

Administering Microsoft SQL Server 2022

Duration: 40 Hours (5 Days)

Course Overview

The Administering Microsoft SQL Server 2022 course is designed to equip IT professionals and database administrators with the knowledge and skills required to maintain a SQL Server 2022 database. Throughout the course, learners will explore a variety of topics, beginning with an introduction to the capabilities and enhancements of SQL Server 2022. They will delve into the installation and configuration of the server, with an emphasis on new features and best practices. Security is a major focus, with lessons covering authentication, authorization, and auditing of database activity. The course also addresses data protection methods such as Always Encrypted and Dynamic Data Masking. For performance and scalability, participants will learn about the SQL Server 2022 storage engine, backup and recovery strategies, and high availability options like Always On availability groups. Topics also include performance tuning and optimization, as well as the automation of SQL Server management tasks. The course provides insights into monitoring using alerts and notifications, along with data integration techniques. Looking to the future, learners will explore cloud connectivity through Azure and the cloud-connected database features of SQL Server 2022. Additionally, advanced tools for monitoring server performance and troubleshooting common issues are covered, ensuring participants can effectively manage databases and resolve problems. Advanced topics provide deeper technical insights into SQL Server's latest enhancements, helping ensure databases are optimized and ready for the future.

Audience Profile

This course provides comprehensive training in SQL Server 2022, targeting IT professionals focused on database management and optimization.

- Database Administrators
- Database Developers
- IT Professionals with a focus on SQL Server
- Data Analysts interested in database management
- System Administrators responsible for database systems
- Database Architects designing and implementing SQL Server solutions
- IT Managers overseeing database or IT infrastructure
- Business Intelligence Professionals needing to understand backend data structures and storage
- Security Analysts involved in data protection and compliance
- Data Engineers looking to upskill with SQL Server 2022 features
- Cloud Specialists working with Azure SQL Managed Instance and other cloud-connected services
- Technical Support Engineers responsible for maintaining SQL Server environments
- Infrastructure Engineers focusing on high availability and disaster recovery
- Software Developers needing to integrate SQL Server databases into their applications
- Data Science Professionals requiring knowledge of SQL Server for data extraction and manipulation

Course Syllabus

Module 01: Introduction to SQL Server 2022

- Overview of SQL Server 2022
- SQL Server Components & Architecture
- SQL Server Instances, Editions, and Versions

Module 02: Installing and Configuring SQL Server 2022

- Installing SQL Server
- Considerations for Installing SQL Server
- Installation Changes / Feature Selection / New Tab

Module 03: SQL Server Security

- Authentication and Authorization
- Managing Users and Logins
- Controlling Access to Objects with Permissions
- Auditing Database Activity

Module 04: Data Protection with Encryption and Management

- Protecting Data with Encryption and Auditing
- Always Encrypted with Secure Enclave
- Dynamic Data Masking
- Database Ledger
- Data Classification and Function
- Row-Level Security

Module 05: SQL Server 2022 Storage Engine Capabilities

- Tempdb Performance Critical for Scalability
- Shrink Database with Low Priority
- Accelerated Database Recovery Improvements
- Current Buffer Pool Scan Operations

Module 06: SQL Server Backup and Recovery

- Types of Backups: Full, Differential, and Transaction Log Backups
- Planning Backup and Recovery Strategies
- Performing Backups and Restores
- Monitoring Backup and Recovery Performance
- Improved Backup Metadata

Module 07: SQL Server High Availability and Disaster Recovery

- Introduction to High Availability and Disaster Recovery
- Configuring Database Mirroring

- Configuring Log Shipping
- Configuring Always On Availability Groups

Module 08: SQL Server Performance Tuning and Optimization

- Identifying Performance Bottlenecks
- Query Tuning Techniques
- Index Tuning
- Server Configuration and Resource Allocation

Module 09: Automating SQL Server Management

- Automating SQL Server Management
- Working with SQL Server Agent
- Managing SQL Server Agent Jobs
- Multi-Server Management

Module 10: Monitoring SQL Server with Alerts and Notifications

- Monitoring SQL Server Errors
- Configuring Database Mail
- Operators, Alerts, and Notifications

Module 11: Working Examples with Data Integration

- Transferring Data to and from SQL Server
- Importing and Exporting Table Data
- Using bcp and BULK INSERT to Import Data

Module 12: SQL Server 2022: The Cloud-Connected Database

- Business Continuity through Azure SQL Managed Instance
- Azure Synapse Link for SQL Server
- Azure Purview Integration
- Extending Cloud-Connected Features

Module 13: Monitoring SQL Server Using Tools

- Extended Events Concepts
- Working with Extended Events
- Working with Windows Performance Counters
- Working with Activity Monitor

Module 14: Common Issues and Solutions with Tips and Tricks

- Troubleshooting Techniques
- Connectivity Issues
- Service-Related Issues
- Common Errors and Solutions

Module 15: Database Management

- Accelerated Database Recovery (ADR) Improvements
- Max Server Memory Calculations
- Improved Snapshot Backup Support
- Shrink Database with WAIT_AT_LOW_PRIORITY
- Asynchronous Auto Update Statistics Concurrency

Module 16: Advanced SQL Server Topics

- System Page Latch Concurrency Enhancements
- Ordered Clustered Columnstore Index
- Improved Columnstore Segment Elimination
- Virtual Log File Growth