

Branch Name:	Computer Engineering (Software Engineering)
Program Code:	ET203
Course Title:	Advance Database Management system
Course Code:	2ET2030302T
Pre-requisite Course:	sql, relational DB, basic of DATABASE

Course Objectives: After successful completion of the course, student will be able to

1. Understand Database basic and advance preliminaries.
2. Express physical phenomenon in database management.
3. Apply in formal representation of various computing constructs.
4. Recognize the importance of advance database for analysis in engineering problems.

Teaching and Examination Scheme:

Credit	Teaching Scheme Hours per week				Evaluation Scheme (Marks)								
					Theory (Marks)				Practical (Marks)				Total (Marks)
	L	T	P	Total	SEE		CCA		SEE		CCA		
					Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
3	3	-	-	3	24	60	16	40	-	-	-	-	100

Course Contents:

Unit No	Topics	Total Hours	Weightage (%)
1	Introduction: Database & Database Users. Characteristics of the Database Approach advantages of using DBMS. Data Models, Schemas & Instances. DBMS Architecture & Data Independence. System Architecture for DBMS and Data Dictionary, Database Users Data Base languages & Interfaces. Relational Data Model Concepts and Constraints. SQL - A Relational Database Language. Data Definition commands, View and Queries, transaction commands, Specifying Constraints & Indexes in SQL.	10	15
2	Relational DATABASE: Function Dependencies & Normalization for Relational Databases. Informal design guidelines for relation schemas, Functional Dependencies. Normal forms based on primary keys (1NF, 2NF, 3NF & BCNF). Lossless join & Dependency preserving decomposition. Multivalued dependencies, join dependencies (4NF & 5NF), Denormalization.	08	20
3	Transaction processing, concurrency and Recovery: Basic concept; ACID properties; transaction state; implementation of atomicity and durability; concurrent executions; Serial and Serializable Schedules, Locking System: Two Phase Locking, Concurrency Control by Timestamps, Serializability and Recoverability, The Dirty-Data Problem, Managing Rollbacks Using Locking, Logical Logging, Recovery From Logical Logs, ARIES (Algorithm for Recovery and Isolation Exploiting Semantics).	10	20
4	Query Processing and Optimization: Architecture of Query Execution Engines, Disk Access, Aggregation and Duplicate Removal, Sorting and Hashing, Binary Matching Operations (Join Algorithms), Execution of complex query plans, Nested Relations, Additional Techniques for performance improvement, Query Evaluation Techniques for Large Databases, Basic Query Optimization.	10	25
5	Advancement in Databases: Study of Hadoop Distributed File System; HIVE - Data warehousing application built on top of Hadoop, MapReduce-It is a patented software framework introduced by Google in 2004 to support distributed computing on large	8	10

	data sets on clusters of computers; Dynamo – It is a highly available, proprietary key-value structured storage system or a distributed data store; Eventual Consistency Model for Distributed Systems.		
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Reference Books:

1. J. D. Ullman, “Database System: The Complete Book” , Pearson, 1st Edition, 2003.
2. Korth Silberschatz and Sudarshan, “Database System Concepts”, Tata McGraw Hill, 6th Edition, 2011.
3. Richardo Baeza –Yates, Berthier Ribiero-Neto “Modern Information Retrieval “ Addison –Wesley.
4. Christopher D. Manning “Introduction to Information Retrieval” Cambridge University Press, 2008.
5. R. Elmasri, and S. Navathe, “Fundamentals of Database Systems”, Benjamin Cummings, Pearson, 6th Edition, 2010
6. C J Van Rijsbergen “Information Retrieval”, An online book by C J Van Rijsbergen, University of Glasgow.

Course Learning Outcomes (CLO):

Course Outcomes	Description	Bloom’s Taxonomy Level
COL1	Understand foundation of RDBMS theory, internal functioning of a typical RDBMS	Understanding (2) Applying (3)
COL2	Design and implement algorithms for various relational operators such as join, group by etc.	Applying (3)
COL3	Analyze and understand latest trends of RDBMS.	Applying (3)
COL4	Understand and discuss current issues and research in searching	Applying (3)
COL5		Applying (3)

Mapping of CLO with PO and PSO

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes(PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CLO1	H	M	M		M											
CLO2	H	M			M							L				
CLO3	H	M	M		M											
CLO4	M	M	M		M							L				
CLO5	M	M										L				

H: High, M: Medium, L: Low