

Kadi Sarva Vishwavidyalaya, Gandhinagar
M.E. (Civil Infrastructure Engineering) Semester: II
(w.e.f. Academic Year 2017-18)

Subject Name: Remote Sensing and GIS Application

Subject code: MECV207-N-B

A. Learning objectives:

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

B. Teaching Scheme (Credits and Hours):

Teaching Scheme				Credit Scheme			Evaluation Scheme				
Lect (Hrs)	Tu (Hrs)	Prac. (Hrs)	Total (Hrs)	Theory	Pra/TW	Total	UE	IE	CIA	Prac/Viva	Total
03	00	00	00	03	00	03	70	30	20	00	120

C. Detailed Syllabus:

Unit No.	Topics
1.	Introduction to Remote Sensing: Definition, Components of Remote Sensing, Advantages and Limitations
2.	Basic Concept of Remote Sensing: Active and Passive Remote Sensing, Platforms, Electro Magnetic Radiation
3.	EMR spectrum: 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 Images
5.	Image Enhancement : Image enhancement, Filtering, Classification, Integration of GIS and Remote Sensing, Environmental Monitoring Techniques from remote sensing images.
6.	Applications of Remote Sensing in Civil Engineering : Water resources, Urban Analysis, Watershed Management, Environmental Management, Construction Management, Resources Information Systems
7.	Introduction to GIS: Definition and scope of GIS; Functional requirements of GIS: GIS components; Cartography-GIS interface; Recent trends and applications of GIS; Open source GIS

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D. Lesson Planning:

Unit No.	Topics	Hours	Weightage (%)
1.	Introduction	3	9
2.	Basic Concepts of Remote Sensing	4	11
3.	EMR Spectrum	5	11
4.	Digital Image	13	27
5.	Image Enhancement	14	30
6.	Application of Remote Sensing	3	7
7.	Introduction to GIS	3	5
Total		45	100

E. Instructional method and pedagogy (Continuous Internal Assessment) (CIA)

- Attendance is compulsory in lectures which carries 05 Marks.
- At regular intervals assignments is given to all students which carries 10 marks. Evaluation of these assignments will be observed under Daily Homework Daily Assessment (DHDA) System.
- One internal exam of 30 marks is conducted as a part of internal theory evaluation.

F. Students Learning Outcomes:

At the end of the course

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

G. Text Books & Reference Books:

1. Gibson P.J. and Power C.H., Introductory Remote Sensing, Rotledge London, 2000
2. Jensen, J.R., Remote sensing of the environment, Prentice Hall, 2000
3. John Wiley and sons Newyork, 1987
4. B. Bhatta, Remote Sensing AND GIS, Oxford University Press, New Delhi
5. Narosa Publishing House, New Delhi.
6. John Wiley and Sons, Inc, New York,1987
7. Burrough, P.A., 1986, Geographical Information System for land Resources System, Oxford Univ. Press, UK.
8. Siddiqui, M.A.; 2006, Introduction to Geographical Information System, Sharda Pustak Bhavan, Allahabad.