GUJARAT TECHNOLOGICAL UNIVERSITY

CIVIL ENGINEERING

B. E. SEMESTER: VII

Subject Name: **Application of Geoinformatics in Civil Engineering**
Subject Code: **170606**

Teaching Scheme				Evaluation Scheme			
Theory	Tutorial	Practical	Total	University Exam (E)		Mid Sem Exam (Theory) (M)	Practical (Internal)
				Theory	Practical		
4	2	0	6	70	30	30	20

Sr. No.	Contents	Hours
Module I		9
I	**Introduction:** Remote sensing systems, multi concept of remote sensing, Remote sensing in India Photogrammetry : terrestrial, aerial, satellite, terminology, scale, flight planning, stereo photogrammetry, relief displacement, ground co ordinates, field applications, uses, comparison of aerial photo and satellite image, digital photogrammetry.	
Module II		10
II	**Electromagnetic radiation:** Introduction, energy interaction in the atmosphere, earth surface feature, resolution, pixel **Sensors and platforms:** classification, land observation satellites, high resolution sensors, weather satellites and sensors, marine observation satellites. Satellite data products: introduction, data reception, transmission, and processing, remote sensing data products, digital data products.	
Module III		10
III	**Image interpretation:** Procedure, elements, strategies, keys, equipments. **Digital image processing:** overview of digital analysis steps, image enhancement, spatial filtering, image transformation, classification and analysis.	

Module IV		10
IV	**GIS:** Introduction, component of GIS, input data for GIS, types of out data products **GIS Data:** Data representation, data sources, data acquisition, verifications, geo referencing of GIS data, spatial data structures, modeling surfaces, networks, GIS data base management systems. Spatial data analysis: terminology, reclassification, data integration, spatial interpolation, surface analysis, network analysis, digital terrain visualization. Global Positioning System	
Module V		9
V	**Application of Geoinformatics in Civil Engineering:** Landuse and land cover mapping, Transportation studies, crop inventory studies, ground water mapping, urban growth studies, flood plain mapping, waste land mapping, Waste disposal facility in urban areas and disaster management	
Note: Each Module carries equal weightage. Term work shall be based on above mentioned syllabus.		

Text Books:

1. P.A. Burrough and R.A. McDonnell, Principles of Geographical Information Systems, 2nd ed. Oxford, England, Oxford University Press.
2. T.M. Lillesand, R.W. Kiefer and J.W. Chipman, Remote Sensing and Image Interpretation, 5th edition, John Wiley and Sons, India
3. B. Bhatia, Remote Sensing and GIS, Oxford University Press, New Delhi
4. J.R. Jensen, Introductory Digital Image Processing, Prentice-Hall, New Jersey
5. J.R. Jensen, Remote Sensing of Environment: An Earth Perspective, Pearson Education, Delhi, 2004