



## Course 2778A: Writing Queries Using Microsoft SQL Server 2008 Transact-SQL

*Three days; Instructor-Led*

### Introduction

Elements of this syllabus are subject to change.

This 3-day instructor led course provides students with the technical skills required to write basic Transact-SQL queries for Microsoft SQL Server 2008.

### Audience

This course is intended for SQL Server database administrators, implementers, system engineers, and developers who are responsible for writing queries.

### At Course Completion

After completing this course, students will be able to:

- Describe the uses of and ways to execute the Transact-SQL language.
- Use querying tools.
- Write SELECT queries to retrieve data.
- Group and summarize data by using Transact-SQL.
- Join data from multiple tables.
- Write queries that retrieve and modify data by using subqueries.
- Modify data in tables.
- Query text fields with full-text search.
- Describe how to create programming objects.
- Use various techniques when working with complex queries.

### Prerequisites

Before attending this course, students must have:

- Logical database design.
- Physical database design.
- How data is stored in tables (rows and columns).
- Data integrity concepts.
- Relationships between tables and columns (primary key and foreign key, one-to-one, one-to-many, and many-to-many).
- Basic knowledge of the Microsoft Windows operating system and its core functionality. For example, how to use Windows Explorer, open and save files, and what a client/server application interaction means.



## **Course Outline**

### **Module 1: Getting Started with Databases and Transact-SQL in SQL Server 2008**

The student will be introduced to how client/server architecture works, and examine the various database and business tasks that can be performed by using the components of SQL Server 2008. The student will also be introduced to SQL Server database concepts such as relational databases, normalization, and database objects. In addition, the student will learn how to use T-SQL to query databases and generate reports.

#### **Lessons**

- Lesson 1: Overview of SQL Server 2008
- Lesson 2: Overview of SQL Server Databases
- Lesson 3: Overview of the SQL Language
- Lesson 4: Syntax Elements of T-SQL
- Lesson 5: Working with T-SQL Scripts
- Lesson 6: Using T-SQL Querying Tools

#### **Lab: Getting Started with Databases and Transact-SQL in SQL Server 2008**

- Exercise 1: (Level 200) Exploring SQL Server Management Studio
- Exercise 2: (Level 200) Executing Queries in SQL Server Management Studio
- Exercise 3: (Level 200) Examining a Database Diagram in SQL Server Management Studio
- Exercise 4: (Level 200) Using Excel to Generate a Report from a SQL Server Database

After completing this module, students will be able to:



- Describe the architecture and components of SQL Server 2008.
- Describe the structure of a SQL Server database.
- Explain the basics of the SQL language.
- Describe the syntax elements of T-SQL.
- Explain how to manage T-SQL scripts.
- Use T-SQL querying tools to query SQL Server 2008 databases.

## **Module 2: Querying and Filtering Data**

The students will be introduced to the basic Transact-SQL (T-SQL) statements that are used for writing queries, filtering data, and formatting result sets.

### **Lessons**

- Lesson 1: Using the SELECT Statement
- Lesson 2: Filtering Data
- Lesson 3: Working with NULL Values
- Lesson 4: Formatting Result Sets
- Lesson 5: Performance Considerations for Writing Queries

### **Lab: Querying and Filtering Data**

- Exercise 1 (Level 200): Retrieving Data by Using the SELECT Statement
- Exercise 2 (Level 200): Filtering Data by Using Search Conditions
- Exercise 3: (Level 200) Using Functions to Work with NULL Values
- Exercise 4: (Level 200) Formatting Result Sets
- Exercise 5: (Level 200) Rewriting Queries for Performance

After completing this module, students will be able to:



- Retrieve data by using the SELECT statement.
- Filter data by using different search conditions.
- Explain how to work with NULL values.
- Format result sets.
- Describe the performance considerations that affect data retrieval.

## **Module 3: Grouping and Summarizing Data**

The students will learn to group and summarize data when generating reports in Microsoft SQL Server 2008 by using aggregate functions and the COMPUTE clause.

### **Lessons**

- Lesson 1: Summarizing Data by Using Aggregate Functions
- Lesson 2: Summarizing Grouped Data
- Lesson 3: Ranking Grouped Data
- Lesson 4: Creating Crosstab Queries

### **Lab: Grouping and Summarizing Data**

- Exercise 1: (Level 200) Summarizing Data by Using Aggregate Functions
- Exercise 2: (Level 200) Summarizing Grouped Data
- Exercise 3: (Level 200) Ranking Grouped Data
- Exercise 4: (Level 200) Creating Crosstab Queries

After completing this module, students will be able to:

- Summarize data by using aggregate functions.
- Summarize grouped data by using the GROUP BY and COMPUTE clauses.



- Rank grouped data.
- Create cross-tabulation queries by using the PIVOT and UNPIVOT clauses.

## **Module 4: Joining Data from Multiple Tables**

The students will learn to write joins to query multiple tables, as well as limiting and combining result sets.

