## Objective:

Students will work on creating a database-driven application using SQL Server. They will identify a database problem, design and analyze the database, and perform various operations using SQL concepts such as joins, stored procedures, user-defined functions, triggers, cursors, and exception handling.

**Project Start Date:** 3rd February 2025

**Project End Date:** 13th April 2025

## Week-wise deadlines

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| **Week-1** | **Objective:** Understanding the Project and Database Identification<br>**Description:**<br>✓ Brainstorm real-world database schema (e.g., Library Management, e-commerce, Hospital Management, Examination Management System, Stoke Market Trading, Airline Reservation System, Music Streaming Platform, Chat Application Database, Property Listing Database, Fantasy League Platform, etc...)<br>✓ Research and identify the data requirements for the chosen schema.<br>✓ Document the project's problem statement and objectives.<br>**Deliverable:**<br>✓ Project proposal with a clearly defined problem and objectives.<br>**Timeframe:** 03/02/25 to 09/02/25 |
| **Week-2** | **Objective:** Database Design<br>**Description:**<br>✓ Analyze the identified database problem.<br>✓ Design an Entity-Relationship Diagram (ERD) based on the requirements.<br>✓ Normalize the database up to the third normal form (3NF).<br>**Deliverable:**<br>✓ E-R diagram and normalized schema.<br>**Timeframe:** 10/02/25 to 16/02/25 |
| **Week-3** | **Objective:** Creating the Database<br>**Description:**<br>✓ Create the database and tables using SQL Server. |

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| | ✓ Define appropriate constraints like primary keys, foreign keys, etc.<br>✓ Insert sample data into the tables. (At least 5 to 6 records in each table)<br>**Deliverable:**<br>✓ SQL scripts for database creation and initial data population.<br>**Timeframe:** 17/02/25 to 23/02/25 |
| **Week-4** | **Objective:** Query Development (Basic SQL Operations and Joins)<br>**Description:**<br>✓ Write and execute basic SQL queries (SELECT, INSERT, UPDATE, DELETE).<br>✓ Implement simple queries for retrieving and modifying data.<br>✓ Implement advanced SQL queries using JOIN concept (INNER, OUTER).<br>✓ Solve complex queries using multiple tables with join concept.<br>**Deliverable:**<br>✓ A set of basic SQL queries & JOIN related operations and corresponding results.<br>**Timeframe:** 24/02/25 to 02/03/25 |
| **Week-5** | **Objective:** Stored Procedures<br>**Description:**<br>✓ Develop stored procedures for frequent operations.<br>✓ Test stored procedures with input and output parameters.<br>**Deliverable:**<br>✓ SQL scripts for stored procedures with test cases.<br>**Timeframe:** 03/03/25 to 09/03/25 |
| **Week-6** | **Objective:** User-Defined Functions<br>**Description:**<br>✓ Create user-defined scalar and table-valued functions.<br>✓ Use functions within queries to simplify complex calculations or data retrieval.<br>**Deliverable:**<br>✓ SQL scripts for user-defined functions and sample queries using them.<br>**Timeframe:** 10/03/25 to 16/03/25 |

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| **Week-7** | **Objective:** Triggers and Cursors<br>**Description:**<br>✓ Find the applications of triggers and cursors, and list the scenarios where they are required.<br>✓ Write triggers for enforcing business rules or logging changes.<br>✓ Test triggers for operations like INSERT, UPDATE, and DELETE.<br>✓ Use cursors to handle row-by-row processing of data.<br>✓ Implement scenarios where cursors are required (e.g., batch updates).<br>**Deliverable:**<br>✓ SQL scripts for triggers and testing logs.<br>✓ SQL scripts for cursors with use-case examples.<br>**Timeframe:** 17/03/25 to 23/03/25 |
| **Week-8** | **Objective:** Exception Handling<br>**Description:**<br>✓ Implement exception handling using TRY...CATCH blocks.<br>✓ Ensure proper error logging for failed database operations.<br>**Deliverable:**<br>✓ SQL scripts for exception handling with use-case examples.<br>**Timeframe:** 24/03/25 to 30/03/25 |
| **Week-9** | **Objective:** Project Presentation and Feedback<br>**Description:**<br>✓ Prepare a presentation to showcase the database design, implementation, and features.<br>✓ Collect feedback for improvement.<br>**Deliverable:**<br>✓ Project presentation and report summarizing the work done.<br>**Timeframe:** 07/04/25 to 13/04/25 |