

Course Objectives/Course Outline
Spokane Community College

Course Title: Database Administration

Prefix and Course Number: CIS 277

Course Learning Outcomes:

By the end of this course, a student should be able to:

- Identify, describe, implement, manage, and monitor and SQL Database server.

Course Outline:

I. Introduction to SQL Server

- A. Introduction to SQL Server
- B. Describe the benefits of using Windows Server 2008 R2 as the host operating system
- C. Access Microsoft's online technical documentation for SQL Server 2012, and utilize different problem-solving strategies when trying to resolve SQL Server 2012 performance issues.
- D. Detail the recommended hardware and operating system requirements for running SQL Server 2012
- E. Prepare for the installation of SQL Server 2012 on a Windows 2008 R2 server.

II. Deploying SQL Server

- A. Describe the steps involved in planning a SQL Server 2012 installation
- B. Explain the different installation options for installing SQL Server 2012
- C. Create an instance of the SQL Server 2012 Enterprise Edition using the SQL Server Installation Wizard or the command prompt
- D. Analyze the system changes that take place during a SQL Server 2012 installation
- E. Manage an instance of SQL Server 2012 by performing repair and uninstall tasks

III. Architecture and Configuration

- A. Identify the physical and logical components of the SQL Server architecture
- B. Explore the objects within a database using Object Explorer in SQL Server Management Studio
- C. Configure a linked server, and explain the advantages and disadvantages of using distributed queries
- D. Apply your knowledge of network protocols that are supported by SQL Server 2012 to manage and troubleshoot remote client connectivity
- E. Explain how to configure SQL Server 2012 settings

IV. Creating SQL Server Databases

- A. Plan a new user database that supports the relevant business requirements
- B. Explain the benefits of tailoring the model system database settings for your organization
- C. Construct a new database from Object Explorer or by executing a SQL query using Query Editor
- D. Modify the configuration setting of an existing database, rename a database, and delete a database
- E. Create new tables, and apply a foreign key relationship between two tables

V. Transact-SQL Primer

- A. Analyze and manipulate data stored in a SQL Server 2012 database using the Transact-SQL language
- B. Create and modify database objects on a SQL Server 2012 instance using the Transact-SQL language
- C. Construct a simple but effective logical security model for a SQL Server 2012 database using the Transact-SQL language

VI. SQL Server Security

- A. Choose an appropriate authentication mode
- B. Create secure client/server connections
- C. Manage access controls on database and server securables using the permissions hierarchy
- D. Evaluate the different options for encrypting sensitive or confidential data

VII. Performance Monitoring and Optimization

- A. Describe the different design factors that affect database performance
- B. Manage database performance by using tools that help detect, analyze, and resolve performance issues
- C. Recognize index fragmentation and discuss the criteria that should be incorporated in the design of an index and statistics maintenance plan

VIII. Backup and Recovery

- A. Evaluate the risks of data loss in conjunction with the business requirements to define recovery objectives
- B. Compare the main database backup types
- C. Design a backup plan that is optimized against a set of recovery objectives, and create database backups
- D. Use SQL Server Agent to automate the backup tasks

IX. Data Integration

- A. Compare the different SQL Server management tools and utilities that can be used to integrate data from external sources
- B. Design a SQL Server Integration Services package using both the SQL Server Import and Export Wizard and SQL Server Data Tools
- C. Construct commands that utilize the bulk copy interface to import and export data from a SQL Server database

X. Monitoring SQL Server

- A. Describe the daily monitoring tasks a database administrator should complete to evaluate the status of critical services and processes
- B. Use SQL Server Agent to configure automated alerts in response to system events and performance conditions
- C. Explain the importance of establishing a baseline set of values for use as a benchmark when monitoring system performance
- D. Assess the health of the system in real time using SQL Server Activity Monitor and the dynamic management views and functions
- E. Collect and analyze historical data using the data collector and the Management Data Warehouse repository
- F. Create and configure a SQL Server audit.