# REMOTE SENSING AND GIS IN CIVIL ENGINEERING

**Course Code: 13CE2103**

| L | P | C |
|---|---|---|
| 4 | 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
## 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
## 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
**DATA ANALYSIS:** Visual Interpretation keys, Digital Image Processing – Principles, Pre-classification processing, Classification techniques – Supervised and Unsupervised.

**UNIT –IV**
**GEOGRAPHICAL INFORMATION SYSTEM**
Introduction to GIS, Components of GIS, Data representation – Raster and Vector - Mannual scanning and digitization, manipulation and data analysis – Integration of Remote sensing, GPS and GIS.

**UNIT–V**
**GEOGRAPHICAL INFORMATION SYSTEM APPLICATIONS**
Conservation and management of natural resources – Land use/land cover mapping –Wasteland 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. Anji reddy, *"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.

\*\*\*\*\*\*