

**Course #20465B - Designing a Data Solution with Microsoft® SQL Server® 2012**  
**Course Outline**

**Module 1: Designing a Database Server Infrastructure**

This module explains how to design an appropriate database server infrastructure for a given business application scenario - including how to decide between on-premise, cloud-based, and hybrid database servers, hardware capacity planning, considerations for storage hardware, and strategies for consolidating database server hardware.

**Lessons**

- Planning a Database Server Infrastructure
- Planning Server Hardware
- Considerations for Database Server Consolidation
- Managing Server Resources in a Consolidated Database Infrastructure

**Lab : Planning Database Server Consolidation**

- Planning for Consolidation
- Managing Resources for an Instance of SQL Server
- Managing Resources for Multiple SQL Server Instances on a Single Windows Server

After completing this module, students will be able to:

- Describe the options and considerations for creating a database server infrastructure.
- Describe how to plan hardware requirements for SQL Server 2012.
- Describe the benefits of database and server consolidation and the different options for consolidating.
- Describe the methods of managing server resources in a range of database infrastructure consolidation scenarios.

**Module 2: Designing a Logical Database Schema**

This module explains how to design a logical schema for a database based on application requirements. This includes planning the level of normalization, and schema and table design, and the use of views.

**Lessons**

- Relational Database Design Techniques
- Planning Schemas and Tables

**Lab : Designing a Logical Database Schema**

- Plan a Database Schema
- Create a View to Display Employee Payment Information

After completing this module, students will be able to:

- Describe the key techniques for designing a logical database schema.
- Describe the considerations for table and schema design in a relational database.

- Describe how to use views to provide a denormalized view of database tables to enable users to work with data more easily.

### **Module 3: Designing a Physical Database Implementation**

This module explains how to design the physical implementation of a database for a given set of requirements. The design will include data files, log files, filegroups, and data partitioning, as well as whether or not to use data compression.

#### **Lessons**

- Planning Files and Filegroups
- Planning a Partitioning Data
- Planning Compression

#### **Lab : Designing a Physical Database Implementation**

- Planning Files and Filegroups
- Implement the Timesheet Archive Strategy

After completing this module, students will be able to:

- Describe the considerations for creating and placing SQL Server data and log files.
- Describe how to use partitioning to improve manageability.
- Describe the benefits of using compression to improve performance and storage efficiently.

### **Module 4: Incorporating Data Files into Databases**

This modules discusses how to consider options for including data files in a database design.

#### **Lessons**

- Considerations for Working with Data Files in SQL Server 2012
- Implementing FileStream and FileTables
- Searching Data Files

#### **Lab : Implementing a Solution for Storing Data Files**

- Exercise 1: Creating a FileTable
- Exercise 2: Creating and using a Full-Text Index

After completing this module, students will be able to:

- Describe the considerations for designing databases that incorporate data files.
- Describe the benefits and design considerations for using FileStream and FileTables to store data files.
- Describe the benefits of full text indexing and semantic search, and explain how to use these features to search data files in SQL Server.

### **Module 5: Tuning Database Performance**

This module explains how to plan and manage indexes and how to use query plans to optimize database performance.

## **Lessons**

- Optimizing Query Performance by Using Indexes
- Working with Query Plans
- Performance Monitoring

## **Lab : Using Indexes and Plan Guides**

- Planning Indexes
- Testing Indexing Strategies
- Working with Execution Plans

After completing this module, students will be able to:

- Describe how to plan indexes to optimize query performance.
- Describe how to use query plans to improve performance.
- Describe how to monitor performance.

## **Module 6: Designing Database Security**

This module explains the key considerations for designing security for SQL Server instances and databases.

## **Lessons**

- Introduction to Security Planning
- Planning Security
- Contained Databases
- Protecting Data with Encryption

## **Lab : Planning and Implementing Security**

- Planning Server and Database Security
- Implementing a Data Access Strategy
- Implementing Transparent Data Encryption

After completing this module, students will be able to:

- Describe the benefits of security planning.
- Describe the design considerations for planning security.
- Describe how to use contained databases.
- Describe the options for encrypting data.

## **Module 7: Policy Based Management**

This module explains how to plan policy-based management to manage server instances, databases, and other SQL Server 2012 objects more efficiently.

## **Lessons**

- Introduction to Policy-Based Management
- Planning and Implementing Policy-Based Management

## **Lab : Planning Policy-Based Management**

- Planning a Policy-Based Management Strategy

- Implementing Policy-Based Management
- Testing Policy Compliance

After completing this module, students will be able to:

- Describe the benefits of policy-based management.
- Plan and implement policy-based management.

### **Module 8: Monitoring Server Health**

This module explains how to plan SQL Server health monitoring and to implement health monitoring by using SQL Server Utility.

#### **Lessons**

- Introduction to Server Health Monitoring
- SQL Server Utility

#### **Lab : Monitoring Server Health**

- Create a Utility Control Point
- Configure Health Policies

After completing this module, students will be able to:

- Describe the benefits of health monitoring and considerations for planning health monitoring.
- Use SQL Server Utility to monitor server health.

### **Module 9: Designing a Database Backup Solution**

This module explains how to identify and implement the appropriate backup strategy for a given scenario.

#### **Lessons**

- SQL Server Backup and Restore
- Planning a Recovery Strategy

#### **Lab : Planning and Implementing a Backup Strategy**

- Planning a Backup and Restore Strategy
- Implementing a Backup Strategy
- Performing a Piecemeal Restore

After completing this module, students will be able to:

- Plan a Backup and Restore Strategy.
- Describe the key features of a disaster recovery plan.

### **Module 10: Automating Multi-Server Maintenance**

This module explains how to better plan and manage multi-server maintenance and automation.

#### **Lessons**

- Overview of Maintenance Automation
- Managing Multiple Servers

#### **Lab : Automating Multi-Server Maintenance**

- Planning and Implementing a Multi-Server Environment

- Planning and Implementing Multi-Server Jobs

After completing this module, students will be able to:

- Describe the benefits and components of multi-server maintenance.
- Manage multiple servers by using master and target servers.

### **Module 11: Managing SQL Server with PowerShell**

This module provides an overview of PowerShell and describes the benefits of using PowerShell to manage SQL Server 2012.

#### **Lessons**

- Introduction to Windows PowerShell
- Scripting with Windows PowerShell

#### **Lab : Managing SQL Server with Windows PowerShell**

- Using PowerShell to Manage SQL Server
- Creating PowerShell Scripts

After completing this module, students will be able to:

- Describe the benefits of using PowerShell to maintain SQL Server and explain the fundamental concepts that underlie PowerShell.
- Explain how to create PowerShell scripts.

**Module 12: Replicating Data** This module explains how to design an optimal replication strategy from a given set of business and technical requirements.

#### **Lessons**

- SQL Server Replication
- Planning Replication

#### **Lab : Planning and Implementing SQL Server Replication**

- Planning Replication
- Implementing Replication

After completing this module, students will be able to:

- Describe the benefits of replication and the options for planning replication in SQL Server 2012.
- Identify the appropriate replication solution for a given scenario.

### **Module 13: Planning High Availability**

This module explains how to plan and implement a high availability solution.

#### **Lessons**

- High Availability in SQL Server 2012
- AlwaysOn Availability Groups

#### **Lab : Implementing High Availability**

- Creating an AlwaysOn Availability Group
- Using an AlwaysOn Availability Group
- Testing Failover for an AlwaysOn Availability Group

After completing this module, students will be able to:

- Choose a high availability strategy for a given scenario.
- Describe how to implement and test AlwaysOn Availability Groups.