REMOTE SENSING AND GIS IN CIVIL ENGINEERING

Course Code: 15CE2103	**L**	**P**	**C**
	3	**0**	**3**

Course Outcomes: At the end of the course, the student will be able to:

CO1: Analyse the principles and components of photogrammetry and remote sensing.

CO2: Describe the process of data acquisition of satellite images and their characteristics.

CO3: Compute an image visually and digitally with digital image processing techniques.

CO4: Explain the concepts and fundamentals of GIS.

CO5: Compute knowledge of remote sensing and GIS in different civil engineering applications.

UNIT-I (10-Lectures)

FUNDAMENTALS OF REMOTE SENSING

Aerial photography: Types of aerial photographs, scale of a vertical aerial photograph.

Photogrammetry: Stereoscopy, Parallax measurement.

Remote Sensing: Definition, Physics of Remote Sensing, Electromagnetic radiation and its interactions with Atmosphere, Spectral reflectance of Earth objects of Vegetation, Water and Soil.

UNIT-II (10-Lectures)

DATA ACQUISITION

Platforms and Sensors: Characteristics of LANDSAT, IRS, SPOT, QUICKBIRD, INSAT & NOAA. Optical, Thermal and Microwave Remote Sensing, Different types of data products.

UNIT –III (10-Lectures)

DATA ANALYSIS: Visual Interpretation keys, Digital Image Processing – Principles, Pre-classification processing, Classification techniques – Supervised and Unsupervised.

UNIT –IV (10-Lectures)

GEOGRAPHICAL INFORMATION SYSTEM

Introduction to GIS, Components of GIS, Data representation – Raster and Vector - Manual scanning and digitization, manipulation and data analysis – Integration of Remote sensing, GPS and GIS.

UNIT–V (10-Lectures)

GEOGRAPHICAL INFORMATION SYSTEM APPLICATIONS

Conservation and management of natural resources – Land use/land cover mapping –Waste land management – Site selection studies - Flood control – Urban and Coastal Zone Management. Air Pollution – EIA – Detection and identification of pollution sources of surface and ground water – Water quality mapping and monitoring.

TEXT BOOKS

1. A.M. Chandra, S.K. Ghosh, *"Remote Sensing and Geographical Information System",* 1st Edition, Narosa Publishing house, 2007.
2. M. Anjireddy, *"Remote Sensing and Geographical Information Systems*", 3rd Edition, B.S. Publications, 2006.

REFERENCES

1. Bernhardsen, *"Geographic Information Systems, an Introduction",* 3rd Edition, Published by John Wiley Sons, 2006.
2. Lillesand T.M. and Kiefer R.W. *"Remote Sensing and Image Interpretation*", 5th Edition John Wiley and Sons, 2008.
3. Peter A Burrough, *"Principles of Geographical Information Systems",* 1st Edition, Oxford publisher, 1998.