

REMOTE SENSING AND GIS

Lectures / Tutorials : 4 / Periods/Week
Semester Exam . : 3 Hrs

Sessional Marks: 40
Semester End Exam. Marks: 60
Credits : 4

Course Objectives:

1. To develop the fundamental concepts of GIS and remote sensing including the electromagnetic Spectrum, and nature of geospatial data.
2. To make the student to understand the various Civil engineering applications of remote sensing.
3. To familiarize s the students in the GIS based analytical and problem solving techniques for Sustainable planning and management of civil Engineering projects.

Course Outcomes:

1. Understand the importance of Remote sensing and GIS application in civil engineering
2. Students are familiarize with study and identification of satellite imageries
3. Students are able to learn the soft skills by using GIS technologies

UNIT – I

Introductions to remote sensing;

Applications and importance of remote sensing

Basic concepts and fundamentals of remote sensing

Elements involved in remote sensing, electromagnetic spectrum, remote sensing terminology and units, over view of Indian Remote sensing satellites and sensors.

UNIT – II

Image Interpretation

Energy resources, energy interactions with earth surface features and atmosphere, resolution, visual interpretation techniques, basic elements, converging evidence, interpretation for terrain evaluation, spectral properties of water bodies.

Geographic Information System:

Introduction, GIS definition and terminology, GIS categories, components of GIS, fundamental operations of GIS, A theoretical framework for GIS.

UNIT – III

Data representation:

Data collection and input overview, data input and output. Keyboard entry and coordinate geometry procedure, manual digitizing and scanning, Raster GIS, Vector GIS - Advantages and disadvantages. File management, Spatial data – Layer based GIS, Feature based GIS mapping.

GIS Analysis

GIS Spatial Analysis Computational Analysis Methods (CAM), Visual Analysis Methods (VAM), Data storage-vector data storage, attribute data storage, overview of the data manipulation and analysis. Integrated analysis of the spatial and attribute data.

UNIT – IV

Applications of GIS

Application areas and user segments; Guide lines for preparation of GIS; Applications of GIS for land use and housing management; Assessment of physical transformation in an urban area.

Water Resources Applications:

Land use/Land cover in water resources, Surface water mapping and inventory, Watershed management for sustainable development. Reservoir sedimentation, Ground Water Targeting and Identification of sites for artificial Recharge structures.

NOTE:

Two questions of 12 marks each will be given from each unit out of which one is to be answered. Twelve questions of one mark each will be given from entire syllabus which is a compulsory question.

TEXT BOOKS:

1. Remote Sensing and its applications by LRA Narayana, University Press 1999.
2. Principals of Geo physical Information Systems – Peter A Burragh and Rachael A. Mc Donnell, Oxford Publishers 2004.

REFERENCE BOOKS :

1. Concepts & Techniques of GIS by C.P.Lo Albert, K.W. Yeung, Prentice Hall, 2002.
2. Text Book of Remote Sensing and Geographical Information systems by M.Anji Reddy , 4th Edition,B.S.Publications,2012.
3. Geographic information Systems by Kang- tsung Chang, McGraw-Hill,2003.
4. Basics of Remote sensing & GIS by S.Kumar, USP,2005.

WEB REFERENCE:

1. <http://www.lib.vt.edu/subjects/maps/cartographic.html>
2. <http://blogs.esri.com/esri/gisedcom/2010/01/08/using-online-resources-to-teach-remote-sensing/>
3. <http://www.tec.army.mil/gis/>