Semester: V		
Course Title: GEOINFORMATICS		
Course Code:16G5B03		**CIE Marks: 100**
Credits: L:T:P:S: 4:0:0:0		**SEE Marks: 100**
Hours: 43		**SEE Duration: 3Hrs**

Course Learning Objectives: The students will be able to	
1	To understand concept of using photographic data to determine relative positions of points
2	To study the use of electromagnetic energy for acquiring qualitative and quantitative land information
3	To analyze the data gathered from various sensors and interpret for various applications
4	To understand the various applications of RS, GIS and GPS

UNIT-I	
Remote Sensing- Definition, types of remote sensing, components of remote sensing, Electromagnetic Spectrum, Black body, Atmospheric windows, energy interaction with earth surface features. spectral reflectance curve- physical basis for spectra reflectance curve, false color composite. Platforms and sensors. Sensor resolutions. Types of satellites- Indian and other remote sensing satellites (IRS, IKONS and Landsat). Concept of image interpretation and analysis - Principle of visual interpretation, recognition elements. Fundamentals of image rectification. Digital Image classification - supervised and unsupervised	**09 Hrs**
UNIT-II	
Photogrammetry: Introduction types of Photogrammetry, Advantages of Photogrammetry, Introduction to digital Photogrammetry. Locating points from two phases determination of focal length. **Aerial Photogrammetry:** Advantages over ground survey methods - geometry of vertical phographs, scales of vertical photograph. Ground coordination- relief displacement, scale ground coordinates – flight planning	**09 Hrs**
UNIT-III	
Geographic Information System- Introduction, Functions and advantages, sources of data for GIS. Database – Types, advantages and disadvantages. Data Management – Transformation, Projection and Coordinate systems. Data input methods, Data Analysis.-overlay operations, network analysis, spatial analysis. Outputs and map generation. . Introduction to GPS- components and working principles	**09 Hrs**
UNIT-IV	
Applications of GIS, Remote Sensing and GPS: Case studies on Water Resources engineering and management (prioritization of river basins, water perspective zones and its mapping), **Case studies on applications of GIS and RS in** highway alignment, Optimization of routes, accident analysis, Environmental related studies. **Case studies on applications of GIS and RS in**	**08 Hrs**

Disaster Management (Case studies on post disaster management - Earthquake and tsunami and pre disaster management - Landslides and floods) Urban Planning & Management - mapping of zones, layouts and infrastructures.	
UNIT-V	
Applications of GIS, Remote Sensing and GPS: Land use land cover (LULC) mapping. Case studies on infrastructure planning and management- Case studies on urban sprawl. Change detection studies – case studies on forests and urban area. Case studies on agriculture. **Applications of geo-informatics in natural resources management: Geo Technical case Studies**, site suitability analysis for various applications.	**08 Hrs**

Course Outcomes: After completing the course, the students will be able to	
1	To remember and understand the principle of Remote Sensing (RS) and Geographical Information Systems (GIS) data acquisition and its applications.
2	To apply RS and GIS technologies in various fields of engineering and social needs.
3	To analyze and evaluate the information obtained by applying RS and GIS technologies.
4	To create a feasible solution in the different fields of application of RS and GIS.

Reference Books	
1.	Tor Bernharadsen, "Geographic Information System-An Introduction (3rd Edition)", Wiley India Pvt. Ltd. New Delhi , 2009.
2.	Lillesand and Kiefer, "Principles of Remote sensing and Image Interpretation", (5th Edition) John Wiley Publishers, New Delhi, 2007.
3.	Bhatta B., "Remote Sensing and GIS", Oxford University Press, New Delhi, 2008
4.	Robert A. Schowengerdt "Remote Sensing" (3rd Edition), Elsevier India Pvt Ltd, New Delhi, 2009

Continuous Internal Evaluation (CIE) (Theory – 100 Marks)	
Evaluation method	Marks
Quiz -1	10
Test -1	30
Quiz -2	10
Quiz -3	10
Test -2	30
Assignment	10
Total	100

Semester End Evaluation Theory (100)	
Part- –A **One mark and two mark questions**	**20**
Part –B There should be five questions from five units. Each question should be for maximum of 16 Marks. The **UNIT-1**, **UNIT-4** and **UNIT-5** should not have any choice. The **UNIT-2 and UNIT-3** should have an internal choice. Both the questions should be of the same complexity in terms of COs and Bloom's taxonomy level.	**80**
Total	**100**

	What		**To whom**	**Frequency of conduction**	**Max Marks**	**Evidence**	**Contribution to Course Outcome**		
Direct Assessment Methods	CIE	Quiz	Students	Three	30	Answer Scripts	80%	100%	90%
		Test		Two	60				
		Assignment		2 phases	10	Reports			
	SEE	Semester End Examination		End of every semester Consisting of Part-A and Part-B	100	Answer Scripts	20%		
Indirect	Course End Survey		Students	End of course		Questionnaire Based on COs	10%		

CO-PO Mapping												
CO/PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	1	-	-	-	-	1	-	-	-	-	-	-
CO2	2	1	-	-	1	1	-	-	-	-	-	-
CO3	2	2	1	-	2	1	1	-	-	-	-	1
CO4	2	2	1	-	3	2	2	-	-	-	1	1

Low-1 Medium-2 High-3