

UNIVERSITY OF MYSORE
Syllabus for Ph.D. .Entrance Exam
GEOGRAPHICAL INFORMATION SYSTEM (GIS)

UNIT - I - CONCEPTS OF GIS

History of GIS; Components of GIS; Application of GIS; spatial data entities; Spatial data structure and management; data models; Coordinate systems; Projection; Datum; Spatial and Attribute Query; Contouring and DEM; Network analysis; Modeling; Layout Generation and reporting; Set theory and Boolean operations.

UNIT -II – SPATIAL DATA MODELING

Thematic Characteristics of spatial data; other sources of spatial data; Sources of error in GIS; Managing GIS errors; Spatial data model; Spatial data structures; Modeling surface; Building computer worlds.

UNIT - III – STATISTICAL METHODS:

Statistical diagrams; study of frequency distribution and cumulative frequency; Measures of central tendency; Selection of class intervals for mapping; Measures of dispersion and concentration; Standard deviation; Lorenz curve; Simple and multiple correlation; Regression.; Nearest-neighbor analysis; Scaling techniques, Sampling techniques for geographical analysis.

UNIT - IV - ATTRIBUTE DATA MANAGEMENT

Database data models; creating a database; GIS data base application, databases, database management system; structure, types of DBMS.

UNIT- V- DATA ANALYSIS AND MODELING

Measurements; Queries; Buffering functions; Map overlay; Network analysis; multi-dimensional GIS-T models; spatial interaction models; local operations, neighborhood operations, zonal operations; terrain mapping and analysis; contour; hill shading; slope and aspect; local, neighborhood, regional operations of overlay analysis.

UNIT VI – CARTOGRAPHY

Scope and importance of Cartography; Elements of cartography; Map as a tool in geographic studies; Types of Maps; Data Models and Information; cartographic communication process; cartographical cube; Contouring algorithms, Surfaces and surface interpolation algorithms; site selection vs. site planning; data suitability.

UNIT VII - REMOTE SENSING

Concepts of Remote Sensing; Process; Source of Energy; Principles; Electromagnetic spectrum; Interpretation and Analysis; Applications of Remote Sensing; Platforms; Digital Imaging; Microwave Remote Sensing; Thermal and Micro wave Remote Sensing; parametric and non-parametric decision, classification and clustering principles.

UNIT VIII - GLOBAL POSITIONING SYSTEM

History of GPS; Components of GPS; Basic concepts of GPS/GNSS; Application of GPS; Functioning; WGS84 co-ordinate system; ground, space and user segment; orbit and constellation; errors and limitations; Application of GPS; DGPS; GNSS Augmentation.

UNIT IX - PHOTOGRAMMETRY

Concepts, Development and classification of Photogrammetry; Process; Acquisition of Imagery; Orientation and Triangulation; Stereo Model Compilation; Stereoscopic Measurement; DTM/Dem Generation; Contour map Generation; Ortho-rectification; Limitations of Photogrammetry; 3D Feature Extraction; 3D Scene Modeling; LIDAR.

UNIT X - AERIAL PHOTOGRAPHY

Concepts; Classification; Aerial photograph; Difference between Map and Aerial Photograph; Air Survey and Ground Survey; Applications of Photogrammetry; Flight Planning and Design; Mosaic; Aerial Cameras – Concepts; Sensitivity of Film Emulsion; Stereoscopy; Mono-vision; Stereoscopic view and its Exaggeration; Interpretation of Aerial Photo; Grey Tone Criteria; Spectral Response.