

**NIRMA UNIVERSITY**  
**SCHOOL OF TECHNOLOGY, INSTITUTE OF TECHNOLOGY**  
**Proposed Teaching & Examination Scheme**  
**Master of Computer Application (2- years programme)**  
**Semester-I**

L	T	P	C
3	0	2	4

<b>Course Code</b>	<b>3MCA104</b>
<b>Course Title</b>	<b>Database Management System</b>

### Course Outcomes (COs):

At the end of the course, students will be able to -

1. describe fundamental elements and various models of database system
2. devise E-R models to represents simple database application scenario
3. apply relational database concepts to design and create databases
4. implement queries and procedures to use database system effectively along with transaction management

### Syllabus:

### Teaching hours:

<b>Unit I</b> <b>Database Concepts:</b> Database-system applications, purpose of database systems, view of data, database languages, types of database models, relational databases, database design, database architecture, database users and administrators.	<b>4</b>
<b>Unit II</b> <b>Relational Model:</b> Structure of relational databases, database schema, keys, schema diagrams, relational query languages, relational operations.	<b>5</b>
<b>Unit III</b> <b>Structured Query Language:</b> Overview of the SQL query language, SQL data definition, basic structure of SQL queries, basic operations, set operations, null values, aggregate functions, nested subqueries, modification of the database, join expressions, views, transactions, integrity constraints, SQL data types and schemas.	<b>8</b>
<b>Unit IV</b> <b>Database Design and E-R Model:</b> Overview of the design process, the entity-relationship model, constraints, entity-relationship diagrams and its design issues, extended E-R features, normalization of database tables, normalization and database design, higher level normal forms, de-normalization.	<b>8</b>
<b>Unit V</b> <b>Transactions and Concurrency Control:</b> Transaction concept, simple transaction model, transaction atomicity and durability, serializability, lock based protocols, deadlock, time stamp based protocols.	<b>6</b>

**Unit VI** 10  
**PL/SQL:** Basic concepts, types, control structures, expressions and operators, SQL within PL/SQL, built-in SQL functions, cursors, error handling, procedures, functions, and triggers.

**Unit VII** 4  
**Indexing and Hashing:** Introduction to indexing and hashing.

### **Self-Study:**

The self-study contents will be declared at the commencement of semester. Around 10% of the questions will be asked from self-study contents.

### **Laboratory Work:**

Laboratory work will be based on SQL and PL/SQL with minimum 8 experiments to be incorporated that will be considered for evaluation.

### **Suggested Readings<sup>^</sup>:**

1. Silberschatz, Korth and Sudarshan,, Database System Concepts, McGraw Hill.
2. Rob & Coronel, Database Systems Design, Implementation & management, Thomson.
3. Scott Urman, Oracle 9i: PL/SQL Programming, Oracle press.
4. George Koch & Kevin Loney, Oracle 9i Complete reference, McGraw Hill.
5. Martin Gruber, Mastering SQL, B.P.B.
6. C.J date, An introduction to database systems, Addison Welsley.

L=Lecture, T=Tutorial, P=Practical, C=Credit

<sup>^</sup>this is not an exhaustive list

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