RSGT- 201  THERMAL AND MICROWAVE REMOTE SENSING

Unit 1
1.1  Thermal radiation principles, thermal process and properties
1.2  Characteristics of thermal IR images and Factors affecting thermal images
1.3  Interaction of thermal radiation with terrain elements
1.4  Multispectral thermal data

Unit 2
2.1  Thermal image and qualitative interpretation,
2.2  Semiquantitative analysis
2.3  Temperature mapping with thermal scanner data
2.4  Applications of thermal sensing

Unit 3
3.1  Introduction to microwave remote sensing – Concept and principle, backscattering, cross section
  Wavelength, incidence angle, aspect angle.
3.2  Interactions between radar and surface materials - complex dielectric properties, roughness
  polarization
3.3  Passive microwave sensors
3.4  Active microwave sensors

Unit 4
4.1  Side looking radar system
4.2  Geometric characteristics of Side looking radar images
4.3  Synthetic aperture radar
4.4  Transmission characteristics of radar signals and other radar image characteristics

Unit 5
5.1  Radar image interpretation
5.2  Fundamentals of radar interferometry
5.3  LIDAR – working principle, scope and applications
5.4  Applications of microwave remote sensing

Books Recommended
Gupta, R.P., 1990: Remote Sensing Geology. Springer Verlag,
RS.GT – 202 GEOGRAPHICAL INFORMATION SYSTEM

Unit - 1
1.1 Introduction to GIS – definitions, concept and history of developments in the field of information systems
1.2 Computer fundamentals for GIS
1.3 Hardware and software requirements for GIS
1.4 Coordinate System and Projections in GIS – Conic, cylindrical and planar

Unit - 2
2.1 Data structure and formats
2.2 Spatial data models – Raster and Vector
2.3 Data inputting in GIS
2.4 Data base design - editing and topology creation in GIS, Linkage between spatial and non spatial data

Unit - 3
3.1 Spatial data analysis – significance and type, Attribute Query, spatial query
3.2 Vector based spatial data analysis
3.3 Raster based spatial data analysis
3.4 Buffer analysis

Unit - 4
4.1 Data quality and sources of errors
4.2 Integration of RS and GIS data
4.3 Digital Elevation Model
4.4 Network Analysis in GIS

Unit - 5
5.1 Data analysis and modeling in GIS – types of GIS modeling
5.2 Decision support systems
5.3 Overview of image processing & GIS Packages – ARC GIS, ERDAS, MAP INFO, ILWIS
5.4 Recent Trends in GIS – AM/FM, Virtual 3D GIS, OLAP, Internet GIS, Open GIS

Books Recommended
Anji Reddy, M. 2004 : Geoinformatics for environmental management, B.S. Publications
Skidmore A. 2002: Environmental modeling with GIS and Remote Sensing, Taylor and Francis
GEOGRAPHICAL INFORMATION SYSTEM

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1.1 Introduction to GIS – definitions, concept and history of developments in the field of information systems
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Anji Reddy, M. 2004: Geoinformatics for environmental management. B.S. Publications
REMOTE SENSING IN GEOSCIENCES

Unit 1
1.1 Remote Sensing in geology – an overview
1.2 Basic concept of geomorphology, earth surface process and resultant landforms
1.3 Spectral characteristics of rocks and minerals
1.4 Drainage patterns – types and its significance in geologic interpretation

Unit 2
2.1 Interpretation of drainage patterns through aerial photographs and satellite images
2.2 Interpretation of fluvial landforms
2.3 Interpretation of glacial and coastal landforms
2.4 Interpretation of eolian and volcanic landforms

Unit 3
3.1 Interpretation of Karst landforms
3.2 Interpretation of structural and denudational landforms – cuesta, hogback, butte, mesa etc.
3.3 Interpretation of landforms related to igneous, sedimentary and metamorphic rocks
3.4 Geomorphological mapping and terrain evaluation

Unit 4
4.1 General observation in lithological interpretation- Factors affecting photographic appearance of rocks
4.2 Lithological interpretation of Igneous rocks
4.3 Lithological interpretation of Sedimentary rocks
4.4 Lithological interpretation of Metamorphic rocks

Unit 5
5.1 Structure – Definition, types and structural mapping
5.2 Interpretation of folds, faults, unconformities and lineaments
5.3 Use of thermal infra red and microwave data in geological mapping
5.4 GIS application in Geosciences

Books Recommended