

# (CE436) REMOTE SENSING AND GIS APPLICATIONS

## (Elective – IV)

Program : B.Tech  
Year : IV  
Sem : II  
Int. Max Marks : 30  
Ext. Max Marks : 70

Lecture : 4/Week  
Tutorial : 1/Week  
Practical : -  
Credits : 4

### COURSE OBJECTIVES:

*Students will be able to .....*

1. Recall the terms of photogrammetry and photo-interpretation.
2. Summarize the basic elements involved in the operation of Remote Sensing & GIS.
3. Apply the knowledge of Remote Sensing & GIS in the field of Water Resources.
4. Evaluate Land use / Land cover studies for a given area.
5. Assess the impact of Droughts and Floods.
6. Estimate the Groundwater potential areas by using Remote Sensing & GIS techniques.

### COURSE OUTCOMES:

*Upon completion of this course, students will develop an ability to.....*

1. Retrieve the basics of Aerial Photography, Remote Sensing and GIS.
2. Describe the working principle of interpretation of Aerial Photographs and Satellite image.
3. Summarize the data types, data storage and carry out the analysis of spatial and attribute data.
4. Distinguish between Raster GIS and Vector GIS.
5. Calculate the impact of the Floods and the Droughts.
6. Classify the areas having Groundwater potential.
7. Recommend the suitable sites for artificial recharge structures.
8. Estimate the depth of the water by using Remote Sensing & GIS tools.

### Time Table:

|           |  |  |          |   |                      |
|-----------|--|--|----------|---|----------------------|
| Monday    |  |  | Thursday | 1 | 12:10 PM to 01:00 PM |
| Tuesday   |  |  | Friday   | 2 | 01:30 PM to 03:10 PM |
| Wednesday |  |  | Saturday | 2 | 09:30 AM to 11:10 AM |

### LESSON PLAN

**Name of the Faculty : Mr. K Pavan Kumar**

**Academic Year: 2015 - 2016**

**Course Number : CE 436**

**Course Name : RS & GIS**

**Program : B. Tech.**

**Branch : CE**

**Year/Semester : IV/ II**

**Section : A**

#### **UNIT – I: Introduction to Photogrammetry**

**Learning Objectives:** At the end of the unit, the students will be able to.....

- Define Aerial Photography and List out the types.
- Discuss Parallax measurement for height determination.
- Define Electromagnetic Spectrum.
- Explain the Basic Concepts of Remote Sensing.
- Distinguish the Remote Sensing terminology.

| <b>Lect. No.</b> | <b>Topic of the lecture</b>                    | <b>Schedule Date DD/MM/YY</b> |
|------------------|--|-------------------------------|
| 1                | Introduction to Photogrammetry                 | 10/12/15                      |
| 2                | Principle and Types of Aerial Photographs      | 11/12/15                      |
| 3                | Stereoscopy, Map Vs Mosaic                     | 11/12/15                      |
| 4                | Ground control, Parallax                       | 12/12/15                      |
| 5                | Parallax measurements for height determination | 17/12/2015                    |
| 6                | Remote Sensing - I                             | 17/12/2015                    |
| 7                | Basic concepts and                             | 18/12/2015                    |
| 8                | Foundation of Remote Sensing                   | 18/12/2015                    |
| 9                | Elements involved in Remote Sensing            | 19/12/2015                    |
| 10               | Electromagnetic Spectrum                       | 24/12/2015                    |
| 11               | Remote Sensing terminology                     | 26/12/2015                    |
| 12               | and the Units                                  | 26/12/2015                    |

## UNIT-II: Remote Sensing - II

**Learning Objectives:** At the end of the unit, the students will be able to.....

- Outline the Energy interactions with earth surface features and atmosphere.
- Define Resolution, Sensors and Satellites.
- Explain about the Visual Interpretation Techniques.
- Evaluate the Terrain and its conditions.
- Asses the spectral properties of the water bodies.

| Lect. No. | Topic of the lecture   | Schedule Date<br>DD/MM/YY |
|-----------|--|---------------------------|
| 1         | Energy resources   | 01/01/16                  |
| 2         | Energy interactions with Earth Surface features and atmosphere | 02/01/16                  |
| 3         | Resolution, Sensors and Satellites                             | 02/01/16                  |
| 4         | Visual Interpretation Techniques                               | 07/01/16                  |
| 5         | Basic elements   | 07/01/16                  |
| 6         | Converging evidence  | 08/01/16                  |
| 7         | Interpretation for Terrain evaluation                          | 09/01/16                  |
| 8         | Spectral properties of water bodies                            | 16/01/16<br>21/01/16      |
| 9         | Introduction to Digital Data Analysis                          | 22/01/16<br>23/01/16      |

