ANDHRA PRADESH

RECRUITMENT OF ASSISTANT PROFESSORS IN THE UNIVERSITY
SYLLABUS FOR THE SCREENING TEST

GEOGRAPHIC INFORMATION SYSTEMS
SUBJECT CODE - 76

Unit-1:

Basic Concepts about spatial information, Philosophy and definition of GIS, features, pictures, variables: points, lines, areas, Position on the earth; Basics of map.

Unit-2:

GIS Data Requirement, sources and collection, Methods of data capture -scanning, digitization and associated errors, Conversion from Other Digital Sources, Attribute data input and management, Edge matching, creating digital data- remote sensing; generating data from existing data; Metadata; Different Kinds of geospatial data.

Unit-3:

Detecting and Evaluating Errors, Data Quality Measurement and Assessment, digital output options. Image storage formats, Data retrieval, Data compression, NSDI, GSDI; Understanding of topographical features, map scales, Geo-reference of maps & satellite imagery, Map projections.

Unit-4:

Data collection and input overview, data input and output. Keyboard entry and coordinate geometry procedure, manual digitizing and scanning, Raster GIS, Vector GIS – File management, Spatial data – Layer based GIS, Feature based GIS mapping.

Unit-5:

Applications of GPS in resource information collection, GIS database creation of natural resources, integration and geo-spatial analysis in resource management. Concepts of Land records, revenue / pattaland, government land, forestland, RoFRact and compensatory A forestation land sunder developmental projects.

Unit – 6:

Planimetric Mapping by Direct Tracing – Planimetric Mapping with Reflection and Projection Instruments – Georeferencing of Digital Imagery – Planimetric Mapping Using a Tablet Digitizer – Heads-up Digitizing – Photomaps and mosaics, Kinds of mosaics, uncontrolled digital mosaics, semi controlled Digital mosaics and Controlled Digital Mosaics.

Unit – 7:

Definition – Scope - chronological development – Energy sources – Electro Magnetic Radiation-Electromagnetic Spectrum. Energy matter interactions: in atmosphere – atmospheric windows, with earth surface features- spectral reflectance patterns. Factors affecting remote sensing Spectral response pattern. Resolution: Spatial, Spectral, Temporal, Radiometric & Angular Resolution. Platforms: Types of Platforms. Advantages and limitations of satellite remote sensing.

Unit-8:

Major satellite programs of the world - Geostationary satellites and their orbits: sensor characteristics and their applications. Earth observation satellites : coarse, medium and high resolution satellites - LANDSAT, SPOT, IRS, IKONOS , Quick bird, World View and other recent satellites – scanning and orbiting mechanisms – Elements of image interpretation.

Unit-9:

Concepts of Urban and Regional planning and its applications, urban services and network planning, Urban land use planning Urban growth/Sprawl; Slum detection, monitoring and updating, Study of Transportation Systems.

Unit-10:

Methods of Vector Input, Method of Raster Input, Remote sensing, Data Input, GPS Data input, Secondary data, Meta data and Meta data Standards. - Storage of GIS Databases, Detecting and Editing, Entity Errors: Vector, Attribute Errors: Raster and Vector, Dealing with Projection Changes, Edge Matching, Conflation and Rubber Sheeting, Templating.

Unit – 11:

Fundamentals of Geographic information system, Components of GIS, Application of RS and GIS in Geology and Geography, Application of RS and GIS in Environmental Science and Town planning, RS data products, Principles of RS data analysis and their applications. Application of Remote Sensing and GIS for preparation of Thematic Maps, Detection of Change in Land Cover and Land Use using Satellite Images and Topographical Sheets, Concept of DEM and TIN, Use of GPS for updating the Maps.