Basic Concepts of Data and Database systems: Data, Fields, Records, Files and Databases, Data modeling for a database, Abstraction and data integration, Three level architecture of a DBMS, Overview of relational, network, hierarchical data models.

Database Design: Entity Relationship model, Extended Entity Relationship model. Relational Model & Relational Data Manipulations: Relation, Conversion of ER diagrams to relations, Integrity constraints, Relational algebra, Relational domain & tuple calculus.

Structured Query Language: DDL, DML, DCL, Views, Embedded SQL, Indexes, Sequences, Synonyms, Data Dictionary.

Relational Database Design Concepts: Functional dependencies, Determining keys, Normalization-1st, 2nd, 3rd, BCNF, 4th and 5th, Lossless join and dependency preserving decomposition.

Advanced Concepts: Centralized and Distributed Databases, Security, Concurrency and Recovery. Introduction to Modern Database Systems: Object Oriented Databases, Deductive Database, Spatial Databases, Cloud Databases: SQL, NoSQL and Hybrid, Big Data Fundamentals.