

CE/BOS/OE413 /0513

K L UNIVERSITY
SPATIAL DATA ANALYSIS AND MODELLING (11-OE413)

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SYLLABUS:

History and basic components of Remote Sensing, Electromagnetic Remote sensing process, Passive and active remote sensing. Electromagnetic Spectrum, Resolution, Characteristics of Various sensors and satellites: IRS, Fundamentals of Image Processing. Fundamentals of GIS: Map – scale, projection and symbolism. Data structures, data models, GIS data, acquisition, input, storage, output generation. Data preprocessing, database management, integrated analysis of spatial and attribute data. Spatial Analysis and Measurement, Classification, Neighborhood functions, Polygonal neighborhoods, Buffers. Statistical Surfaces, Digital Elevation Model (DEM). Interpolation- linear and non-linear, uses and problems. Terrain reclassification, Discrete surfaces - dot distribution maps, choropleth maps. Spatial Arrangement: Spatial Arrangement, Directionality of Linear and Areal objects, Connectivity of Linear objects, Routing and allocation. Overlay Analysis, Cartographic overlay, Automating point-in-polygon and line-in-polygon procedures in Raster, Automating Polygon overlay in Raster, Automating vector overlay, types of overlay. Data Modelling, Cartographic Modeling, Scope of GIS and relationship to environmental modeling, data models and data quality. Hydrological Modeling - Land-surface-subsurface Process Modeling, solid and hazardous waste disposal site selection, zoning atlas for industrial siting, environmental information system development, risk and hazard modelling.

TEXT BOOKS:

1. Fundamentals of GIS by Michael N Demers. John Wiley & Sons Inc.
2. Text book of Remote sensing and GIS by M. Anji Reddy, BSP Publications, Hyderabad, 2001

REFERENCE BOOKS:

1. Environmental Modelling with GIS, Michael F. Goodchild, Bradley O. Parks, Louis T. Steyaert
2. Geoinformatics for Environmental Management by M. Anji Reddy, , BS Publications, 2004
3. Introduction to Geographic Information Systems By Kang-Tsung Chang (Tata McGraw-Hill Edition).