

**Bachelor of Technology (Civil Engineering)****Semester: VI**

Subject Code	Subject Title	Teaching Scheme					
		(Hours/Week)		Credits	Examination Marks		Total Marks
		Theory	Tutorial		Internal	External	
1010202610	Remote Sensing and GIS - Theory	2	0	2	40	60	100

**Duration of Exam: 2:30 Hours****Objective of the course:**

- To develop a basic understanding about Geo-Spatial techniques and its applications.
- To enable the students to apply the tools to solve various problems related to Civil Engineering.

**Course Outcomes:**

Upon completion of the course, the student shall be able:

Sr. No.	CO statement	Marks % weightage
CO-1	Observe, Identify and define simple/ complex problems of day to day lives present in Industry/ Society where GIS and Remote Sensing applications can be useful.	20
CO-2	Apply knowledge of basic image interpretation and data image processing.	25
CO-3	Integrate the existing data through various observations from various angles and layer creation.	15
CO-4	Apply problem-solving methodologies to generate, evaluate and justify innovative solutions by designing and conducting/ analyzing and interpreting the data.	15
CO-5	Demonstrate the ability to give solutions with an ability which can help communicate effectively for giving better interpretation and solutions.	25

**Detail Content:**

<b>Sr. NO.</b>	<b>Topic</b>	<b>Total Hrs.</b>
<b>1</b>	<b>Fundamental Of Remote Sensing:</b> Definition –Components of Remote Sensing –Active and Passive Remote Sensing – Electro Magnetic Spectrum – Interaction of EMR With the Earth's Surface – Interactions with the Atmosphere Energy Sources and Radiation. Active and Passive Remote Sensing. Energy Interaction with the Earth Surface Features. Data Acquisition and Recording. Remote Sensing Data Products.	<b>6</b>
<b>2</b>	<b>Image Interpretation And Digital Image Processing:</b> Introduction to Digital Image and Imaging Sensors- Data Formats of Digital ImageDisplay of Digital Image - Image Processing Systems – Strategies – Keys – Equipment – Fundamentals of Image Classification and Analysis.	<b>5</b>
<b>3</b>	<b>Geographic Information System:</b> Introduction to GIS- Definitions of GIS and related terminology - Components of GIS – GIS Data – Georeferenced data – introduction to data input and output in GIS – Fundamentals of data quality and Management	<b>6</b>
<b>4</b>	<b>Spatial Data Analysis:</b> Characteristics of Map Coordinate systems - Introduction to Map projections - Geo-referencing Frameworks and Reference Coordinate Systems. GIS analysis functions – Retrieval – Reclassification – Buffering and Neighborhood – Overlaying – Data Output – Fundamentals of GIS Analysis functions	<b>7</b>
<b>5</b>	<b>Software:</b> GIS and Image interpretation Software – Salient features – Capabilities and Limitations. Data management in public domain GIS software- Attribute Data Management	<b>5</b>
<b>6</b>	<b>Applications:</b>	<b>3</b>



	Application of Remote Sensing / GIS– Case studies. GIS and Remote Sensing – Usefulness in Civil Engineering.	
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**Text Books:**

1. A.M. Chandra and S.K. Ghosh, Remote Sensing and Geographical information System, Narosa Publishing House, New Delhi, 2006.
2. Manual of Remote Sensing (Edited), Series of volumes.
3. Bhatta B., Remote Sensing and GIS, Oxford University Press, New Delhi, 2008
4. Lilliesand T.M. and Kiefer R.W., Remote Sensing and image Interpretation, John Wiley and Sons, New York, 2004.
5. Lo C.P. and Yeung Albert K.W., Concepts and Techniques of Geographical Information Systems, Prentice-Hall of India Pvt. Ltd. New Delhi, 2006

**List of Open Source Software/learning website:**

<https://archive.nptel.ac.in/>

<https://www.iirs.gov.in/>

<https://ncog.gov.in/>

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