

## Course 6231A: Maintaining a Microsoft SQL Server 2008 Database

### Introduction

Elements of this syllabus are subject to change.

This five-day instructor-led course provides students with the knowledge and skills to maintain a Microsoft SQL Server 2008 database. The course focuses on teaching individuals how to use SQL Server 2008 product features and tools related to maintaining a database.

### Audience

This course is intended for IT Professionals who administer and maintain SQL Server databases.

### At Course Completion

After completing this course, students will be able to:

- Install and configure SQL Server 2008.
- Manage database files.
- Backup and restore databases.
- Manage security.
- Transfer data into and out of SQL Server.
- Automate administrative tasks.
- Replicate data between SQL Server instances.
- Maintain high availability.
- Monitor SQL Server.

### Prerequisites

Before attending this course, students must have:

- Basic knowledge of the Microsoft Windows operating system and its core functionality.
- Working knowledge of Transact-SQL.
- Working knowledge of relational databases.
- Some experience with database design.

### Course Outline

#### Module 1: Installing and Configuring SQL Server

The students will be introduced to planning for a SQL Server installation. The students will then be introduced to installing, configuring, and managing SQL Server.

Lessons

- Lesson 1: Preparing to Install SQL Server
- Lesson 2: Installing SQL Server
- Lesson 3: Configuring a SQL Server Installation

Lab: Installing and Configuring SQL Server

- Exercise 1: (Level 200) Installing SQL Server
- Exercise 2: (Level 200) Configuring SQL Server

After completing this module, students will be able to:

- Explain how to prepare the hardware and other resources necessary to install SQL Server.
- Install SQL Server.
- Manage and configure SQL Server.

## Module 2: Managing Databases and Files

The students will be introduced to database planning and creation, and using database options to control database behavior.

Lessons

- Lesson 1: Planning Databases
- Lesson 2: Creating Databases
- Lesson 3: Using Policy-Based Management

Lab: Managing Databases and Files

- Exercise 1: (Level 200): Creating a Database
- Exercise 2: (Level 200): Monitoring and Managing Filegroup Usage
- Exercise 3: (Level 200) Creating a Policy

After completing this module, students will be able to:

- Plan a database implementation that meets an organization's requirements.
- Create a SQL Server database.
- Manage a SQL Server database.

## Module 3: Disaster Recovery

The students will be introduced to disaster recovery techniques for SQL Server. They will learn how to perform different types of backup and restore operations, including online restores and backup and restores of system databases.

Lessons

- Lesson 1: Planning a Backup Strategy
- Lesson 2: Backing Up User Databases
- Lesson 3: Restoring User Databases
- Lesson 4: Performing Online Restore Operations
- Lesson 5: Recovering Data from Database Snapshots
- Lesson 6: System Databases and Disaster Recovery

Lab: Disaster Recovery

- Exercise 1: (Level 200) Designing a Backup Strategy
- Exercise 2: (Level 200) Implementing a Backup Strategy
- Exercise 3: (Level 200) Restoring and Recovering a Database
- Exercise 4: (Level 300) Performing Piecemeal Backup and Restore Operations
- Exercise 5: (Level 200) Restoring the master Database

After completing this module, students will be able to:

- Plan a backup strategy for a database.
- Back up user databases.
- Restore user databases from backups.
- Restore data in a user database while it is online.
- Recover data for a user database from a database snapshot.
- Restore and recover system databases.

## Module 4: Managing Security

The students will be introduced to protecting SQL Server. Students will learn about the SQL Server security model and how to use SQL Server security features to control access to databases and their contents.

Lessons

- Lesson 1: Overview of SQL Server Security
- Lesson 2: Protecting the Server Scope
- Lesson 3: Protecting the Database Scope
- Lesson 4: Protecting the Server Scope
- Lesson 5: Auditing Security

Lab: Managing Security

- Exercise 1: (Level 200) Creating Logins and Assigning Server-Scope Permissions
- Exercise 2: (Level 200) Creating and Managing Users
- Exercise 3: (Level 300) Using a Certificate to Protect Data

■ Exercise 4: (Level 200) Implementing SQL Server Audit  
After completing this module, students will be able to:

- Describe how SQL Server manages security.
- Protect SQL Server at the server level.
- Protect SQL Server databases.
- Use keys and certificates to protect SQL Server objects.
- Audit SQL Server security.

### Module 5: Transferring Data

The students will be introduced to transfer data to and from SQL Server using UI and command-line tools, and learn about transferring and transforming data with SQL Server Integration Services.

Lessons

- Lesson 1: Overview of Data Transfer
- Lesson 2: Introduction to SQL Server Integration Services

Lab: Transferring Data

- Exercise 1: (Level 200) Using the Import/Export Wizard
- Exercise 2: (Level 200) Performing a Bulk Load
- Exercise 3: (Level 200) Creating an SSIS Solution

After completing this module, students will be able to:

- Use UI and command-line tools to import and export data.
- Describe the features of SQL Server Integration Services.

