

Course Objective:

The Learning objective of this course are as follows-

1. To explain the meaning, concept, and definition Remote sensing and GIS, as an important tool in the study and Explaining geographic phenomenon.

Sl.	Unit	Topics	Methodology	Assessment	Outcome
1	Unit 1: 17 Lectures	Image Analysis: Principles of Visual Image Interpretation, Recognition Elements and Interpretation Keys for Visual Interpretation. (Shape, Size, Colour, Tone, Texture, Association); Interpretation of a Satellite Image (Landsat, LISS III, LISS IV, Cartosat etc).	<ul style="list-style-type: none"> • Lecture • Digital Classes • Group Discussion • Self-study • EX-situ Examples. • Practical 	<ul style="list-style-type: none"> • Quiz on basic concepts • Practical Class Test • Assignments • Presentation 	Will equip students with the ability to extract meaningful information from visual images by understanding key elements like tone, texture, shape, pattern, and spatial relationships, allowing them to analyze and interpret images effectively across various fields like medicine, geography, forensics, and research, where visual data analysis is crucial; essentially, graduates would be skilled at visually interpreting images to make informed decisions based on the information gleaned from them
2	Unit2: 15 Lectures	Introduction to Digital Image Processing, Image Rectification and Registration, Image Enhancement, Browsing Satellite Data (NRSC, GLCF, Glovis), Image Display, Preparing Mosaic, Layer Stack e	<ul style="list-style-type: none"> • Lecture • Digital Classes • Group Discussion • Self-study • Ex-situ Examples. • Practical. 	<ul style="list-style-type: none"> • Quiz on basic concepts and Theories • Practical Class Test • Assignments • Presentation 	Will equip students with the foundational knowledge and practical skills to manipulate and analyze digital images, allowing them to correct geometric distortions, align multiple images, and improve the visual quality of images for better interpretation and analysis in various applications, such as medical imaging, remote sensing, and computer vision.
3	Unit3: 10 Lectures	True Colour and False Colour Composite Images and Preparation of Interpretation Keys; Mapping Land Use/land Cover with any Software	<ul style="list-style-type: none"> • Lecture • Digital Classes • Group Discussion. • Ex-situ 	<ul style="list-style-type: none"> • Quiz on basic concepts and Theories • Practical Class Test 	Will result in students gaining the ability to visually represent and analyze how land is currently being used and what physical features cover a specific area, allowing them to identify patterns, monitor changes over time, and inform

		(at least one exercise each on Point, Line and Polygon Features), Vegetation Mapping using NDVI, Supervised and Unsupervised Classification, Accuracy Assessment and Ground Truthing; Digital Elevation Models.	Examples. <ul style="list-style-type: none"> • Practical. • Self-study 	<ul style="list-style-type: none"> • Assignments • Presentation 	decision-making in areas like urban planning, environmental management, natural resource conservation, and disaster preparedness, by utilizing GIS software to interpret satellite imagery and create detailed land use/land cover maps.
4	Unit4: 15 Lectures	Introduction to GIS Software, Geo-Referencing and Projection, Spatial Data Entry, Editing, Topology Creation and Linking Spatial and Non Spatial Data, Spatial Data Visualization, Output Map Generation	<ul style="list-style-type: none"> • Lecture • Digital Classes • Group Discussion • Self-study • Ex-situ Examples. 	<ul style="list-style-type: none"> • Quiz on basic concepts and Theories • Class Test • Assignments • Presentation 	<ul style="list-style-type: none"> • Understand the basic concepts of Geographic Information Systems. • Define terms related to raster and vector data models (e.g. pixel, grid, spatial resolution, attribute table, topology). • Compare vector and raster data models. • Understand the difference between geographic and projected coordinate systems. • Select objects using attribute and spatial queries. • Perform simple analysis with geoprocessing tools. • List map elements and basic principles of map creation. • Create a thematic map using different methods of symbolization.

Suggested Readings:

1. Jensen, J.R. (2007): Remote Sensing of the Environment: An Earth Resource Perspective, Prentice-Hall Inc., New Jersey.
2. Chauniyal, D.D., (2010): Sudur Samvedan evam Bhogolik Suchana Pranali (Hindi), Sharda Pustak Bhawan, Allahabad.