



## Administering Microsoft SQL Server Databases

Course 20462D 5 Days Instructor-led, Hands-on

### Course Description

This five-day instructor-led course provides students with the knowledge and skills to maintain a Microsoft SQL Server 2014 database. The course focuses on teaching individuals how to use SQL Server 2014 product features and tools related to maintaining a database.

**Note:** This course is designed for customers who are interested in learning SQL Server 2012 or SQL Server 2014. It covers the new features in SQL Server 2014, but also the important capabilities across the SQL Server data platform.

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.

The secondary audience for this course is individuals who develop applications that deliver content from SQL Server databases.

### Course Objectives

Upon successful completion of this course, students will be able to:

- Describe core database administration tasks and tools.
- Install and configure SQL Server.
- Configure SQL Server databases and storage.
- Plan and implement a backup strategy.
- Restore databases from backups.
- Import and export data.
- Monitor SQL Server.
- Trace SQL Server activity.
- Manage SQL Server security.
- Audit data access and encrypt data.
- Perform ongoing database maintenance.
- Automate SQL Server maintenance with SQL Server Agent Jobs.
- Configure Database Mail, alerts and notifications

### Prerequisites

This course requires that you meet the following prerequisites:

- Basic knowledge of the Microsoft Windows operating system and its core functionality.
- Working knowledge of Transact-SQL.
- Working knowledge of relational databases.

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- Some experience with database design.

Students who attend this training can meet the prerequisites by attending the following courses, or obtaining equivalent knowledge and skills: 20461C: Querying Microsoft SQL Server

## Course Materials

The student kit includes a comprehensive workbook and other required materials for this class.

## Course Content

### Module 1: Introduction to SQL Server Database Administration

This module introduces the Microsoft SQL Server 2012 & 2014 platforms. It describes the components, editions, and versions of SQL Server, and the tasks that a database administrator commonly performs for a SQL Server instance.

#### Lessons

- Database Administration Overview
- Introduction to the SQL Server Platform
- Database Management Tools and Techniques

#### Lab : Using SQL Server Administrative Tools

- Using SQL Server Management Studio
- Using the sqlcmd Utility
- Using Windows PowerShell with SQL Server

After completing this module, you will be able to:

- Describe the SQL Server platform.
- Describe common database administration tasks.
- Use SQL Server administration tools.

### Module 2: Installing and Configuring SQL Server

This module explains how to assess resource requirements for SQL Server and how to install it.

#### Lessons

- Planning SQL Server Installation
- Installing SQL Server
- Post-Installation Configuration

#### Lab : Installing SQL Server

- Preparing to Install SQL Server
- Installing SQL Server
- Performing Post-Installation Configuration

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After completing this module, you will be able to:

- Plan a SQL Server installation.
- Install SQL Server.
- Perform post-installation configuration tasks.

### **Module 3: Working with Databases and Storage**

This module describes how data is stored in databases, how to create databases, how to manage database files, and how to move them. Other tasks related to storage, include managing the tempdb database and using fast storage devices to extend the SQL Server buffer pool cache, are also discussed.

#### **Lessons**

- Introduction to Data Storage with SQL Server
- Managing Storage for System Databases
- Managing Storage for User Databases
- Moving Database Files
- Configuring the Buffer Pool Extension

#### **Lab : Managing Database Storage**

- Configuring tempdb Storage
- Creating Databases
- Attaching a Database

After completing this module, you will be able to:

- Describe how SQL Server stores data.
- Manage storage for system databases.
- Manage storage for user databases.
- Move database files.
- Configure the buffer pool extension.

### **Module 4: Planning and Implementing a Backup Strategy**

In this module, you will consider how to create a backup strategy that is aligned with organizational needs, and learn how to perform the backup operations required by that strategy.

#### **Lessons**

- Understanding SQL Server Recovery Models
- Planning a Backup Strategy
- Backing up Databases and Transaction Logs
- Using Backup Options
- Ensuring Backup Reliability

#### **Lab : Backing Up SQL Server Databases**

- Backing Up Database
- Performing Database, Differential, and Transaction Log Backups
- Performing a Partial Backup

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After completing this module, you will be able to:

- Describe how database transaction logs function, and how they affect database recovery.
- Plan a backup strategy for a SQL Server database.
- Back up databases and transactions logs.
- Perform copy-only, compressed, and encrypted backups.
- Maximize backup reliability.

