

Database Management Systems

Subject Code : 18CS4SP04
Credits : 03

Total Contact Hours : 45
L-T-P : 3-0-0

Prerequisite: Knowledge on basics of Computers, Programming Languages, Storage Concepts

Course Objectives:

- Master the basics of SQL and construct queries using SQL
- Be familiar with a commercial relational database system (Oracle) by writing SQL using the system
- Be familiar with the relational database theory, and be able to write relational algebra expressions for queries.
- Master sound design principles for logical design of databases, including the E-R method and normalization approach

Unit I: (7 Hours)

Database System Concepts and Architecture

Introduction of Database, DBMS, Characteristics of database approach, Advantages of DBMS, Data models, schemas, Three schema architecture - The external level, the conceptual level and The internal level. Data Independence, Database languages and Interfaces, Roles of Database Administrator,

Unit II: (10 Hours)

Data Models

Introduction to Data Models (Hierarchical, Network and Relation), Client/Server Architecture, Introduction to Distributed Database, Classification of DBMS.

ER Modeling and Introduction to RDBMS

Entity type, Entity sets, Attributes and keys. The ER Model, ER Diagram & Database design with the ER Model, Introduction, Relational Model -Concepts, Characteristics.

Unit III: (8 Hours)

Relational Operations and Normalization

Relational operations (Insert, delete, update, select, project, rename, union, intersection, minus, Join, division), Transactions and ER mapping (Examples). Normalization of RDBMS (1NF, 2NF, 3NF and 4NF) and inference rules.

Unit IV: (11 Hours)

SQL

Introduction to Unit. DBMS v/s RDBMS, Introduction to SQL, Data types, Constraints, Commands in SQL (Create table, Drop command, Alter command), queries in SQL, Statements in SQL (Insert, delete and update), Features of SQL, Manipulation of data, Tables in SQL

Approaches to database programming, with function calls, Embedded SQL using CURSORS, Dynamic SQL, SQL commands in Java, Retrieving multiple triples using Iterators

Unit V :

(9 Hours)

PL/SQL

Advantages of PL/SQL and features of PL/SQL - blocks structure, error handling, input and output designing, variables and constant, data abstraction, control structures and subprogram Fundamentals of PL/SQL - character sets, lexical, delimiters, identifiers, declarations, scope and visibility, Static and dynamic and static SQL, Implicit and explicit locking.

Course Outcomes:

At the end of the course, Students will be able to:

- Write queries using SQL.
- Use commercial relational database system (Oracle).
- Write relational algebra expressions for queries.
- Design logical databases using the normalization approach

Text Books:

- 1.S. Sudarshan, Henry F. Korth, Abraham Silberschatz, Database System Concepts, Edition 6, McGraw Hill Publications, 2010
- 2.Ivan Bayross, “SQL, PL/SQL”, Bpb Publications” .
- 3.Elmasri and Navathe, “Fundamentals of Database Systems, Seventh Edition, 2016, Pearson.

Reference Books:

1. Steven Feuerstein, “PL/SQL”,bestpractisesBpb Publications”
2. Liebschuty, “The Oracle Cook Book”, BPB Publication
3. Michael Abbey, Michael J.Corey, “Oracle A Beginners Guide”. TMH Publication
4. Kevin Loney, “Oracle Complete Reference”, Bpb Publications”.