

**GOVERNMENT OF INDIA**  
**Geological Survey of India Training Institute**  
**Hyderabad**

**Scheme: ITEC**

**Proposed Year: 2023-24**

**Course Content for FY 2023-24 (Geographic Information System for Geoscientists)**

**COURSE OVERVIEW**

The course in Geographic Information System for Geoscientists is designed to equip the participants with the latest trends in GIS-based spatial data processing, analysis, visualization, and decision-making. The course includes exercises and case studies with the view to develop skills in data capture, data integration, digital mapping, raster and vector geoprocessing, spatial analysis / modeling and use of GIS as a data management / decision-making tool in earth science & natural resource management, geography, forestry, hydrology, environmental science, pollution studies and other related domains.

**COURSE CONTENT**

- GIS concepts: Introduction to GIS, Data models and planning of GIS projects
- Data input: Digitization of features, import of widely used vector and raster data formats, creation of attribute tables, RDBMS concepts, SQL, etc.
- Data processing: Projections; vector and raster data, on-screen editing of maps and tables, topological editing, data and coordinate transformations, etc.
- Data visualization: display of maps and tables in map windows, display of raster layer overlain with multiple vector layers, 3D views, etc.
- Data output & presentation: Preparation of GIS outputs as thematic maps, introduction of Desktop cartography, map layout design, map generalization, map composition, map annotation, etc.
- Drainage extraction / drainage morphometry and its significance, Terrain Analysis, etc.
- **Interpolation:** Concept of interpolation and contouring of anomalies.
- **Geostatistics:** Concept of Stationary and Regionalized Variables in Geostatistics, Experimental Variogram and Variogram modelling and interpolation techniques and error estimation in prediction using Kriging
- Use of GIS in site suitability analysis and Mineral Prospectivity Mapping using Boolean, Index Overlay, and other relevant methods.
  - Project work.

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