

Course Code	Course Name	L-T-P-C	Year of Introduction
CE486	GEOINFORMATICS FOR INFRASTRUCTURE MANAGEMENT	3-0-0-3	2016

Prerequisites: Nil

Course objectives:

- To expose the concept of GIS and Remote sensing
- To introduce the applications of GIS and Remote sensing for infrastructure management

Syllabus:

Remote Sensing - Energy sources and radiation principles - Data acquisition - Multispectral, Thermal and Microwave remote sensing -; Elements of visual image interpretation- Introduction to Digital Image processing - Coordinate Systems – Map projections - GIS: Components of GIS - Data input and editing –GIS output- Data visualization -Digital Elevation Models and Digital Terrain Models – Mapping - Site suitability analysis - Network Analysis

Course Outcomes:

The students will

- Understand various satellite data products and their uses.
- Know about the Geospatial data and its importance in Spatialanalysis.
- Apply Geoinformatics techniques in various engineering applications and for infrastructure development.

Text Books / References:

1. Burrough P.P. &McDonnel, R.A. (1998) Principles of GIS, Oxford University Press
2. Chang, K (2008), Introduction to Geographic Information Systems, Tata McGraw-Hill
3. Davis, B. E. (2001), GIS: A visual approach, Onword Press
4. F.F Sabins(Jr.), Remote Sensing : Principals and Interpretation, Freeman & Co., San Francisco, 1978
5. Joseph, G., Fundamentals of Remote Sensing, Universities Press (2003)
6. Keith P.B., Thompson et. Al. (Ed.), Remote Sensing and Water Resources Management, American Water Resources Association, Urbana Illinois, 1973.
7. Kennie, T.J.M. and Matthews, M.C., Remote Sensing in Civil Engineering, Surrey University Press (1985)
8. Lo, C.P. and Albert Yeung , Concepts and Techniques of GIS , Prentice Hall, 2nd Ed. 2006
9. M Anji Reddy(2001), Remote Sensing and Geographic Information Systems, B S Publications, Hyderabad
10. Panigrahi,N (2008), Geographical Information Science, University Press
11. R.N. Colwel (Ed.), Manual of Remote Sensing, Vol. I & II, American Society of Photogrammetry and Remote Sensing, Falls Church, Va. (1983)
12. Schowengerdt, R. A.,Remote sensing, Models and Methods for image processing, Academic Press (2009)
13. T.M. Lillesand and R.W.Kiefer, Remote Sensing and Image Interpretation, John Wiley and Sons, 1979

COURSE PLAN

Module	Contents	Hours	End Sem Exam Marks %
I	Remote Sensing: Energy sources and radiation principles-Interaction of EM energy with atmosphere and surface features,	7	15

	spectral reflectance patterns, Data acquisition - Multistage and multispectral remote sensing concept		
II	Classification of Remote sensing systems - Optical, Thermal and Microwave remote sensing. Image Interpretation: Elements of visual image interpretation – Image interpretation keys - Introduction to Digital Image processing.	7	15
FIRST INTERNAL EXAMINATION			
III	Coordinate Systems: Geographic coordinate systems- approximations of earth, ellipsoid and geoid models, geodetic datum and vertical datum, coordinate transformation, Map projections-concepts, properties, and types.	7	15
IV	GIS: Geographical concepts and terminology, Components of GIS, Spatial and non-spatial data, Vector and raster data; Methods of data input, Spatial data editing; Vector data analysis-buffering, overlay, slivers; Raster data analysis- categories; GIS output: cartographic and non-cartographic output	7	15
SECOND INTERNAL EXAMINATION			
V	Digital Elevation Models and Digital Terrain Models; Land use/ Land cover mapping, Ground Water Potential Zonation Mapping, Hazard Zonation Mapping.	7	20
VI	Site suitability analysis for Residential area, Industrial area, Recreational Area, Solid Waste Disposal, Water treatment plant Network Analysis- Water supply line, Sewer line, Power line, Telecommunication, Road network	7	20
END SEMESTER EXAMINATION			

QUESTION PAPER PATTERN (End semester examination)

Maximum Marks : 100

Duration : 3 hours

Part A -Module I & II : 2 questions out of 3 questions carrying 15 marks each

Part B - Module III & IV: 2 questions out of 3 questions carrying 15 marks each

Part C - Module V & VI : 2 questions out of 3 questions carrying 20 marks each

Note : 1.Each part should have at least one question from each module

2.Each question can have a maximum of 4 subdivisions (a,b,c,d)