PCS4I103 DATABASE SYSTEM

Module I: **(10 Hours)**

Introduction to database Systems, advantages of database system over traditional file system, Basic concepts & Definitions, Database users, Database Language, Database System Architecture, Schemas, Sub Schemas, & Instances, database constraints, 3-level database architecture, Data Abstraction, Data Independence, Mappings, Structure, Components & functions of DBMS, Data models.

Module II: **(10 Hours)**

Entity relationship model, Components of ER model, Mapping E-R model to Relational schema, Network and Object Oriented Data models, Storage Strategies**:** Detailed Storage Architecture, Storing Data, Magnetic Disk, RAID, Other Disks, Magnetic Tape, Storage Access, File & Record Organization, File Organizations & Indexes, Order Indices, B+ Tree Index Files, Hashing Data Dictionary

Module III: **(10 Hours)**

Relational Algebra, Tuple & Domain Relational Calculus, Relational Query Languages: SQL and QBE. Database Design :-Database development life cycle (DDLC), Automated design tools, Functional dependency and Decomposition, Join strategies, Dependency Preservation & lossless Design, Normalization, Normal forms:1NF, 2NF,3NF, and BCNF, Multi-valued Dependencies, 4NF & 5NF. Query processing and optimization: Evaluation of Relational Algebra Expressions, Query optimization, Query cost estimation.

Module IV: **(10 Hours)**

Transaction processing and concurrency control: Transaction concepts, properties of transaction, concurrency control, locking and Timestamp methods for concurrency control schemes. Database Recovery System, Types of Data Base failure & Types of Database Recovery, Recovery techniques. fundamental concepts on Object-Oriented Database, Object relational database, distributed database, Parallel Database, Data warehousing & Data Mining and Big data and NoSQL.

Text Books:

1. Sudarshan, Korth: **Database System Concepts**, 6th edition, McGraw-Hill Education.

References Books:

1. Elmasari &Navathe: **Fundamentals of Database System**, Pearson Education.
2. Ramakrishnan: **Database Management Systems**, McGraw-Hill Education.
3. Andrew S. Tanenbaum: **Modern Operating Systems**, 3rd Edition, Pearson Education.
4. Terry Dawson, Olaf Kirch: **Linux Network Administrator's Guide**, 3rd Edition, O'Reilly Media