Gyanmanjari
Innovative University

Subject: SQL and Data Management – BBABA12305

Type of course: Major (Core)

Prerequisite:

Students must have a clear understanding of basic computer concepts, fundamental programming concepts, and basic mathematical concepts.

Rationale:

The course is designed to equip students with foundational knowledge and skills in data management, SQL, and data analysis to effectively collect, organize, and interpret data for informed business decision-making.

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-Classroom Instructions; T – Tutorial; P - Practical; C – Credit; SEE - Semester End Evaluation; MSE- Mid Semester Examination; LWA- Lab Work Assessment V – Viva; 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 Data Management** • Overview of Data Management • Importance of Data Management in Business • Data Types -Structured, Semi-Structured, Unstructured • Data Sources -Internal, External • Data Quality -Accuracy, Completeness, Consistency	15	25
2	**SQL Fundamentals** • Introduction to SQL (Structured Query Language) • Basic SQL Syntax -SELECT, FROM, WHERE, GROUP BY, HAVING • Data Retrieval -Queries, Filtering, Sorting • Data Manipulation	15	25
3	**Data Management** • Data Modeling: Meaning, Importance, Types • Data Normalization: Concept, Objectives, Normal Forms for data Normalization • Data Security-Basic Concepts, Threats and Best Practices • Data Recovery -Basic Concepts and Importance	15	25
4	**Data Analysis** • Introduction to Data Analysis, Meaning of Data Analysis • Basic Concepts: Data Types, Interpretation, Ethics and Privacy of Data, Descriptive statistics, Predictive Analysis, Tools and Software • Importance of Data Analysis • Data Analysis Techniques: Descriptive, Diagnostic, Predictive • Data visualization –Meaning, Types and Applications of Charts, Graphs, Tables	15	25

Sr. No	Practical's	Unit no	App hours
1	Introduction to SQL Data Modeling	2	3
2	Exploring data analysis techniques	4	3

3	Data Visualization Tools review	4	3
4	Create a Data Management Policy	3	4
5	Introduction to data recovery techniques	3	4
6	Data Management Tools Comparison	2	3
7	Data quality challenges	1	3
8	Data privacy laws	3	3
9	Analyze Data types	1	3
	Total		30

Continuous Assessment:

Sr.No	Active Learning Activities	Marks
1	**Data Manipulation Tool:** Students will select a data manipulation tool like Microsoft Excel, and Google Sheets and prepare a PDF report about its features, benefits, limitations and uses and upload it on GMIU Web Portal.	10
2	**Presentation Challenge:** Students will prepare PPT on the topic "Types of Data Sources" and present it in a group of 3 and upload it on GMIU Web Portal.	10
3	**Poster Making:** Students will make a poster on the topic "Data Analysis Lifecycle" and upload it on GMIU Web Portal.	10
4	**Case Study Analysis:** Students will be provided with real-world/hypothetical case study related to the subject; students will analyze it, identify key issues, and propose solutions and upload the PDF 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%	30%	15%	15%	5%	5%

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	Design and implement effective data management strategies to ensure data quality, integrity, and security, and identify various data types and sources.
CO2	Use efficient SQL queries to retrieve, manipulate, and analyze data, and apply basic SQL syntax and data retrieval techniques to solve business problems.
CO3	Manage databases using data modeling, normalization, and security best practices, and develop strategies for data recovery and backup.
CO4	Apply data analysis techniques to extract insights from data, identify trends and patterns, and make informed business decisions using data driven approaches.

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] "Data Management: Databases and Organizations" by Richard T. Watson.

[2] "SQL Queries for Mere Mortals: A Hands-On Guide to Data Manipulation in SQL" by John D. Cook.

[3] "Data Analysis with Python" by Wes McKinney.

[4] "Data Quality: Improving the Quality of Your Data Using Statistical Process Control" by Larry P. English.

[5] "Database Systems: The Complete Book" by Hector Garcia-Molina, Ivan Martinez, and Jose Valenza.