

Name of the Course: Foundation Course in Remote Sensing and GIS

Educational Qualification: B.A. Geography /B.Sc. / M.A. /M.Sc. Geography /M.Sc.

Duration: Two Months

Maximum Marks: 50

Assessment: Assignment, MCQ and Project

Teaching Method: Theory and Practical

Course Medium: Marathi/English

Total Credits: 02

Course Objectives:

- 1) To introduce students to the fundamental concepts of remote sensing (RS) and geographic information systems (GIS).
- 2) To understand the characteristics of electromagnetic radiation (EMR) and its relevance in remote sensing applications.
- 3) To explore the interaction of EMR with the atmosphere and Earth's surface, including key processes such as reflection, absorption, and scattering.
- 4) To familiarize students with digital photogrammetry and its role in remote sensing.
- 5) To provide a comprehensive overview of satellite remote sensing, including platforms, sensors, and orbits.
- 6) To introduce the basic principles and components of GIS, including software, hardware, and data requirements.
- 7) To develop practical skills in GIS software, focusing on digitization, data inputs, projections, and map elements.

Course Outcomes:

By the end of the course, students will be able to:

CO1: Understand the basic principles of remote sensing and GIS, including key terminologies and concepts.

CO2: Analyze the characteristics of electromagnetic radiation and its interaction with atmospheric and surface elements.

CO3: Explain the stages and types of satellite remote sensing, including the role of platforms, sensors, and orbits.



CO4: Gain proficiency in GIS software, including open-source options, for tasks such as digitization and attribution.

CO5: Apply knowledge of map projections, coordinate systems, and georeferencing to GIS mapping projects.

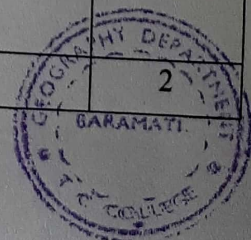
CO6: Differentiate between vector and raster data models, and understand their significance in spatial analysis.

CO7: Visualize and design maps using GIS, focusing on symbology, map layout, and spatial data visualization techniques.

CO7. Implement image classification techniques proficiently, understanding their significance in remote sensing.

1) Syllabus:

Sr. No.	Topics	Periods
1	Introduction to remote sensing	1
2	Characteristics of electromagnetic radiation (EMR): EMR spectrum, blackbody, radiation laws	2
3	Interaction of EMR with atmosphere and Earth's surface: reflection, absorption, transmission, scattering and refraction. Atmospheric windows	2
4	Introduction to digital photogrammetry	1
5	Basics of satellite remote sensing: definition, principle, stages and types	2
6	Platforms and orbits	1
7	Sensors and scanning / Input systems	1
8	Introduction to GIS: definition, development, components, objectives, hardware and software requirements	2
9	Introduction to GIS software (open sources)	2
10	Digitization and attribution	2
11	The basis of GIS mapping: map projections, datum and coordinate systems	2
12	Data types and data inputs: spatial data and attributes, data input, scanning, digitization, error corrections and topology	3
13	Data models: vector and raster, spatial and non-spatial data	2



	models	
14	Data visualization: types of visualization, map layout design and symbology	3
15	Georeferencing of maps	3
16	Map elements: scale, projection, coordinate systems	3

3) Mode of Exam:

- 1) Multiple choice question : 50% Mark (25 Marks)
 2) Practical : 50 % Marks (25 Marks)

4) Expected Fees: 500 per student

5) Total Credits : 2

