Microsoft SQL Server: Beginner to Professional

Course Description

This training program introduces complete beginners to the fundamentals of databases and Microsoft SQL Server. The course gently builds foundational skills before moving into core T-SQL, data modeling, queries, database objects, transactions, procedures, and security. Each lesson emphasizes clear explanations, hands-on exercises, and real-world problem solving to ensure every participant can design, query, manage, and maintain SQL Server databases confidently.

Duration : 20 Days

Prerequisites

- Comfort with basic computer usage (mouse, keyboard, navigation)
- No previous experience with databases or programming

Learning Objectives

- Understand what databases are and why they matter
- Recognize and explain how SQL Server fits into business environments
- Design and create well-structured tables with correct data types and constraints
- Write, debug, and optimize T-SQL queries to extract and manipulate data
- Build multi-table solutions using joins, sub-queries, and set operations
- Apply core data integrity and database security principles
- Implement backup, restore, and simple administrative tasks
- Develop stored procedures, user-defined functions, and triggers
- Gain the confidence for professional work with Microsoft SQL Server

Content Coverage

Module 1: Introduction to Databases and SQL Server

- What is data? Why databases are needed
- Types of databases (relational, non-relational)
- Database terminology: tables, rows, columns
- Introduction to Microsoft SQL Server ecosystem
- Overview of SQL Server editions, tools, and interface
- Installing SQL Server & SQL Server Management Studio (SSMS)
- Navigating SSMS workspace

Module 2: Database Architecture and SQL Server Objects

- Understanding databases, schemas, and objects
- Introduction to tables, views, indexes, and constraints
- Basic database design principles
- Hands-on: Creating your first database in SSMS

Module 3: Data Types and Table Structures

- SQL Server data types (numeric, text, dates, unique identifiers, etc.)
- Designing tables for real-life data scenarios
- Creating, altering, and dropping tables
- Setting default values and rules

Module 4: Data Integrity and Constraints

- Importance of data integrity
- Primary keys, foreign keys, and unique constraints
- Default, check, and not null constraints

- Referential integrity
- Hands-on: Defining and testing constraints

Module 5: Basic T-SQL Queries

- Introduction to T-SQL syntax
- SELECT statements for data retrieval
- Using WHERE, ORDER BY, and DISTINCT
- Filtering, sorting, and limiting results

Module 6: Data Manipulation Language (DML)

- Inserting new records (INSERT)
- Updating existing records (UPDATE)
- Deleting records (DELETE)
- Working with NULL values

Module 7: Advanced Query Techniques

- Aggregate functions: SUM, COUNT, AVG, MIN, MAX
- GROUP BY and HAVING clauses
- Nested queries and subqueries basics
- Combining queries with UNION, INTERSECT, and EXCEPT

Module 8: Joining Data from Multiple Tables

- Introduction to joins: why they are needed
- INNER JOIN, LEFT JOIN, RIGHT JOIN, FULL JOIN
- Self-joins and cross joins
- Hands-on: Designing queries for multi-table scenarios

Module 9: Views

- What are views and when to use them
- Creating, modifying, and dropping views
- Using views to secure and simplify data access

Module 10: Indexes for Performance

- Introduction to indexing
- Creating and managing indexes (clustered, non-clustered)
- Basics of performance optimization
- Identifying when to add or remove an index

Module 11: Transactions and Concurrency

- Understanding ACID properties
- Starting, committing, and rolling back transactions
- Isolation levels and locking basics

Module 12: Stored Procedures and User-Defined Functions

- Procedural vs. declarative SQL
- Creating, editing, and executing stored procedures
- Intro to user-defined scalar and table-valued functions

Module 13: Triggers and Automation

- What are triggers and when are they useful
- Creating and managing triggers
- Automating business rules with T-SQL

Module 14: Database Security

- Introduction to SQL Server authentication and roles
- Granting, revoking, and denying permissions
- Best practices for securing data

Module 15: Backup, Restore, and Recovery Basics

- Why backups matter: disaster recovery scenarios
- Creating database backups (full, differential, transaction log)
- Restoring databases from backup

Module 16: Server and Database Maintenance

- Monitoring database health
- Checking logs and troubleshooting basics
- Routine maintenance tasks

Module 17: Working with Advanced Data Types

- Dates, times, and calculations
- Working with XML, JSON, and spatial data in SQL Server

Module 18: Data Import, Export, and Integration

- Importing and exporting data (CSV, Excel, etc.)
- Introduction to SQL Server Integration Services (SSIS) concepts

Module 19: Reporting and Simple Analytics

- Writing queries for reporting and dashboards

- Using SSMS export and formatting options
- Basics of connecting SQL Server to reporting tools

Module 20: Capstone Project and Review

- Designing and building a database to meet a sample business case