

Course Type	Course Code	Name of the Course	L	T	P	Credits
DC	NESC509	Environmental Remote Sensing and GIS	3	1	0	4

Course Objectives

- Understanding of the fundamental concepts of Remote Sensing and Geographic Information System.
- Understanding the wide application of Remote Sensing and GIS in Environmental System.

Overall Learning Outcomes

Upon successful completion of this course, students will be able to:

- To develop applications of environmental remote sensing and GIS which can directly enhance service delivery on land use management, ground water management/prospects, agriculture, forestry, food and water security, disaster management, etc.
- Knowledge on concepts and applications leading to modeling of earth resources management using Remote Sensing.

Unit No.	Topics to be covered	Contact Hr (L+T)	Learning outcomes
I	Introduction, Types, Application and importance of Remote Sensing; Physics of Remote Sensing; The Electromagnetic spectrum; Spectral Reflectance Curves; Spectral Signatures; Resolution. Remote Sensing Platforms: Ground, airborne and satellite-based platforms; Some important Remote Sensing Satellites.	11+3	To Understand basics of Remote sensing
II	Sensors: Passive and Active Sensors; Major Remote Sensing Sensors; Satellite band designations and principal applications; Colour / False Colour; Aerial Photography/ Aerial Photo Interpretation, LiDAR.	11+3	To understand development of sensors and satellites
III	Digital Image Processing: Pixels and Digital Number; Digital Image Structure; Format of Remote Sensing Data; Image Processing functions: Image Restoration, Image Enhancement, Image Transformation, Image Fusion, Image Classification and Analysis; Image interpretation strategies.	10+4	To understand the processing of satellite Image
IV	Geographic Information System: Introduction; Preparation of thematic map from remote sensing data; Co-ordinate systems; 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 (Water resources – Urban Analysis – Watershed Management – Resources Information Systems, Suitability Analysis). An introduction Global Positioning System.	10+4	To understand basics of GIS and its application in the field of environment,
		42+14	

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 Guilford Press, 2011

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.
3. Concepts and Techniques of Geographic Information Systems by Chor Pang Lo, Albert K. W. Yeung, Prentice Hall, 2002.