Course Type	Course Code	Name of the Course	L	T	P	Credits
DP2	NMNC513	GIS Lab	0	0	3	1.5

Learning outcomes: students will be able to export the data from various sources, process the GIS data and perform spatial analysis techniques.
Course Objectives: Students will learn the practical aspects of GIS data processing and Map making techniques.

Unit No.	Topics to be covered	Contact Hours	Learning Outcomes
I	Demo on various GIS software and their salient features.	3	Students will know various GIS packages including open source
II	Georeferencing of various maps and Satellite image	3	Students will be able to perform Georeferencing of Toposheets, satellite imagery.
III	Database creation (shape file and personal database) and management and digitization,	3	Students will be understand data creation like shape file, Working with Attributes, Importing Spreadsheets or CSV files and Working with attributes.
IV	Data verification and editing of features.	3	Students will be able to apply verification and editing techniques.
V	Boolean operations and overlay analysis of GIS data	3	Students will be able to apply Boolean operations like buffering and overlay analysis.
VI	Preparation of map in GIS environment (Layout of the map)	3	Students will prepare the maps in GIS environment.
VII	Spatial and Mathematical operations.	3	Students will learn various mathematical operations like calculating line lengths and statistics.
VIII	Query based analysis and Area calculation	3	Students will be able to understand the query based analysis and computing area.
IX	Familiarization with various 2D and 3D coordinate transformations and Map Projection Systems.	3	Students learn 2D & 3D coordinate transformation and Working with Projections.
X	Network Analysis, routing problems including shortest path through a network	3	Students will be able to perform network analysis like shortest path finding.
XI	Web publishing of GIS layers and 3D GIS	3	Students will be learning available web GIS data and visualization GIS data in 3D
XII	Work on various GIS based applications	3	Students will be able to generate a GIS maps for various applications.
	Mini Project	3	
	Practice & Review	3	
	Total	42	

Text Books:

1. Burrough, P.A. and Mc Donnel, R.A.(1998), "Principles of Geographic Information System"
2. Kang-tsung Chang. (2002), "Introduction to Geographic Information System"

Reference Books:

1. P.D.Sreekanth, S.K.Soam and Ch.Srinivasa Rao (2020) "Practical Manual for GIS"