

APPLICATION OF REMOTE SENSING & GIS FOR ENVIRONMENTAL ENGINEERING

Module –I

Remote Sensing: Introduction to Remote Sensing: Principles of Remote sensing, Types of Remote Sensing, Advantages of Remote Sensing, Physical basis of Remote Sensing, Applications of Remote Sensing ; History of Remote Sensing; The Electromagnetic spectrum; The nature and generation of Electromagnetic radiation (EMR) Spectral Reflectance Curves. Interaction of EMR with the atmosphere and earth's surface features. Spectral signatures and characteristics, spectral reflectance curves for rocks, soil, vegetation and water features within near and near Infrared. Spectral signatures, Resolution. Remote Sensing observations and platforms: Ground, airborne and satellite based platforms; Some important Remote Sensing Satellites. Aerial Stereo coverage and Remote Sensing Satellites. Sensors: Passive and Active Sensors; Major Remote Sensing Sensors; single and multi band scanners Satellite band designations and principal applications; Colour / False Colour; Aerial Photography/ Aerial Photo Interpretation. USS sensor and other type of sensors. Details of sensors on BOARD LATEST EARTH RESOURCES SATELLITES VIZ.; LANDSAT 6/7/8, SPOT, IKONOS, IRS AND ERS.

Module -II

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 Classification and Analysis; Image interpretation strategies. Visual Photo- Interpretation Techniques based on 'Photo elements' and 'Terrain elements'.

Module -III

Geographic Information System: Introduction, Definition, Preparation of thematic map from remote sensing data, Map Projection and Coordinatesystem , GIS components: Hardware, software and infrastructures, GIS data types, Data acquisition ,Data Input and Data Processing, and management including topology DEM/ DTM generation.

Module -IV

Integration of Remote Sensing and GIS techniques and its applications in Environmental Impact Assessment and Management including some case studies.

Books and Reference:

1. Remote Sensing and GIS - Anji Reddy M., The Book Syndicate, Hyderabad, 2000.
2. Principles of Geographical Information Systems - P A Burrough and R. A. McDonnell, OUP, Oxford, 1998.
3. Remote Sensing for Earth Resource- Rao, L.P., AEG Publication, Hyderabad, 1987.
4. Geographic Information System- Kang Tsung Chang, Tata Mc Graw Hill, Publication Edition, 2002.
5. Remote Sensing And Image Interpretation Thomas M. Lillesand, Ralph W. Kiefer, Jonathan W. Chipman, Wiley,2003
6. Journal by Insurance company surveyors and loss assessors – Mumbai – published by Insurance companies.

TENTATIVE
Likely to be Modified