

- **Introduction**

- Logical and Physical Files
- File, File Structure, Logical and Physical Files Definitions
- Basic File Operations, Opening Files, Closing Files
- Reading and Writing, Seeking
- File Organization, Field and Record structure in file
- Record Types, Types of file organization
- Sequential, Indexed, Hashed, Indexing,
- What is an Index?
- When to use Indexes?
- Types of Index
- Dense Index, Sparse Index

- **Database Management System**

- Introduction
- Basic Concept and Definitions
- Data and Information
- Data Vs Information
- Data Dictionary
- Data Item or Field
- Record
- Definition of DBMS
- Applications of DBMS
- File processing system Vs DBMS
- Advantages and Disadvantages of DBMS
- Users of DBMS
- Database Designers
- Application programmer
- Sophisticated Users
- End Users
- Views of Data
- Data Models
- Object Based Logical Model
- Object Oriented Data Model
- Entity Relationship Data Model
- Record Base Logical Model
- Relational Model
- Network Model
- Hierarchical Model
- Entity Relationship Diagram (ERD)
- Extended features of ERD
- Overall System structure

- **Relational Model**

- Introduction
- Terms
- Relation, b. Tuple, c. Attribute, d. Cardinality, e. Degree of relationship set, f. Domain
- Keys
- Super Key, Candidate Key, Primary Key, Foreign Key
- Relational Algebra Operations
- Select, b. Project, c. Union, d. Difference, e. Intersection, f. Cartesian Product, g. Natural Join

- **SQL (Structured Query Language)**

- Introduction
- History Of SQL
- Basic Structure
- DDL Commands
- DML Commands
- Simple Queries
- Nested Queries
- Aggregate Functions

- **Relational Database Design**

- Introduction
- Anomalies of un normalized database
- Normalization
- Normal Form
- 1 NF, 2 NF, 3 NF