



Course Title : Database Management System(FC-II)			
Course Code: P18CS46	Semester : 4	L:T:P: H - 2 : 2 : 0 : 4	Credits: 3
Contact Period : Lecture :52 Hrs, Exam: 3Hrs		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

**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; Refining the ER Design; ER Diagrams,

**Self study component :** Naming Conventions and Design Issues; Relationship types of degree higher than two.

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;

**Self study component :** Binary Relational Operations : JOIN and DIVISION.

10 Hours

#### Unit-3

Additional Relational Operations; Examples of Queries in Relational Algebra; Relational Database Design Using ER- to-Relational Mapping

**Structured query language ::** SQL Data Definition and Data Types; Specifying basic constraints in SQL; Basic Retrieval Queries in SQL, INSERT,

**Self study component :** DELETE, and UPDATE Statements in SQL.

12 Hours

#### Unit-4

More complex SQL Retrieval Queries, Specifying constraints as Assertion and Actions as Trigger; Views (Virtual Tables) in SQL;

**Database design:** Informal Design Guidelines for Relation Schemas; Functional Dependencies.

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

10 Hours

#### Unit – 5

Normal Forms Based on Primary Keys; General Definitions of Second and Third Normal Forms; Boyce-Codd Normal Form; Multi valued Dependencies and Fourth Normal Form; Join Dependencies and Fifth Normal Form. Transaction processing concepts: Introduction to Transaction processing; Transactions and System concepts; Desirable properties of transactions

**Self study component:** Concurrency control: Two-phase locking techniques for concurrency control.

10 Hours



**Text Books:**

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

**Reference Books:**

1. **DataBase System Concepts** – Silberschatz, Korth and Sudharshan, 5<sup>th</sup> Edition, McGraw-Hill, 2006.
2. **An Introduction to Database Systems** – C.J. Date, A. Kannan, S. Swamynatham, 8<sup>th</sup> Ed., Pearson Education, 2006.
3. **Database Management Systems** – Raghu Ramakrishnan and Johannes Gehrke – 3<sup>rd</sup> 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**

Course code : P18CS46				Title : Database Management System (FC-II)											
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
CO 502.1	Design an ER model for a given example from real world description	3	3	3	1					2		2	2		3
CO 502.2	Design relational models for a given application using schema definition and constraints.	3	2	3	1					2		2	2		3
CO 502.3	Develop complex queries using SQL to retrieve the required information from database	3	3	3		2				2		2			3
CO 502.4	Apply suitable normal forms to normalize the given database	2	2	2						2		2			2
CO 502.5	Determine the roles of con-currency control in database design.	2	1	1											2
C502, C302		2.6	2.2	2.4	1	2				2			2	2	2.6