Course Syllabus
Gyanmanjari College of Computer Application
Semester-2 (BCA)

Subject: Relational Database Management System - BCAXX12305

Type of course: Major Core

Prerequisite: Basic knowledge of Relational Database object.

Rationale:

The aim of this course is to get broad understanding of the basic concepts of database management system used for business, scientific and engineering application which stored centralized. The students will develop the skills to develop manage & retrieve data from different perspective using Structured Query Language (SQL) in ORACLE (centralized storage) so there is no need of storing data in files and paper. This will turn reduce of paper wastage. By the end of this course the students will be able to write simple and advanced PL/SQL code blocks, use advanced features such as cursors and bulk fetches and database designing with normalization. Hence students will be able to design database which will be helpful to them in the designing phase of project in the upcoming semester.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks					Total Marks
				SEE		CCE			
CI	T	P	C	Theory	Practical	MSE	LWA	ALA	
3	0	2	4	75	25	30	20	50	200

Legends: CI-Class Room Instructions; T – Tutorial; P - Practical; C – Credit; SEE - Semester End Evaluation; MSE- Mid Semester Examination; LWA - Lab Work Assessment; V – Viva voce; CCE-Continuous and Comprehensive Evaluation; ALA- Active Learning Activities.

3 Credits * 25 Marks = 75 Marks (each credit carries 25 Marks) Theory
1 Credits * 25 Marks = 25 Marks (each credit carries 25 Marks) Practical
SEE 100 Marks will be converted in to 50 Marks
CCE 100 Marks will be converted in to 50 Marks
It is compulsory to pass in each individual component.

Course Content:

Sr. No	Course content	Hrs	% Weightage
1	**Introduction to Relational Database System and SQL commands** • Relational Model concept and Terminologies • Actors on Scene • Workers behind the Scene • Data Models • 3 tier architecture • Transactional Control Language(TCL) : Commit, Save point, Rollback • Data Control Language (DCL): Grant and Revoke	09	20%
2	**Database Object, Operator & Joins** • Views–Create and Drop views • Synonym: Create, Drop synonym • Sequences: Create, Drop sequences • Index: Unique and composite–Create, Drop • SQL Set operators: Union, union all, Intersect, Minus • Joins: Simple, Inner-join, Outer -join, Self-Joins, cross - join.	10	20%
3	**Transaction processing** • Desirable Properties Of Transactions • Types Of Transaction Failure • Types of Schedule • Characterizing Schedules Based on Recoverability And Serializability	07	15%
4	**PL/ SQL and Triggers** • Basics of PL / SQL • Advantages of PL/SQL over SQL • Control Structures: Conditional, Iterative, Sequential • Exceptions: Predefined Exceptions, User defined exceptions • Cursors: Static (Implicit & Explicit) • Procedures & Functions • Fundamentals of Database Triggers • Creating Triggers • Types of Triggers: Before, after for each row, for each statement	10	25%

5	**Database Design** • Basics of Normalization, (Functional Dependencies, Multi-valued Dependency) • **Normal Forms** • First Normal Form(1NF) • Second Normal Form(2NF) • Third Normal Form(3NF) • Boyce-Codd Normal Form(BCNF) • Fourth Normal Form(4NF) • Advantages and disadvantages of Normalization	09	20%

Continuous Assessment:

Sr. No	Active Learning Activities	Marks
1	**Bug Detectives :** Students will be assigned a code containing intentional errors, students need to identify errors, correct and upload on GMIU web Portal.	10
2	**Group Projects :** A database-driven project will be assigned to a student group (four Students). They have to collectively design and implement a database system for a specific application. prepare a database and upload it on GMIU web Portal.	10
3	**Data Modeling:** Students have to create an entity-relationship (ER) diagram on given topic and upload it on GMIU web Portal.	10
4	**Query Writing Exercises:** Provide a set of sample databases and ask students to write SQL queries to retrieve specific information. This can include simple SELECT statements, as well as more complex queries involving joins and sub queries and upload it on GMIU web Portal.	10
5	**Attendance**	10
Total		50

Suggested Specification table with Marks (Theory):75

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage	30 %	40 %	10 %	10 %	10 %	0 %

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcome:

After learning the course the students should be Able to :	
CO1	Understand the fundamental concepts of Relational Database Management and it's terminology.
CO2	Recognize the purpose of query processing, optimization and demonstrate the SQL query evaluation.
CO3	Apply and relate the concepts of transaction, concurrency control, recovery and security in databases.
CO4	Solve the given problem using Relational Algebra, Relational Calculus, SQL and PL/SQL
CO5	Identify the entities and relations and draw an E-R diagram and design database applying normalization.

List of Practical

Sr. No.	Descriptions	Unit No.	Hrs
1	Perform queries for TCL and DCL Commands.	1	2
2	Implement SQL queries using Group by, Having and Order by Clause.	1	2
3	Implement SQL queries using Set operators like Union, union all, Intersect, Minus etc.	2	2
4	Retrieve data spread across various tables or same table using various Joins.	2	2
5	Perform queries to Create and Drop views.	2	2
6	Perform queries to Create and Drop synonyms, sequence.	2	2
7	Write a PL/SQL block to show a reserved word can be used as a user-define identifier.	2	2
8	Implement PL/SQL programs using CURSORS.	4	2
9	Implement PL/SQL programs using IF STATEMENT.	4	2
10	Implement PL/SQL programs using WHILE LOOP.	4	2
11	Implement PL/SQL programs using PROCEDURE.	4	2
12	Implement PL/SQL programs using FUNCTION.	4	2
13	Implement PL/SQL programs using EXCEPTION HANDLING.	4	2

14	Implement PL/SQL programs using TRIGGER.	4	2
15	Implement PL/SQL program to perform ant * pattern.	4	2
		Total	30

Instructional Method:

The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

From the content 10% topics are suggested for flipped mode instruction.

Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory.

The internal evaluation will be done on the basis of Active Learning Assignment

Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

Reference Books:

[1] SQL - Bayross , Ivan
[2] Database Systems Concepts, design and Applications 2/e - Singh, S.K.
[3] An Introduction to Database Systems - Date, C. J.
[4] Database System Concepts, - Korth , Henry