



**MANGALORE UNIVERSITY**

**Department of Biosciences**  
**MSc Environmental Science**

**ESS455 REMOTE SENSING AND GIS**

**Course Outcomes:**

CO1 Learn the fundamental aspects of remote sensing and GIS.

CO2 Know the applications of remote sensing and GIS in environmental science.

CO3 Describe the principles of platforms.

CO4 Describe the methods of photogrammetry to assess earth surface features.

CO5 Understand satellites and GIS software.

**UNIT I (13 hours)**

Fundamentals of Remote sensing: Remote Sensing – history & development, definition, concept and principles. Energy Resources, radiation principles, Electromagnetic radiation, interaction between matter and Electromagnetic radiation, Sensors: Types of sensors, concept of Resolution – Spatial, Spectral, Temporal and Radiometric. Basic concept and principles of thermal, microwave and hyperspectral sensing, spectral reflectance and their characteristics of Earth surface features.

**UNIT II (13 hours)**

Platforms: Products used in Remote sensing, Images, scale, mosaics, time and seasons of orbital cycles. Aerial photographs, photographic systems, Satellite data products. Photogrammetry - Basic principles, types, steps and elements of image interpretation, visual interpretation, interpretation equipments- digital image processing- image rectification, enhancement, classification, data merging and biophysical modeling- image processing software. Satellites and their characteristics – Geo-stationary and sun-synchronous, Indian Space programme.

**UNIT III (13 hours)**

Introduction to GIS: GIS and their uses for Environmental monitoring, Remote Sensing Data Products and their procurement, GIS and spatial distribution of environmental data. Data integration and analysis, Data based structure, satellite data analysis, GIS software. Remote sensing and GIS applications - Management and monitoring of Environment, conservation of resources, natural resources, coastal zone management.

**References:**

1. Jain, H.C. Radiation and Man, National Book Trust, New Delhi.
2. Merrill Eisenbud and Thomas Gessell. Environmental Radioactivity from Natural, Industrial and Military sources, Academic Press, London.
3. Murli Krishna.I.V. Remote Sensing and GIS for Environmental Planning (1995)
4. Srikantaswamy,S. Essential of Remote Sensing (2008)