Government PG College, Ambala Cantt
Course File(Session 2023-24)
Name of Professor: Dr. Poonam Dhiman
Class: BCA-II/4th Semester/ SECTION: A and B
Subject code and Name: BCA – 244 RELATIONAL DATABASE MANAGEMENT SYSTEM

SYLLABUS

Maximum Marks: 100	**External: 80**
Minimum Pass Marks: 35	**Internal: 20**

Time: 3 hours

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT – I
Relational Model Concepts, Codd's Rules for Relational Model, Relational Algebra:- Selection and Projection, Set Operation, Renaming, Join and Division, Relational Calculus: Tuple Relational Calculus and Domain Relational Calculus.

UNIT – II
Functional Dependencies and Normalization:-Purpose, Data Redundancy and Update Anomalies, Functional Dependencies:-Full Functional Dependencies and Transitive Functional Dependencies, Characteristics of Functional Dependencies, Decomposition and Normal Forms (1NF, 2NF, 3NF & BCNF).

UNIT – III
SQL: Data Definition and data types, SQL Operators, Specifying Constraints in SQL, Basic DDL, DML and DCL commands in SQL, Simple Queries, Nested Queries, Tables, Views, Indexes, Aggregate Functions, Clauses

UNIT – IV
PL/SQL architecture, PL/SQL and SQL*Plus, PL/SQL Basics, Advantages of PL/SQL, The Generic PL/SQL Block: PL/SQL Execution Environment, PL/SQL Character set and Data Types, Control Structure in PL/SQL, Cursors in PL/SQL, Triggers in PL/SQL, Programming using PL/SQL.

TEXT BOOKS:

1. Elmasri & Navathe, "Fundamentals of Database Systems", 5thedition, Pearson Education.
2. Ivan Bayross, "SQL, PL/SQL-The Programming Language of ORACLE", BPB Publications 3rd edition.

REFERENCE BOOKS:

1. C. J. Date, "An Introduction to Database Systems", 8th edition,Addison Wesley N. Delhi.
2. Oracle 8 –PL/SQL programming –Scott Urman
3. A Guide to the SQL Standard, Data,C. and Darwen, H.3rd Edition,Reading, MA:1994, Addison-Wesley Publications, New Delhi.

COURSE OBJECTIVES

The course objectives outlined are as follows:

- **Understand Relational Database Systems Management Systems:** Understand Relational Database System Applications, Purpose of Relational Database Systems, Applying the Relational Model Concepts, Codd's Rules for Relational Model, Compute the Relational Algebra

- **Applying the Concept of Normalization:** To develop conceptual understanding of database management system, to understand how a real world problem can be mapped to schemas , to solve different industry level problems & to learn its applications

- **Demonstrating SQL Language:** Enable students to Understand Data base design , Bascs of SQL and data types , Understand Beyond DDL, DML, DCL and TCL, Demonstrate Additional features of SQL functions, operators, and views

- **Understand Basics PL/SQL:** The RDBMS typically provides data dictionaries and metadata collections that are useful in data handling. These programmatically support well-defined data structures and relationships. Data storage management is a common capability of the RDBMS, and this has come to be defined by data objects that range from binary large object -- or blob -- strings to stored procedures

The objective of the course is to present an introduction to database management systems, with an emphasis on how to organize, maintain and retrieve - efficiently, and effectively - information from a RDBMS.

COURSE OUTCOMES

After the successful completion of the course, students will be able:

- To understand the different issues involved in the design and implementation of a database system. To study the physical and logical database designs, database modeling, relational, hierarchical, and network models, relational algebra.

- *Apply* relational database theory and be able to *describe* relational algebra expression, tuple and domain relation expression from queries. *Recognize* and *identify* the use of normalization and functional dependency.

- Develop a clear understanding of the conceptual frameworks and definitions of specific terms that are integral to the Relational Database Management Systems. Demonstrate an understanding of the elementary & advanced features of DBMS & RDBMS.

- Able to develop structured query language (SQL) queries to create, read, update, and delete relational database data as well as advance knowledge of pl/sql language.

- To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a RDBMS.

Lesson Plan

Week No	Scheduled Dates	Topics to be covered
1	**1-6 January**	Relational Model Concepts, Codd's Rules for Relational model Hierarchical Data Model–Introduction;
2	**8-13 January**	Features, Components, Example, Network Data Model–Introduction, Features, Components, Example, Differences between Hierarchical Data Model and Network Data Model;
3	**15-20 January**	Comparison of Relational Data Model with Hierarchical Data Model and Network Data Model;
4	**22-27 January**	Relational Algebra:-Selection and Projection, Set Operation, Join and Division; Relational Calculus: Tuple Relational Calculus and Domain Relational Calculus;
5	**29-3 February**	Functional Dependencies and Normalization -- Purpose, Data Redundancy, Update Anomalies;
6	**5-10 February**	Partial/Fully Functional Dependencies, Transitive Functional Dependencies;
7	**12-17 February**	Functional Dependencies, Decomposition and Normal Forms (1NF, 2NF, 3NF & BCNF);
8	**19-24 February**	Revision and Practice;
9	**26-2 March**	SQL: Data Definition and data types, Create Table; insert Data, Viewing Data, Filtering Table Data, Sorting data;
10	**4-9 March**	Creating Table from a Table, Destroy table, Update, View, Delete;
11	**11-16 March**	Join, Concatenating data from Table Specifying Constraints in SQL;
12	**18-23 March**	Relations and properties of relation, Basic concept of hierarchal and network data model;
13	**1-6 April**	Revision and Practice;
14	**8-13 April**	PL/SQL-Introduction, Advantages of PL/SQL; The Generic PL/SQL Block: PL/SQL Execution Environment;
15	**15-20 April**	PL/SQL Character Set and Data Types, Declaration and Assignment of Variables; Control Structure in PL/SQL: Conditional Control; Iterative Control, Sequential Control;

| 16 | 22-27 April | Cursors, Triggers; Procedure; Packages, Quiz , Revision and Practice; |