## UNIT-III: Geographical Information System

**Learning Objectives:** At the end of the unit, the students will be able to.....

- Retrieve the GIS Terminology
- Describe the Fundamental operations of GIS
- Distinguish between Computational Analysis Methods and Visual Analysis Methods.
- Execute data manipulation and Analysis.
- Compile Spatial and attribute data for Integrated Analysis.

| Lect. No. | Topic of the lecture           | Schedule Date<br>DD/MM/YY |
|-----------|--------------------------------|---------------------------|
| 1         | Introduction to GIS            | 28/01/16                  |
| 2         | GIS definition and terminology | 29/01/16                  |
| 3         | GIS categories and components  | 30/01/16                  |

|    |  |          |
|----|--|----------|
| 4  | Fundamental operations of GIS                      | 30/01/16 |
| 5  | A theoretical framework of GIS                     | 04/02/16 |
| 6  | Spatial Analysis                                   | 04/02/16 |
| 7  | Computational Analysis Methods ( CAM)              | 05/02/16 |
| 8  | Visual Analysis Methods ( VAM )                    | 05/02/16 |
| 9  | Data Storage – Vector data Storage                 | 06/02/16 |
| 10 | Data Storage – Attribute data Storage              | 11/02/16 |
| 11 | Overview of the data manipulation and Analysis     | 11/02/16 |
| 12 | Integrated Analysis of Spatial and Attribute data. | 12/02/16 |

### UNIT-IV: Types of Data Representation

**Learning Objectives:** At the end of the unit, the students will be able to.....

- List out the types of data and entry procedure.
- Explain coordinate geometry procedure of data entry.
- Execute manual digitizing and Scanning.
- Distinguish between Raster GIS and Vector GIS.
- Decide Feature based GIS mapping for an application.

| Lect.<br>No. | Topic of the lecture                             | Schedule Date<br>DD/MM/YY |
|--------------|--|---------------------------|
| 1            | Data collection and input overview               | 13/02/16                  |
| 2            | Data input and data output                       | 18/02/16                  |
| 3            | Keyboard entry and coordinate geometry procedure | 19/02/16                  |
| 4            | Manual digitization and Scanning                 | 20/02/16                  |
| 5            | Raster GIS                                       | 20/02/16                  |
| 6            | Vector GIS                                       | 20/02/16                  |
| 7            | File Management                                  | 25/02/16                  |
| 8            | Spatial Data                                     | 25/02/16                  |
| 9            | Layer based GIS                                  | 26/02/16                  |
| 10           | Feature based GIS mapping                        | 26/02/16                  |

## UNIT-V: Water Resources Applications – I & II

**Learning Objectives:** At the end of the unit, the students will be able to.....

- Compute the runoff generated from the Watershed.
- Estimate the impact of Droughts and Floods.
- Asses the available resources in a Watershed.
- Recommend the suitable areas for Groundwater targeting.
- Design Artificial recharge structures
- Apply the knowledge of Remote Sensing and GIS in the field of Water Resources.

| Lect. No. | Topic of the lecture   | Schedule Date<br>DD/MM/YY |
|-----------|--|---------------------------|
| 1         | <b>Water Resources Applications – I</b><br>Land use / Land cover in water resources        | 27/02/16                  |
| 2         | Surface water mapping and Inventory  | 03/03/16                  |
| 3         | Rainfall – Runoff relations and potential potential indices of watersheds.                 | 03/03/16                  |
| 4         | Flood and Drought Impact assessment and monitoring   | 04/03/16<br>05/03/16      |
| 5         | Watershed Management for Sustainable development   | 10/03/16                  |
| 6         | Watershed Characteristics.   | 11/03/16                  |
| 7         | <b>Water Resources Applications – II</b><br>Reservoir Sedimentation, Fluvial Geomorphology | 12/03/16<br>17/03/16      |
| 8         | Water Resources Management and Monitoring  | 17/03/16                  |
| 9         | Groundwater Targeting  | 18/03/16                  |
| 10        | Identification of Sites for Artificial Recharge Structures.                                | 19/03/16                  |
| 11        | Drainage Morphometry   | 19/03/16                  |
| 12        | Inland water quality Survey and Management   | 26/03/16                  |
| 13        | Water depth estimation and Bathymetry  | 26/03/16                  |

| Sr. No | Type of exam                      | Scheduled date (DD/MM/YY) |
|--------|-----------------------------------|---------------------------|
| 1      | Mid semester exam - I             | 01/02/16 to 03/02/16      |
| 2      | Mid semester exam - II            | 31/03/16 to 02/04/16      |
| 3      | End semester exam (Regular)       | 04/04/16 to 30/04/16      |
| 4      | End semester exam (Supplementary) | 23/04/16 to 18/05/16      |

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**Academic Year: 2015 - 2016**

**Course Number : CE 436**

**Course Name : RS & GIS**

**Program : B. Tech.**

**Branch : CE**

**Year/Semester : IV/ II**

**Section : B**

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