SECOND SEMESTER

GIH 451: DATA BASE MANAGEMENT SYSTEM (DBMS) AND SPATIAL STATISTICS

Skills, employability and entrepreneurship: This course provides the basic knowledge of DBMS and SQL framework which are necessary to understand storing, accessing, and managing geo-spatial data. Integrating SQL with GIS software allows for the visualization of queried data which are useful for decision-making process. The skills learn out of this course provide students to try for various employment across various private organizations. The spatial statistics of different types data such as environmental science, urban planning, public health, and ecology is useful for decision-making policies.

Unit 1	**Data and data base**: Organization of data base, Components of Data Base Management Systems. Files: key, file directories and file storage. Data retrieval and Data Security, Basics of Database models: Entity-relationship model, Flat File system, Network Data model. Concept of Data Mining and Data Warehousing.	06 hrs
Unit 2	**Structured Query Language (SQL)** **Relational and Hierarchical Data Models:** Relational Algebra, Projection operators, Selection operators (Arithmetic & Logical operators), Set unions, Set differences, Cartesian product. Record Storage & primary File Organization, Buffering of Blocks, Hashing Techniques, Index Structures for Files. Transaction Processing Concepts, Data Base Recovery Techniques, Data Base Security Authorizations, Functional Dependencies and Normalization for Relation Data bases.	06 hrs
Unit 3	**C Programming:** Overview of C, Constants, Variables and Data types. Managing input and output operations. Decision Making Statements: Branching (simple if, else, nested if else, else if ladder) and looping statements (while, do while, for loops). Arrays: One-dimensional, Two-dimensional arrays, declaring and initializing arrays.	06 hrs
Unit 4	**Spatial Statistics:** Measures of Central Tendency: Mean, Median and Mode and theirApplications in GIS and Remotely Sensed Data interpretation.	06 hrs
Unit 5	**Correlation Co-efficient** and its application to GIS and Remotely Sensed Data.	06 hrs
Unit 6	**Cluster Analysis:** Introduction to Cluster Analysis. Interpretation of Q-mode and R- mode Clusters with reference to Spatial Data. Application of Cluster Analysis to Spatial Data.	06 hrs
Unit 7	**Factor Analysis:** Outlines of Factor Analysis. Interpretation of Factors for Spatialdata.	06 hrs
Unit 8	**Statistical Packages:** Introduction to Statistical Packages. Introduction to SPSS Package. Functions of SPSS. Graphic out-put of processed data using SPSS. Application of SPSS to Geoinformatics. Case studies using SPSS. Use of SPSS in spatial data analysis. Designing of Cluster Analysis and Dendrograms related to Geoinformatics data.	06 hrs