Detailed Syllabi of Skill Enhancement Courses (SECs)

SEC 103

Introduction to Geo-informatics [Credits: 2 Theory+1 Practical]

Course Objectives

- To provide the basic concepts and significance of Geoinformatics
- To give an idea to understand maps used in Geographic Information System (GIS)
- To familiarize with the GIS and its applications
- To get an idea of various GIS data types
- To describe the applications of geoinformatics in different areas

Course Outcomes

At the end of the course, a learner will be able to

- Understand the relationship between people, climate, landforms, river system, vegetation and much more
- Develop the computer and management skills as a part of geospatial technology using GIS tools

UNIT 1: UNDERSTANDING MAPS

Definition of a map; Properties of maps; Types of maps; Present day significance of maps; Map Projection Systems; Map Projections for Hemispheres and the World; Map Projections for Continents and Regions; Concept of Datum; Universal Transverse Mercator projection; International Terrestrial Reference Frame in GIS

UNIT 2: INTRODUCTION TO GIS

Basic Concepts of Geographic Information System; Components of a GIS; Spatial Data Creation; Data Types: Spatial Data, Non-Spatial Data, Raster Data, Vector Data, TIN; Data Editing and Analysis; Topological Relationships; Advantages of GIS; Social and Institutional Context of GIS; Contemporary Development of GIS; Web GIS

UNIT 3: INTRODUCTION TO GNSS

Introduction to GPS; GPS Applications: Asset Mapping, Navigation Services, Location Based Services; Introduction and Surveying

UNIT 4: BASICS OF REMOTE SENSING

Introduction to Remote Sensing; Types of Remote Sensing; Indian Remote Sensing Programmes

UNIT 5: OPEN DATA SOURCES AND SOFTWARE FOR GEOINFORMATICS

Open-Source Data: Bhuvan, USGS, Google Earth, Gram Manchitra; Open source Digital Elevation Model; Open Source Software: QGIS.

UNIT 6: APPLICATIONS OF GEOINFORMATICS

Application of Geoinformatics in Natural Resource Management, Watershed Management, Disaster Management, Rural Development, Urban Planning, Monitoring and Evaluation of Projects.

Reading List

George Joseph, (2005), Fundamentals of Remote Sensing (2nd ed.), University Press, pp.1-474

DeMers M. N., 2000: Fundamentals of Geographic Information Systems, John Wiley & Sons

Lillesand, T.M., Kiefer, W.R. and Chipman, W.J, (2004), Remote Sensing and Image Interpretation, (5th ed.), Wiley India Publication, pp.1-763

Clarke K. C., 2001: Getting Started with Geographic Information Systems, Prentice Hall

French, G. T. 1996: Understanding the GPS: An Introduction to the Global Positioning System, Geo Research Inc.

Burrough. P.A. & McDonnell. R. (1998), Principles of Geographic Information Systems, OUP