SQL Server for Data Analysis (15 Hours)

Module 1: SQL Basics, Data Retrieval & Language Types (2.5 Hours)

Goal: Lay the foundation of SQL by understanding its language types, basic syntax, and how to retrieve data.

Topics Covered:

- Introduction to Relational Databases and SQL Server Management Studio (SSMS)

- **SQL Language Categories:**
  - DML (Data Manipulation Language): INSERT, UPDATE, DELETE
  - DDL (Data Definition Language): CREATE, ALTER, DROP
  - DQL (Data Query Language): SELECT
  - TCL (Transaction Control Language): COMMIT, ROLLBACK, SAVEPOINT
  - DCL (Data Control Language): GRANT, REVOKE (optional)

- Writing SELECT queries to extract data

- Using WHERE clause for filtering records

- Sorting results using ORDER BY

- Eliminating duplicates with DISTINCT

- Applying logical operators: AND, OR, IN, BETWEEN, LIKE

Module 2: Aggregation, Grouping, and Filtering (2 Hours)

Topics Covered:

- COUNT, SUM, AVG, MIN, MAX

- GROUP BY clause

- HAVING clause

Module 3: Data Manipulation and Transactions (2 Hours)

Topics Covered:

- INSERT, UPDATE, DELETE

- Introduction to Transactions

- COMMIT and ROLLBACK

Module 4: Joins and Subqueries (3 Hours)

Topics Covered:

- INNER, LEFT, RIGHT, FULL OUTER JOIN

- Real-life Join Use Cases

- Subqueries in SELECT, WHERE, and FROM

Module 5: Indexing and Performance Optimization (1.5 Hours)

Topics Covered:

- Clustered vs. Non-Clustered Indexes

- Creating and Dropping Indexes

- How Indexes Improve Speed

- Best Practices for Indexing

Module 6: Window Functions for Advanced Analysis (2 Hours)

Topics Covered:

- RANK(), DENSE_RANK(), ROW_NUMBER()

- LEAD(), LAG()

- PARTITION BY

Module 7: Stored Procedures and Reusability (2 Hours)

Topics Covered:

- Creating, Executing, and Modifying Stored Procedures

- Parameters in Procedures

- Reusability and Maintenance Benefits