



# Marwadi University

## Bachelor of Computer Application

### Semester III

**Subject Code: 05BC0305**

**Subject Name: Database Management System – II (DBMS-II)**

#### Learning Objectives:

Distributed Systems are gaining popularity due to various advantages it offers. Database is also getting distributed. When database is distributed, the concepts of database need to be revisited, the student should be made aware of the concepts such as architecture, how to distribute database, database control, optimizing query, controlling replication, handling concurrency and deadlock.

The learning objective of the course is to:

1. Understand Distributed database systems (DDBMS)
2. Architecture & Design of DDBMS
3. Query Processing & Optimization
4. Concurrency control & reliability issues in DDBMS
5. Use tools for implementing DDBMS applications.

#### Prerequisites:

1. Knowledge of DBMS

#### Course Content:

Unit	Course Content	Hours
1	<b>Introduction:</b> Distributed Data Processing, Distributed Database Systems (DDBS), Problems of DDBMS, Completing Factors and Problem Areas.	4
2	<b>Distributed DBMS Design and Architecture:</b> DBMS Standardization, Architectural Models for DDBMS, DDBMS Architecture and Global Directory Issues. Alternative Design Strategies, Distributed Design Issues, Fragmentation and Allocation.	8
3	<b>Distributed Query Processing:</b> Query Processing Problems, Objectives of Query Processing, Complexity of Relational Algebra Operators, Characterization of Query Processors, Layers of Query Processing  <b>Query Decomposition &amp; Data Localization:</b> Query Decomposition, Localization of Distributed Data.  <b>Optimization of Distributed queries:</b> Query optimization, Centralized Query optimization, Join Ordering in Fragmented Queries, Distributed Query Optimization algorithms.	12
4	<b>Distributed Transaction Management and Concurrency Control:</b> Destination of a Transaction, Problems of Transactions, Type of Transactions and Architecture Revisited, Serializability Theory, Taxonomy of Concurrency Control Mechanisms, Locking Based Concurrency control Mechanisms, TimeStamp-Based Concurrency control Algorithms, Optimistic Concurrency control Algorithms, Deadlock Management, Relaxed Concurrency Control.	12
5	<b>Distributed DBMS Reliability:</b> Reliability Concepts & Measures, Failures & Fault Tolerance in Distributed systems, Failures in Distributed DBMS, Local Reliability Protocols, Distributed	12



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Reliability Protocols, Dealing with site failures, Network Partitioning	
<b>Parallel Database Systems:</b> Database Servers, Parallel Architectures, Parallel DBMS Techniques, Parallel Execution problems, Parallel Execution For Hierarchical Architecture.	
<b>Current Issues:</b> Data Delivery Alternatives, Data Warehousing, World Wide Web, Push-based Technologies, Mobile Databases.	

<b>Text Book(s):</b>
<ol style="list-style-type: none"><li>1. M. Tamer Ozsu and Patrick Valduriez, "Principle of Distributed Database Systems", Springer Publication, "3rd Edition", ISBN No- 978-1-4419-8833-1</li><li>2. Stefano Ceri and Giuseppe Pelagatti, "Distributed Database, principles and Systems", McGraw-Hill International Editions, Year- 2008, ISBN No- 978-0-07-026511-0</li></ol>
<b>Reference Book(s):</b>
<ol style="list-style-type: none"><li>1. Distributed Database Management Systems- A Practical Approach by Saeed K Rahimi, Frank S Haug (Wiley Publication)</li></ol>
<b>Accomplishment of the student after completing the course :</b>
After completing the course student should be able to: <ol style="list-style-type: none"><li>1. Understand Distributed database systems (DDBMS)</li><li>2. Architecture &amp; Design of DDBMS</li><li>3. Query Processing &amp; Optimization</li><li>4. Concurrency control &amp; reliability issues in DDBMS</li><li>5. Use tools for implementing DDBMS applications.</li></ol>