## NARSIMHA REDDY ENGINEERING COLLEGE
### UGC AUTONOMOUS INSTITUTION
Maisammaguda (V), Kompally - 500100, Secunderabad, Telangana State, India

Accredited by NBA & NAAC with 'A' Grade
Approved by AICTE
Permanently affiliated to JNTUH

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## 3. SYLLABUS

### DATABASE MANAGEMENT SYSTEM

**B Tech III Year I Sem**

| Course Code | Category | Hours/Week | | | Credits | Maximum Marks | | |
|---|---|---|---|---|---|---|---|---|
| | | L | T | P | | CIE | SEE | TOTAL |
| **23CY502** | **Professional Core** | **3** | **0** | **0** | **3** | **40** | **60** | **100** |
| **Contact Classes:48** | **Tutorial Classes: Nil** | **Practical Classes:-** | | | **TotalClasses:48** | | | |

**Pre-requisites: A course on "Data Structures".**

**Course Objectives:**

- To understand the basic concepts of database systems and ER Model.
- To analyze and apply the concepts relational model and normalization.
- To master the basics of SQL and construct queries using SQL.
- To understand the basics of transaction processing and concurrency control.
- To know the concepts of database storage structures and access techniques.

**Course Outcomes:**

- Gain knowledge of fundamentals of DBMS and ER Model.
- Able to apply the knowledge of relational model and normalization.
- Apply the basics of SQL for retrieval and management of data.
- Be acquainted with the basics of transaction processing and concurrency control.
- Gain knowledge on database storage structures and access techniques.

## UNIT–I

**Database System Applications:** A Historical Perspective, File Systems versus a DBMS, the Data Model, Levels of Abstraction in a DBMS, Data Independence, Structure of a DBMS
**Introduction to Database Design:** Database Design and ER Diagrams, Entities, Attributes, and Entity Sets, Relationships and Relationship Sets, Additional Features of the ER Model, Conceptual Design With the ER Model

## UNIT–II

**Introduction to the Relational Model:** Integrity constraint over relations, enforcing integrity constraints, querying relational data, logical database design, introduction to views, destroying/altering tables and views. Relational Algebra, Tuple relational Calculus, Domain relational calculus.

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## UNIT–III

**SQL:** QUERIES,CONSTRAINTS,TRIGGERS: form of basic SQL query, UNION, INTERSECT, and EXCEPT, Nested Queries, aggregation operators, NULL values, complex integrity constraints in SQL, triggers and active databases.

**Schema Refinement:** Problems caused by redundancy, decompositions, problems related to decomposition, reasoning about functional dependencies, First, Second, Third normal forms, BCNF, lossless join decomposition, multi valued dependencies, Fourth normal form, Fifth normal form.

## UNIT–IV

Transaction Concept, Transaction State, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Testing for serializability, Lock Based Protocols, Timestamp Based Protocols, Validation- Based Protocols, Multiple Granularity, Recovery and Atomicity, Log–Based Recovery, Recovery with Concurrent Transactions.

## UNIT–V

Data on External Storage, File Organization and Indexing, Cluster Indexes, Primary and Secondary Indexes, Index data Structures, Hash Based Indexing, Tree based Indexing, Comparison of File Organizations, Indexes- Intuitions for tree Indexes, Indexed Sequential Access Methods (ISAM), B+ Trees: A Dynamic Index Structure.

### TEXT BOOKS :

1. Database System Concepts, Silberschatz,Korth,McGrawhill,Vedition.3rd Edition.
2. Database Management Systems, Raghurama Krishnan, Johannes Gehrke, Tata Mc Graw Hill.

### REFERENCEBOOKS:

1. Database Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7thEdition.
2. Fundamentals of Database Systems, Elmasri Navrate, Pearson Education.
3. Introduction to Database Systems, C.J.Date, Pearson Education.
4. Oracle for Professionals, The X Team, S.Shah and V.Shah, SPD.
5. Database Systems Using Oracle: A Simplified guide to SQL and PL/SQL, Shah, PHI.
6. Fundamentals of Database Management Systems, M.L.Gillenson, Wiley Student Edition.