



## Querying Data with Transact-SQL

This course is designed to introduce participants to Transact-SQL. It is designed in such a way that the first three (3) days can be taught as a course to participants requiring the knowledge for other courses in the SQL Server curriculum.

Days 4 & 5 teach the remaining skills required to take exam 70-761.

### Who Should Attend:

This course is intended for Database Administrators, Database Developers, and Business Intelligence professionals

### Course Prerequisites:

**Before attending this course, participants must have, in addition to their professional experience:**

- A working knowledge of relational databases
- Basic knowledge of the Microsoft Windows operating system and its core functionality

**Course Code:** 20761C

**Course Duration:** 5 Days

### Course Summary

**Module 1:** Introduction to SQL Server

**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 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

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## Course Outline

### Module 1: Introduction to Microsoft SQL Server

This module introduces SQL Server, the versions of SQL Server, including cloud versions, and how to connect to SQL Server using SQL Server Management Studio.

#### Lessons

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

#### Lab

- Working with SQL Server Tools

### Module 2: Introduction to T-SQL Querying

This module introduces the elements of T-SQL and their role in writing queries, describes the use of sets in SQL Server, describes the use of predicate logic in SQL Server, and describes the logical order of operations in SELECT statements.

#### Lessons

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

#### Lab

- Introduction to Transact-SQL Querying

### 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

- Writing Basic SELECT Statements

### Module 4: Querying Multiple Tables

This module describes how to write queries that combine data from multiple sources in Microsoft SQL Server.

#### Lessons

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

#### Lab

- Querying Multiple Tables

### Module 5: Sorting and Filtering Data

This module describes how to implement sorting and filtering.

#### Lessons

- Sorting Data
- Filtering Data with Predicates
- Filtering with the TOP and OFFSET-FETCH
- Working with Unknown Values

#### Lab

- Sorting and Filtering Data

### Module 6: Working with SQL Server Data Types

This module introduces the data types SQL Server uses to store data

#### Lessons

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

#### Lab

- Working with SQL Server Data Types

### Module 7: Using DML to Modify Data

This module describes how to create DML queries, and why you would want to

#### Lessons

- Adding Data to Tables
- Modifying and Deleting Data
- Generating automatic column values

#### Lab

- Using DML to Modify Data



### Module 8: Using Built-In Functions

This module introduces some of the many built in functions in SQL Server

#### Lessons

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

- Using Built-In Functions

### Module 9: Grouping and Aggregating Data

This module describes how to use aggregate functions

#### Lessons

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

#### Lab

- Grouping and Aggregating Data

### Module 10: Using Subqueries

This module describes several types of subquery and how and when to use them..

#### Lessons

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

#### Lab

- Using Subqueries

### Module 11: Using Table Expressions

Previously in this course, you learned about using subqueries as an expression that returned results to an outer calling query.

Like subqueries, table expressions are query expressions, but table expressions extend this idea by allowing you to name them and to work with their results as you would work with data in any valid relational table.

Microsoft SQL Server supports four types of table expressions: derived tables, common table expression (CTEs), views, and inline table-valued functions (TVFs). In this module, you will learn to work with these forms of table expressions and learn how to use them to help create a modular approach to writing queries

#### Lessons

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

#### Lab

- Using Table Expressions

### Module 12: Using Set Operators

This module introduces how to use the set operators UNION, INTERSECT, and EXCEPT to compare rows between two input sets.

#### Lessons

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

#### Lab

- Using Set Operators



### Module 13: Using Windows Ranking, Offset, and Aggregate Functions

This module describes the benefits to using window functions. Restrict window functions to rows defined in an OVER clause, including partitions and frames. Write queries that use window functions to operate on a window of rows and return ranking, aggregation, and offset comparison results.

#### Lessons

- Creating Windows with OVER
- Exploring Windows Functions

#### Lab

- Using Windows Ranking, Offset, And Aggregate Functions

### Module 14: Pivoting and Grouping Sets

This module describes write queries that pivot and unpivot result sets. Write queries that specify multiple groupings with grouping sets.

#### Lessons

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

#### Lab

- Pivoting and Grouping Sets

### Module 15: Executing Stored Procedures

This module describes how to return results by executing stored procedures. Pass parameters to procedures. Create simple stored procedures that encapsulate a SELECT statement. Construct and execute dynamic SQL with EXEC and sp\_executesql

#### Lessons

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

#### Lab

- Executing Stored Procedures

### Module 16: Programming with T-SQL

This module describes how to enhance your T-SQL code with programming elements.

#### Lessons

- T-SQL Programming Elements
- Controlling Program Flow

#### Lab

- Programming with T-SQL

### Module 17 Implementing Error Handling

This module will introduces error handling for T-SQL.

#### Lessons

- Implementing T-SQL error handling
- Implementing structured exception handling

#### Lab

- Implementing Error Handling

### Module 18: Implementing Transactions

This module will describe how to implement transactions.

#### Lessons

- Transactions and the database engines
- Controlling transactions

#### Lab

- Implementing Transactions