Major elective 3 : GIS – GPS IN CIVIL ENGINEERING

Course Objectives :

This course covers the fundamental of Geographical Information System. Some applications irrelevant to various engg. Disciplines have also been described.

Course Contents :

Introduction : Geographical Concepts and Terminology, Difference between Image Processing System and Geographic Information System (GIS), utility of GIS, various GIS packages and their salient features, Essential components of a GIS. Data Acquisition : Scanners and Digitizers, Method of Digitization, Raster and Vector Data, Data Storage, Verification and Edition. Data Preprocessing; Format Conversion, Data Compression, Data Reduction and Generalization, Run Length Coding, Merging, Edge Matching, Rectification and Registration, Interpolation. Data Base Structure - Hierarchical Data, Network Systems. Relation Database. Data Management - Conventional Database Management Systems, Spatial Database Management. Data Manipulation and Analysis – Reclassification and Aggregation, geometric and Spatial Operations on Data Measurement and Statistical Modelling. Data Output – Types of Output. Application of GIS in various Natural Resources Mapping & Monitoring, Engineering Application, GPS Application.

Pre-requisite : Nil

Reference Books :

1. Principles of Geographic information Systems for Land Resources Assessment, P.A. Borough, Oxford University Press, 1986
2. Manual of Remote Sensing Vol. 2, American Society of Photorammetry and Remote Sensing.
3. Geographic Information Systems : A Management Perspective, Stan Aronoff, WDL Publications, 1991.

Practicals :
The Practicals design based on theory classes & practical applicability.

1. Introduction to GPS receiver
2. Data capture by various techniques using GPS receiver, Part I
3. Data capture by various techniques using GPS receiver, Part II
4. Data processing using software
5. Computing position, time and velocity and pr eparing final output such as Maps and Reports.
6. Introduction toGIS Models : Raster and Vector Models
7. Map registration and Digitization process.
8. Attribute table creation and joining to vector data
9. Thematic map generation.

10 Semester problem: A case study of small area.