REMOTE SENSING AND GIS IN CIVIL ENGINEERING

Course Code: 13CE2103

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Course Educational Objectives:

1. To impart the knowledge of Remote Sensing & GIS along with simple applications in Civil Engineering.
2. To familiarize the student with Satellites and Sensors.

Course Outcomes:

1. Student will demonstrate the ability to understand the latest developments in Remote Sensing Satellites and sensor characteristics.
2. Students will be able to know the interpretation of satellite images visually and with help of digital image processing techniques.
3. Students will be able to know GIS and its applications in different fields of Civil Engineering.

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.

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