

CAP570:ADVANCED DATABASE TECHNIQUES

L:2 T:0 P:3 Credits:4

Course Outcomes: Through this course students should be able to

CO1 :: remember and understand the basic concepts of DBMS and RDBMS and the evolution of database

CO2 :: apply normalization concepts to the any database & implement with SQL

CO3 :: apply the concepts of SQL and PL-SQL

CO4 :: analyze various advanced databases prevalent in the market, including Big Data, OLAP, Cloud Databases, NewSQL, NoSQL

Unit I

Basics of Database : Overview of Databases, Importance and Applications, Types of Databases, Database Architecture, Database Components, Introduction to Database Schemas, Types of Data Models, Conceptual, Logical, and Physical Database Design

Unit II

E-R Modeling : Basics of ER Modelling, Entities, Attributes, and Relationships, ER Diagrams and Notations, Conversion of ER Models to Relational Schemas, Introduction & implementation of ACID properties, Constraints on relations, Types of Keys

Unit III

Database Normalisation : Functional Dependencies and Anomalies, Normalization Concepts and Forms (1NF, 2NF, 3NF, BCNF), Denormalization

Unit IV

Database Joins : Concept & Need - Database Joins, Database Joins (Inner, Left, Right, Self), Views, Transactional Control

Unit V

PL-SQL : Overview of PL/SQL, Differences between SQL and PL/SQL, Benefits and Features of PL/SQL, Basic Structure of a PL/SQL Block

Unit VI

Advance Databases : Current Trends and Future Directions in Database Technology, Big Data and Databases, OLAP, Cloud Databases, NewSQL, NoSQL

List of Practicals / Experiments:

Basic Commands

- DDL Commands
- Various Keys & Constraints
- DML Commands & Views

Normalisation Implementation

- Implementation of database normalisation in SQL
- Conversion from non-normalised data to normalised

Advance Queries

- Inbuilt Functions(Numeric & Character)
- Sub Queries & Nested Queries
- Transaction Control (COMMIT, ROLLBACK, SAVEPOINT)

Database Joins Implementation

- Implementation of various Joins(Inner, Left, Right, Self)
- Joins with conditions

PL/SQL Implementation

- Functions

- Stored Procedures
- Cursors
- Triggers

Text Books:

1. DATABASE SYSTEM CONCEPTS BY H. F. KORTH & A. SILBERSCHATZ, MCGRAW HILL
EDUCATION by SILBERSCHATZ, ABRAHAM, KORTH, HENRY F., SUDARSHAN, S., MC GRAW
HILL

References:

1. FUNDAMENTALS OF DATABASE SYSTEM by ELMASRI AND NAVATHE, PEARSON