Gyanmanjari University

Course Syllabus

Gyanmanjari Institute of Management Studies

Semester-3 (MBA)

Subject: SQL & Data Management   – MBABA13510

Type of course: Major (Core)

Prerequisite:

This subject can be taken by any beginner who wants to build career in Information Technology. The Student needs to have practical knowledge of Windows Operating System, foundational understanding of the internet and Database.

Rationale:

SQL & Data Management is essential for handling, organizing, and retrieving structured data efficiently. This subject equips students with the knowledge of database design, querying, transaction management, and concurrency control, ensuring data integrity and security. By mastering SQL, students gain the ability to interact with relational databases, optimize performance, and manage large datasets, making it a crucial skill for careers in data analytics, software development, and database administration.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks					Total Marks
				Theory Marks		Practical Marks		CA	
CI	T	P	C	ESE	MSE	V	P	ALA	
03	00	02	04	60	30	10	20	30	150

Legends: CI-Classroom Instructions; T – Tutorial; P - Practical; C – Credit; SEE - Semester End Evaluation; MSE- Mid Semester Examination; V – Viva; CCE-Continuous and Comprehensive Evaluation; ALA- Active Learning Activities.

Course Content:

Sr. No	Course content	Hrs.	%Weightage
1	**Introduction of Database System:** • Concepts and Definitions • Database and database systems and database environment • Data, Information, Data Item or Fields, Records, Metadata, Data dictionary and it's components • Data Administrator (DA) and Database Administrator (DBA) • Functions and Responsibilities of DBA • Advantage and disadvantages of DBMS. **Database System Architecture:** • Schemas, Sub-schemas, and Instances • Three-level ANSI SPARC Database Architecture: Internal Level, Conceptual Level, External Level • Advantages of three schema Architecture • Types of Database System: Centralized Database System, Distributed Database System.	15	25
2	**Introduction to SQL commands:** • Data types, Database Language commands: • Data Definition Language (DDL): CREATE, ALTER, TRUNCATE, • DROP Data Manipulation Language (DML): INSERT, SELECT, UPDATE, DELETE. • Operators Arithmetic, Comparison, Logical SQL functions- Single row function. • Date functions (add-months, months between, round, truncate). • Numeric Functions (abs, power, mod, round, trunc, sqrt). • Character Functions (initcap, lower, upper, ltrim, rtrim, replace, substring, instr) • Conversion Functions (to-char, todate, to-number)	15	25
3	**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	15	25

4	**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.	15	25

Sr. No.	Practical's	Unit	Hrs.
1	Create 2 tables of students and employees with 5 fields and store actual data in the table.	2	2
2	Implement SQL queries to perform various DDL Commands. (Create minimum 5 tables with different data types and operate upon them)	2	2
3	Implement SQL queries to perform various DML Commands. (Insert minimum10 rows using different insert methods, edit and remove data using update and delete commands).	2	2
4	Retrieve data using SELECT command and various SQL operators	2	2
5	Implement SQL queries using Date functions like add-months, months between, round, next day, truncate etc	2	2
6	Implement SQL queries using Numeric functions like abs, ceil, power, mod, round, trunc, sgrt etc.	2	2
7	Implement SQL queries and Character Functions like initcap, lower, upper, rtrim, replace, substring, instr etc.	2	2
8	Implement SQL queries using Conversion Functions like to- char, to-date, to-number.	2	2
9	Implement SQL queries using Group functions like Avg, Min, Max, Sum, Count, Decode etc.	2	2
10	Retrieve data from multiple tables using Sub queries (Multiple, Correlated) (write minimum 3 level sub query)	3	2
11	Perform queries for TCL and DCL Commands.	4	2
12	Implement SQL queries using Group by, Having and Order by Clause.	4	2
13	Implement SQL queries using Set operators like Union, union ali, Intersect, Minus etc.	4	2
14	Retrieve data spread across various tables or same table using various Joins.	4	2
15	Perform queries to Create and Drop views.	4	2
	Total		30

Continuous Assessment:

Sr.No	Active Learning Activities	Marks
1	**Create a Table with Different Datatypes** Explore different PL/SQL datatypes and their applications. Ask students to create a student database table with fields of various datatypes (VARCHAR, NUMBER, DATE, BOOLEAN)	10
2	**Create a DBA Job Description** Understand the daily tasks and responsibilities of a DBA. Students are required to research and write a job description for a Database Administrator (DBA), including: User management, Backup & recovery, Performance tuning, Security management. Students present their descriptions, followed by a class discussion on how DBA roles vary across industries.	10
3	**Simulating a Banking Transaction** Understand how transactions work in a database system. Scenario: Students simulate a simple banking transaction where a customer transfers money from Account A to Account B. Task: Write a PL/SQL block to simulate a transaction. Ensure the transaction follows commit and rollback mechanisms.	10
	Total	30

Suggested Specification table with Marks (Theory): 60

	Distribution of Theory Marks (Revised Bloom's Taxonomy)					
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage	30%	30%	20%	10%	0%	10%

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	Recognize the various elements of Database Management Systems.
CO2	Solve the given problem using Relational Algebra, Relational Calculus, SQL and PI/SQL.
CO3	Understand the fundamental concepts of Relational Database Management and it's terminology.
CO4	Recognize the purpose of query processing, optimization and demonstrate the SQL query evaluation.

Instructional Method:

The course delivery method will depend upon the requirement of content and the needs of students. The teacher, in addition to conventional teaching methods by black board, may also use any 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. 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 the laboratory.

Reference Books:

[1] SQL - Bayross, Ivan

[2] Database Systems Concepts, design and Applications 2/e - Singh, S.K. An Introduction to Database Systems - Date, C. J.

[3] Database System Concepts, - Korth, Henry

[4] Abraham Silberschatz,Henry F.Korth,S.Sudarshan: Database System Concepts, 6th edition, McGraw Hill Publication. i Chellappan, "Big Data Analytics" Wiley 2015.

[5] Raghu Ramakrishnan, Johannes Gehrke: Database Management Systems, McGraw Hill Publication

[6] Anjali Jivani and Amisha Shingala- Practice book on SQL and PL/SQL with solutions, 3rd edition, Roopal book prakasan.