L | T | P | C |
|---|---|---|---|---|---|---|
| Core/ Elective/ Supportive | | Core-XII | 0 | 6 | 0 | 4 |
| Pre-requisite | | The purpose of quantitative research is to attain greater knowledge and understanding of the social world. | Syllabus version | | 2022-2023 | |

**Course Objectives:**

Quantitative Methods in Geography will be composed of lectures, discussions and exercises and is designed as an undergraduate level introduction to spatial analysis and the application of statistical methods in a spatial context.

**Course Outcomes:**

After the completion of course, the students will have ability to:

| | | |
|---|---|---|
| CO1 | The quantitative revolution made geography closer to science as it introduced mathematical tools in geography that developed objectivity and reduce the over descriptive. | K2 |
| CO2 | Those techniques which provide the decision makes a systematic and powerful means of analysis, based on quantitative data. | K1 |
| CO3 | All the techniques are firmly based on empirical observations and are readily verifiable. | K3 |
| CO4 | They help in reducing a multitude of observations to a manageable number of factors. | K3 |
| CO5 | They allow the formulation of structured ideas and theories which can be tested under the assumed conditions. | K2 |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate;

| Unit- I | Quantification | 18 hours |
|---|---|---|

Need for Quantification – Quantitative revolution in Geography – Geographical data – Spatial data and non-Spatial data – types, sources and classification.

| Unit- II | Sampling techniques | 18 hours |
|---|---|---|

Sampling techniques: Definition – types – size of sampling – Merits and Demerits – uses in Geographical analysis – field techniques – local Geography.

| Unit- III | Primary data | 18 hours |
|---|---|---|

Primary data – methods of collection – problems – secondary data – sources – problems.
Data Analysis: tabulation – frequency distribution – curves.

| Unit- IV | Central tendency | 18 hours |
|---|---|---|

Measures of central tendency – measures of location – Centrographic measures – Standard distance – Dispersion – nearest neighbor analysis – analysis of variance.

| Unit- V | Correlation | 18 hours |
|---|---|---|

Analysis of relationship: Simple correlation – Pearson's product moment – correlation – Rank correlation – Scatter diagram – regression – residual mapping. Hypothesis – testing of hypothesis – T test, F test, Chi square.

| | Total lecture hours | 90 |
|---|---|---|

| **Text Books:** | |
|---|---|
| 1 | Quantitative Techniques in Geography: An Introduction Paperback – 9 November 1978 by R. Hammond (Author), Patrick S. McCullagh (Author) |
| 2 | Quantitative Techniques In Geography: An Introduction Robert Hammond , Patrick McCullagh |
| | |

| **Books For Reference:** | |
|---|---|
| 1 | Quantitative Geography Techniques And Presentations 1st Edition (Paperback, Sarkar A) |
| 2 | Hammond, R. & McCullagh, Patrick S., 1978. "Quantitative Techniques in Geography: An Introduction," OUP Catalogue, Oxford University Press, edition 2. |
| | |
| **Related Online Contents:** | |
| 1 | https://www.rawatbooks.com/geography/quantitative-methods-in-geography |
| 2 | https://orca.cardiff.ac.uk/59957/1/report-130906041556-.pdf |
| | |
| **Course Designed By:Dr. Sunilkumar** | |

| **Mapping with Program Outcomes** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
| CO1 | M | S | S | S | S | S | S | S | S | M |
| CO2 | S | S | M | S | M | S | S | M | S | S |
| CO3 | S | M | S | S | S | S | M | S | S | S |
| CO4 | M | S | S | M | L | M | S | S | M | M |
| CO5 | S | S | S | S | S | S | S | M | S | L |

S- Strong: M- Medium: L- Low

| Course code | 43B | DISASTERS MITIGATION AND MANAGEMENT | L | T | P | C |
|---|---|---|---|---|---|---|
| Core/ Elective/ Supportive | | Core-XIII | 0 | 6 | 0 | 4 |
| Pre-requisite | | The knowledge and understanding of the disaster phenomenon. | Syllabus version | | 2022-2023 | |

**Course Objectives:**

Disaster management aims to reduce, or avoid the potential losses from hazards, assure prompt and appropriate assistance to victims of disaster, and achieve rapid and effective recovery.

