

Course Type	Course Code	Name of Course	L	T	P	Credit
DP5	NGLC216	Principles of Remote Sensing and GIS Practical	0	0	2	1

Course Objective

The course aims to develop practical understanding and application of remote sensing and GIS tools, techniques, algorithms, and data processing workflows using industry-standard and open-source software platforms.

Learning Outcomes

After completing the practical course, students will be able to:

1. Perform image enhancement and color composite generation techniques.
2. Apply image fusion, pan-sharpening, and mosaic operations effectively.
3. Analyze spatial features using filtering and parallax methods.
4. Conduct georeferencing and evaluate positional accuracy errors.
5. Develop GIS-based classification models and automated workflows.

No.	Unit	Topics to be Covered	Practical Class (P) hours	Learning Outcome
1.		Histogram matching	2	Matching colors in stitched images (mosaics), image normalization
2.		Creation of color composites (TCC, standard FCC and FCC)	2	Creation of basic visual images of the study area for interpretation
3.		Pan-sharpening and image fusion, Image Math operations	2	Implementation of image fusion to enhance images and perform mathematical tasks on a set of images
4.		Image Mosaic operation with color balancing	2	Mosaicking operation
5.		Parallax effect: height of a building using aerial remote sensing data	2	Calculation of the height of building trees, etc., using remote sensing data
6.		Application of spatial filters: high-pass filters	2	Application of filtering in satellite images
7.		Application of spatial filters: low-pass filters	2	Application of filtering in satellite images
8.		Georeferencing (procedure)	2	Map projection, Image-to-image, Image-to-map
9.		Georeferencing: error calculation	2	GCPs and error analysis.
10.		Image Classification and Error matrix	4	Identification of objects of interest and error analysis
11.		GIS-based models (automated workflows) and Project.	4	Automated analysis of images and map production
12.		Practical Examination	2	
		Total Classes	28	

Text Book:

1. Jensen, J.R. (2007), Remote Sensing of the Environment: An Earth Resource Perspective, Pearson Prentice Hall.

Reference Books:

2. Jensen, J.R. (1996), Introductory Digital Image Processing: A Remote Sensing Perspective, Prentice Hall.
3. Jensen, J.R. (2007), Remote Sensing of the Environment: An Earth Resource Perspective, Pearson Prentice Hall.
4. Shared tutorials and reference materials for each practical.