

TRAINING MODULE CONTENT

Module I: Incorporating the 'where' of decision making: GIS

- What is GIS : history, components, basic concepts
- Why GIS: needs, scope and utility
- Conceptualising Space: Modelling what we see around us
- Making the computers understand what we see: Data Models: Raster and Vector, GIS File formats, Compression techniques
- The story of maps: Map projections, datum, Coordinate System, Map Scale, Georeferencing, Re-projections, Google maps
- Making of Maps: Types of Maps, visualisation, components, symbolisation
- GIS softwares: basics, requirement, tools, customisation, proprietary and open source

Module II: How to get things done, when not being present there: Remote Sensing

- Introduction to RS: history, needs, methods, Platforms- air borne vs space borne, concept of orbits- sun synchronous vs geostationary, energy source- passive vs active, stereo pairs.
- How RS works: Principle of RS: Energy interaction, EMR spectrum, concept of band, sensors
- How best is your RS data: Resolution of RS Image
- Inferring RS data: Image Interpretation: visual vs digital, True Colour composite vs False colour composite,
- Multi spectral RS,: principle, scope, satellite and sensors, Applications
- Hyperspectral RS, Thermal RS, Microwave RS: principles, scope

Module III: What to do with Remote Sensing Imagery: Digital Image Processing

- What is inside an image: Fundamentals of a RS image: format, pixels, DN, image formats- BIP,BIL,BSQ, data correction
- Reading the data: Image statistics, histograms, ratios
- Pre-processing the data: correcting and restoring- geometric and radiometric, atmospheric correction- noise removal
- Enhancing RS image: contrast stretching, level slicing
- Manipulating features in RS image: concept of kernels, spatial filtering, edge enhancement- linear and nonlinear, convolutions
- Stitching together RS images: mosaicking
- Manipulating Image contents: Spectral Ratio- vegetation, soil and other indices
- Classifying RS Images: basics, unsupervised classification-K-means, ISODATA; supervised classification-stages, algorithms-Minimum distance to mean, Parallelepiped, maximum likelihood classifiers. Comparing classification methods. Resampling: Interpolation methods- nearest neighbourhood (NNI), bilinear interpolation (BII), and cubic convolution (CCI).
- Post classification tasks: recoding, filtering, smoothening, assessing accuracy, area statistics.
- Analysing and comparing classified Images: Change Detection

Module IV: Analysing 'Space' for Decision Making: Spatial Analysis

- Analysing spatial dimensions: integration of spatial and nonspatial components, concepts of operators-mathematical and logical operators, statistical methods and use, measurement of spatial dimensions.
- Analysing vector data: overlay analysing, proximity analysis- buffering
- Analysing raster data: playing with pixel(s) and DN- local, zonal and global operations, distance measurement, location-allocation analysis
- Querying for analysis: non-spatial and spatial queries
- Pattern analysis, site suitability analysis
- Path analysis- shortest path finding,
- Network analysis
- Interpolating space: krigging, variogram; theissen polygon, TIN
- Analysing the third dimensions: DEM, DTM, view shed analysis, watershed analysis, site suitability analysis.
- Virtual GIS

Module V: Where am I ? : The story and working of GPS

- Locating oneself in space: history, surveying, concept of triangulation
- The address finder: Introduction to GPS- history and principles, current navigation programmes- GPS, GLONASS, GAGAN etc, IRNSS.
- Use of GPS: surveying with GPS, operating principles, reading a GPS.
- Applications of GPS for GIS: vehicle navigation, Disaster management, FIS,

Module VI: Where and how are we in utilising GI: Trends in GIS and RS Applications

- Google Maps, Google Earth
- Applications of GIS in Watershed Management, Disaster Management, Smart City planning, Land use Land Cover(LULC) studies, Forestry, Mining, Climate change studies, Facility Information System (FIS), medical geography, business applications, Law and Order. Land Record information system etc
- Data quality and web GIS.

Module VII: Let's talk and explain: Seminars and Presentations

Module VII: Think of a problem and solve it: Working through a GI Project

Contact Us

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