UNIVERSITY OF MADRAS

B.Sc. DEGREE PROGRAMME IN COMPUTER SCIENCE

SYLLABUS WITH EFFECT FROM 2023-2024

Year: III **Semester: V**

Relational Database Management System Common for B.C.A. , B.Sc.-SA , B.Sc.-CSc	**325C5B**
Credits 4	**Lecture Hours:5 per week**

Learning Objectives: (for teachers: what they have to do in the class/lab/field)

- Gain a good understanding of the architecture and functioning of Database Management Systems
- Understand the use of Structured Query Language (SQL) and its syntax.
- Apply Normalization techniques to normalize a database.
- Understand the need of transaction processing and learn techniques for controlling theconsequences of concurrent data access.

Course Outcomes: (for students: To know what they are going to learn)

1. Describe basic concepts of database system
2. Design a Data model and Schemas in RDBMS
3. Competent in use of SQL
4. Analyse functional dependencies for designing robust Database

Units	**Contents**
I	Introduction to DBMS– Data and Information - Database – Database Management System – Objectives- Advantages – Components - Architecture. ER Model: Building blocks of ER Diagram –Relationship Degree – Classification – ER diagram to Tables – ISA relationship – Constraints –Aggregation and Composition – Advantages
II	Relational Model: CODD's Rule- Relational Data Model - Key - Integrity – Relational AlgebraOperations – Advantages and limitations – Relational Calculus – Domain Relational Calculus -QBE.
III	Structure of Relational Database. Introduction to Relational Database Design - Objectives – Tools –Redundancy and Data Anomaly – Functional Dependency - Normalization – 1NF – 2NF – 3NF –BCNF. Transaction Processing – Database Security.
IV	Introduction to SQL: Data Definition Commands – Data Manipulation Commands – SELECT Queries – Additional Data Definition Commands – Additional SELECT Query Keywords – Joining Database Tables.Advanced SQL:Relational SET Operators: UNION – UNION ALL – INTERSECT - MINUS.SQL Join Operators: Cross Join – Natural Join – Join USING Clause – JOIN ON Clause – Outer Join.
V	Sub Queries and Correlated Queries: WHERE – IN – HAVING – ANY and ALL – FROM. SQL Functions: Date and Time Function – Numeric Function – String Function – Conversion Function PL/SQL: Structure - Elements – Operators Precedence – Control Structure – Iterative Control -Cursors - Procedure - Function - Packages – Exceptional Handling - Triggers.

TEXT BOOK:

1. S. Sumathi, S. Esakkirajan, “Fundamentals of Relational Database Management System”, Springer International Edition 2007.

REFERENCE BOOKS:

1. Abraham Silberchatz, Henry F. Korth, S. Sudarshan, “Database System Concepts”,McGrawHill2019, 7th Edition.
2. Alexis Leon & Mathews Leon, “Fundamentals of DBMS”, Vijay Nicole Publications 2014, 2nd Edition.

WEB REFERENCES:

NPTEL & MOOC courses titled Relational Database Management Systems
https://nptel.ac.in/courses/106106093/
https://nptel.ac.in/courses/106106095/