

M.Sc. Environmental Science
Semester-III
GIS AND REMOTE SENSING

UNIT – I

Remote Sensing : Basics of Remote Sensing: Definitions; Principles and Processes of Remote Sensing; Types of Remote Sensing; Advantages and Limitation. Concepts of Electromagnetic Radiation (EMR): EMR Spectrum and its properties; Wavelength-frequency-energy relationship of EMR; EMR interaction in the atmosphere (scattering, absorption, transmission, atmospheric windows) and with earth's surface features (Spectral Reflectance Curve, Concept of Signatures); Spectral Signatures, Atmospheric Windows. Physical Basis of Remote Sensing: Sources of Energy; Radiation Laws (Plank's law, Stefan-Boltzmann Law, Wien's Displacement Law, Kirchhoff's law etc.); Blackbody Concept Platforms & Sensors: Introduction; Types and Characteristics of Sensors; Remote Sensor Platforms and Satellite Orbits; Types of Satellites and images.

UNIT – II

Image Interpretation : Introduction, Principles and Elements & Techniques of Visual Image Interpretation, Visual and Digital Image processing, Digital Image Fundamentals: Steps Involved; Components of Image Processing System-Hardware and Software Considerations, Image characteristics of common land cover types, Pattern Recognition and Image Classification: Supervised and Unsupervised Classification.

Unit 3

GIS & GPS :

Fundamental of GIS: Definitions; Basic Components and tools of GIS;

GIS Data Structure: Spatial and Attribute Data; Data Base Structures- Raster and Vector Data

Structure; Database Management Systems (DBMS), Concepts and Application of Digital Elevation

Model (DEM), Definitions & Basic Principle of Global Positioning System (GPS).

UNIT – IV

Role of Remote Sensing, GIS & GPS :Role of Remote Sensing and GIS in: Geo-Resources Management, Bio-Resources

Management and Disaster Management, Environmental Management: EIA, Natural Resource Management (Water, forest, Soil and Land), Natural Hazards, Disaster

Management, Agriculture, Urban, Rural Development and Regional Planning