

SYMBIOSIS INTERNATIONAL (DEEMED UNIVERSITY)
Ph D ENTRANCE TEST

The Syllabus of Geo-spatial Sciences

GIS

History of GIS, Components of GIS, Hardware, software, people, GIS functionality, Data input, data management and analysis, Applications of GIS, Georeferencing, Data generation : Data sources, Data input, Digitization, On-screen digitization, Choice between raster and vector, Data editing, Errors and quality control. Data structures: Hierarchical Structure and relational, Raster data models, Grid data, tessellation data model, Topological data model, Overlay. Proximity analysis (buffering), Overlay analysis (Point-in-polygon, line-in-polygon, polygon overlay), Network analysis (Path finding, tracking, distribution analysis), Dynamic segmentation, route analysis, Type of Network dataset, Boolean algebra

Remote Sensing

Definitions, Type of Remote Sensing, Sensors and platforms, Space remote sensing, Active and passive remote sensing, Satellite image Resolutions, Swath and width, Data generation: Data sources, Data input, Physical bases of Remote Sensing, Elements of satellite images, Georeferencing and mosaicing, Digital nature of satellite data, radiometric and geometric Corrections, Image enhancements (Spectral and Spatial), Image transformations, Vegetation Indices, various applications of Remote Sensing.

Photogrammetry and GNSS

Photogrammetry Terminologies, History, Types of Photogrammetry, Photogrammetric sensing systems Aerial photogrammetry, Stereoscopy, Interior Orientation, End Lap Side Lap and Flight Map, Geometry of Vertical Photograph, Aerial photo errors, Relief Displacement, X and Y Parallax, Vertical Exaggeration, Exterior Orientation, Aero Triangulation. Working principle of GPS system, Satellite positioning, Different types of GNSS systems