

Year: B. Tech IV (Semester VII)

Subject Name: Advanced Database Systems

Subject Code: BTIT14708

Type of course: Professional Elective Course

Prerequisite (if any): Database Management System

Rationale: The course, Advanced Database Systems, is to introduce fundamental concepts and design of distributed databases and many other emerging trends in database systems such as parallel, object-based, peer-to-peer, and web databases. The overall aim of this course is to help the students to meet the requirements of present-day database applications.

Teaching and Examination Scheme:

Teaching Scheme				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	
3	0	0	3	60	25	15	00	00	100

CA1: Continuous Assessment (assignments / projects / open book tests / closed book tests) CA2: Sincerity in attending classes / class tests / timely submissions of assignments / self-learning attitude / solving advanced problems TEE: Term End Examination TEP: Term End Practical Exam (Performance and viva on practical skills learned in course) CA3: Regular submission of Lab work / Quality of work submitted / Active participation in lab sessions / viva on practical skills learned in course.

Contents:

Sr. No.	Contents	Total Hours
1.	Introduction - Distributed data processing, what is a DDBS, Promises of DDBSs; Problem areas, Design Issues, Distributed DBMS Architecture	03
2.	Distributed Database Design -Top-Down Design Process, Distribution Design Issues, Fragmentation, Allocation, Data Directory	05
3.	Data and Access Control - View Management, Data Security, Semantic Integrity Control	04
4.	Transaction Management and concurrency management - Definition of a Transaction, Properties of Transactions, Types of Transactions, 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	10
5.	Distributed DBMS Reliability: Reliability Concepts and Measures, Failures in Distributed DBMS, Local Reliability Protocols, Distributed Reliability Protocols,	07

	Dealing with Site Failures, Network Partitioning, Architectural Considerations	
6.	Data Replication - Consistency of Replicated Databases, Update Management Strategies, Replication Protocols, Group Communication, Replication and Failures, Replication Mediator Service	06
7.	Introduction to parallel, object based, peer-to-peer and web databases - Parallel Database System Architectures, Fundamental Object Concepts and Object Models, Peer-to-Peer Data Management Infrastructure, Web Graph Management, Web Search	10

Suggested Specification table with Marks (Theory): (For B. Tech only)

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
20	20	10	10	-	-

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (Revised Bloom’s Taxonomy)

Reference Books:

Sr no	Title of book /article	Author(s)	Publisher and like ISBN	Year of publication	Publication Edition
1	Principles of Distributed Database Systems	M.T. Ozsü and P. Valduriez	Pearson	2011	3 rd Edition
2	Distributed Databases: Principles and Systems	Stefano Ceri and Giuseppe Pelagatti	McGraw Hill	2017	-
3	Distributed Database Systems	David Bell, Jane Grimson	Addison-Wesley	1922	

SARVAJANIK UNIVERSITY
**SarvajaniK College of Engineering and
 Technology**
Bachelor of Technology

Course Outcomes (CO):

Sr. No.	CO statements	Marks % weightage
CO-1	Demonstrate Proficiency in Distributed Database Design and Architecture	30%
CO-2	Apply Data and Access Control Mechanisms Effectively	20%
CO-3	Exploit Transaction Management and Concurrency Control Techniques	25%
CO-4	Analyse Distributed Database Reliability and Explore Advanced Concepts	25%