

**M.A./M.Sc. Geography**  
**Third Semester**  
**Paper – V(P) (43365 A) Remote Sensing and Image Interpretation**

Unit – I

Basic principles

- a) Basics of Remote Sensing
- b) Electromagnetic radiation, laws of radiation, sources of EMR
- c) Interaction of EMR with atmosphere and earth surface
- d) Atmospheric windows, spectral signature

Unit – II

- a) Remote sensing systems – active and passive systems, imaging and non-imaging systems; resolution – spatial, spectral, radiometric and temporal
- b) Orbits and platforms for earth observation; multispectral scanners
- c) Sensors used in earth observation satellites and their characteristics
- d) Radiometric errors and correction in satellite data; geometric errors

Unit – III

Microwave remote sensing and image interpretation

- a) Principles of visual interpretation of aerial photos and satellite image
- b) Recognition elements and interpretation keys for visual interpretation, basic interpretation equipments
- c) Principles of microwave remote sensing
- d) Ground truth data collection – use of spectrometers and radiometers

Unit – IV

Principles of photogrammetry

- a) Fundamentals of aerial photography and aerial cameras
- b) Basic geometric characteristics of aerial photographs; scale, ground coverage and resolution of aerial photos, tilt and relief displacement
- c) Principles of stereo photogrammetry – stereo-model and measurement of height from aerial photos, parallax measurement
- d) satellite sensors for stereo coverage

Unit – V

Interpretation

- a) Interpretation and mapping of natural and cultural landscapes using satellite image
- b) Interpretation and mapping of natural and cultural landscapes using aerial photographs
- c) Application of remote sensing in geomorphic, agricultural and forestry
- d) Application of remote sensing in resource management, and environment studies

Practical Exercises

**Notes:**

- a) Number of practical classes: 50 hours duration
  - b) Students are required to perform one experiment from each unit during examination
1. Stereo test
  2. Determination of photo/image scale
  3. Determination of heights using single photograph
  4. Orientation of stereo model under mirror stereoscope
  5. Electromagnetic energy
  6. Study of satellite imagery border information
  7. Study of digital referencing system
  8. Multispectral scanners
  9. Spectral response pattern
  10. Interpretation on single vertical aerial photographs
  11. Comparison of four spectral types of aerial photographs
  12. Identification of objects on different data products
  13. Microwave data interpretation
  14. Familiarization with dip s/w, data import and subset
  15. Interpretation and mapping of natural and cultural landscapes using satellite image
  16. Interpretation and mapping of natural and cultural landscapes using aerial photographs

**References:**

1. American Society of Photogrammetry: Manual of Remote Sensing, ASP, Falls Church, VA, 1983
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3. Barrett, E. C. and L. F. Curtis, Fundamentals of Remote Sensing and Air Photo Interpretation, Macmillan, New York, 1992
4. Compbell, J., Introduction to Remote Sensing, Guilford, New York, 1989
5. Curran, Paul J., Principles of Remote Sensing, Longman, London, 1985
6. Hord, R. M., Digital Image Processing of Remotely Sensed Data, Academic, New York, 1989
7. Kennie and Methue, Remote Sensing in Civil Engineering Survey, University Press, London
8. Luder, D., Aerial Photograph Interpretation: Principles and Applications, McGraw Hill, New York, 1959
9. Plates, J. E. and L. W. Sangery, Remote Sensing Techniques for Analysis, Hamilton Publishing Company
10. Robert, G. Reeves et al, Manual of Remote Sensing, Volume I and II
11. Smith, H. T. V., Aerial Photographs and their Applications, Appleton Century Crofts
12. Spurr, S. H., Photogrammetry and Photo Interpretation, Ronald Press
13. Talbut, A., Essentials of Aerial Surveying and Photo Interpretation

14. Thomas, M. Lillesand and Ralf W. Kefer, Remote Sensing and Image Interpretation, John Wiley and Sons, New York, 1994
15. Tomar, M. S. and A. R. Maslekar, Aerial Photographs in Land use and Forest Surveys, Kishore and Co., Dehradun