



Querying SQL Server

This five-day instructor-led course provides participants with the technical skills required to write basic Transact-SQL queries for Microsoft SQL Server 2014. This is the foundation for all SQL Server-related disciplines; namely, Database Administration, Database Development and Business Intelligence, and helps people prepare for exam 70-461.

Note: This course is designed for participants who are interested in learning SQL Server 2012 or SQL Server 2014. It covers the new features in SQL Server 2014, but also the important capabilities across the SQL Server data platform.

Who Should Attend:

This course is intended for Database Administrators, Database Developers, and BI professionals.

The course will very likely be well attended by SQL power users who are not necessarily database-focused or plan on taking the exam; like report writers, business analysts and client application developers

Course Prerequisites:

Before attending this course, participants are required to have:

- A working knowledge of relational databases
- Basic knowledge of the MS Windows operating system & its core functionality

Course Objectives:

After completing this course, participants will be able to:

- Write SELECT Queries
- Query Multiple Tables
- Sort and Filter Data
- Describe the Use of Data Types in SQL Server
- Modify Data using Transact-SQL
- Use Built-in Functions
- Group and Aggregate Data
- Use Subqueries
- Use Table Expressions
- Use Window Ranking, Offset & Aggregate Functions
- Implement Pivoting & Grouping Sets
- Execute Stored Procedures
- Program with T-SQL
- Implement Error Handling
- Implement Transactions

Course Code: 20461c

Course Duration: 5 Days

Course Summary

Module 1: Introduction to MS SQL Server 2014

Module 2: Introduction to T-SQL Querying

Module 3: Writing SELECT Queries

Module 4: Querying Multiple Tables

Module 5: Sorting & Filtering Data

Module 6: Working with SQL Server 2014 Data Types

Module 7: Using DML to Modify Data

Module 8: Using Built-In Functions

Module 9: Grouping & Aggregating Data

Module 10: Using Subqueries

Module 11: Using Table Expressions

Module 12: Using Set Operators

Module 13: Using Window Ranking, Offset & Aggregate Functions

Module 14: Pivoting & Grouping Sets

Module 15: Executing Stored Procedures

Module 16: Programming with T-SQL

Module 17: Implementing Error Handling

Module 18: Implementing Transactions

Module 19: Improving Query Performance

Module 20: Querying SQL Server Metadata

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Course Outline

Module 1: Introduction to MS SQL Server 2014

This module introduces the SQL Server platform and major tools. It discusses editions, versions, tools used to query, documentation sources, and the logical structure of databases

Lessons

- The Basic Architecture of SQL Server
- SQL Server Editions and Versions
- Getting Started with SQL Server Management Studio

Lab

- Working with SQL Server Management Studio
- Creating and Organizing T-SQL scripts
- Using Books Online

Module 2: Introduction to T-SQL Querying

This module introduces Transact SQL as the primary querying language of SQL Server. It discusses the basic structure of T-SQL queries, the logical flow of a SELECT statement, and introduces concepts such as predicates and set-based operations.

Lessons

- Introducing T-SQL
- Understanding Sets
- Understanding Predicate Logic
- Understanding the Logical Order of Operations in SELECT statements

Lab

- Executing Basic SELECT Statements
- Executing queries which filter data using predicates
- Executing queries which sort data using ORDER BY

Module 3: Writing SELECT Queries

This module introduces the fundamentals of the SELECT statement, focusing on queries against a single table.

Lessons

- Writing Simple SELECT Statements
- Eliminating Duplicates with DISTINCT
- Using Column and Table Aliases
- Writing Simple CASE Expressions

Lab

- Write simple SELECT Statements
- Eliminate Duplicates Using Distinct
- Use Table and Column Aliases
- Use a Simple CASE Expression

Module 4: Querying Multiple Tables

This module explains how to write queries which combine data from multiple sources in SQL Server. The module introduces the use of JOINS in T-SQL queries as a mechanism for retrieving data from multiple tables

Lessons

- Understanding Joins
- Querying with Inner Joins
- Querying with Outer Joins
- Querying with Cross Joins and Self Joins

Lab

- Writing Queries That Use Inner Joins
- Writing Queries That Use Multiple-Table Inner Join
- Writing Queries That Use Self Joins
- Writing Queries That Use Outer Joins
- Writing Queries That Use Cross Joins

Module 5 : Sorting & Filtering Data

This module explains how to enhance queries to limit the rows they return, and to control the order in which the rows are displayed. The module also discusses how to resolve missing and unknown results.

