

Syllabus

Panjab University, Chandigarh

M.Sc. [IT], 2nd Semester

Paper Title: Advanced Database Programming & MySQL

Paper Code: MS-60

UNIT – I

1. Database Management Systems: Definition, Characteristics, Advantages of Using DBMS Approach, Classification of DBMSs, Data Models, Database Schema and Instance, Three Schema Architecture, Data Independence – Physical and Logical data Independence.
2. Entity-relationship model: Entities, Relationships, Representation of entities, attributes, Representation of relationship set, Generalization, Aggregation.
3. Normalization: Functional Dependency, Full Functional Dependency, Partial Dependency, Transitive Dependency, Normal Forms – 1NF, 2NF, 3NF, BCNF, Multi-valued Dependency.

UNIT – II

4. Relational Algebra and Relational Calculus: Relational Algebra: Operations- Union, Intersection, Difference, Cartesian product, Projection, Selection, Division and relational algebra queries; Relational Calculus: Tuple oriented and domain oriented relational calculus and its operations.
5. Transaction and Concurrency control: Concept of transaction, ACID properties, Serializability, States of transaction, Concurrency control: Locking techniques, Time stamp based protocols, Granularity of data items, Deadlock.

UNIT – III

6. MySQL: Introduction; Why MySQL; Tools provided with MySQL; MySQL Architectural Terminology; Databases: Creating, Selecting, Dropping and Altering Databases; Tables: Creating, dropping, Altering, Indexing Tables; Adding new rows,

Retrieving Information, Deleting or Updating Existing rows; Obtaining MySQL Metadata; Joins; Subqueries; Views; Multiple Tables Deletion and Updation; Foreign Keys and Referential Integrity; MySQL Data Types; Sequences.

UNIT - IV

7. Data Warehousing: Introduction; Features; Data modeling for Data Warehousing; Building Data warehouse; Comparison between Data Warehouse and DBMS Metadata; Problems and issues in Data Warehouse.
8. Data Mining: Overview; Goals of Data Mining; Techniques: Association rules (Market Basket Algorithm, Apriori Algorithm); Classification: Decision Tree, Induction Algorithm; Applications of Data Mining.