



**SARVAJANIK UNIVERSITY**  
**Sarvajanik College of Engineering and Technology**  
**Master of Computer Applications**



**MCA I Semester 1**

**Subject Name:** Relational Database Management System **Subject Code:** MTCA23103

**Type of course:** Professional Core Course

**Prerequisite (if any):**

- Basic knowledge of working with computers

**Rationale:**

Relational Database Management System helps students to learn structured data management, transaction management, Concurrency Control, Normalization, advanced SQL covering all aspects of PL/SQL and preparing learners for developing scalable, high-performance applications in data-driven industries.

**Teaching and Examination Scheme:**

TEACHING SCHEME				Theory Marks		Practical Marks		Total
L	T	P	C	TEE	CAT	TEP	CAP	
3	0	0	3	60	40	-	-	100

**CAT:** Continuous Assessment Theory comprised of CA1 and CA2 **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) **CAP:** Regular submission of Lab work/Quality of work submitted/Active participation in lab sessions/viva on practical skills learned in course





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**Content:**

Sr. No.	Topics	Teaching Hrs.	Module Weightage
1.	<b>Introduction to Database System</b> Introduction (Basic Concepts: Data, Database, Database systems, Database Management Systems), Characteristics of Database Approach, Advantages of using the DBMS approach. Data Models and its type, Schemas, Instances, the three schema architectures and data independence, Database Languages and interfaces, Database System environment, Centralized and client / Server Architecture for DBMS, Classifications of Database Management Systems. Types of Relational Databases and Codd 12 Rules Introduction to NOSQL	7	14%
2.	<b>Entity Relationship Concepts</b> Design Phases of database design, Entity types, Entity Sets, Attributes and keys, Relationship Types, Relationship sets, Roles and structural constraints, Weak entity Types, Entity Relationship Diagram Naming conventions Design issues, Relationship types of degree higher than 2. Subclasses, Super Classes, Inheritance Specialization and Generalization. Relational Database design by ER and EER to Relational Mapping, Mapping EER model constructs to Relations	8	19%
3.	<b>Relational Model concepts</b> Relational Model concepts, Relational, Model constraints and Relational Database Schemas. <b>The Relational Algebra</b> Unary Relational Operations: SELECT and PROJECT Relational Algebra Operations from SET Theory Binary Relational Operations: JOIN and DIVISION Additional Relational Operations. Examples of Queries in Relational Algebra.	7	14%
4.	<b>Database Design</b>	8	19%





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	<p>Informal Design Guidelines for Relational Schema, Functional Dependencies, Normal Forms based on Primary keys, General Definitions of 1NF, 2NF and 3NF, Boyce- Codd Normal Forms (BCNF)  Multi-valued Dependency and Fourth Normal Form  Fifth Normal Form</p>		
5.	<p><b>Transaction processing</b>  Introduction to Transaction Processing Concepts:  Introduction to Transaction Processing, Transaction and System concepts,  Desirable properties of Transactions, characterizing Schedules based on recoverability and Serializability.</p>	7	14%
6.	<p><b>SQL Concepts</b>  Basics of SQL, DDL,DML,DCL, structure –creation, alteration, defining constraints – Primary key, foreign key, unique, not null, check, IN operator, Functions - aggregate functions, Built-in functions –numeric, date, string functions, set operations, sub-queries, correlated sub-queries, Use of group by, having, order by, join and its types, Exist, Any, All, view and its types.  Transaction control commands – Commit, Rollback, Savepoint.</p>	8	20%

**Suggested Specification table with Marks (Theory):**

% Distribution of Marks					
R Level	U Level	A Level	N Level	E Level	C Level
20	20	10	15	15	20

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

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.





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**Reference Text Books:**

Sr. No.	Title of book /article	Author(s)	Publisher and details like ISBN	Year of publication	Publication Edition
1	Fundamental of Database Systems	RamezElmasri, Shamkant B. Navathe	Pearson Education ISBN-10: 0-13-397077-9 ISBN-13: 978-0-13-397077-7	2016	7th Edition
2	Database System Concepts	Abraham Silberschat, Henry F. Korth, S. Sudarshan	McGraw Hill Education ISBN-10: 9332901384 ISBN-13: 978-9332901384	2013	6th Edition

**Course Outcome:**

Sr. No.	CO Statement After learning this subject, students will be able to	Marks % Weightage
CO-1	Understand the basics concepts of the relational database management system, database schema and relational database design	14
CO-2	Understand the concept of Entity model and mapping of ER model to Relational Model	19
CO-3	Analyse Relational Model concepts	14
CO-4	Understand the need for improving the database design using normalization	19
CO-5	Understand the fundamentals of Transaction Processing concepts	14
CO-6	Create database tables, populate the databases and formulate SQL queries on data and develop PL/SQL Blocks	20





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**Mapping with POs:**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PO 13
CO-1	3	3	0	0	0	0	3	0	0	0	0	3	0
CO-2	3	3	0	0	3	0	3	0	0	0	0	3	0
CO-3	3	3	0	0	0	0	3	0	0	0	0	3	0
CO-4	3	3	0	0	3	0	3	0	0	0	0	3	0
CO-5	3	3	0	0	0	0	3	0	0	0	0	3	0
CO-6	3	3	0	0	3	0	3	0	0	0	0	3	0
Rationale*													

**Rationale\*:** Explaining why it is matching this particular program outcome

**List of Open Source/learning website:**

<https://docs.oracle.com/en/database/index.html>

<https://www.w3schools.com/sql/>

**List of Open-Source Software:** NA

**Major Equipment Needed:** NA

