



# SWARNANDHRA

## COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

Accredited by National Board of Accreditation, AICTE, New Delhi, Accredited by  
NAAC with 'A' Grade – 3.32 CGPA, Recognized under 2(f) & 12(B) of UGC Act 1956,  
Approved by AICTE, New Delhi, Permanent Affiliation to JNTUK, Kakinada  
Seetharampuram, W.G.DT., Narsapur-534280, (Andhra Pradesh)

### DEPARTMENT OF INFORMATION TECHNOLOGY

Course Code	Course Title	Semester	Branch	Contact Periods /Week	Academic Year	Date of commencement
20IT4T03	DATA BASE MANAGEMENT SYSTEMS	IV	CSE & CS	6	2023-2024	03-01-2024

#### **COURSE OUTCOMES**

1	Explain the basic concepts of database management system and design an Entity-Relationship (E-R) model and convert E-R model to relational model.
2	Construct database using Relational algebra and SQL.
3	Apply Normalization techniques to normalize the database.
4	Discuss transaction management using different concurrency control protocols and recovery algorithms.
5	Illustrate different file organization and indexing methods.

UNIT	Out Comes / Bloom's Level	Topics No.	Topics/ Activity	Text Book/ Ref	Contact Hour	Delivery Method
I	CO – 1		<b>Introduction:</b>			Chalk & Board  Power point presentations  Assignment  Test
		1.1	Database System Applications,	T2	1	
		1.2	Purpose of Database Systems.	T2	1	
		1.3	View of Data - Data Abstraction, Instances and Schemas.	T2	1	
		1.4	Data Models, Database Languages	T2	1	
		1.5	Database Architecture, Database Users and Administrators	T2	1	
			<b>Introduction to Database Design:</b>			
		1.6	Database Design and ER Diagrams	T2	1	
		1.7	Entities, Attributes and Entity sets	T2	1	
		1.8	Relationships and Relationship sets	T2	1	
		1.9	Additional features of ER Model, Conceptual Design with the ER Model	T1	1	
			<b>Relational Model:</b>			
		1.10	Introduction to the Relational Model - Integrity Constraints over Relations.	T1	1	
		1.11	Enforcing Integrity constraints, querying relational data	T1	1	
		Content beyond syllabus		1.12	Logical data base Design, Views.	
		1.13	Distributed Databases: Architecture	T1	1	
					<b>Total</b>	<b>13</b>
II	CO – 2		<b>Relational Algebra:</b>			Chalk & Board
		2.1	Relational Algebra -	T1	1	
		2.2	Selection and Projection	T1	1	
		2.3	Set operations, Renaming, Joins, Division.	T1	1	
			<b>Concurrency:</b>			
		2.4	Form of Basic SQL Query	T1	1	





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		2.5	Examples of Basic SQL Queries, UNION	T1	1	Power point presentations
		2.6	INTERSECT, and EXCEPT	T1	1	
		2.7	Introduction to Nested Queries, Correlated Nested Queries	T1	1	
		2.8	Set Comparison Operators, Aggregate Operators	T1	1	Assignment
		2.9	NULL values - Comparison using Null values - Logical connectives - AND	T1	1	Test
		2.10	OR and NOT - Outer Joins	T1	1	
		2.11	Disallowing NULL values, Triggers	T1	1	
Content beyond syllabus		2.12	Introduction to PL/SQL	T1,T3	1	
					Total	12
III	CO – 3		SCHEMA REFINEMENT AND NORMAL FORMS:			
		3.1	Introduction to Schema Refinement -	T1	1	Chalk & Board
		3.2	Problems Caused by redundancy	T1	1	
		3.3	Decompositions - Problem related to decomposition	T1	1	
		3.4	Functional Dependencies -	T1	1	
		3.5	Reasoning about FDS	T1	1	
		3.6	Normal Forms - FIRST, SECOND	T1	1	Power point presentations
		3.7	THIRD Normal forms - BCNF - Properties of Decompositions	T1	1	Assignment Test
		3.8	Loss less join Decomposition	T1	1	
		3.9	Dependency preserving Decomposition	T1	1	
		3.10	Multi valued Dependencies - FOURTH Normal Form	T1	1	
		3.11	Join Dependencies, FIFTH Normal form.	T1	1	
Content beyond syllabus		3.12	Non-loss Decomposition	T1,T3	1	
					Total	12
IV	CO – 4		Transaction Management:			
		4.1	The ACID Properties	T1	1	Chalk & Board
		4.2	Transactions and Schedules	T1	1	
		4.3	Concurrent Execution of Transactions-	T1	1	
		4.4	Lock-Based Concurrency Control- 2PL	T1	1	
		4.5	Serializability	T1	1	
		4.6	Recoverability	T1	1	Power point presentations
		4.7	Dealing With Deadlocks	T1	1	
		4.8	Concurrency Control without Locking	T1	1	
			CRASH RECOVERY:			Assignment Test
		4.9	Introduction to ARIES	T1	1	
		4.10	The Log - The Write-Ahead Log Protocol – Checkpoints	T1	1	
		4.11	Recovering from a System Crash(ARIES) - Media Recovery.	T1	1	
Content beyond syllabus		4.12	– Query optimization using Heuristics and Cost Estimation	T1	1	
					Total	12





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V	CO – 5		Overview of Storage and Indexing:			Chalk & Board Power point presentations Assignment Test	
		5.1	Data on External Storage Directory File	T1, R1	1		
		5.2	Organization and Indexing-		1		
		5.3	Clustered Indexes	T1	1		
		5.4	Primary and Secondary Indexes	T1, R1	1		
		5.5	Index data Structures -	T1, R1	1		
		5.6	Hash Based Indexing	T1	1		
		5.7	Tree based Indexing	T1, R1	1		
		5.8	Comparison of File Organizations	T1, R1	1		
			Tree Structured Indexing:				
		5.9	Intuitions for tree indexes	T1, R1	1		
		5.10	Indexed Sequential Access Methods(ISAM),	T1, R1	1		
		5.11	B+ Trees: A Dynamic Index Structure	T1, R1	1		
		5.12	Search, Insert, Delete	T1, R1	1		
Content beyond syllabus		5.13	Queries in IR systems	T1, R1	1		
					Total	13	
					Cumulative Proposed Periods	62	

## Text Books:

S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
1	Raghurama Krishnan, Johannes Gehrke Data base Management Systems - McGraw-Hill Education, 3rd Edition, 2014.
2	A.Silberschatz, H.F. Korth, S.Sudarshan, Data base System Concepts, McGraw Hill, 6 <sup>th</sup> edition, 2016.

## Reference Books:

S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
1	RamezElmasri, Shamkant B, Fundamentals of Database Systems, 7 <sup>th</sup> Edition, Navathe 2016.
2	A.Silberschatz, H.F. Korth, S.Sudarshan, Data base System Concepts, 3 <sup>rd</sup> edition, PHI, 2015

## Web Details:

1	<a href="https://www.javatpoint.com/dbms-sql-operator">https://www.javatpoint.com/dbms-sql-operator</a>
2	<a href="https://www.tutorialspoint.com/dbms/index.htm">https://www.tutorialspoint.com/dbms/index.htm</a>

## TEACHING PLAN

	Name	Signature with Date
i. Faculty	Mr.MNVL Narayana	
ii. Module Coordinator	Dr. RVVSV Prasad	
iii. Programme Coordinator	Dr. RVVSV Prasad	

Principal