

Course Profile

Course Name:-	Distributed Database Systems
Course Code:-	CEN 449
Academic Year:-	1434-1435(2013-2014)
Semester :-	Second

Course Overview

This course introduce to-Introduction to Distributed Database: Introduction to Distributed systems - Examples of distributed systems, challenges - architectural models - fundamental models - Introduction to interprocess communications - external data representation and marshalling- client server communication - group communication. Distributed objects and File system: Introduction - Communication between distributed objects - Remote procedure call - Events and notifications - Introduction to DFS - File service architecture - Sun network file system - Name services and DNS - Directory and directory services. Distributed Operating system support: The operating system layer - Protection - Process and threads - Communication and invocation - Operating system architecture - Introduction to time and global states - Clocks, Events and Process states - Synchronizing physical clocks - Logical time and logical clocks - Global states - Distributed debugging - Distributed mutual exclusion. Transaction and Concurrency Control-Distributed Transactions: Transactions - Nested transaction - Locks - Optimistic concurrency control - Timestamp ordering - Comparison of methods for concurrency control - Introduction to distributed transactions - Atomic commit protocols - Concurrency control in distributed transactions - Distributed deadlocks - Transaction recovery. Replication and Recent databases: Replication - System model and group communications - Fault tolerant services - Highly available services - Transactions with replicated data. Introduction to Mobile databases and Web databases. Distributed Database Design, Database Integration, Data and Access Control, Query Processing, Optimization of Distributed Queries.

Course Details

Level:-	10
Credit:-	2(1-1-2)
Pre-Requisites:-	NA
Co- Requisites :-	NA

Learning Outcomes of Course

After successful completion of this course, student will be able to-

1. Describe distributed database concept and architecture.
2. Compare the type of distributed database systems.
3. Display a knowledge of the fragmentation in distributed database systems.
4. Understand of query processing, data and access control of distributed database systems.
5. Describe transaction management in distributed database systems.
6. Analyze distributed database system with mobile databases and web databases.

Course Assessment

Name of Assessment Task	Weight of Assessment	Week Due
1. Midterm Exam-1	15%	6 th , 7 th
2. Midterm Exam-2	15%	14 th
3. Quizzes/ Assignments/Report/Seminar	10%	3 rd , 4 th , 5 th , 6 th , 8 th , 10 th , 12 th , 15 th
4. Lab	20%	7 th , 12 th , 14 th
5. Final Exam	40%	16 th

Assessment Task and Learning Outcomes Alignment

Assessment Task Name	Course Learning Outcomes					
	1	2	3	4	5	6
1. Midterm Exam-1	√	√	√			
2. Midterm Exam-2				√	√	
3. Quizzes/Assignments/Report/Seminar	√	√	√	√		
4. Lab				√	√	
5. Final Exam	√	√	√	√	√	√

Teaching Contact Details

Name of Course Coordinator:-	Mohammed Rafiq
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Office Number:-	R10
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Details of Required Text Book

Book Name	Authors Name	Publisher	Year	Edition
1. Principles of Distributed Database Systems	M.TamerOzsu, Patrick Valduriez	Springer	2011	3rd

Details of Required Reference Books

Book Name	Authors Name	Publisher	Year	Edition
1. Distributed Database Principles & Systems	Stefano Ceri, Giuseppe Pelagatti	McGraw-Hill	2008	
2. Distributed Database Management Systems: A Practical Approach	Saeed K. Rahimi , Frank S. Haug	Wiley-IEEE Computer Society Pr	2010	1st
3. Distributed Systems Principles and Paradigms	Andrew S. Tanenbaum, Maarten Van Steen	Prentice Hall	2006	2nd
4. Distributed Systems: Concepts and Design	George Coulouris, Jean Dollimore, Tim Kindberg, Gordon Blair	Addson Wesley	2011	5 th

IT Resources

The following IT Resources will require to access-

1. <http://faculty.mu.edu.sa/mrafiq/>
2. Internet
3. MU Student and Faculty Email.
4. <http://nptel.ac.in/courses.php?disciplineId=106>
5. <http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-824-distributed-computer-systems-engineering-spring-2006/>
6. http://books.google.com.sa/books?id=TOBaLQMuNV4C&pg=PA497&lp_g=PA497&dq=Distributed+Database+Systems&source=bl&ots=LpGhdFVVZa&sig=SbSyGCVxa5b4VPBB0sPoLzIxR4E&hl=en&sa=X&ei=cm3vUtfVKsqR0AX-yYGICg&ved=0CEAQ6AEwBDgK#v=onepage&q=Distributed%20Database%20Systems&f=false
7. <http://www.cs.gsu.edu/~cscskp/DistSystems/chap01-prasad.pdf>
8. **Oracle11g**
<http://www.oracle.com/technetwork/database/database-technologies/express-edition/downloads/index.html>
Oracle SQL Developer
<http://www.oracle.com/technetwork/developer-tools/sql-developer/downloads/index.html?ssSourceSiteId=ocomen>

