Course Type	Course Code	Name of Course	L	T	P	Credit
DC	ESC312	Geoinformatics	3	0	0	9

Course Objective
Understanding of the fundamental concepts of Remote Sensing and Geographic Information System and the understanding of the wide applications of Remote Sensing and GIS in Environmental Management.
Learning Outcomes
Upon successful completion of this course, students will develop: • Understanding of the fundamental concepts of Remote Sensing and Geographic Information System. • Understanding of the wide applications of Remote Sensing and GIS in Environmental Management.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Introduction, Types of Remote Sensing, Application and importance of Remote Sensing; Physics of Remote Sensing; The Electromagnetic spectrum; Spectral Reflectance Curves; Spectral Signatures; Types of Resolution. Remote Sensing Platforms: Ground, airborne and satellite-based platforms; Some important Remote Sensing Satellites.	10	This unit will help the students to develop an elementary idea on origin of remote sensing and important fundamental concepts related to EM spectrum.
2	Aerial Photography and Photogrammetry: aerial and terrestrial photogrammetry, applications of photogrammetry, types and geometry of aerial photograph, flying height and scale, relief (elevation) displacement, Stereoscopy and Orthophotography, Aerial Photo Interpretation, LiDAR.	9	This unit will help the students to learn the various types of sensors involved in RS techniques and the image components
3	Digital Image Processing: Pixels and Digital Number; Digital Image Structure; Format of Remote Sensing Data; Concept of False Color and True Color Imagery; Image Processing functions: Image Restoration, Image Enhancement, Image Transformation, Image Fusion, Image Classification and Analysis; Image interpretation strategies.	11	This unit will help the students to develop the fundamental concepts of digital image processing techniques.
4	Geographic Information System: Introduction; Preparation of thematic map from remote sensing data; Co-ordinate systems; Concept of Datum; GIS components: Hardware, software and infrastructures; GIS data types: Data Input and Data Processing; DEM/ DTM generation. Integration of GIS and Remote Sensing. Application of Remote Sensing and GIS in Environmental Management: Case Studies; An introduction Global Positioning System.	12	Students will have a vivid knowledge on the concepts of GIS and its applications to real environmental case studies.

Text Books

1. Remote Sensing & GIS - by Basudeb Bhatta, Oxford University Press (OUP) Higher Education Division, (Second Edition), 2011.
2. Introduction to Remote Sensing - by James B. Campbell and Randolph H.Wynne, (Fifth Edition), The Guiford Press, 2011
3. Concepts and Techniques of Geographic Information Systems by Chor Pang Lo, Albert K. W. Yeung, Prentice Hall, 2002.

Reference Books

1. Principles of Geographical Information Systems - P A Burrough and R. A. McDonnell, OUP,Oxford 1998.
2. Geographic Information System- Kang Tsung Chang, Tata Mc Graw Hill, Publication Edition, 2007.