NIRMA UNIVERSITY
Institute of Technology
School of Engineering
Bachelor of Technology - Civil Engineering
Open Electives (all branches except Civil Eng. and B.Tech. students who have opted for University Elective course- 'GIS and Remote Sensing' offered by Institute of Architecture & Planning)

L	T	P	C
3	0	0	3

Course Code	2CLOE02
Course Title	Remote Sensing, GIS and GPS

Course Outcomes:

At the end of the course, students will be able to -

1. apply principles of Remote Sensing in Engineering
2. demonstrate applications of Geographical information system (GIS) in Engineering domains
3. appraise the need of geodesy and projection system in map making
4. illustrate applications of Global Positioning System (GPS) in Engineering domains.

Syllabus:

Teaching Hours: 45

Unit 1: Remote Sensing **Hours: 15**

Definition, sources of energy, electromagnetic radiation, interaction with target and atmosphere, concept of signatures, sensors characteristics, satellites, spatial and spectral resolution, digital image format, digital image processing, visual image interpretation; Data integration, analysis & presentation; Applications.

Unit 2: Geographic Information System **Hours: 15**

Concept, components, Data: source, capture, processing, analysis; attribute data management, metadata and spatial data, Applications.

Unit 3: Global Navigation Satellite Systems **Hours: 15**

Basics of reference system, types of datum, transformation, coordinate systems, map projection systems, Navigation satellites systems, Global Positioning System: segments, principles, signal, receivers, positioning methods, code and carrier phase observable, data processing, location based applications.

Self-Study:

The self-study contents will be declared at the commencement of semester. Around 10% of the questions will be asked from self-study contents.

Suggested Readings:

1. Bhatt B., *Remote Sensing and GIS*, Oxford University Press.
2. Reddy, M. A. *Remote Sensing and Geographical Information System*, B S Publication.
3. Chang, K. *Introduction to Geographic Information Systems*, McGraw-Hill.
4. Kiefer, L. *Remote sensing and image interpretation*, John Wiley & Sons.
5. Rabbany, A. *Introduction to Global Positioning System*, Artech house.

L= Lecture, T= Tutorial, P= Practical, C= Credit

w.e.f. academic year 2020-21 and onwards