

## St. Xavier's College (Autonomous), Ahmedabad

Syllabus of Semester – I of the following departments under Faculty of Computer Science based on Undergraduate Curriculum Framework to be implemented from the Academic Year 2025-26.

### DEPARTMENT OF COMPUTER SCIENCE BSC-IT (Hons.) Category – IV

#### CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

| Course Title & Code                     | Credit Distribution of The Course |          |                      | Eligibility Criteria |
|-----------------------------------------|-----------------------------------|----------|----------------------|----------------------|
|                                         | Lecture                           | Tutorial | Practical / Practice |                      |
| Database Management System-1 (ITMN111C) | 2                                 | 0        | 2                    | BSC-IT Sem 1         |

**Course Objectives:** To provide students with a strong foundation in the concepts of databases and Database Management Systems (DBMS). To enable student's to acquire both theoretical and practical skills necessary for working with database systems, setting them up for more advanced studies or real-world applications in IT and database management.

Course Outcomes: Students would be able to:-

- Understand and apply basic DBMS concepts and theories.
- Write SQL queries to retrieve and manipulate data.
- Design simple databases using ER diagrams and normalize them to 3NF.
- Ensure data integrity using primary and foreign keys.
- Use DBMS tools to create and manage relational databases.[MS Access]

| Units | Unit Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Hours |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1     | <b>Introduction to Databases and DBMS:</b> <ul style="list-style-type: none"><li>• What is Data , Information and a database?</li><li>• Characteristics of the database approach</li><li>• Roles of Database Administrators, Designers, and End Users</li><li>• Types and Applications of DBMS</li><li>• Advantages and limitations of using a DBMS</li></ul> <b>Data Models and DBMS Architecture:</b> <ul style="list-style-type: none"><li>• Categories of data models</li><li>• Schemas, Instances, and Database State</li><li>• Three-schema architecture and data independence</li></ul> | 10    |
| 2     | <ul style="list-style-type: none"><li>• <b>Entity Relationship Model:</b></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 30    |

- Conceptual data modelling; entities, entity types, attributes, relationships, connectivity, cardinality, E/R diagram notation, Case studies.

- **Relational Data Model:**

- Concept of relations, schema-instance, keys, integrity constraints.
- Creating tables with attributes and constraints using MS Access.
- Creating relationships.
- Creating forms through various methods.
- Data entry and form design.
- Report generation.

### 3      **SQL Basics:**      30

- Relational algebra operators, basic relational algebra queries.
- Introduction to SQL (Structured Query Language)
- Data types in SQL
- Basic SQL commands: SELECT, INSERT, UPDATE, DELETE
- Simple queries using SQL using conditional, relational and logical operators.
- Action Queries.

### 4      **Normalization and Denormalization**      10

- Functional Dependencies
- Dependency diagram
- Introduction to database normalization
- First, Second, and Third Normal Forms (1NF, 2NF, 3NF)
- Advantages of normalization...with examples.
- Denormalization.

**TEXT BOOK:** Database System Concepts (First Edition: 2008) Publisher: Cengage Learning By Peter Rob and Carlos Coronel

#### **REFERENCE BOOKS:**

1. Introduction to Database Management Systems (First Edition 2006) Publisher: Tata McGraw-Hill  
By ISRD Group
2. An Introduction to Database Systems (Eighth Edition 2006) Publisher : Pearson

By C. J. Date, A. Kannan & S. Swamynathan.

3. Fundamentals of Database Systems by Elmasri & Navathe