Lessons

- Sorting Data
- Filtering Data with a WHERE Clause
- Filtering with the TOP and OFFSET-FETCH Options
- Working with Unknown and Missing Values

Lab

- Writing Queries That Filter Data Using a WHERE Clause
- Writing Queries That Filter Data Using an ORDER BY Clause
- Writing Queries That Filter Data Using the TOP Option
- Writing Queries That Filter Data Using the OFFSET-FETCH Clause



Module 6 : Working with SQL Server 2014 Data Types

This module explains the data types SQL Server uses to store data. It introduces the many types of numeric and special-use data types. It also explains conversions between data types, and the importance of type precedence

Lessons

- Introducing SQL Server 2014 Data Types
- Working with Character Data
- Working with Date and Time Data

Lab

- Writing Queries That Return Date and Time Data
- Writing Queries That Use Date and Time Functions
- Writing Queries That Return Character Data
- Writing Queries That Use Character Functions

Module 7 : Using DML to Modify Data

This module describes the use of Transact-SQL Data Manipulation Language to perform inserts, updates, and deletes to your data.

Lessons

- Inserting Data
- Modifying and Deleting Data

Lab

- Inserting Data
- Updating and Deleting Data

Module 8 : Using Built-In Functions

This module introduces the use of functions that are built in to SQL Server Denali, and will discuss some common usages including data type conversion, testing for logical results and nullability

Lessons

- Writing Queries with Built-In Functions
- Using Conversion Functions
- Using Logical Functions
- Using Functions to Work with NULL

Lab

- Write queries which use conversion functions
- Write queries which use logical functions
- Write queries which test for nullability

Module 9 : Grouping & Aggregating Data

This module introduces methods for grouping data within a query, aggregating the grouped data and filtering groups with HAVING. The module is designed to help the student grasp why a SELECT clause has restrictions placed upon column naming in the GROUP BY clause as well as which columns may be listed in the SELECT clause

Lessons

- Using Aggregate Functions
- Using the GROUP BY Clause
- Filtering Groups with HAVING

Lab

- Write queries which use the GROUP BY clause
- Write queries which use aggregate functions
- Write queries which use distinct aggregate functions
- Write queries which filter groups with the HAVING clause

Module 10 : Using Subqueries

This module will introduce the use of subqueries in various parts of a SELECT statement. It will include the use of scalar and multi-result subqueries, and the use of the IN and EXISTS operators.

Lessons

- Writing Self-Contained Subqueries
- Writing Correlated Subqueries
- Using the EXISTS Predicate with Subqueries

Lab

- Write queries which use self-contained subqueries
- Write queries which use scalar and multi-result subqueries
- Write queries which use correlated subqueries and EXISTS predicate

Module 11 : Using Table Expressions

This module introduces T-SQL expressions which return a valid relational table, typically for further use in the query. The module discusses views, derived tables, common table expressions and inline table-valued functions.

Lessons

- Using Derived Tables
- Using Common Table Expressions
- Using Views
- Using Inline Table-Valued Functions

Module 11 cont...

Lab

- Write Queries Which Use Views
- Write Queries Which Use Derived Tables
- Write Queries Which Use Common Table Expressions
- Write Queries Which Use Inline Table-Valued Functions

Module 12 : Using Set Operators

This module introduces Microsoft SharePoint Server as a platform for BI, and then focuses on building BI dashboards and scorecards with PerformancePoint Services.

