Course Title: Distributed and Object Oriented Database
Course no: CSC-457
Credit hours: 3

Full Marks: 60+20+20
Pass Marks: 24+8+8

Nature of course: Theory (3 Hrs.) + Lab (3 Hrs.)

Course Synopsis: Design and development of distributed and Object oriented database systems

Goal: This course introduces fundamental concept and implementation of object oriented and distributed database systems with focus on data distribution, query processing, transaction processing, concurrency control and recovery.

Course Contents:

Unit 1: 12 hrs.

1.1 Introduction to Distributed Database: Distributed Data Processing, Concept of Distributed Database. Distributed vs Centralized Database System; advantages and Application. Transparency, performance and reliability. Problem areas of Distributed Database. Integrity Constraints in Distributed Databases.

1.2 Distributed Database Architectures: DBMS standardization. Architectural models for Distributed DBMS – autonomy, distribution and heterogeneity. Distributed Database architecture – Client/Server, Peer-to-Peer distributed systems, MDBS Architecture. Distributed Catalog management.


Unit 2: 17 hrs.

2.1 Distributed Query Processing: Query Decomposition and Data localization for distributed data, join ordering, semi-join strategy, Distributed Query optimization methods.


Unit 3: 16 hrs.

3.1 Object Oriented Database Concept: Data types and Object, Evolution of Object Oriented Concepts, Characteristics of Object Oriented Data Model. Object Hierarchies - Generalization, Specialization, Aggregation. Object Schema. Inter-object Relationships, Similarities and difference between Object Oriented Database model and Other Data models.


3.3 The Object Oriented DBMS Architecture, Performance Issue in Object Oriented DBMS, Application Selection for Object Oriented DBMS, the Database Design for an Object Relational DBMS. The Structured Typed and ADTs, Object identity, Extending the ER Model, Storage and Access Methods, Query Processing Query Optimization, Data Access API(ODBC, DB Library, DAO, ADO, JDBC, OLEDB), Distributed Computing Concept in COM, COBRA.

Laboratory works: All distributed and OO database components mentioned in this course.

(Practical implementation in Oracle 9i or Oracle 10g covering both Distributed and Object Oriented Database Features)

Reference Book:

2. Object Oriented Database System – Approaches and Architectures ; C.S.R. Prabhu, PHI
6. R.Cattel: "Object Data management",(1993), Addison-Wesley
Prerequisite: Relational Database Management System, SQL, Computer Network, Object Oriented Programming Languages

Homework Assignment: Assignment should be given throughout the semester.