

# **Paper No- 13: REMOTE SENSING**

## **Course Objectives**

The paper introduces aerial photography and satellite remote sensing. Students learn about digital and manual image processing as well as interpretation and application of remote sensing particularly for land use/cover. This will increase the student's ability to learn the satellite data processing and interpretation that will minimize their time of conventional survey methods and will enhance student's knowledge on geoinformatics.

## **1. Remote Sensing**

### **1.1 Definition and Development**

### **1.2 Platforms and Types**

### **1.3 Aerial Photography: Principles, Types and Geometry.**

- Campbell, J.B. and Randolph, H. W. (2011) Introduction to Remote Sensing, Guilford press, London. Chapter 1.
- Mather, Paul M. (2003) Computer Processing of Remotely Sensed Images-An Introduction Wiley, New York. Chapter 2
- Wolf, P.R. and Devit, B.A. (2000) Elements of Photogrammetry with Applications in GIS, McGraw Hill.

## **2. Satellite Remote Sensing**

### **2.1 Principles, EMR Interaction with Atmosphere and Earth Surface**

### **2.2 Satellites (Landsat and IRS)**

### **2.3 Sensors**

- Campbell, J.B. and Randolph, H. W. (2011) Introduction to Remote Sensing, Guilford Press, London. Chapter 2 and 6
- Mather, Paul M. (2003) Computer Processing of Remotely Sensed Images-An Introduction, Wiley, New York. Chapter 2.

## **3. Image Processing (Digital and Manual)**

### **3.1 Pre-processing (Radiometric and Geometric Correction)**

### **3.2 Enhancement (Filtering)**

### **3.3 Classification (Supervised and Un-supervised)**

- Mather, Paul M. (2003) Computer Processing of Remotely Sensed Images- An Introduction, Wiley, New York. Chapter 3, 4 and 8
- Rees, W.C (2001) Physical Principles of Remote Sensing, Cambridge University Press, Cambridge. Chapter 11
- Sabins, F.F. (1997) Remote Sensing: Principles and Interpretation, Freeman Press, New York. Chapter 8

## **4. Interpretation and Application**

### **4.1 Interpretation**

### **4.2 Application of Remote Sensing: Land Cover**

### **4.3 Application of Remote Sensing: Land Use.**

- Jenson, J. R. (2007) Remote Sensing of the Environment: An Earth Resource Perspective, Pearson. Chapter 5
- Singh, R.B. et al. (eds) (2001) Land Use and Land Cover Change, Sciences Publications, Enfield.
- Lillesand, T.M, Keifer, R.W. and Chipman (2004) Remote Sensing and Image Interpretation, Willey, New York. Chapter 4.

#### **Further Readings**

- Bhatta , B. (2008) Remote Sensing and GIS, Oxford University Press, New Delhi.
- Jensen, J. R. (2005) Introductory Digital Image Processing: A Remote Sensing Perspective, Pearson Prentice-Hall.
- Chauniyal, D. (2010) Sudur Samvedana Avam Bhaugolik Suchna Pranali, Sharda Pustak Bhawan, Allahabad.
- Li, Z., Chen, J. and Batsavias, E. (2008) Advances in Photogrammetry, Remote Sensing and Spatial Information Sciences CRC Press, Taylor and Francis, London
- Mukherjee, S. (2004) Textbook of Environmental Remote Sensing, Macmillan, Delhi.