Lessons

- Writing Queries with the UNION Operator
- Using EXCEPT and INTERSECT
- Using APPLY

Lab

- Write queries which use UNION set operators and UNION ALL multi-set operators
- Write queries which use CROSS APPLY and OUTER APPLY operators
- Write queries which use EXCEPT and INTERSECT operators

Module 13 : Using Window Ranking, Offset, and Aggregate Functions

This module introduces window functions including ranking, aggregate and offset functions. Much of this functionality is new to SQL Server 2012. It will cover the use of T-SQL functions such as ROW_NUMBER, RANK, DENSE_RANK, NTILE, LAG, LEAD, FIRST_VALUE and LAST_VALUE to perform calculations against a set, or window, of rows.

Lessons

- Creating Windows with OVER
- Exploring Window Functions

Lab

- Write queries which use ranking functions
- Write queries which use offset functions
- Write queries which use window aggregate functions

Module 14 : Pivoting & Grouping Sets

This module discusses techniques for pivoting data in T-SQL as well to introduce the fundamentals of the GROUPING SETS clause. It will also cover the use of GROUP BY ROLLUP and GROUP BY CUBE syntax in SQL Server.

Lessons

- Writing Queries with PIVOT and UNPIVOT
- Working with Grouping Sets

Lab

- Write queries which use the PIVOT operator
- Write queries which use the UNPIVOT operator
- Write queries which use the GROUPING SETS subclause

Module 15 : Executing Stored Procedures

This module introduces the use of existing stored procedures in a T-SQL querying environment. It discusses the use of EXECUTE, how to pass input and output parameters to a procedure, and how to invoke system stored procedures.

Lessons

- Querying Data with Stored Procedures
- Passing Parameters to Stored Procedures
- Creating Simple Stored Procedures
- Working with Dynamic SQL

Lab

- Use the EXECUTE statement to invoke stored procedures
- Pass parameters to stored procedures
- Execute system stored procedures

Module 16 : Programming with T-SQL

This module provides a basic introduction to T-SQL programming concepts and objects. It discusses batches, variables, control of flow elements such as loops and conditionals, how to create and execute dynamic SQL statements, and how to use synonyms.

Lessons

- T-SQL Programming Elements
- Controlling Program Flow

Lab

- Declaring Variables and Delimiting Batches
- Using Control-of-Flow Elements
- Generating Dynamic SQL
- Using Synonyms



Module 17 : Implementing Error Handling

This module introduces the use of error handlers in T-SQL code. It will introduce the difference between compile errors and run-time errors, and will cover how errors affect batches. The module will also cover how to control error handling using TRY/CATCH blocks, the use of the ERROR class of functions, and the use of the new THROW statement.

Lessons

- Using TRY / CATCH Blocks
- Working with Error Information

Lab

- Redirecting Errors with TRY / CATCH
- Using THROW to Pass an Error Message Back to a Client

Module 18 : Implementing Transactions

This module introduces the concepts of transaction management in SQL Server. It will provide a high-level overview of transaction properties; cover the basics of marking transactions with BEGIN, COMMIT and ROLLBACK.

Lessons

- Transactions and the Database Engine
- Controlling Transactions
- Isolation Levels

Lab

- Controlling transactions with BEGIN, COMMIT, and ROLLBACK
- Adding error handling to a CATCH block

Module 19 : Improving Query Performance

This module presents several key guidelines for writing well-performing queries, as well as ways to monitor the execution of your queries and their impact on Microsoft SQL Server.

Lessons

- Factors in Query Performance
- Displaying Query Performance Data

Lab

- Viewing Query Execution Plans
- Viewing Index Usage and Using SET STATISTICS Statements

Module 20 : Querying SQL Server Metadata

SQL Server provides access to structured metadata by using a variety of mechanisms, such as system catalog views, system functions, dynamic management objects, and system stored procedures.

In this module, you will learn how to write queries to return system metadata using these mechanisms.

Lessons

- Querying System Catalog Views and Functions
- Executing System Stored Procedures
- Querying Dynamic Management Objects

Lab

- Querying System Catalog Views
- Querying System Functions
- Querying System Dynamic Management Views