### Module 6: Automating Administrative Tasks

The students will learn how to automate routine administrative tasks using jobs, operators, and alerts.

Lessons

- Lesson 1: Automating Administrative Tasks in SQL Server
- Lesson 2: Using SQL Server Agent
- Lesson 3: Creating Maintenance Plans
- Lesson 4: Implementing Alerts
- Lesson 5: Managing Multiple Servers
- Lesson 6: Managing SQL Server Agent security

Lab: Automating Administrative Tasks

- Exercise 1: (Level 200) Configuring SQL Server Agent
- Exercise 2: (Level 200) Creating Operators and Jobs
- Exercise 3: (Level 200) Creating Alerts

After completing this module, students will be able to:

- Define SQL Server administrative tasks and schedule those tasks to run automatically.
- Configure SQL Server Agent to support automatic task scheduling.
- Script tasks by using SQL Server jobs, and define operators for managing those jobs.
- Define alerts to warn operators about events raised by SQL Server.
- Define and manage administrative tasks that span multiple servers.
- Configure SQL Server Agent security.

### Module 7: Implementing Replication

The students will be introduced to techniques for configuring SQL Server replication.

Lessons

- Lesson 1: Overview of Replication
- Lesson 2: Managing Publications and Subscriptions
- Lesson 3: Configuring Replication in Some Common Scenarios

Lab: Implementing Replication

- Exercise 1: (Level 300) Implementing Snapshot Replication

- Exercise 2: (Level 300) Implementing Peer-to-Peer Transactional Replication
  - Exercise 3: (Level 300) Implementing HTTP Merge Replication
- After completing this module, students will be able to:

- Describe replication and its components.
- Configure and implement replication.
- Use replication to meet the requirements of some common scenarios.

### Module 8: Maintaining High Availability

The students will be introduced to concepts and methods for maintaining high availability with SQL Server.

Lessons

- Lesson 1: Introduction to High Availability
- Lesson 2: Implementing Log Shipping
- Lesson 3: Implementing Database Mirroring
- Lesson 4: Implementing Server Clustering
- Lesson 5: Using Distributed High Availability Solutions

Lab: Maintaining High Availability

- Exercise 1: (Level 300) Configuring Log Shipping
- Exercise 2: (Level 300) Configuring Database Mirroring
- Exercise 3: (Level 300) Implementing SQL Server Clustering

After completing this module, students will be able to:

- Describe the factors affecting database availability.
- Describe how to implement log shipping to support fast recovery of a standby SQL Server database
- Describe how to use SQL Server mirroring to implement a software solution for fast failover
- Explain how to implement clustering to support fast failover of computers running SQL Server instances.
- Describe how to implement distributed high availability solutions.

### Module 9: Monitoring SQL Server

The students will be introduced to monitoring SQL Server performance and activity.

Lessons

- Lesson 1: Viewing Current Activity
- Lesson 2: Using SQL Server Profiler
- Lesson 3: Monitoring with DDL Triggers
- Lesson 4: Using Event Notifications

Lab: Monitoring SQL Server

- Exercise 1: (Level 200) Monitoring SQL Server Activity
- Exercise 2: (Level 300) Tracing SQL Server Activity
- Exercise 3: (Level 200) Using DDL Triggers
- Exercise 4: (Level 200) Using Event Notifications

After completing this module, students will be able to:

- Examine the current activity in a SQL Server instance.
- Use SQL Server Profiler to trace server and database activity.
- Use DDL triggers to monitor changes to the structure of database objects.
- Use event notifications to capture and monitor significant events for a SQL Server instance.

### Module 10: Troubleshooting and Performance Tuning

The students will learn how to troubleshoot a variety of common SQL Server problems. Students will also learn how to tune SQL Server for improved performance using a variety of tools.

Lessons

- Lesson 1: Troubleshooting SQL Server

- Lesson 2: Performance Tuning in SQL Server
- Lesson 3: Using Resource Governor
- Lesson 4: Using Data Collector

Lab: Troubleshooting and Performance Tuning

- Exercise 1: (Level 300) Troubleshooting Connectivity Problems
- Exercise 2: (Level 300) Troubleshooting Concurrency Problems
- Exercise 3: (Level 300) Using the Database Engine Tuning Advisor
- Exercise 4: (Level 300) Implementing Resource Governor
- Exercise 5: (Level 300) Implementing Data Collector

After completing this module, students will be able to:

- Troubleshoot common SQL Server problems, such as connectivity, concurrency, and job and disk space problems.
- Perform basic performance tuning tasks in SQL Server using the Database Engine Tuning Advisor, index tuning, and query tuning.
- Use Resource Governor to manage SQL Server workloads and resources.
- Use Data Collector to obtain performance data about your computer and the instances of SQL Server running on your computer.