**Course Outcomes:**

After the completion of course, the students will have ability to:

| | | |
|---|---|---|
| CO1 | Reduce, or avoid, losses from hazards | K2 |
| CO2 | Assure prompt assistance to victims | K1 |
| CO3 | Achieve rapid and effective recovery | K2 |
| CO4 | Disaster risk reduction is aimed at preventing new and reducing existing disaster risk and managing residual risk, all of which contribute to strengthening resilience and therefore to the achievement of sustainable development. | K2 |
| CO5 | Prevention. Actions taken to avoid an incident, Mitigation, Preparedness, Response. Recovery. | K2 |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate;

| Unit- I | Disasters | 18 hours |
|---|---|---|

Disasters – Meaning and Types – Need for study – Natural Hazards - Risk – vulnerability. Disaster Management- Preparing for natural disasters – role of government agencies, NGOs and individuals.

| Unit- II | Seismic zones | 18 hours |
|---|---|---|

Seismic zones regions of the world. Impact of Earthquakes and Tsunamis. Earthquake mitigation and management Volcanic zones of the world. Impacts of volcanic activity. Disaster management in volcanic zones.

| Unit- III | Mass movements | 18 hours |
|---|---|---|

Mass movements- mitigation and management Global Warming- climate change – Storm prone regions of the world - Impact of Storms - disaster management during storms. Floods - Flood prone regions of the world - Mitigation and management of floods.

| Unit- IV | Global Warming | 18 hours |
|---|---|---|

Global Warming – climate change - Drought and Famine prone regions of the world- Mitigation and management of drought and famine Forest Fire – its mitigation and management.

| Unit- V | Manmade disasters | 18 hours |
|---|---|---|

Manmade disasters - types - Impact of Man-made disasters. Management and mitigation of manmade disasters.

| | Total lecture hours | 90 |
|---|---|---|

**Text Books:**

1. Natural Disasters by Partick L. Abbott., WCB WM.C. Brown Publishers.

| **Books For Reference:** | |
|---|---|
| 1 | The Changing Earth-Exploring Geology & Evolution by James S.Monore &Reed Wicander BROOKS / COLE. |
| 2 | Natural Disasters : A guide for Relief Workers (1980) JAC Adhyatma Sadhana Kendra, Mehruali, New Delhi – 110 030. |
| 3 | Disaster Planning: The Preservation of Life and Property, Harold D.Faster (1980) Springer Verlag, New York. |
| 4 | Disasters Management, Shailendra K. Singh, Subash C.Kundu & Shobu Singh (1998) Mittal Publications, New Deldhi. |
| 5 | Natural Disaster Reduction, Girish K. MIshra & Mathur. G.C. (1993),Reliance Publishing House, New Delhi. |
| | |

| **Related Online Contents:** | |
|---|---|
| 1 | www.gisdevelopment.net |
| 2 | https://en.wikipedia.org/wiki/Disaster |
| | |
| **Course Designed By:S. Ravichandran** | |

**Mapping with Program Outcomes**

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | S | S | S | M | S | S | S | S | M | S |
| CO2 | M | S | M | S | S | S | S | M | S | S |
| CO3 | S | M | S | S | M | S | M | S | S | M |
| CO4 | M | S | S | M | S | M | S | S | M | S |
| CO5 | S | M | S | S | L | S | S | M | S | S |

S- Strong: M- Medium: L- Low

| Course code | 43C | REGIONAL PLANNING AND DEVELOPMEN | L | T | P | C |
|---|---|---|---|---|---|---|
| Core/ Elective/ Supportive | | Core-XIV | 0 | 6 | 0 | 4 |
| Pre-requisite | | To understand the urban planning development | Syllabus version | | 2021-2022 | |

**Course Objectives:**

Regional planning may be defined as the integrated management of the economic, social, and physical resources of a spatially bounded area.

**Course Outcomes:**

After the completion of course, the students will have ability to:

| | | |
|---|---|---|
| CO1 | Regional planning also helps in reducing the conflicts and competition for resources between cities in a region. | K2 |
| CO2 | Planning and development of buildings, parks, streets, understanding the use of resources, land, and environment. | K1 |
| CO3 | Strategic thinking, analysis, architecture, designing are the areas of strengths that are developed. | K3 |
| CO4 | It seeks the development of all sectors of economy along with advancement of all segments of society. | K3 |
| CO5 | Effective and efficient delivery of urban services to raise the quality to living of people residing in urban areas. | K2 |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate;

| Unit- I | Regional Planning | 18 hours |
|---|---|---|

Geography and Regional Planning: Basic concepts – Geographic space and regions. – Concept of regions – growth pole and growth centre – regional units – types of regions – goals and objectives of regional planning process – inter disciplinary nature of regional planning Nationalization and sectionalism.

| Unit- II | Approaches | 18 hours |
|---|---|---|

Approaches to regional planning analysis: Systems concept; Geographic matrix – spatio temporal dimensions – grouping of dimensions in regional analysis – regional science – Methods of Indian regional problems.

