II YEAR I SEMESTER

S.No.	Course Code	Course Title	C	L	T	P	Credits
1	23EC301	Digital Electronics	ES	3	0	0	3
2	23CS302	Data Structures	PC	3	0	0	3
3	23CS303	Discrete Mathematics	PC	3	0	0	3
4	23CS304	Computer Organization and Architecture	PC	3	0	0	3
5	23CS305	Object Oriented Programming through Java	PC	3	0	0	3
6	23CS306	Data Structures Lab	PC	0	0	3	1.5
7	23CS307	Object Oriented Programming through Java Lab	PC	0	0	3	1.5
8	23CS308	Data visualization- Power BI	SC	0	0	2	1
9	23CS309	Node JS	SC	0	0	2	1
10	*MC3001	Gender Sensitization Lab	MC	0	0	2	0
Total				**15**	**0**	**12**	**20**

II YEAR II SEMESTER

S.No.	Course Code	Course Title	C	L	T	P	Credits
1	23MA401	Computer Oriented Statistical Methods	BS	3	1	0	4
2	23MB402	Business Economics & Financial Analysis	HS	3	0	0	3
3	23CS403	Operating Systems	PC	3	0	0	3
4	23CS404	Database Management Systems	PC	3	0	0	3
5	23CS405	Software Engineering	PC	3	0	0	3
6	23CS406	Operating Systems Lab	PC	0	0	2	1
7	23CS407	Database Management Systems Lab	PC	0	0	2	1
8	23CS408	Real-time Research Project/Societal Related Project	PW	0	0	4	2
9	*MC4001	Constitution of India	MC	3	0	0	0
Total				**18**	**1**	**8**	**20**

DATABASE MANAGEMENT SYSTEMS

B Tech II Year II Sem

Course Code	Category	Hours/ Week			Credits	Maximum Marks		
		L	T	P		CIE	SEE	TOTAL
23CS404	Professional Core	3	0	0	3	40	60	100
Contact Classes: 48	Tutorial Classes: Nil	Practical Classes: -				Total Classes:48		

Prerequisites: A course on "Data Structures".

Course Objectives:

1. To understand the basic concepts and the applications of database systems.
2. To master the basics of SQL and construct queries using SQL.
3. Topics include data models, database design, relational model, relational algebra, transaction control, concurrency control, storage structures and access techniques.

Course Outcomes:

1. Gain knowledge of fundamentals of DBMS, database design and normal forms
2. Master the basics of SQL for retrieval and management of data.
3. Be acquainted with the basics of transaction processing and concurrencycontrol.
4. Familiarity with 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.

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, multivalued 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, McGraw hill, V edition.3rdEdition
2. Database Management Systems, Raghurama Krishnan, Johannes Gehrke,Tata Mc Graw Hill

REFERENCE BOOKS:

1. Database Systems design, Implementation, and Management, Peter Rob &Carlos Coronel 7th Edition.
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, WileyStudent Edition.

DATABASE MANAGEMENT SYSTEMS LAB

B Tech II Year II Sem

Course Code	Category	Hours/ Week			Credits	Maximum Marks		
		L	T	P		CIE	SEE	TOTAL
23CS407	Professional Core	0	0	2	1	40	60	100
Contact Classes: -	Tutorial Classes: Nil	Practical Classes:48				Total Classes:48		

Co-requisites: "Database Management Systems"

Course Objectives:

1. Introduce ER data model, database design and normalization
2. Learn SQL basics for data definition and data manipulation

Course Outcomes:

1. Design database schema for a given application and apply normalization
2. Acquire skills in using SQL commands for data definition and data manipulation.
3. Develop solutions for database applications using procedures, cursors andtriggers

List of Experiments:

1. Concept design with E-R Model
2. Relational Model
3. Normalization
4. Practicing DDL commands
5. Practicing DML commands
6. A. Querying (using ANY, ALL, UNION, INTERSECT, JOIN, Constraints etc.)
   B. Nested, Correlated subqueries
7. Queries using Aggregate functions, GROUP BY, HAVING and Creation anddropping of Views.
8. Triggers (Creation of insert trigger, delete trigger, update trigger)
9. Procedures
10. Usage of Cursors

TEXT BOOKS:

1. Database Management Systems, Raghurama Krishnan, Johannes Gehrke,Tata Mc Graw Hill, 3rd Edition
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