DISTRIBUTED DATABASES (Minor Elective-II)

Semester II (Computer Engineering)
SUB CODE: MECE205-B

TEACHING SCHEME (Credits and Hours):

Teaching scheme				Total	Evaluation Scheme					
L	T	P	Total	Credit	Theory		Mid Sem Exam	CIA	Pract.	Total
Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	Marks
03	00	02	05	04	3	70	30	20	30	150

LEARNING OBJECTIVES:

The educational Objectives of this Course are:

- To Introduce various Distributed Database Applications in real world scenario
- To be learning more about various Distributed Database Techniques
- Applying efficient Advanced Techniques to solve engineering problems

OUTLINE OF THE COURSE:

Unit No	Topics
1	Introduction
2	Architecture of distributed systems
3	Distributed Database Design
4	Concepts of Database links
5	Transparencies
6	Transaction processing
7	Semantic Data Control
8	Query processing and Query optimization strategies
9	Autonomy and Security in Distributed Databases
10	Current Trends in Distributed Database

Total hours (Theory): 45

Total hours (Practical): 30

Total hours: 75

DETAILED SYLLABUS:

Sr. No	Topic	Lecture Hours	Weight age (%)
1	**Chapter 1. Introduction** • Distributed Data Processing • Promises of DDBs • Complicating Factors and Problem Areas.	03	07
2	**Chapter 2. Architecture of distributed systems** • Architectural Models for Distributed DBMSs ▪ Homogeneous ▪ Heterogeneous ▪ Client/server ▪ Distributed Databases versus Replicated Databases	05	08
3	**Chapter 3. Distributed Database Design** • Alternative Design Strategies • Distribution Design Issues • Fragmentation • Allocation.	06	15
4	**Chapter 4. Concepts of Database links** • Introduction • Types Database Links • Creating and Managing Database Links • Restrictions through Database Links • Practical Scenarios and examples	05	10
5	**Chapter 5. Transparencies** • Database link name resolution • Schema object name resolution • Location trans-RPC, creating location transparencies using views, synonyms and procedures • Managing statement trans	03	10
6	**Chapter 6. Transaction processing** • Concept and Properties of Transactions • Remote and Distributed SQL Statements • Shared SQL for Remote and Distributed Statements • Remote and Distributed Transactions • 72PC and 3PC Mechanisms and its types	05	15
7	**Chapter 7. Semantic Data Control** • View Management • Data Security • Semantic Integrity control	04	05

8	**Chapter 8. Query processing and Query optimization strategies** • Distributed Query Processing Methodology. • Distributed Query Optimization. • New query optimization techniques in distributed database. • Distributed Query Optimization problems and some solutions. • Advantages of query optimization techniques in distributed database.	04	10
9	**Chapter 9. Autonomy and Security in Distributed Databases** • Site Autonomy • DD Security ▪ Authentication trough Database Links ▪ Authentication without Password ▪ Supporting User Accounts and Roles ▪ Centralized User and Privilege Management ▪ Data Encryption ▪ Database Auditing	04	10
10	**Chapter 10. Current Trends in Distributed Database** • Data Delivery Alternatives • Data Warehousing • World Wide Web • Push-based • Technologies • Mobile Databases. • Real Application Clusters(RAC) • Cloud based databases	06	10

INSTRUCTIONAL METHOD AND PEDAGOGY (Continuous Internal Assessment (CIA) Scheme)

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- Lectures will be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lecture and laboratory which carries 10 marks in overall evaluation.
- One internal exam will be conducted as a part of internal theory evaluation.
- Assignments based on the course content will be given to the students for each unit and will be evaluated at regular interval evaluation.
- Surprise tests/Quizzes/Seminar/tutorial will be conducted having a share of five marks in the overall internal evaluation.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
- Experiments shall be performed in the laboratory related to course contents.

STUDENTS LEARNING OUTCOMES:

On successful completion of the course, the student will:

- Be able to Compare various Distributed Databases methods
- Be able to understand and identify the analytical characteristics of Distributed Databases algorithms.
- Employ algorithm to model engineering problems, when appropriate.

REFERENCE BOOKS:

1. Principles of Distributed Database Systems by M. TAMER OZSU, Patrick Valduriez, S. Sridhar (Pearson Publication)
2. Database system concepts', 6th Edition –Abraham Silberschatz, Henry Korth, S, Sudarshan, (McGraw Hill International)
3. Distributed Databases by Stefano Ceri, Giuseppe Pelagatti(TMH)
4. Oracle Documentation

LIST OF PRACTICALS:

Sr No.	Practical Aim	Hrs
1	Working with Database Link. • Create a Database Link with hardcoded UserName and Password • Create a Database Link without UserName and Password. • Create a public database link with hardcoded user name and password. • Create a Public Database Link without UserName and Password. • Write a command to close the database link. • How can we drop database link	4
2	Access any table from created Database Link to display all its content.	2
3	Write commands to Insert, Update, Delete records using database link	2
4	Create a view or synonym to hide distributed database complexity from your user.	2
5	Using database link develop a join query based on separate horizontal partition on different machine.	4
6	Develop a single table and try to update from multiple terminals and show the concurrency control and lock details.	4
7	Write a join query based on two tables and analyse the query using action plan.	2
8	Show the database activities using Audit Trails	4
9	Create various Views using anyone of example of database and design various Constraints.	4
10	Using Commit and Rollback show Transaction ACID Property.	2