

MANGALORE UNIVERSITY
DEPARTMENT OF MARINE GEOLOGY
MSc GEOINFORMATICS

GIH 402: REMOTE SENSING AND PHOTOGRAMMETRY

Course Outcome:

CO1: Students will gain knowledge in the field of remote sensing and photogrammetry. They will come to know the history and concept of Remote Sensing, Electromagnetic Spectrum, Energy Interaction with atmosphere and earth surface features. Basic concepts of visible, Optical, Thermal (Infrared), and Microwave remote Sensing. Platforms and Sensors.

CO2: Students will learn **principles and applications of Aerial Photography**: Aerial photo interpretation in resource evaluation – geology, delineation of geological structures, mineral exploration, geomorphology, geological structure.

Technologies not only to identify useful features, but also effects of natural processes and humans on the earth.

Unit 1	Introduction: History and concept of Remote Sensing, Electromagnetic Spectrum, Energy Interaction with atmosphere and earth surface features. Basic concepts of visible, Optical, Thermal (Infrared), and Microwave remote Sensing. Platforms and Sensors. Optical Remote Sensing: Principles of Optical remote sensing, spectral reflectance of earth's features in different Wavelength regions, multispectral concepts of remote sensing, Scanners, applications of optical Remote Sensing Indian Remote Sensing Programme and important Indian Satellites.	06 hrs
Unit 2	Thermal Remote Sensing: Principles of thermal remote sensing, black body, radiant temperature, radiation from Earth's objects, thermal conductivity, thermal capacity, thermal inertia, thermal diffusivity, Thermal Radiometers, scanners, calibration of scanners, mapping with Thermal scanners, Imaging Spectrometer, Application of Thermal Remote Sensing.	06 hrs
Unit 3	Hyper Spectral Remote Sensing: Introduction to Hyperspectral Remote Sensing Sensors/Imaging Spectrometers, Hyperspectral Satellite Systems,	06 hrs

	Hyperspectral Image Analysis Techniques including Correction.	
Unit 4	Microwave Remote Sensing & RADAR Remote Sensing: Concept and principles of Microwave Remote Sensing, SLAR, SAR and Scatterometer, Application of Microwave Remote Sensing. Outlines of Radar Image Interpretations. Image Interpretation: Visual and Digital Interpretation techniques - Basic concepts of visual interpretation, tone, color, texture, pattern, shape and contextual features. Digital Image Interpretation-	06 hrs
Unit 5	Principles of Aerial photography; Geometry of aerial photography: Fundamentals of photogrammetry and aerial photography: History, aerial cameras, aerial films and processing. Types of aerial photos. Fundamentals and geometry of aerial photographs, Scale, Advantages and disadvantages of small scale and large scale aerial photographs.	06 hrs
Unit 6	Relief and tilt displacements, mosaics and types of mosaics, stereoscopic vision and stereoscopes, image displacement due to relief, concepts of stereo-photogrammetry, normal vision, depth perception and vertical exaggeration. Planning for aerial photographs, flight procedures, planning and execution of photographic flights, radiometric characteristics. Elements of aerial photo interpretation: tone, color, texture, pattern, shape, size and associated features, geotechnical analysis and convergence of evidence.	06 hrs
Unit 7	Principles and Applications of Aerial Photography: Aerial photo interpretation in resource evaluation – geology, delineation of geological structures, mineral exploration, geomorphology, geological structure.	06 hrs
Unit 08	Digital photogrammetry and interpretation techniques: definition, creation of digital images, automatic measurements, automatic surface modeling, aerial triangulations, digital photogrammetric workstation	06 hrs

References

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