

COURSE TITLE	FINTECH DATA MANAGEMENT
COURSE CODE	05FN0205
COURSE CREDITS	4

Objective:

- 1 To impart a thorough understanding of the concept of Database & E-R Diagram
- 2 To impart a thorough understanding of the concept of SQL Syntax and Queries
- 3 To impart a thorough understanding of optimize SQL queries and utilize indexing to enhance the performance of database systems.
- 4 To impart a thorough understanding in integrating databases with applications using appropriate connectivity technologies
- 5 To impart a thorough understanding in integrating databases with applications, refining their skills and understanding of database connectivity technologies

Course Outcomes: After completion of this course, student will be able to:

- 1 Students can learn to write SQL queries for data retrieval, manipulation, and administration tasks. Through practical exercises and theoretical understanding, they gain proficiency in crafting SQL queries for various purposes
- 2 Students can develop the capability to design and implement well-structured, normalized database schemas using appropriate modeling techniques, ensuring data integrity and efficiency
- 3 Students can optimize SQL queries and utilize indexing techniques to improve database system performance.
- 4 Student can learn to establish seamless communication between databases and applications, enabling the development of robust, scalable software solutions.
- 5 Students can emerge with the ability to write SQL queries, design database schemas, optimize SQL queries for performance, and integrate databases with applications

Pre-requisite of course:NA

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
3	0	2	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	Data base Concept - What is a Database System, Components of Database Systems, DBMS , - Building blocks, applications, advantages, disadvantage	11

Contents : Unit	Topics	Contact Hours
2	E-R Diagram - ER model in DBMS , - Introduction to ER Model, Components of ER Model, Relationships in ER Model, Keys in ER Model, Generalization, Specialization, and Aggregation, Advantages and Limitations of ER Model, - ER model to Relational Model, - Mapping Entities to Tables, Mapping Relationships to Tables, Handling Constraints, Handling Weak Entities and Relationships, Normalization during Mapping	11
3	SQL Syntax - SQL Syntax, SQL Data Type, SQL Introduction, DML, DDL , Create, Drop, DQL, - Alter Command, Truncate, Creating Relations (Create Table statement) Modifying Relations (Alter table statement), , - Constraints in DBMS, Integrity constraint, Keys in DBMS	11
4	SQL Queries - Introduction, Types of Keys, Foreign key in DBMS, Super key in DBMS, Candidate key in DBMS, Primary key in DBMS, keys in DBMS, - SQL Queries for Data Manipulation and Views	12
Total Hours		45

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	Unit 1 1. Create a simple relational database schema with tables for storing student information. 2. Develop a relational database management system for SBI Bank database management system 3. Define the primary keys for each table and establish relationships between them. 4. Perform insert duplicate data in the table which have primary and not null constraint. 5. Define Not Null for each table and establish relationships between them. 6. Insert sample data into the tables and practice querying to retrieve specific information. 7. Practice creating and dropping tables in a relational database using SQL commands. 8. Practice using SQL clauses WHERE to filter, sort, and group data. 9. Practice using SQL clauses ORDER BY to filter, sort, and group data. 10. Practice using SQL clauses GROUP BY to filter, sort, and group data. 11. Practice using SQL clauses and find the top and least element from the table. 12. Perform basic data manipulation operations such as inserting new records, updating existing records, and deleting records. 13. Perform list of DDL commands 14. Perform list of DML commands 15. Perform list of DCL commands 16. Perform list of DQL commands 17. Create a relational database schema to manage employee information, including tables for departments, employees, and salaries, with appropriate relationships between them. 18. Design a database for an e-commerce platform to store customer details, product catalog, and order details, ensuring proper use of primary and foreign keys. 19. Implement a library management system with tables for books, members, and borrow records, including constraints for unique book identifiers and member IDs. 20. Insert sample data into an inventory management database and practice SQL queries to identify low stock items and most popular products. 21. Practice adding, modifying, and deleting constraints (such as primary keys and unique constraints) in existing tables using SQL commands. 22. Write SQL queries using JOIN operations (INNER JOIN, LEFT JOIN, RIGHT JOIN) to combine data from multiple tables and retrieve meaningful insights. 23. Perform advanced filtering and aggregation using HAVING clause in SQL to filter groups based on aggregate conditions. 24. Create and manage user-defined views in SQL to provide simplified representations of the underlying database tables. 25. Design and execute queries to calculate aggregates, such as SUM, AVG, COUNT, MAX, and MIN, for analyzing data trends in a business scenario	30
Total Hours		30

Textbook :

- 1 Database Systems: Design, Implementation, and Management, Database Systems: Design, Implementation, and Management & Steven Morris , Cengage Learning, 2022

References:

- 1 Database System Concepts, Database System Concepts, Abraham Silberschatz, Henry F. S. Sudarshan, , McGraw-Hill Education, 2022
- 2 Fundamentals of Database Systems, Fundamentals of Database Systems, Ramez Elmasri and Shamkant B. Navathe, Pearson, 2015

Suggested Theory Distribution:

The suggested theory distribution as per Bloom’s taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery					
Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking / Creative
20.00	30.00	25.00	15.00	10.00	0.00

Instructional Method:

- 1 Board and pen method
- 2 PPT

Supplementary Resources:

- 1 <https://www2.deloitte.com/us/en/pages/advisory/articles/data-management-trends-in-financial-services.html>
- 2 <https://www.accenture.com/us-en/services/financial-services/fintech-innovation-lab>