Course Schedule

Course Topics	Book's Chapter	Event Name	Week Due
Introduction to Distributed Database: Introduction to Distributed systems Examples of distributed systems, architectural models	Principles of Distributed Database Systems Chapter-1		Week-1,2
Distributed Database Design	Principles of Distributed Database Systems Chapter-3	Assignment-1	Week-3
Query Processing	Principles of Distributed Database Systems Chapter-6	Assignment-2	Week-4,5
Introduction to interprocess communications - client server communication - group communication	Principles of Distributed Database Systems Chapter-1,13	Quiz-1	Week-6

Distributed objects and File system: Communication between distributed objects -Introduction to DFS	Distributed Systems Principles and Paradigms Chapter-11, 14		Week-7
		Midterm-1	Week-6,7
File service architecture - Sun network file system - Name services and DNS - Directory and directory services.	Distributed Systems Principles and Paradigms Chapter-11	Assignment-3	Week-8
Distributed Operating system support: The operating system layer - Protection - Process and threads - Communication and invocation - Operating system architecture	Distributed Systems Principles and Paradigms Chapter-11		Week-9
Distributed debugging - Distributed mutual exclusion, Distributed Transactions: Transactions - Nested transaction - Locks - Optimistic concurrency control - Timestamp ordering	Distributed Systems Principles and Paradigms Chapter-6, Principles of Distributed Database Systems Chapter-10	Quiz-2	Week-10
Concurrency control in distributed transactions - Distributed deadlocks - Transaction recovery, Data and Access Control	Principles of Distributed Database Systems Chapter-11,5		Week-11,12
Replication and Recent databases: Replication - System model and group communications - Fault tolerant services - Highly available services -	Principles of Distributed Database Systems Chapter-13	Assignment-4	Week-13
Database Integration, Optimization of Distributed Queries	Principles of Distributed Database Systems Chapter-4,8	Midterm-2	Week-14
Introduction to Mobile databases and Web databases	Principles of Distributed Database Systems Chapter-17		Week-15
		Final Exam	Week-16

Referencing Style

The **American Psychological Association (APA)** referencing style must be used for all submissions of this course.

Course Assessment Task

Assessment Name:-	Midterm-1
Description of Task Assessment:-	Written Exam , Provide knowledge of Distributed Database Concepts, Architecture and Fragmentation. Reveal the kind of Distributed Database Systems.
Task Assessment Due Week/Date:-	6 th , 7 th
Return Week/Date to Students:-	9 th
Weight of Task Assessment:-	15%
List of Learning Outcomes Assessed:-	<ol style="list-style-type: none">1. Describe distributed database concept and architecture.2. Compare the type of distributed database systems.3. Display a knowledge of the fragmentation in distributed database systems.
Assessment Name:-	Midterm-2
Description of Task Assessment:-	Written Exam , Provide knowledge of Query Processing, Access Control and Transaction Management in Distributed Database Systems.
Task Assessment Due Week/Date:-	14 th
Return Week/Date to Students:-	15 th
Weight of Task Assessment:-	15%
List of Learning Outcomes Assessed:-	<ol style="list-style-type: none">4. Understand of query processing, data and access control of distributed database systems.5. Describe transaction management in distributed database systems.

Assessment Name:-	Lab-Tests
Description of Task Assessment:-	Practical Exams, Provide knowledge of Query Processing, Access Control and Transaction Management.
Task Assessment Due Week/Date:-	7 th ,12 th , 14 th
Return Week/Date to Students:-	8 th ,13 th , 15 th
Weight of Task Assessment:-	20%
List of Learning Outcomes Assessed:-	<ol style="list-style-type: none"> 4. Understand of query processing, data and access control of distributed database systems. 5. Describe transaction management in distributed database systems.

Assessment Name:-	Quizzes/Assignments/Report/Seminar
Description of Task Assessment:-	<p>Quizzes:- Written Exams, Provide knowledge of Distributed Database Concepts, Architecture, Type of Distributed Database Systems, Fragmentation in Distributed Database Systems.</p> <p>Assignments:- Paper Reading Homework.</p> <p>Seminar:- Selecting the seminar topic and preparing the presentation. Delivering seminar on selected topic.</p>
Task Assessment Due Week/Date:-	3 rd ,4 th , 5 th , 6 th , 8 th , 10 th , 12 th , 15 th
Return Week/Date to Students:-	4 th , 5 th , 6 th , 7 th , 9 th , 11 th , 13 th , 15 th
Weight of Task Assessment:-	10%
List of Learning Outcomes Assessed:-	<ol style="list-style-type: none"> 1. Describe distributed database concept and architecture. 2. Compare the type of distributed database systems. 3. Display a knowledge of the fragmentation in distributed database systems. 4. Understand of query processing, data and access control of distributed database systems.

Assessment Name:-	Final Exam
Weight of Task Assessment:-	40%
Duration:-	3 Hours
Warning:-	Calculator and Mobile Not Allowed
List of Learning Outcomes Assessed:-	<ol style="list-style-type: none">1. Describe distributed database concept and architecture.2. Compare the type of distributed database systems.3. Display a knowledge of the fragmentation in distributed database systems.4. Understand of query processing, data and access control of distributed database systems.5. Describe transaction management in distributed database systems.6. Analyze distributed database system with mobile databases and web databases.