Course Name: Database Management Systems

Course Type: Core   **Course Credits:** 3+ 1 credits

Objectives:

To understand the basic and advanced concepts of database management systems along with the practical implementation of SQL queries in database.

Learning Outcomes

After successful completion of the course, the students should be able to:

1. Understand the basic concepts and the applications of database systems.
2. Understand the relational database design principles.
3. Master the basics and advanced SQL and construct queries using SQL.
4. Understand and apply Normalization to relations.
5. Understand the basic issues of transaction processing and concurrency control.
6. Design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the data.
7. Perform various PL/SQL operations.

UNIT-I

Introduction to Database: Traditional file processing systems, evolution of database systems, purpose of database systems, characteristics of database, DBMS, components of DBMS, applications of DBMS, DBMS architecture, classification of DBMS users.

Introduction Database design: Database Design and ER diagrams, Entities, Attributes and Entity sets, Relationships and Relationship sets, Features of ER Model, Conceptual Design with the ER Model.

UNIT-II

Relational Algebra and Calculus: Preliminaries, Relational Algebra, Relational calculus – Tuple relational Calculus, Domain relational calculus, Introduction to Data definition language, Data manipulation Language, Data control language.

Relational model concepts: Relational database, Benefits of RDBMS, Data integrity rules, Functional dependency.

UNIT-III

Normalization: Introduction, Need for normalization, Normal forms (1NF, 2NF, 3NF, 4NF, BCNF).

Database Transaction Processing : transaction system concepts, desirable properties of transactions, schedules, serializability of schedules, concurrency control, recoverability Database Transaction Processing: Transaction system concepts, desirable properties of transactions, schedules, serializability of schedules, concurrency control, recoverability.

File organization and indexing concepts in database.

UNIT-IV

Relational database manipulation: SQL-A relational database language, data definition in SQL, data manipulation in SQL, views and queries in SQL, specifying constraints and indexes in SQL, SQL functions, SQL Joins, Sub Queries in SQL, Introduction to PL/SQL, Architecture, Data Types, Control Structures, Concept of Error Handling, Cursors and Database Triggers, Subprograms and Packages.

REFERENCES:

1. Date, C.J." An Introduction to Database System", Narosa publications house, Delhi
2. Elmasri and Navathe," Fundamentals of Database System", Addison Wesley, N.Y.
3. Bipin Desai,"An Introduction to Database Concepts", Galgotia publications, N. Delhi
4. SQL The Complete Reference, 3rd Edition James R Groff, Paul N. Weinberg, AndyOppel(Mcgraw Hill)

Course Name : Lab on Database Management Systems

1. Queries to implement DDL, DML, DCL.
2. Create, alter, drop statements in SQL.
3. Insert, update, delete statements in SQL
4. 2. Queries to implement constraints (Primary key, Foreign key, unique, not null, check , default)
5. Queries for inbuilt and user defined functions.
6. Queries for scalar and aggregate functions.
7. Queries implementing various arithmetic, logical relations operations.
8. Queries to implement views.
9. Queries to implement indexes.
10. Queries to implement various types of joins in SQL.
11. Queries to understand the concept of sub query in SQL.
12. Queries to understand basics of PL/ SQL.
13. Queries for creating cursors in PL/SQL
14. Queries for creating Triggers in PL/SQL
15. Queries for implementing error-handling in PL/SQL.
16. Queries to create sub programs and packages in PL/SQL
17. Mini project implementation in RDBMS Environment.