SYMBIOSIS INTERNAITONAL (DEEMED UNIVERSITY)
Ph D ENTRANCE TEST

The Syllabus of Geoinformatics

Fundamental of Remote Sensing
Definitions, History of Remote Sensing, Type of Remote Sensing

Remote Sensing Platforms and Sensors
Data Acquisition through various platforms such as aerial, Satellite Shuttle etc., cameras and sensor parameters

Elements of Satellite Images
Image formats, construction, concept of bands, pixel, digital number, metadata.

Multispectral Remote Sensing
Color theory Nature and construction of multispectral image, natural color composite, false color composite, interpretation of multispectral image, combination of sensors

Visual Image Interpretation
Image interpretation parameters, interpretation of arial photographs, satellite images and sensors, examples of interpretation key such as color, texture, pattern etc.

Projections and georeferencing
Concepts of projections, types of projections and their applications, projections in satellite images, georeferencing images,

Introduction to GIS
History of GIS, components of GIS, hardware and software

GIS functionality
Data capture, management, analysis and visualization, applications of GIS, overview of GIS software

Data Pre-processing
Georeferencing: data sources, data input, scanning systems, digitization, on-screen digitization

Data processing
Data editing, errors and quality control, choice between raster and vector

Data transformation
Tessellation data model, raster data models, grid data, TIN vector data model, spaghetti data model, whole polygon structure

Data models
Topological data model, entity relationship, overlay, data transformations, raster and vector data conversion

Photogrammetry
Application, history and cameras, Different geometrical relations for photogrammetry, Vertical and Tilted photographs, Errors in Photogrammetry, GCPS, Check Points and Tie Points,

The orthorectification Process
Data, Interior and Exterior Orientation, Geometric Model, Projections and Datum, Ingest of Data, Geometric Model, Fiducial Marks, Interior Orientation, Exterior Orientation, GCPS, Check Points and tie Points, Triangulation, Orthorectification, Visualisation

Map and Map Design
What is a map, map features, map design

Basic Geodesy
Geoid, coordinate system, measurement

Map Projections
Concept of projections, various surfaces, types of projections, important projections, map distortions, mathematics involved

Global Positioning System
Working principle of GPS system, Satellite positioning, Different types of GNSS systems