4IT50: ADVANCED DATABASE MANAGEMENT SYSTEMS
CREDITS – 4(LTP: 3,0,1)

Course Objective:

Learn different type of database management systems and gain knowledge of query optimization and transaction models

Teaching and Assessment Scheme:

Teaching Scheme (Hours per Week)			Credits	Assessment Scheme				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE	CE	ESE	CE	
3	0	2	4	60	40	20	30	150

Course Contents:

Unit No.	Topics	Teaching Hours
1	**Overview of RDBMS and SQL:** Relational Query Languages, The SQL Query Language, Querying Multiple Relations, Integrity Constraints (ICs), Normalization: Functional Dependency, normalization of tables, normalization and database design	5
2	**Query Processing:** Query Execution, Physical-Query-Plan-Operators, Algorithms for Database Operations, Algorithms for Joins and Sorting, hash and index based algorithms, Buffer Management, Parallel Algorithms for Relational Operators	6
3	**Query Optimization:** Algebraic Foundation for Improving Query Plans, Estimating Cost of Operations, Cost Based Plan Selection, Choosing Order of Joins, Optimization of Queries for Parallel, Distributed, Multidimensional and Text Database	6
4	**Advanced Transaction Models:** Online transaction processing system, serializability and recoverability, Savepoints, Nested Transactions, Multi-Level Transactions, Shared disk systems, Distributed systems 2PC, 3PC, replication and hot spares, resolving deadlock, distributed locking, long duration transaction, high-performance transaction system	8
5	**Distributed DBMS Architecture:** Distributed Data Processing, Complicating Factors, Problem Areas, Distributed DBMS architecture, Distributed Database Design:Strategies, Design Issues, Fragmentation, Allocation, Semantic Data Control	6
6	**Parallel Database:** Parallel Architectures, shared disk/shared memory based architectures, Data partitioning, Intra-operator parallelism, Pipelining, Scheduling, Load balancing	6

Unit No.	Topics	Teaching Hours
7	**Object & XML Databases:** Object Identity, Object structure, Type Constructors, Encapsulation of Operations, Importance of attaching database to web page, Web services, compare web server interfaces(CGI, API, Java Servlets), Purpose of XML as a standard, XML schema, XML document data, Server side extensions, PHP scripts	8
	Total	**45**

List of References:

1. M. tamer Ozsu, Petrick Valduriez,*"Principles of Distributed database systems"*, Pearson.
2. Jeffrey A. Hoffer, Mary B. Prescott,Fred R. McFadden, *"Modern Database Management*", Eight Edition, Prentice Hall.
3. Abraham Silberschatz, Henry Korth, S. Sudarshan,*"Database System Concepts"*, Sixth Edition, McGraw HILL publication-2011.
4. C. J. Date, A.Kanan, S. Swaminathan,*"An introduction to Database Systems"*, Eighth Edition, Pearson publication-2006.
5. Ivan Bayross, *"SQL, PL/SQL",* Fourth Edition, BPB Publication, 2010.
6. Nilesh shah, *"Database System using Oracle",* PHI Publication, 2002.
7. Chhanda Ray,*"Distributed Database Systems",* Pearson.

Course Outcomes (COs):

At the end of this course students will be able to …

1. Apply normalization techniques
2. Analyze the background processes involved in queries and transactions
3. Apply knowledge of parallel databases for various applications
4. Understand working of distributed databases
5. Understand the need and concepts of object-oriented database
6. Evaluate and develop methods of storing, managing and interrogating XML files