Course Title : Database Systems			
Course Code: P18CSO652	**Semester : 6**	**L:T:P - 3 : 0 : 0**	**Credits: 3**
Contact Period : Lecture :52 Hr, Exam: 3Hr		**Weightage :CIE:50% SEE:50%**	

Course Content

Unit-1

Introduction : An example: Characteristics of Database approach; Advantages of using DBMS approach; A brief history of database applications; Data models, schemas and instances; Three-schema architecture and data independence; Database languages and interfaces;

ENTITY-RELATIONSHIP MODEL: Using High-Level Conceptual Data Models for Database Design; An Example Database Application; Entity Types, Entity Sets, Attributes and Keys; Relationship types, Relationship Sets, Roles and Structural Constraints; Weak Entity Types;

Self study component: Refining the ER Design; ER Diagrams, Naming Conventions and Design Issues.

10 Hours

Unit-2

RELATIONAL MODEL AND RELATIONAL ALGEBRA: Relational Model Concepts; Relational Model Constraints and Relational Database Schemas; Update Operations, Transactions and dealing with constraint violations; Unary Relational Operations: SELECT and PROJECT; Relational Algebra Operations from Set Theory; Binary Relational Operations : JOIN and DIVISION.

Self study component: Additional Relational Operations; Examples of Queries in Relational Algebra.

10 Hours

Unit-3

STRUCTURED QUERY LANGAUGE : SQL Data Definition and Data Types; Specifying basic constraints in SQL; Basic Retrieval Queries in SQL, INSERT, DELETE, and UPDATE Statements in SQL, More complex SQL Retrieval Queries, Specifying constraints as Assertion and Actions as Trigger; Views (Virtual Tables) in SQL;

Self study component: Additional features of SQL; Schema Change Statements in SQL.

12 Hours

Unit-4

DATABASE DESIGN: Informal Design Guidelines for Relation Schemas; Functional Dependencies; Normal Forms Based on Primary Keys; General Definitions of Second and Third Normal Forms; Boyce-Codd Normal Form.

Self study component : Multi valued Dependencies and Fourth Normal Form.

10 Hours

Unit-5

TRANSACTION PROCESSING CONCEPTS: Introduction to Transaction processing; Transactions and System concepts; Desirable properties of transactions; Characterizing Schedules based on Serializability. Concurrency control: Two-phase locking techniques for concurrency control;

Self study component: concurrency control based on timestamp ordering.

10 Hours

Text Book:

1. Fundamentals of Database Systems – Elmasri and Navathe, 6th Edition, Addison-Wesley, 2011

Reference Books:

1. **Data Base System Concepts** – Silberschatz, Korth and Sudharshan, 5th Edition, Mc-GrawHill, 2006.
2. **An Introduction to Database Systems** – C.J. Date, A. Kannan, S.Swamynatham, 8th Edition, Pearson Education, 2006.
3. **Database Management Systems** – Raghu Ramakrishnan and Johannes Gehrke – 3rd Edition, McGraw-Hill, 2003.

Course outcomes : At the end of the course the student should be able to

1. **Design** an ER model for a given example from real world description.
2. **Design** relational models for a given application using schema definition and constraints.
3. **Develop** complex queries using SQL to retrieve the required information from database.
4. **Apply** suitable normal forms to normalize the given database
5. **Determine** the roles of concurrency control in database design.

CO-PO Mapping

Semester : 6		Course code :P18CSO652						Title : Database Systems							
CO	**Statement**	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS O2**
CO1	**Design** an ER model for a given example from real world description	3	3	3	1					2		2	2		3
CO2	**Design** relational models for a given application using schema definition and constraints.	3	2	3	1					2		2	2		3
CO3	**Develop** complex queries using SQL to retrieve the required information from database	3	3	3		2				2		2			3
CO4	**Apply** suitable normal forms to normalize the given database	2	2	2						2		2			2
CO5	**Determine** the roles of concurrency control in database design.	2	1	1											2
		2.6	**2.2**	**2.4**	**1**	**2**				**2**		**2**	**2**		2