

Subject Code: 1ET2030208	Subject Title: DISTRIBUTED DATABASE APPLICATION SYSTEM (Elective – II)
Pre-requisite	Database Management Systems

Course Objective:

The objective of this course is to prepare the students in depth information about system implementation techniques, data storage, representing data elements, database system architecture, the system catalog, query processing and optimization. Students should also be aware of transaction processing concepts, concurrency control techniques, database recovery techniques, database security and authorization, enhanced data models for advanced applications, temporal databases, deductive databases, database technology for decision support systems, distributed databases and client server architecture, advanced database concepts, and emerging technologies and applications.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture	Tutorial	Practical	Credit	Theory		Practical		Total
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
2	-	2	4	60	40	30	20	150

Subject Contents			
Sr. No	Topic	Total Hours	Weight (%)
1	Introduction: Distributed Data Processing, Promises of DDBs, Complicating Factors, and Problem Areas.	1	5
2	Distributed DBMS Architecture & Design: DBMS Standardization, Architectural Models for Distributed DBMSs, Distributed DBMS Architecture, Alternative Design Strategies, Distribution Design Issues, Fragmentation, Distribution Transparency,	3	15
3	Semantic Data Control: Authentication and Access rights, View Management, Data Security, Semantic Integrity control & its enforcement.	2	5
4	Overview of Query Processing: Query Processing Problem, Objective of Query Processing, Complexity of Relational Algebra Operations, Query processing in centralized system, Query processing in distributed system, Characterization of Query Processors, Layers of Query Processing.	3	10
5	Query Decomposition, Optimization & Data Localization: Query Decomposition, Localization of Distributed Data. Query optimization, Centralized Query optimization, Distributed Query Optimization algorithms.	2	10
6	Introduction to Transaction Management: Definition Of Transaction, Properties of Transactions, Types of Transactions.	2	10
7	Distributed Concurrency Control & Reliability: Serializability Theory, Taxonomy of Concurrency control Mechanisms, Lock based Concurrency control Mechanisms, TimeStamp-Based Concurrency control Algorithms, Optimistic Concurrency control Algorithms, Deadlock Management, Relaxed Concurrency Control. Reliability Concepts & Measures, Failures & Fault Tolerance in Distributed systems	4	15
8	Parallel Database Systems: Database Servers, Parallel Architectures, Parallel DBMS Techniques, Parallel Execution problems.	3	10
9	Distributed Object Database Management Systems: Fundamental objects concepts & object models, Object distribution design	2	10
10	Current Issues: Data Delivery Alternatives, Data Warehousing, Push-based Technologies, Mobile Databases.	2	10

Course Outcome:

At the end of this course, the students would be able to:

- Have fundamental knowledge on Distributed Database System
- To manage Concurrency control & reliability issues in DDBMS
- To Study, analyze and understand Query Processing & Optimization
- To Use tools for implementing DDBMS applications programs
- To design architecture for distributed environment.

List of References:

1. Principles of Distributed Database Systems by M. Tamer Ozsu, Patrick Valduriez (Pearson Publication).
2. Distributed Database Management Systems- A Practical Approach by Saeed K Rahimi, Frank S Haug (Wiley Publication)
3. Database system concepts, Abraham Silberschataz, Henry F. Korth & S. Sudarshan, Mc Graw Hill

E-Resources / Web Links:

- <http://infolab.stanford.edu/cs347.2001.spring/lectures.html>
- http://www.csee.umbc.edu/portal/help/oracle8/server.815/a67784/ds_ch5.htm

List of Experiments:

Note: The experiment list provided beneath is for reference only. The course teacher may change/formulate it as per his/her methodology and requirement.

1. To study about advantages of database system over file system.
2. To implement the DDL and DML commands in RDBMS.
3. To study and execute the procedures and functions in PL/SQL
4. To study and execute Triggers in RDBMS.
5. To study and implement small application of DDBMS using tools such as J2EE, .NET etc