55316 - Administering a SQL Database

Duration: 40 Hours (5 Days)

Overview

The 55316 - Administering a SQL Database course is a comprehensive SQL database class designed to provide learners with essential skills for managing and maintaining SQL Server databases. Through a blend of theory and practical exercises, students learn about various aspects of SQL Server security, including Authenticating connections, Authorizing logins, and Managing server and database roles. The course covers how to protect data with encryption and auditing, implement Backup strategies, restore databases, and automate SQL management tasks.Moreover, it delves into advanced topics such as Monitoring with alerts and notifications, managing SQL Server using PowerShell, Tracing with Extended Events, and troubleshooting common issues. Participants will also gain knowledge on Data import and export techniques, ensuring well-rounded expertise in SQL Server administration. By the end of this about SQL course, learners will be equipped with the skills necessary to efficiently administer a SQL database environment, enhancing their professional capabilities in the field of database management.

Audience Profile

The course 55316 - Administering a SQL Database equips professionals with essential skills for managing SQL Server databases and security.

- Database Administrators
- IT Professionals responsible for SQL Server management
- System Engineers tasked with database security and role management
- Data Protection Officers overseeing compliance and data integrity
- Systems Architects designing database infrastructure
- Technical Support Specialists providing SQL Server troubleshooting
- SQL Developers needing to understand the administrative aspects of SQL Server
- Security Consultants focusing on database encryption and auditing
- Data Analysts requiring knowledge of SQL Server backup and restore
- Network Administrators involved in multi-server SQL Server environments
- DevOps Engineers integrating SQL Server management into automation workflows
- Cloud Database Administrators managing Azure SQL Databases
- IT Managers overseeing database administration teams
- Data Scientists needing to import and export data efficiently
- PowerShell Users automating SQL Server configuration and maintenance

Course Syllabus

Module 1: SQL Server Security

Lessons

- Authenticating Connections to SQL Server
- Authorizing Logins to Connect to databases
- Authorization Across Servers

- Partially Contained Databases

Lab 1: SQL Server Security

- Authenticating Connections to SQL Server
- Authorizing Connections to databases
- Authorization across server instances
- Authorizing Connections to databases

Module 2: Assigning Server and Database Roles

Lessons

- Working with Server Roles
- Working with Fixed Database Roles
- User-Defined Database Roles

Lab 1: Assigning Server and Database Roles

- Using Server Roles
- Using Database Roles
- Using User-defined Database Roles & Application Roles

Module 3: Authorizing Users to Access Resources

Lessons

- Authorizing User Access to Objects
- Authorizing Users to Execute Code
- Configuring Permissions at the Schema Level

Lab 1: Authorizing Users to Access Resources

- Assigning Fixed and User-Defined Server Roles
- Managing Database Roles and Users
- Configure Permissions at the Schema Level

Module 4: Protecting Data with Encryption and Auditing

Lessons

- Options for auditing data access in SQL Server
- Implementing SQL Server Audit
- Managing SQL Server Audit
- Protecting Data with Encryption

Lab 1: Using Auditing and Encryption

- Auditing with Temporal Tables
- Using SQL Server Audit

- View Audit Output
- Using Dynamic Data Masking

Module 5: Recovery Models and Backup Strategies

Lessons

- Understanding Backup Strategies
- SQL Server Transaction Logs
- Planning Backup Strategies

Lab 1: Understanding SQL Server Recovery Models

- Backup Databases
- Transaction Log Backups
- Shrinking a database

Module 6: Backing Up SQL Server Databases

Lessons

- Backing Up Databases and Transaction Logs
- Managing Database Backups
- Advanced Database Options

Lab 1: Backing Up Databases

- Backing Up Databases
- Verifying Backups
- Using Advanced Backup Features

Module 7: Restoring SQL Server Databases

Lessons

- Understanding the Restore Process
- Restoring Databases
- Advanced Restore Scenarios
- Point-in-Time Recovery

Lab 1: Restoring SQL Server Databases

- Determining the order of restores
- Restoring databases
- Restore encrypted backup
- Point-in-Time restore

Module 8: Automating SQL Server Management

Lessons

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

Lab 1: Automating SQL Server Management

- Using SQL Server Agent
- Scripting SQL Server Agent jobs
- Viewing job history
- Multimaster management

Module 9: Configuring Security for SQL Server Agent

Lessons

- Understanding SQL Server Agent Security
- Configuring Credentials
- Configuring Proxy Accounts

Lab 1: Configuring SQL Server Agent

- Assigning a security context to job steps
- Create credentials
- Create a proxy account

Module 10: Monitoring SQL Server with Alerts and Notifications

Lessons

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

Lab 1: Monitoring SQL Server with Alerts and Notifications

- Working with Database Engine Error Logs
- Configuring Database Mail
- Configure Operators and Alerts
- Configuring Alerts in Azure SQL Database (Optional)

Module 11: Introduction to Managing SQL Server by using PowerShell

Lessons

- Getting Started with Windows PowerShell
- Configure SQL Server using PowerShell
- Administer and Maintain SQL Server with PowerShell
- Managing Azure SQL Databases using PowerShell

Lab 1: Using PowerShell to Manage SQL Server

- Exploring SQL Server Management Objects (SMOs)
- Configure database and Instance features with PowerShell
- Manage logins and backups with PowerShell
- Create an Azure SQL Database with PowerShell

Module 12: Tracing Access to SQL Server with Extended Events

Lessons

- Extended Events Core Concepts
- Working with Extended Events

Lab 1: Using SQL Server Extended Events

- Create Extended Events sessions
- Working with Extended Events sessions

Module 13: Monitoring SQL Server

Lessons

- Monitoring activity
- Capturing and Managing Performance Data
- Analyzing Collected Performance Data

Lab 1: Monitoring SQL Server

- Using Performance Monitor
- Configuring Data Collection
- Viewing the Reports

Module 14: Troubleshooting SQL Server

Lessons

- Applying a Troubleshooting Methodology
- Resolving Service-Related Issues
- Resolving Connectivity and Login issues

Lab 1: Troubleshooting SQL Server

- Troubleshooting errors
- Troubleshooting services
- Troubleshooting logins

Module 15: Importing and Exporting Data

Lessons

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

Lab 1: Importing and Exporting data

- Disabling and Enabling Constraints
- Using the Import and Export Wizard
- Import with bcp and BULK INSERT
- Working with DACPACs and BACPACs