GUJARAT TECHNOLOGICAL UNIVERSITY

8th Semester Civil Engineering - PDDC

Subject Code & Name: X80604 - Application of Geoinformatics in Civil Engineering

(Department Elective-II)

Teaching scheme hours				Subject Credits	Evaluation Scheme (Examination Scheme)				
					University Exam (E)		Internal Exam		
Theory Hours	Tutorial Hours	Practical Hours	Total Hours		Theory (E)	Practical (E)	Mid Sem Theory (M)	Practical (I)	Total Marks
4	2	0	**6**	**6**	70	30	30	20	**150**

Sr. No.	Course content	Total Hrs.
1.	**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 coordinates, field applications, uses, comparison of aerial photo and satellite image, digital photogrammetry.	**9**
2.	**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.	**10**
3.	**Image Interpretation:** Procedure, elements, strategies, keys, equipment. **Digital Image Processing:** Overview of digital analysis steps, image enhancement, spatial filtering, image transformation, classification and analysis.	**10**
4.	**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, modelling 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	**10**
5.	**Application of Geoinformatics in Civil Engineering:** Land use 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	**9**

Note: Each module carries equal weight age

Term Work: Term work shall be based on the 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

Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–VIII • EXAMINATION – SUMMER • 2015

Subject Code: X80604 **Date: 13/05/2015**

Subject Name: Application of Geo-Informatics in Civil Engineering

Time: 10:30 AM to 01:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Differentiate between GIS and GPS.	**07**
	(b)	Differentiate between : (1) Active and Passive Remote sensing (2) Airborne and Space borne Sensor.	**07**
Q.2	**(a)**	Describe the Integrated role of GIS and Remote Sensing for Civil Engineering applications with suitable example.	**07**
	(b)	Explain the significance of spectral reflectance curves in remote sensing.	**07**
		OR	
	(b)	Explain the following terms : (1) Ground truth (2) Flight Planning	**07**
Q.3	**(a)**	Enlist and explain various softwares used for Remote Sensing. Explain any one in detail.	**07**
	(b)	Describe the work of GPS work with neat sketch.	**07**
		OR	
Q.3	**(a)**	Enlist and explain various softwares used for GIS. Explain any one in detail.	**07**
	(b)	Describe the energy interaction with atmosphere and earth surface features	**07**
Q.4	**(a)**	Explain various components of GIS.	**07**
	(b)	Describe the Photogrammetry and various types of photo used in Photogrammetry	**07**
		OR	
Q.4	**(a)**	Differentiate between Raster and Vector model in detail	**07**
	(b)	Enlist and explain various elements of image interpretation.	**07**
Q.5	**(a)**	Write various applications of GIS in Civil Engineering and explain any one in detail	**07**
	(b)	How does remote sensing work ? Enlist advantages of remote sensing	**07**
		OR	
Q.5	**(a)**	Explain the following terms : (1) Georeferencing (2)Multispectral Image	**07**
	(b)	Differentiate between (1) Aerial photo and satellite image. (2) Image enhancement and Image interpretation	**07**

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