

First Year B.C.A. (Under Science) Semester II

Course Code: BCA 204

Course Title: Relational Database Management System Total Contact Hours: 48 hrs.

Total Credits: 04

Total Marks: 100(60 Lectures)

Teaching Scheme: Theory- 05 Lect./ Week

Course Objectives: The objective of this course is to study the basics DBMS and to learn SQL.

UNIT NO.	DESCRIPTION	No. of LECTURES
UNIT 1	1. File Organization 1.1. Introduction 1.2. Physical / logical files 1.3. Record organization (fixed, variable length) 1.4. Types of file organization(heap, sorted, indexed,hashed)	04
UNIT 2	2. Introduction of DBMS 2.1. Overview 2.2. File system Vs. DBMS, 2.3. Describing & storing data (Data models - relational, hierarchical, network) 2.4. Levels of abstraction 2.5. Data independence 2.6. Structure of DBMS 2.7. Users of DBMS 2.8. Advantages of DBMS	06
UNIT 3	3. Conceptual Design (E-R model) 3.1. Overview of DB design 3.2. ER data model (entities, attributes, entity sets, relations, relationship sets) 3.3. Additional constraints (key constraints, participation constraints, weak entities, aggregation / generalization) 3.4. Case studies	10
UNIT 4	4. Structure of Relational Databases 4.1. Concepts of a table, a row, a relation, a tuple and a key in a relational database 4.2. Conversion of ER to Relational model 4.3. Integrity constraints (primary key, referential integrity, Null constraint, unique constraint, check constraint)	05
UNIT 5	5. SQL 5.1. Introduction 5.2. DDL commands (create, drop, alter) with examples 5.3. Basic structure SQL query 5.4. Set operations 5.5. Aggregate functions 5.6. Null values 5.7. Nested Sub-queries	20

	5.8. Modifications to Database (insert, delete, update) 5.9. SQL mechanisms for joining relations (inner joins, outer joins and their types) 5.10. Examples on SQL (case studies)	
UNIT 6	6. Relational Database Design 6.1. Pitfalls in Relational-Database Design (undesirable properties of a RDB design like repetition, inability to represent certain information) 6.2. Functional dependencies (Basic concepts, Closure of set of functional dependencies, Closure of an Attribute set) 6.3. Concept of a Super Key and a primary key (Algorithm to derive a Primary Key for a relation) 6.4. Concept of Decomposition 6.5. Desirable Properties of Decomposition (Lossless join and Dependency preservation) 6.6. Concept of Normalization 6.7. Normal forms (only definitions) 1NF, 2NF, 3NF, BCNF 6.8. Examples on Normalization	15

Reference Books:

1. Database System Concepts, Henry F. Korth, Abraham Silberschatz, S. Sudarshan, Tata McGraw-Hill Education
2. Database Management Systems, Raghu Ramakrishnan and Johannes Gehrke, McGraw-Hill Science/Engineering/Math; 3 Edition
3. Database Systems, Shamkant B. Navathe, Ramez Elmasri, Pearson Higher Education