

Elective Course: Remote Sensing

Unit – I

Concepts and Foundations of Remote Sensing:

Introduction, Energy source and radiation principles, Energy interactions in the atmosphere, Energy interactions with earth surface features, Data acquisition and interpretation, Reference data, Global positioning system, characteristics of real remote sensing systems, Successful applications of remote sensing.

Introduction to Visual image interpretation:

Introduction, Fundamentals of visual image interpretation, Basic visual image interpretation equipments, Land use/ land cover mapping, Agricultural Applications, Environmental assessment, Natural disaster assessment

Unit – II

Multispectral, thermal and hyperspectral sensing:

Introduction, Across track scanning, Along track scanning, Example – Across track multispectral scanner and imagery, Example – Along track multispectral scanner and imagery, Geometric characteristics of across track scanner imagery, Geometric characteristics of along track scanner imagery, Thermal scanning, Thermal radiation principles, Interpreting thermal scanner imagery, Radiometric calibration of thermal scanners, Temperature mapping with thermal scanner data,

Earth Resource satellites operating in the optical spectrum:

Introduction, Landsat major features, SPOT major features, Other earth resource satellites – IRS, IKONOS, QuickBird, Meteorological Satellites – NOAA, INSAT, Earth Observing system - MODIS

Unit-III

Digital image processing:

Introduction, Image rectification and restoration, Image enhancement, Contrast manipulation, Spatial feature manipulation, multi-image manipulation, image classification, Supervised classification, Classification stage, Training stage, Unsupervised classification

Microwave and Lidar sensing:

Introduction, Radar development, Side looking radar system operation, Synthetic aperture radar, Geometric characteristics of radar imagery. Transmission characteristics of radar signals, Other radar image characteristics, Radar image interpretation, Interferometric radar, Radar remote sensing from space, Shuttle imaging radar, ENVISAT, Radarsat, Passive microwave sensing, Lidar

Text book

Lillesand T.M, Kiefer R.W., Chipman J.W., Remote Sensing and Image interpretation, Wiley student edition (6th edition) , 2009

Reference Books:

George Joseph, Fundamentals of Remote Sensing, University Press,
B.C. Panda, Remote Sensing – principles and applications, Viva Books, N. Delhi, 2005
Sabins, F.F., Remote sensing- Principles and Interpretation, W.H. Freeman, 1996
Curran, P.J., Principles of remote sensing, Longman Publishing, 1984,
Jenson J.R., Remote sensing environment: An earth resource perspective, Prentice Hall, 2000
Campbell J.B., Introduction to remote sensing, Taylor & Francis, 1996.