



# Complete Computing, Inc.

SERVING OUR CUSTOMERS SINCE 1982

## 20764M: Administering and Provisioning Microsoft® SQL Databases

*Course length: 5 day(s)*

### Course Description

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.

**Note:** This modified course is comprised of two Microsoft Official Curriculum (MOC) courses – *20764: Administering a SQL Database Infrastructure* and *20765: Provisioning SQL Databases*. Students will receive the full materials for both classes, but only a subset of modules from each course will be taught to fit a five-day class. Students will have access to all the labs (in a virtual lab environment) from both classes for at least nine months post class. Students can complete optional modules on their own at any time.

### Audience Profile

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 audiences for this course are individuals who develop applications that deliver content from SQL Server databases.

### Prerequisites

In addition to their professional experience, students who attend this training should already have the following technical knowledge:

- Basic knowledge of the Microsoft Windows operating system and its core functionality.
- Working knowledge of Transact-SQL (considered a co-requisite).
- Working knowledge of relational databases.
- 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: 20761 Querying Data with Transact-SQL.

### Performance-Based Objectives

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

- Understand the components of the Microsoft SQL Server Architecture
- Install SQL Server using industry standard best practices
- Understand the basics of creating databases
- Authenticate and authorize users
- Assign server and database roles
- Authorize users to access resources

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- 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
- Monitor a SQL Server infrastructure
- Troubleshoot a SQL Server infrastructure
- Import and export data

## Course Content

### ***Microsoft Course 20765: Provisioning SQL Databases -***

#### **Module 1: SQL Server 2016 Components**

Describe the SQL Server platform, SQL Server services, and SQL Server configuration options.

- Introduction to the SQL Server Platform
- Overview of SQL Server Architecture
- SQL Server Services and Configuration Options

#### **Module 2: Installing SQL Server 2016**

This module describes the process to install SQL Server 2016.

- Considerations for installing SQL Server
- TempDB Files
- Installing SQL Server 2016
- Automating Installation

#### **Module 5: Working with Databases**

This module describes the preinstalled system databases, the physical structure of databases and the most common configuration options related to them.

- Overview of SQL Server Databases
- Creating Databases
- Database Files and Filegroups
- Moving Database Files
- Buffer Pool Extension

### ***Microsoft Course 20764: Administering a SQL Database Infrastructure -***

#### **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



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

Using roles simplifies the management of user permissions. With roles, you can control authenticated users' access to system resources based on each user's job function—rather than assigning permissions user-by-user, you can grant permissions to a role, then make users members of roles. Microsoft SQL Server includes support for security roles defined at server level and at database level.

- Working with server roles
- Working with Fixed Database Roles
- Assigning User-Defined Database Roles

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

In this module, you will see how object permissions are managed. In addition to access permissions on database objects, SQL Server provides the ability to determine which users are allowed to execute code, such as stored procedures and functions. In many cases, these permissions and the permissions on the database objects are best configured at the schema level rather than at the level of the individual object.

- Authorizing User Access to Objects
- Authorizing Users to Execute Code
- Configuring Permissions at the Schema Level

## **Module 5: Recovery Models and Backup Strategies**

In this module, you will consider how to create a disaster recovery strategy that is aligned with organizational needs, based on the available backup models, and the role of the transaction logs in maintaining database consistency.

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

## **Module 6: Backing Up SQL Server Databases**

This module will focus on actually performing SQL Server backups, including full and differential database backups, transaction log backups, and partial backups.

- Backing Up Databases and Transaction Logs
- Managing Database Backups
- Advanced Database Options

## **Module 7: Restoring SQL Server Databases**

This module is designed to get students comfortable with restoring SQL Server-based databases using best practice methodologies.

- Understanding the Restore Process
- Restoring Databases
- Advanced Restore Scenarios
- 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 multiserver jobs.

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



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

This module is designed to teach how to create a minimal privilege security environment for jobs that run in SQL Server Agent.

- Understanding SQL Server Agent Security
- Configuring Credentials
- Configuring Proxy Accounts

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

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

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

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

This module looks at how to use Windows PowerShell with Microsoft SQL Server. Businesses are constantly having to increase the efficiency and reliability of maintaining their IT infrastructure; with PowerShell, you can improve this efficiency and reliability by creating scripts to carry out tasks. PowerShell scripts can be tested and applied multiple times to multiple servers, saving your organization both time and money.

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

## **Module 13: Monitoring SQL Server (If time permits)**

This module presents a number of tools that you can use to monitor current activity and record details of previous activity.

- Monitoring activity
- Capturing and Managing Performance Data
- Analyzing Collected Performance Data
- SQL Server Utility

## **Module 14: Troubleshooting SQL Server**

It is important to have a solid methodology for resolving issues in general, and to be familiar with the most common issues that can arise when working with SQL Server systems.

- A Trouble Shooting Methodology for SQL Server
- Resolving Service Related Issues
- Resolving Connectivity and Log-in issues

## **Module 15: Importing and Exporting Data**

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

- Transferring Data to and from SQL Server
- Importing and Exporting Table Data
- Using bcp and BULK INSERT to Import Data
- Deploying and Upgrading Data-Tier Application