SQL Server 2019 - Course Details

Course Objective

This course is designed to equip participants with the skills required to install, configure, manage, and optimize Microsoft SQL Server 2019. Participants will gain a solid foundation in both **administration and T-SQL development**, covering areas such as database design, security, backup/recovery, performance tuning, high availability, and new features introduced in SQL Server 2019. By the end of this course, learners will be able to manage real-world SQL Server environments both on-premises and in hybrid/cloud infrastructures.

Course Content

Introduction to SQL Server 2019

- Overview of SQL Server Editions
- What's New in SQL Server 2019
- Core Engine Architecture
- Installation Requirements and Best Practices
- SQL Server Management Studio (SSMS)
- SQL Server on Linux and Docker Overview

SQL Server Installation & Configuration

- Installing SQL Server 2019 (Windows & Linux)
- Configuring SQL Server Instance
- Using SQL Server Configuration Manager
- SQL Server Services and Roles
- Post-Installation Configuration Steps

Database Design & Creation

- Understanding Databases, Schemas, and Objects
- Creating and Managing Databases

- Filegroups, MDF, LDF, and NDF Files
- Collation Settings
- Containment Types (Partial/Full)
- Database Properties and Options

T-SQL Programming

- Data Types and Operators
- Writing SELECT Statements
- Joins: INNER, OUTER, CROSS, SELF
- GROUP BY, HAVING, ORDER BY
- Subqueries and CTEs
- Views, Stored Procedures, Functions
- Error Handling (TRY…CATCH)
- Transactions and Isolation Levels

Security and User Management

- Authentication Modes (Windows vs SQL)
- Creating Logins and Users
- Server and Database Roles
- Object-Level Permissions
- Row-Level Security (RLS)
- Always Encrypted
- Dynamic Data Masking (DDM)
- Auditing and SQL Server Audit

Backup and Recovery

- Backup Types: Full, Differential, Transaction Log
- Backup to Disk and URL (Azure)

- Restoring Databases
- Point-in-Time Recovery
- Recovery Models (Simple, Full, Bulk-Logged)

Performance Monitoring & Tuning

- Monitoring Tools: Activity Monitor, DMVs
- Query Store
- Execution Plans & Query Tuning
- Indexing Strategies (Clustered, Non-Clustered, Columnstore)
- Statistics and Fragmentation
- Resource Governor
- Extended Events

Data Import & Export

- Using SQL Server Import and Export Wizard
- BULK INSERT and bcp Utility
- Using SSIS (Intro)
- OPENROWSET and Linked Servers
- Format Files for Bulk Operations

Automation & Maintenance

- Maintenance Plans
- SQL Server Agent Jobs and Alerts
- Operators and Notifications
- Automating Backups and Index Maintenance
- Using PowerShell with SQL Server

High Availability and Disaster Recovery (HA/DR)

- Introduction to HA/DR Concepts

- Log Shipping
- Database Mirroring (Deprecated)
- Failover Clustering
- Always On Availability Groups (Overview)
- Backup to Azure Blob Storage
- Replication Types: Snapshot, Transactional, Merge

SQL Server on Linux and Containers

- Installing SQL Server on Linux
- Using SQL Server in Docker Containers
- Cross-Platform Tools (Azure Data Studio)
- Configurations and Limitations on Linux

Advanced Features & Tools

- Temporal Tables
- In-Memory OLTP
- JSON Support in SQL Server
- Graph Database Features
- Intelligent Query Processing (IQP)
- Machine Learning Services (R, Python – Overview)

Patching, Migration, and Upgrades

- Applying Cumulative Updates and Service Packs
- Upgrade Paths and Compatibility Levels
- Data Migration Assistant (DMA)
- Migrating to Azure SQL or Managed Instance
- Testing and Validation

Capstone Project & Final Assessment

- Build a Full Database Lifecycle (Design → Deploy → Secure → Tune)
- Implement Automated Backup Strategy
- Optimize a Poorly Performing Application
- Simulate Disaster Recovery

Tools

- Microsoft Docs: https://docs.microsoft.com/sql/
- SQL Server Developer Edition (Free)
- SQL Server Management Studio (SSMS)
- Azure Data Studio
- PowerShell / Command Line

Target Audience

- Aspiring SQL Server DBAs
- Software Developers
- IT Support/System Admins
- Data Analysts/Data Engineers

Total Duration of the Course

- Total duration: 1.5 month(s)
- Days: Monday to Friday (1 hr daily)
- Mode: Online

Certificate

A course completion certificate will be awarded once you have successfully completed this course.

Wishing you a Smooth Coding ahead!