



## Administering a SQL Database Infrastructure

This five-day instructor-led course provides students who administer and maintain SQL Server databases with the knowledge and skills to administer a SQL server database infrastructure. Additionally, it will be of use to individuals who develop applications that deliver content from SQL Server databases.

### Who Should Attend:

This course is intended for individuals who:

- Administer & maintain SQL Server databases
- Perform database administration & maintenance or work in environments where databases play a key role in their job
- Who develop applications that deliver content from SQL Server databases

### Course Prerequisites:

Before attending this course, participants must have, in addition to their professional experience:

- A basic knowledge of the Microsoft Windows operating system
- Working knowledge of Transact-SQL
- Working knowledge of relational databases
- Some experience with database design

### Course Objectives:

After completing this course, participants will be able to:

- Authenticate and authorize users
- Assign server and database roles
- Authorize users to access resources
- Protect data with encryption and auditing
- Describe recovery models and backup strategies
- Backup SQL Server databases
- 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)

Course Code: 20764A  
Course Duration: 5 Days

### Course Summary

**Module 1:** Authenticating and Authorizing Users

**Module 2:** Assigning Server and Database Roles

**Module 3:** Authorizing Users to Access Resources

**Module 4:** Protecting Data with Encryption and Auditing

**Module 5:** SQL Server Recovery Models

**Module 6:** Backup of SQL Server Databases

**Module 7:** Restoring SQL Server Databases

**Module 8:** Automating SQL Server Management

**Module 9:** Configuring Security for SQL Server Agent

**Module 10:** Monitoring SQL Server with Alerts and Notifications

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

**Module 12:** Tracing Access to SQL Server

**Module 13:** Monitoring SQL Server

**Module 14:** Troubleshooting SQL Server

**Module 15:** Importing and Exporting Data

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## Course Outline

### Module 1: Authenticating and Authorising Users

This module covers SQL Server security models, logins, and users.

#### Lessons

- Authenticating connections to SQL Server
- Authorizing logins to access databases
- Authorization across servers
- Partially contained databases

#### Lab

- Authenticating Users

### Module 2: Assigning Server and Database Roles

This module covers fixed server roles, user-defined server roles, fixed database roles, and user-defined database roles

#### Lessons

- Working with server roles
- Working with Fixed database roles
- Creating user-defined database roles

#### Lab

- Assigning Server and Database Roles

### Module 3: Authorizing Users to Access Resources

This module covers permissions and the assignment of permissions

#### Lessons

- Authorizing user access to objects
- Authorizing users to execute code
- Configuring permissions at the schema level

#### Lab

- Authorising Users to access resources

### Module 4: Protecting Data with Encryption and Auditing

This module covers SQL Server Audit

#### Lessons

- Options for auditing data access in SQL Server
- Implementing SQL Server audit
- Managing SQL Server audit
- Protecting data with encryption

#### Lab

- Using Auditing and Encryption

### Module 5: SQL Server Recovery Models

This module describes the concept of the transaction log and SQL Server recovery models. It also introduces the different backup strategies available with SQL Server.

#### Lessons

- Backup strategies
- Understanding SQL Server transaction log
- Planning a SQL Server backup strategy

#### Lab

- Understanding SQL Server Recovery Models

### Module 6: Backup of SQL Server Databases

This module describes SQL Server Backup and the backup types

#### Lessons

- Backing up databases and transaction logs
- Managing database backups
- Working with backup options

#### Lab

- Backing Up SQL Server Databases

### Module 7: Restoring SQL Server Databases

This module describes the restoration of databases

#### Lessons

- Understanding the restore process
- Restoring databases
- Working with point-in-time recovery
- Restoring system databases and individual files

#### Lab

- Restoring SQL Server User Databases

### Module 8: Automating SQL Server Management

This module describes how to use SQL Server Agent for automation. It also explains the benefits of using master and target servers to centralize the administration of automation

#### Lessons

- Automating SQL Server management
- Working with SQL Server agent
- Managing SQL Server agent jobs
- Multi-server management

#### Lab

- Automating SQL Server Management



### Module 9: Configuring Security for SQL Server Agent

This module describes the considerations for SQL Server Agent security, including proxy accounts and credentials

#### Lessons

- Understanding SQL Server Agent Security
- Configuring credentials
- Configuring proxy accounts

#### Lab

- Configuring Security for SQL Server Agent

### Module 10: Monitoring SQL Server with Alerts and Notifications

This module covers the configuration of database mail, alerts and notifications

#### Lessons

- Configuration of database mail
- Monitoring SQL Server errors
- Configuring operators, alerts, and notifications
- Alerts in Azure SQL database

#### Lab

- Monitoring SQL Server with Alerts and Notifications

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

This module introduces PowerShell for SQL Server

#### Lessons

- Configure SQL Server using PowerShell
- Administer SQL Server using PowerShell
- Maintain the SQL Server environment using PowerShell
- Managing Azure SQL Server databases using PowerShell

#### Lab

- Administering SQL Server using PowerShell

### Module 12: Tracing Access to SQL Server

This module describes how to use SQL Profiler and SQL Trace stored procedures to capture information about SQL Server. The module also describes how to use Distributed Replay to capture trace information from multiple servers, and how to monitor locking

#### Lessons

- Capturing activity using SQL Server profiler
- Improving performance with the database engine tuning advisor

### Module 12 continued....

- Working with tracing options
- Distributed replay
- Monitoring locks

#### Lab

- Tracing Access to SQL Server

### Module 13: Monitoring SQL Server

This module explains how to use Distributed Management Views to monitor SQL Server. It also describes configuration of data collection and the SQL Server Utility

#### Lessons

- Monitoring activity
- Capturing and managing performance data
- Analyzing collected performance data
- SQL Server utility

#### Lab

- Monitoring SQL Server

### Module 14: Troubleshooting SQL Server

This module explains the SQL Server troubleshooting methodology and discusses the most common issues that can arise when working with SQL Server systems

#### Lessons

- SQL Server troubleshooting methodology
- Resolving service related issues
- Resolving login and connectivity issues
- Troubleshooting common issues

#### Lab

- Troubleshooting Common Issues

### Module 15: Importing and Exporting Data

This module covers the use of the import/export wizards and explains how they relate to SSIS. The module also introduces BCP and BULK INSERT

#### Lessons

- Transferring data to/from SQL Server
- Importing and exporting table data
- Using BCP and BULK INSERT to import data
- Deploying and upgrading data-tier applications

#### Lab

- Importing and Exporting Data