### **Lessons**

- Lesson 1: Querying Multiple Tables by Using Joins
- Lesson 2: Applying Joins for Typical Reporting Needs
- Lesson 3: Combining and Limiting Result Set

### **Lab: Joining Data from Multiple Tables**

- Exercise 1: (Level 200) Querying Multiple Tables by Using Joins
- Exercise 2: (Level 200) Applying Joins for Typical Reporting Needs
- Exercise 3: (Level 200) Combining and Limiting Result Sets

After completing this module, students will be able to:

- Query multiple tables by using joins.
- Apply joins for typical reporting needs.
- Combine and limit result sets.

## **Module 5: Working with Subqueries**



The students will be introduced to basic and correlated subqueries and how these compare with joins and temporary tables. The students will also be introduced to using common table expressions in queries.

## Lessons

- Lesson 1: Writing Basic Subqueries
- Lesson 2: Writing Correlated Subqueries
- Lesson 3: Comparing Subqueries with Joins and Temporary Tables
- Lesson 4: Using Common Table Expressions

## Lab: Working with Subqueries

- Exercise 1: (Level 200) Writing Basic Subqueries
- Exercise 2: (Level 200) Writing Correlated Subqueries
- Exercise 3: (Level 200) Comparing Subqueries with Joins and Temporary Tables
- Exercise 4: (Level 200) Using Common Table Expressions

After completing this module, students will be able to:

- Write basic subqueries.
- Write correlated subqueries.
- Compare subqueries with joins and temporary tables.
- Use common table expressions in queries.

## Module 6: Modifying Data in Tables



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The students will be able to modify the data in tables by using the INSERT, DELETE, and UPDATE statements. In addition, students will examine how transactions work in a database, the importance of transaction isolation levels, and how to manage transactions.

## Lessons

- Lesson 1: Overview of Transactions
- Lesson 2: Inserting Data into Tables
- Lesson 3: Deleting Data from Tables
- Lesson 4: Updating Data in Tables

## Lab: Modifying Data in Tables

- Exercise 1: (Level 200) Inserting Data into Tables
- Exercise 2: (Level 200) Deleting Data from Tables
- Exercise 3: (Level 200) Updating Data in Tables
- Exercise 4: (Level 200) Working with Transactions

After completing this module, students will be able to:

- Describe transactions.
- Insert data into tables.
- Delete data from tables.
- Update data in tables.

## Module 7: Querying Metadata, XML, and Full-Text Indexes



The students will learn to query semi-structured and unstructured data. The students will also learn how SQL Server 2008 handles XML data and will query XML data. The students will also be introduced to full-text indexing in SQL Server 2008.

## Lessons

- Lesson 1: Querying Metadata
- Lesson 2: Overview of XML
- Lesson 3: Querying XML Data
- Lesson 4: Overview of Full-Text Indexes
- Lesson 5: Querying Full-Text Indexes

## Lab: Querying Metadata, XML, and Full-Text Indexes

- Exercise 1: (Level 200) Querying Metadata
- Exercise 2: (Level 200) Querying XML Data
- Exercise 3: (Level 200) Creating and Querying Full-Text Indexes

After completing this module, students will be able to:

- Query metadata.
- Describe the functionality of XML.
- Query XML data.
- Describe the functionality of full-text indexes.
- Query full-text indexes.

## Module 8: Using Programming Objects for Data Retrieval



The students will be introduced to user-defined functions and executing various kinds of queries by using user-defined functions. The students will be introduced to SQL Server views that encapsulate data and present users with limited and relevant information. In addition, the students will be introduced to SQL Server stored procedures and the functionalities of the various programming objects. The students will learn how to perform distributed queries and how SQL Server works with heterogeneous data such as databases, spreadsheets, and other servers.

## Lessons

- Lesson 1: Encapsulating Expressions by Using User-Defined Functions
- Lesson 2: Encapsulating Queries by Using Views
- Lesson 3: Overview of Stored Procedures
- Lesson 4: Writing Distributed Queries

## Lab: Using Programming Objects for Data Retrieval

- Exercise 1: (Level 300) Creating User-Defined Functions
- Exercise 2: (Level 200) Creating Views
- Exercise 3: (Level 300) Writing Distributed Queries

After completing this module, students will be able to:

- Encapsulate expressions by using user-defined functions.
- Encapsulate queries by using views.
- Explain how stored procedures encapsulate T-SQL logic.
- Write distributed queries.



## Module 9: Using Advanced Querying Techniques

The students will be introduced to best practices for querying complex data. The students will also examine how to query complex table structures such as data stored in hierarchies and self-referencing tables. The students will analyze the recommended guidelines for executing queries and how to optimize query performance.

### Lessons

- Lesson 1: Considerations for Querying Complex Data
- Lesson 2: Querying Complex Table Structures
- Lesson 3: Writing Efficient Queries
- Lesson 4: Using Different Techniques for Complex Queries
- Lesson 5: Maintaining Query Files

### Lab: Using Advanced Querying Techniques

- Exercise 1: (Level 300) Breaking up a Complex Business Reporting Requirement
- Exercise 2: (Level 300) Writing Complex Queries
- Exercise 3: (Level 300) Rewriting Complex Queries

After completing this module, students will be able to:

- Explain the recommendations for querying complex data.
- Query complex table structures.
- Write efficient queries.
- Use various techniques when working with complex queries.
- Maintain query files.