2IT03: DATABASE MANAGEMENT SYSTEM
CREDITS – 4 (LTP:3,0,1)

Course Objective:
Understand basic database concepts including the structure and operation of various data models.

Teaching and Assessment Scheme:

Teaching Scheme (Hours per week)			Credits	Assessment Scheme				Total Marks
				Theory		Practical		
L	T	P	C	ESE	CE	ESE	CE	
3	0	2	4	60	40	20	30	150

Course Contents:

Unit No.	Topics	Teaching Hours
1	**Introductory concepts of DBMS:** Purpose of database system, View of data, Database Languages, Relational Databases, Database Design, Storage management, Transaction management, Database administrator, Database users, Database Architecture, Specialty Database, History of Database Systems.	04
2	**Relational Model:** Structure of relational databases, Database Schema, Keys, Schema Diagrams, Relational algebra operators, relational algebra queries.	04
3	**Introduction to SQL:** Overview of SQL Query Language, SQL Data Definition, Basic structure of SQL Queries, Additional Basic Operations, Set operations, Null values, Aggregate functions, nested sub-queries, Modification of the Database.	03
4	**Entity-Relationship Model:** Design process, E-R Model, constraints, Removing redundant attributes in Entity Sets, E-R diagrams, reduction of E-R database schema to Relational schema, Design issues, Extended E-R features.	06
5	**Relational Database Design:** Features of good relational designs, Dependency preservation, Loss-less decomposition FD-Functional Dependency , closure of FD set, closure of attributes sets, irreducible set of FD, Decomposition using FD, Normalization – 1Nf, 2NF, 3NF,BCNF, Multivalve dependency, 4NF, Join dependency and 5NF,Database design process, Modeling Temporal data.	06
6	**Transaction Management:** Transactions: Transaction concepts, transaction model, storage structure, properties of transactions, Transaction Atomicity and Durability, Transaction Isolation, serializability of transactions, testing for serializability, Transaction Isolation and Atomicity, Transaction Isolation level, Concurrency Control: Lock based protocols, deadlock handling, Multiple granularity, Timestamp	12

Unit No.	Topics	Teaching Hours
	protocols, Recovery System :Types of failure, Storage, Recovery and atomicity, Recovery Algorithms.	
7	**Query Processing & Optimization:** Overview, measures of query cost, selection operation, sorting, join, other operations, evaluation of expressions. Transformation of relational expressions, estimating statistics of expression results, evaluation plans, materialized views.	10
	Total	**45**

List of References:

1. Abraham Silberschatz, Henry Korth, S. Sudarshan, "*Database System Concepts*", Sixth Edition, McGraw HILL publication-2011.
2. C. J. Date, A. Kanan, S. Swaminathan, "*An introduction to Database Systems*", Eighth Edition, Pearson publication-2006.
3. Ivan Bayross, "*SQL, PL/SQL*", Fourth Revised Edition, BPB Publication-2017.
4. Nilesh shah, "*Database System using Oracle*", Second Edition, PHI Publication-2004.
5. Shamkant B. Navathe ,"*Fundamentals of Database Systems*", Pearson,7th edition-2016.

Course Outcomes (COs):

At the end of this course students will be able to …

1. Evaluate and design business information problems.
2. Develop and design various data models like ER-Model and Relational Model.
3. Interpret concept of normalization in database design.
4. Use database for concurrent transactions.
5. Interpret concepts like query processing and query optimization.
6. Experiment various commands in SQL.