## **Module 5: 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.

### **Lessons**

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

### **Lab : Restoring SQL Server Databases**

- Restoring a Database Backup
- Restoring Database, Differential, and Transaction Log Backups
- Performing a Piecemeal Restore

After completing this module, you will be able to:

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

## **Module 6: Importing and Exporting Data**

In this module, you will briefly explore tools and techniques so that you can import and export data to and from SQL Server.

### **Lessons**

- Introduction to Transferring Data
- Importing and Exporting Table Data
- Copying or Moving a Database

### **Lab : Importing and Exporting Data**

- Using the SQL Server Import and Export Wizard
- Using the bcp Utility
- Using the BULK INSERT Statement
- Using the OPENROWSET Function

After completing this module, you will be able to:

- Describe tools and techniques for transferring data.

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- Import and export data.
- Copy or move a database.

## **Module 7: Monitoring SQL Server**

This module explains how to use three of the most commonly used tools: Activity Monitor, dynamic management views and functions (DMVs and DMFs), and Performance Monitor.

### **Lessons**

- Introduction to Monitoring SQL Server
- Dynamic Management Views and Functions
- Performance Monitor

### **Lab : Monitoring SQL Server**

- Collecting Baseline Metrics
- Monitoring a Workload

After completing this module, you will be able to:

- Describe considerations for monitoring SQL Server and use Activity Monitor.
- Use dynamic management views and functions to monitor SQL Server.
- Use Performance Monitor to monitor SQL Server.

## **Module 8: Tracing SQL Server Activity**

This module describes how to use SQL Server Profiler and SQL Trace stored procedures to capture information about SQL Server, and how to use that information to troubleshoot and optimize SQL Server workloads.

### **Lessons**

- Tracing SQL Server Workload Activity
- Using Traces

### **Lab : Tracing SQL Server Workload Activity**

- Capturing a Trace in SQL Server Profiler
- Generating Database Tuning Recommendations
- Using SQL Trace

After completing this module, you will be able to:

- Trace activity in SQL Server.
- Use captured traces to test, troubleshoot, and optimize database performance.

## **Module 9: Managing SQL Server Security**

In this module, you will learn about the core concepts on which the SQL Server security architecture is based, and how to manage security at the server and database levels.

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#### Lessons

- Introduction to SQL Server Security
- Managing Server-Level Security
- Managing Database-Level Principals
- Managing Database Permissions

#### Lab : Managing SQL Server Security

- Managing Server-Level Security
- Managing Database-Level Security
- Testing Database Access

After completing this module, you will be able to:

- Describe core security concepts in the SQL Server security architecture.
- Manage server-level security.
- Manage database-level security principals.
- Manage database permissions.

### **Module 10: Auditing Data Access and Encrypting Data**

This module describes the available options for auditing in SQL Server, how to use and manage the SQL Server audit feature, and how to implement encryption.

#### Lessons

- Auditing Data Access in SQL Server
- Implementing SQL Server Audit
- Encrypting Databases

#### Lab : Auditing Data Access and Encrypting Data

- Implementing Auditing
- Implementing Transparent Database Encryption

After completing this module, you will be able to:

- Describe options for auditing data access.
- Implement SQL Server audit.
- Manage SQL Server audit.
- Implement Transparent Data Encryption.

### **Module 11: Performing Ongoing Database Maintenance**

This module describes common database maintenance tasks that a DBA must perform, and demonstrates how to automate these tasks using maintenance plans.

#### Lessons

- Ensuring Database Integrity
- Maintaining Indexes
- Automating Routine Database Maintenance

#### Lab : Performing Ongoing Database Maintenance

- Managing Database Integrity
- Managing Index Fragmentation
- Implementing a Maintenance Plan

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After completing this module, you will be able to:

- Ensure database integrity by using DBCC CHECKDB.
- Maintain indexes.
- Configure Database Maintenance Plans.

## **Module 12: 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.

### **Lessons**

- Automating SQL Server Management
- Implementing SQL Server Agent Jobs
- Managing SQL Server Agent Jobs
- Managing Job Step Security Contexts
- Managing Jobs on Multiple Servers

### **Lab : Automating SQL Server Management**

- Creating a Job
- Scheduling a Job
- Configuring Job Step Security Contexts

After completing this module, you will be able to:

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

## **Module 13: Monitoring SQL Server by Using Alerts and Notifications**

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

### **Lessons**

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

### **Lab : Monitoring SQL Server by Using Alerts and Notifications**

- Configuring Database Mail
- Implementing Operators and Notifications
- Implementing Alerts

After completing this module, you will be able to:

- Configure Database Mail.
- Monitor SQL Server errors.
- Configure operators, alerts, and notifications.

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