
SYLLABUS

Date/ Revision April 2017

Faculty Engineering

Approval

SUBJECT : DISTRIBUTED DATABASE SYSTEM

1. Identification of Subject:

Name of Subject : DISTRIBUTED DATABASE SYSTEM
Code of Subject :
SKS / ECTS :
Semester : Semester 4
Study Program : B-CSE
Lecturer :

2. Competency

After having the course, students are expected to:

- a) Understand the concept of Distributed Database Systems (DDBMS), including the architecture and design of DDBMS
- b) Gain skill about query processing & optimization
- c) Implement applications/tools in order to utilize DDBMS applications.

3. Description of Subject:

The Internet certainly changed the way we typically look at distribution. The appearance of distributed computing requires better data streams in terms of distributed data management. This course covers database integration and querying over multidatabase systems, data replication protocols, peer-to-peer data management, search engines to distributed XML, data management stream and cloud computing.

4. Learning Approach

Approach : Combination of Expository - inquiry and collaborative
Method : Discussion, question answer, sample problem, group work
Student Task : Home work, presentation
Media : LCD projector, Teaching Aids (components), Simulation SW, film.

5. Evaluation

a) Absence maximum	: 25%
b) Participation and Quiz	: 5 points
c) Projects	: 25 points
d) Final Examination	: 60 points
Total	: 100 points

6. Contents/ Topics of Lecturing:

Week	Content/ Topics of Lecturing	Text Book Chapter	Remark
1	Introduction Distributed Data Processing, What is a Distributed Database System?, Data Delivery Alternatives, Promises of DDBSs, Complications Introduced by Distribution, Design Issues, Distributed DBMS Architecture	1	
2	Distributed Database Design Top-Down Design Process, Distribution Design Issues, Fragmentation, Allocation, Data Directory	3	
3	Database Integration Bottom-Up Design Methodology, Schema Matching, Schema Integration, Schema Mapping, Data Cleaning	4	
4	Data and Access Control View Management, Data Security, Semantic Integrity Control	5	
5	Overview of Query Processing Query Processing Problem, Objectives of Query Processing, Complexity of Relational Algebra Operations, Characterization of Query Processors, Layers of Query Processing, Query Decomposition, Localization of Distributed	6,7	
6	Optimization of Distributed Queries Query Optimization, Centralized Query Optimization, Join Ordering in Distributed Queries, Distributed Query Optimization	8	
7	Multidatabase Query Processing Issues in Multidatabase Query Processing, Multidatabase Query Processing Architecture, Query Rewriting Using Views, Query Optimization and Execution, Query Translation and Execution	9	
8	Mid Term Break		
9	Distributed Concurrency Control Serializability Theory, Taxonomy of Concurrency Control Mechanisms, Locking-Based Concurrency Control Algorithms, Timestamp-Based Concurrency Control Algorithms, Optimistic Concurrency Control Algorithms, Deadlock Management, "Relaxed" Concurrency Control	11	
10	Data Replication Consistency of Replicated Databases, Update Management Strategies, Replication Protocols, Group Communication, Replication and Failures, Replication Mediator Service	13	
11	Parallel Database Systems Parallel Database System Architectures, Parallel Data Placement, Parallel Query Processing, Load Balancing, Database Clusters	14	
12	Distributed Object Database Management Fundamental Object Concepts and Object Models, Object Distribution Design, Architectural Issues, Object Management, Distributed Object Storage, Object Query Processing, Transaction	15	

	Management		
13	Peer-to-Peer Data Management Infrastructure, Schema Mapping in P2P Systems, Querying Over P2P Systems, Replica Consistency Web Data Management	16	
14	Web Graph Management , Web Search, Web Querying, Distributed XML Processing, Cloud Data Management Data Stream Management Cloud Data Management	17, 18	
15	Final Exam		

7. Book Reference:

- a) Principles of Distributed Database Systems, M. Tamer Ozsu, Patrick Valduriez , Springer, 2011, ISBN 978-1-4419-8833-1
- b) Distributed Database Management Systems- A Practical Approach, Saeed K Rahimi, Frank S Haug, Wiley Publication, 2010, ISBN 978-0-470-40745-5