



**Kadi Sarva Vishwavidyalaya's  
LDRP Institute of Technology & Research  
Gandhinagar-382 015**



**M.E. (Civil) (Infrastructure Engineering) Semester: III  
Subject Name: Remote Sensing and Application (MECV303-A)**

**A. Course Objective:**

- To introduce remote sensing as an important enabling tool for earth surface research problems and applications.
- To introduce the basics of remote sensing and the main satellite/sensor systems in use.
- To provide information of different engineering fields using remote sensing.

**B. Teaching /Examination Scheme :**

Teaching scheme				Total Credit	Evaluation Scheme					Total Marks
L	T	P	Total		Theory		IE	CIA	PR/VIVO	
Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	
03	00	00	03	03	03	70	30	20	00	120

**C. Detailed Syllabus:**

**UNIT**

**DETAILED SYLLABUS**

- 1. Introduction:**  
Definition, Application, Advantage and Limitations of Remote Sensing
- 2. Basic Concept of Remote Sensing:**  
Active and Passive Remote Sensing, Platforms, Electro Magnetic Radiation
- 3. EMR Spectrum:**  
Introduction, Scattering of EMR, EMR interaction with Earth Surface Materials, Spectral Signature, spectral characteristics.
- 4. Digital Image:**  
Satellites, Satellite Sensors, Resolution, Description of Multi Spectral Scanning, Interpretation of Satellite Images, Characteristics of Digital Satellite Image.
- 5. Image Enhancement:**  
Image enhancement, Filtering, Image Classification, Integration of GIS an Remote Sensing, Environmental Monitoring Techniques from remote sensing images.
- 6. Application of Remote Sensing:**



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Water resources, Urban Analysis, Watershed Management, Environmental management,  
Construction Management, Resources Information Systems

**D. Lesson Planning :**

Sr. No.	Title of the Unit	Minimum Hours	Weightage %
1.	Introduction	4	9
2.	Basic Concept of Remote Sensing:	5	11
3.	EMR Spectrum:	5	11
4.	Digital Image	13	29
5.	Image Enhancement:	15	33
6.	Application of Remote Sensing:	3	7
<b>Total</b>		<b>45</b>	<b>100</b>

**E. List of Tutorials:**

1	Various Component parts of Remote Sensing
2	Type of Remote Sensing
3	Study of EMR Spectrum
4	Type of Satellite Sensors
5	Images and its interpretation
6	Application of Remote Sensing in civil Engineering

**F. Instructional method and pedagogy (Continuous Internal Assessment Scheme) (CIA)**

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- Lecture may be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lectures and practical which carries marks.
- At regular intervals assignments will be given. Students should submit all assignments during given period.



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- Classroom participation and involvement in solving the problems in Tutorial rooms  
Carries Marks
- Internal exam of 30 marks will be conducted as a part of Mid semester evaluation.
- Experiments shall be performed in the field related to course contents.
- The course includes a practical, where students have an opportunity to build an appreciation for the concept being taught in lectures.

**G. Students Learning Outcomes:**

- An understanding of the basic physical principals underpinning the collection and use of a wide range of RS data types.
- Knowledge of basic processing methods and output data-types derived from RS data using industry-standard software
- An understanding of key application of RS data for regional/global monitoring.

**H. Recommended Study Materials :**

➤ **Reference Books:**

- Gibson P.J. and Power C.H., Introductory Remote Sensing, Rotledge London, 2000
- John Wiley and Sons, Inc, New York,1987
- A.M. Chandra and S.K. Ghosh, Remote Sensing and Geographical Information System,
- Narosa Publishing House, New Delhi.
- B. Bhatta, Remote Sensing and GIS, Oxford University Press, New Delh
- J.R. Jensen, Remote Sensing of Environment: An Earth Perspective, Pearson Education,
- Delhi
- T.M. Lillesand and R.W. Kiefer and J.W. Chipman, Remote Sensing and Image Interpretation, John Wiley and Sons, India

➤ **Web Materials:**

- <http://civil.iisc.ernet.in>