CEOE-002: *Remote Sensing & GIS*

L	T	P	Credit
3	0	0	3

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

CEOE-002.1	Identify the basic remote sensing concepts and its characteristics
CEOE-002.2	Perform digital image processing of satellite images
CEOE-002.3	Use various analysis and interpretation of GIS results.

Mapping of course outcomes with Program Outcomes

CO	PO1: Engineering knowledge	PO2 Problem analysis	PO3:Design/development of solutions	PO4:Conduct investigations of complex problems	PO5:Modern tool usage	PO6: The engineer and society	PO7:Environment and sustainability	PO8:Ethics	PO9:Individual and team work	PO10:Communication	PO11:Project management and finance	PO12:Life-long learning
CEOE-002.1	2	2			1	1	1		1			
CEOE-002.2	3	3					1		1			
CEOE-002.3	3	3					1		1			

Unit-I: Basic concepts of Remote Sensing:
1.1 Introduction to Remote Sensing,
1.2 Electromagnetic Spectrum and radiation,
1.3 Remote Sensing Platforms
1.4 , Satellite Sensors, Orbits in Remote Sensing
Sensors and Scanning Systems:
1.5 Indian Remote Satellites (IRS), ,
1.6 Spectral characteristics earth surface features i.e.vegetation
1.7 water and soil,
1.8 Understanding the spectral curves to create spectral library groundwater contours

Unit-II: Digital Image processing:
2.1 Elements of Image Interpretation

2.2 , Concepts of Digital Image Processing,
2.3 Image Registration,
2.4 Feature Extraction Techniques,
2.5 Image Classification,
2.6 Land Use and Land Cover

Basic concepts of GIS:

2.7 Introduction to GIS,
2.8 History of development of GIS,
2.9 Elements of GIS - Computer hardware and software,
2.10 Map reading, various maps in GIS.

Spatial Analysis tools:

2.11 Map overlay operations,
2.12 Vector and Raster data model,
2.13 storage and database management,
2.14 Spatial data analysis techniques yield of a well - test holes - well logs

Unit-III: Introduction and Principles of Photogrammetry:

1.1 Type of Photogrammetry,
1.2 Stereoscopic Instruments / views,
1.3 Vertical Photography,
1.4 Ortho-photos,
1.5 Oblique Photographs,
1.6 Topographic Mapping ,
1.7 Digital Elevations/
1.8 Terrain Modelling

Applications of Remote Sensing in Civil Engineering and GIS, Case Studies

Text / Reference Books:

1. Basudeb Bhatta, Remote Sensing and GIS, Oxford University Press, New Delhi, Second Edition, 2012
2. Thomos Lilles, Ralph W. Kiefer and Jonathan Chripman, Remote Sensing and Image Interpretation, Wiley Publisher, 7th Edition, (2015).
3. Kang-tsung Chang, Introduction to Geographic Information Systems, McGraw-Hill Education; 8th Edition, (2015).
4. G S Srivastava, An Introduction to Geoinformatics, McGraw Hill Education (India) Private Limited, (2014)
5. Paul Wolf, Bon DeWitt and Benjamin Wilkinson, Elements of Photogrammetry with Application in GIS, McGraw-Hill Education; 4th Edition, (2014)