| Unit- III | Planning in India | 18 hours |
|---|---|---|

Planning in India; Historical development – appraisal of five year planning and annual plans – dimensions – grouping of dimensions in regional analysis – regional imbalances – development program; command area, drought prone, metropolitan, river valley, tribal and hill area.

| Unit- IV | Regional planning in Tamil Nadu | 18 hours |
|---|---|---|

Regional planning in Tamil Nadu: Evaluation of regional planning – planning regions – backward area development – Metropolitan, rural planning – local planning authorities – 73rd and 74th amendments of constitution of India – powers and functions of Nagar Panchayat, Municipal council and Municipal Corporation.

| Unit- V | Town planning | 18 hours |
|---|---|---|

Town planning: Basic concepts of town planning need of town planning – functions of town planning – town planning activities in Tamil Nadu.

| | Total lecture hours | 90 |
|---|---|---|

**Text Books:**

| | |
|---|---|
| 1 | Regional Planning in India Paperback – 1 March 2012 |
| 2 | City and Regional Planning By Richard LeGates Copyright Year 2022 |

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|---|---|
| 1 | Misra R.P. (1971) Regional Planning: Concepts Techniques. Politics and case studies. University Mysore, Mysore. |
| 2 | Misra.R.P., Sundram, K.V and V.L.S Prakasa Rao (1974); Regional development in India, Vikas publishing House, New Delhi. |
| 3 | Prakasa Rao V.L.S (1963) ; Regional Planning, Asia Publishing House, Kolkatta. |


| **Related Online Contents:** | |
|---|---|
| 1 | https://gacbe.ac.in/pdf/ematerial/18MAG41C-U1.pdf |
| 2 | http://www.dspmuranchi.ac.in/pdf/Blog/Regional-Planning-All_Part-Conc.pdf |

**Course Designed By:Dr. J. Ganesan**

**Mapping with Program Outcomes**

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | S | S | S | S | S | S | S | S | S | M |
| CO2 | S | S | M | S | S | S | S | M | M | S |
| CO3 | S | M | S | S | S | S | M | S | S | L |
| CO4 | M | S | M | M | S | M | S | S | M | S |
| CO5 | S | M | S | S | L | S | S | S | S | M |

S- Strong: M- Medium: L- Low

| Course code | 43P | METHODS OF DATA ANALYSIS | L | T | P | C |
|---|---|---|---|---|---|---|
| Core/ Elective/ Supportive | | CORE PRACTICAL -III | 0 | 0 | 6 | 4 |
| Pre-requisite | | To analyses the image and air photos | Syllabus version | | 2022-2023 | |

**Course Objectives:**

Satellites looking toward Earth provide information about clouds, oceans, land and ice. They also measure gases in the atmosphere.

**Course Outcomes:**

After the completion of course, the students will have ability to:

| | | |
|---|---|---|
| CO1 | Satellite imagery and elevation data at 30 M resolution are readily available for most of the Earth via Landsat and other sources. | K2 |
| CO2 | Satellite images are one of the most powerful and important tools we have for monitoring the earth. | K1 |
| CO3 | They track the physical environment (water, air, land, vegetation) and the changing human footprint across the globe. | K3 |
| CO4 | How is satellite imagery used for development?<br>Satellite image data is highly useful for creating or updating base maps and detecting major changes in urban land cover and land use | K3 |
| CO5 | satellites images can help you monitor what is happening in any location, assess environmental impact, analyze historical data and report on what is happening today, | K2 |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate;

| | | |
|---|---|---|
| **Unit- I** | **Spatial Analysis** | **18 hours** |

Spatial Analysis – nearest neighbor analysis – Centro graphic analysis mean center – weighted mean – Median center – Standard distance.

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| **Unit- II** | **Transport network analysis** | **18 hours** |

Transport network analysis – Topology – Connectivity – alpha – beta – gamma indices – accessibility measures – shortest path and binary index and detour index.

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| **Unit- III** | **Aerial photo interpretation** | **18 hours** |

Aerial photo interpretation: Stereovision test – Marginal information – Interpretation of aerial photos.

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|---|---|---|
| **Unit- IV** | **Satellite image interpretation** | **18 hours** |

Satellite image interpretation: Marginal information – Visual interpretation imagery.

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| **Unit- V** | **Field trip** | **18 hours** |

**Field trip for one week (Minimum).**

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|---|---|---|
| | **Total lecture hours** | **90** |

**Text Books:**


1. Monhkose & Wilknson (1976) Maps and Diagrams Mathew London.
2. Lillesand T.M & R.W.Kifer (1986) Remote Sensing and Image Interpretation, John Wiley Sons, New York.
3. Sabins F.F. Jr.(1986) Principle of Remote Sensing, English books society Long Man.


