

Semester-IV

Core VIII

REMOTE SENSING AND GIS

Unit-I:

Learning Outcome:

Understand the nature and scope of GIS and RS vis a vis conventional Maps.

Sources and characteristics of spatial data: Maps vs RS images, Concept of Remote Sensing, Meaning and significance of EMR Spectrum, Elements of a RS image: Pixel, Digital Number (DN), Band, Resolution of Remote sensing data; Visual Interpretation of Aerial Photograph and Satellite imagery.

Unit-II

LO: apply the acquired skills to spatial problem solving situations and evaluate their efficacy over other methods.

Abstraction and representation of Spatial Data: Data Models in GIS, Vector Data Model, Types and Components of Vector data, Attribute data Management, Query of Spatial and non-spatial Data, Processing and Analysis of Vector Data, Geoprocessing, Overlay Analysis

Unit-III

Learning Outcome:

Able to interpret and analyze various satellite images and decode the information.

Working with Continuous spatial Data: Nature and processing of Raster Data, Various Gridded Data Sources and application, DEM, Interpretation of Remote Sensing images: Visual and Digital interpretation, Supervised and Unsupervised classification, LULC classification, NDVI, Accuracy assessment, Facility Information System using spatial data, Various other applications: Land Use planning, disaster management etc.

Unit-IV: Practical

Learning Outcome:

Acquire of skills to handle popular GIS and RS softwares to process and analyse spatial data

1. Visual Image Interpretation;
2. Vectorisation: digitisation, attribute data query, SQL;
3. Geoprocessing: Buffering, Union, intersection, merge, dissolve;
4. Subsetting and mosaicking Images, Indices, Image enhancement Rectification,
5. Image classification- supervised and unsupervised, accuracy assessment.

6. Report and Viva-Voce

Suggested Readings:

Text Books:

- ✓ Bhatta B., (2020). Remote Sensing and GIS, New Delhi: Oxford University Press.
- ✓ Jensen, J.R. and Jensen, R.R. (2018). Introductory Geographic Information Systems, Pearson Education.

Reference Books:

- ✓ *Bernhardsen, T. (2002) Geographical Information System: An Introduction. Norway: John Wiley and Sons.*
- ✓ *Burrough, Peter. A., Rachel, A. M. and Lloyd C. D. (2015). Principles of Geographical Information System, Clarendon: Oxford University Press.*
- ✓ *Lillesand, K. C., (2008). Remote Sensing and Image Interpretation, New York: John Wiley and Sons.*
- ✓ *Chang, K. T., (2008). Introduction to Geographical Information System, Toronto: McGraw Hill Higher Education.*
- ✓ *Heywood, I., Sarah, C. and Steve, C., (2011). An Introduction to Geographical Systems: Pearson Education Limited, India.*
- ✓ *Lo, C.P. and Albert, K.W. Y., (2008). Concepts and Techniques of Geographical Information System, New Delhi: John Wiley and Sons.*
- ✓ *DeMers, Michael M. (2009) GIS for Dummies. New Jersey: John Wiley and Sons.*
- ✓ *Jensen, J.R, (2012). Remote sensing of the environment: an Earth resource perspective, New Delhi: Prentice Hall.*
- ✓ *Jensen, J R. (2018). Introductory Digital Image Processing: A remote sensing perspective, 4th Edition (Indian Sub-continent edition): Pearson India Education Services.*
- ✓ *Mohammad, N., Singh, R.B. and Dutta, A., (2007). Spatial Information Technology for Natural Resource Management, New Delhi: Concept Publishing Company.*
- ✓ *Nag, P. and Sengupta, S., (2008). Introduction to Geographical Information System, New Delhi: Concept Publishing Company*