Administering a SQL Database

Duration: 5 Days Course Code: M55316

Overview:

This instructor-led course provides students who manage SQL Server and Azure SQL databases with the knowledge and skills needed to administer a SQL server database infrastructure. The material will also be useful to individuals who develop applications that deliver content from SQL Server databases.

Target Audience:

The primary audience for this course is individuals who administer and maintain SQL Server databases. These individuals perform database administration and maintenance as their primary area of responsibility, or work in environments where databases play a key role in their primary job.

Objectives:

- Authenticate and authorize users
- Assign server and database roles
- Authorize users to access resources
- Use encryption and auditing features to protect data
- Describe recovery models and backup strategies
- Backup and Restore SQL Server databases
- Automate database management
- Configure security for the SQL Server agent
- Manage alerts and notifications
- Managing SQL Server using PowerShell
- Trace access to SQL Server
- Monitor a SQL Server infrastructure
- Troubleshoot a SQL Server infrastructure
- Import and export data

Prerequisites:

Course M55315, Introduction to SQL Databases would give you a solid introduction for this course.

Content:

Module 1: SQL Server Security

This module describes SQL Server security models, logins, users, partially contained databases, and cross-server authorization.

- 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

After completing module 1, students will be able to:

- SQL Server basic concepts.
- SQL Server connection authentication.
- User login authorization to databases.
- Partially contained databases.
- Authorization across servers.

Module 2: Assigning Server and Database Roles

This module explains how to use roles at the server and database level to manage user permissions.

- 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

After completing module 2, students will be able to:

- SQL Server basic concepts.
- SQL Server connection authentication.
- User login authorization to databases.
- Partially contained databases.
- Authorization across servers.

Module 3: Authorizing Users to Access Resources

This module explains how to authorize users to access server and database roles. It also describes how to manage permissions at

In this module, you will learn how to apply various backup strategies.

- 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

After completing module 6, students will be able to:

- Perform backups of SQL Server databases and transaction logs.
- Manage database backups.
- Describe advanced backup options.

Module 7: Restoring SQL Server Databases

In this module, you will see how to restore user and system databases and how to implement point-in-time recovery.

- 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

After completing module 7, students will be able to:

- Explain the restore process.
- Restore databases.
- Perform advanced restore operations.
- Perform a point-in-time recovery.

Module 8: Automating SQL Server Management

This module describes how to use SQL Server Agent to automate jobs, how to configure security contexts for jobs, and how to implement multi-server jobs.

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

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

After completing module 11, students will be able to:

- Describe the benefits of PowerShell and its fundamental concepts.
- Configure SQL Server by using PowerShell.
- Administer and maintain SQL Server by using PowerShell.
- Manage an Azure SQL Database by using PowerShell.

Module 12: Tracing Access to SQL Server with Extended Events

This module explains how to monitor performance metrics for SQL Server and Azure SQL Database. It also describes troubleshooting strategies and usage scenarios for working with Extended Events.

- Extended Events Core Concepts
- Working with Extended Events

Lab 1: Using SQL Server Extended Events

- Create Extended Events sessions
- Working with Extended Events sessions

After completing module 12, students will be able to:

- Describe Extended Events core concepts.
- Create and query Extended Events sessions.

Module 13: Monitoring SQL Server

This module explains how to monitor databases with the goal of proactively dealing with potential issues. It also describes how to use the built-in tools provided to analyze instance and server activity.

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

different levels in a SQL Server instance.

- 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

After completing module 3, students will be able to:

- Authorize user access to objects.
- Authorize users to execute code.
- Configure permissions at the schema level.

Module 4: Protecting Data with Encryption and Auditing

This module describes the available options for auditing and how to manage audit features. It also describes how to configure and implement data encryption.

- 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

After completing module 4, students will be able to:

- Describe the options for auditing data access.
- Implement SQL Server Audit.
- Manage SQL Server Audit.
- Describe and implement methods of encrypting data in SQL Server.
- Implement encryption

Module 5: Recovery Models and Backup Strategies

In this module, you will learn how to use the available backup features for databases and transaction logs to create backup strategies.

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

Lab 1: Automating SQL Server Management

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

After completing module 8, students will be able to:

- Describe methods for automating SQL Server Management.
- Configure jobs, job step types, and schedules.
- Manage SQL Server Agent jobs.
- Configure master and target servers.

Module 9: Configuring Security for SQL Server Agent

This module explains how to configure SQL Server Agent to use a minimal privilege security environment and how to use credentials and proxy accounts to run jobs securely.

- 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

After completing module 9, students will be able to:

- Explain SQL Server Agent security.
- Configure credentials.
- Configure proxy accounts.

Module 10: Monitoring SQL Server with Alerts and Notifications

This module covers the configuration of Database Mail, alerts, and notifications for a SQL Server instance, and the configuration of alerts for Microsoft Azure SQL Database.

- 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

Lab 1: Monitoring SQL Server

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

After completing module 13, students will be able to:

- Monitor current activity.
- Capture and manage performance data.
- Analyze collected performance data.
- Configure SQL Server Utility.

Module 14: Troubleshooting SQL Server

This module explains how to resolve common issues that may arise when working with SQL Server systems. It also describes a methodology for resolving general database server issues.

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

Lab 1: Troubleshooting SQL Server

- Troubleshooting errors
- Troubleshooting services
- Troubleshooting logins

After completing module 14, students will be able to:

- Describe a troubleshooting methodology for SQL Server.
- Resolve service-related issues.
- Resolve login and connectivity issues.

Module 15: Importing and Exporting Data

This module explains how to use SQL Server native tools to import and export data to and from SQL Server and Azure SQL Databases.

- 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

After completing module 15, students will be able to:

- Describe tools and techniques for

Lab 1: Understanding SQL Server Recovery Models

- Backup Databases
- Transaction Log Backups
- Shrinking a database

After completing module 5, students will be able to:

- Describe various backup strategies.
- Describe how database transaction logs function.
- Plan SQL Server backup strategies.

Module 6: Backing Up SQL Server Databases

- Configure Operators and Alerts
- Configuring Alerts in Azure SQL Database (Optional)

After completing module 10, students will be able to:

- Monitor SQL Server errors.
- Configure database mail.
- Configure operators, alerts, and notifications.
- Work with alerts in Azure SQL Database.

Module 11: : Introduction to Managing SQL Server by using PowerShell

This module explains how to use Windows PowerShell with Microsoft SQL Server and Azure SQL Database. It also describes how to improve efficiency and reliability by scripting tasks and jobs.

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

transferring data.

- Import and export table data.
- Use bcp and BULK INSERT to import data.

Use data-tier applications to import and export database applications

Further Information:

For More information, or to book your course, please call us on Head Office 01189 123456 / Northern Office 0113 242 5931

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