**Books For Reference:**


1. Peter Toyne Techniques in human Geography
2. Hammond R. An introduction Quantitative techniques in Geography, Mc.Graw Hill, Company, London.

| **Related Online Contents:** | |
|---|---|
| 1 | https://www.satimagingcorp.com/applications/engineering-and-construction/urban-and-land-development/ |
| 2 | https://en.wikipedia.org/wiki/Transport_network_analysis |
| | |
| **Course Designed By:Dr. Dunilkumar** | |

| **Mapping with Program Outcomes** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
| CO1 | S | S | S | S | M | S | S | S | S | M |
| CO2 | S | S | M | S | S | M | L | M | S | S |
| CO3 | S | M | S | S | L | S | M | S | S | M |
| CO4 | M | S | S | M | S | S | S | S | M | S |
| CO5 | S | S | M | S | M | S | S | M | S | S |

S- Strong: M- Medium: L- Low

| Course code | 4EP | Practical's in Geoinformatics | L | T | P | C |
|---|---|---|---|---|---|---|
| Core/ Elective/ Supportive | | Elective Practical -IV | 0 | 0 | 6 | 4 |
| Pre-requisite | | Mapping knowledge of GIS | Syllabus version | | 2022-2023 | |

**Course Objectives:**

Geoinformatics is a branch of science that deals with issues of geosciences, cartography, geography and other streams related to science, engineering and technology.

**Course Outcomes:**

After the completion of course, the students will have ability to:

| | | |
|---|---|---|
| CO1 | The primary job of geographic information systems (GIS) professionals is to use appropriate technology to map the digital data that has been obtained and then reduce information out of the compiled data. | K2 |
| CO2 | The primary requirement of this job is to analyse the data that is available. | K1 |
| CO3 | This is one sector that has a tremendous scope of employment both in the government sector as well as that in the private. | K3 |
| CO4 | The typical office setting of a GIS expert involves working on multiple computers at the same time. | K3 |
| CO5 | Broadly speaking, there are a very few things in the modern world that are not under the reigns of geoinformatics. | K2 |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate;

| | | |
|---|---|---|
| **Unit- I** | **Computer mapping** | **18 hours** |

Basics of computer mapping and GIS: digitization and scanning – editing – import and export – registration.

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| **Unit- II** | **Stereoscopic vision test** | **18 hours** |

Stereoscopic vision test – use of pocket stereoscope and mirror stereoscope – visual interpretation of aerial photographs – measurement of height using Parallax bar.

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|---|---|---|
| **Unit- III** | **Marginal information** | **18 hours** |

Marginal information of satellite imagery – visual interpretation – image processing techniques – image enhancement techniques – classification techniques.

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| **Unit- IV** | **GIS data creation tools and techniques** | **18 hours** |

GIS data creation tools and techniques: building polygons – topology and Attribute data- creation of base map – raster data layers – vector data layers – data analysis – overlay analysis – buffering and network analysis.

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| **Unit- V** | **Surveying with GPS** | **18 hours** |

Surveying with GPS – lines, points and polygons – editing – geo-referencing
- GIS and GPS data integration**.**

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|---|---|---|
| | **Total lecture hours** | **90** |

**Text Books:**

| | |
|---|---|
| 1 | Fundamentals of Geographic Information Systems" by Michael N DeMers. |
| 2 | The Fundamentals of Human Factors Design for Volunteered Geographic Information (SpringerBriefs in Geography)" by Christopher J Parker. |
| 3 | Map Framework: A Formal Model of Maps as a Fundamental Data Type in Information Systems" by Mark McKenney and Markus Schneider. |
| 4 | |

| **Books For Reference:** | |
|---|---|
| 1 | Fundamentals of Geographic Information Systems" by Michael N Demers. |
| 2 | Fundamentals of Geographic Information System" by Rabi N Sahoo and Debashis Chakraborty. |
| 3 | Fundamentals of Remote Sensing" by George Joseph. |
| 4 | Geographic Information Systems (GIS) for Disaster Management" by Brian Tomaszewski. |
| **Related Online Contents:** | |
| 1 | https://en.wikipedia.org/wiki/Geoinformatics |
| 2 | https://en.wikipedia.org/wiki/Geographic_information_system |
| | |
| **Course Designed By:Dr. J Ganesan** | |

| **Mapping with Program Outcomes** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
| CO1 | S | S | S | S | M | S | S | S | S | M |
| CO2 | S | S | M | S | S | M | L | M | S | S |
| CO3 | S | M | S | S | L | S | M | S | S | M |
| CO4 | M | S | S | M | S | S | S | S | M | S |
| CO5 | S | S | M | S | M | S | S | M | S | S |