

MOC 55366AC Querying Microsoft SQL Server with Transact-SQL

Course Summary

Description

This five-day instructor-led course is intended for IT professionals who wish to use the Transact-SQL language to query and configure Microsoft SQL Server. Students are typically database developers and database administrators, but might also be Business Intelligence developers, report creators, or application developers. In this course, students learn how to query single tables, join data from multiple tables, filter and sort data, modify data, use procedures and functions, and implement error handling.

Objectives

At the end of this course, students will be able to:

- Create single table SELECT queries
- Create multiple table SELECT queries
- Filter and sort data
- Insert, update, and delete data
- Query data using built-in functions
- Create queries that aggregate data
- Create subqueries
- Create queries that use table expressions
- Use UNION, INTERSECT, and EXCEPT on multiple sets of data
- Implement window functions in queries
- Use PIVOT and GROUPING SETS in queries
- Use stored procedures in queries
- Add error handling to queries
- Use transactions in queries

Topics

- Introduction to Transact-SQL
- Joining tables with Transact-SQL
- Filtering and sorting results
- SQL Server data types
- Inserting, updating and deleting data
- Using SQL Server functions with Transact-SQL
- Aggregating data with Transact-SQL
- Implement subqueries with Transact-SQL
- Create queries that use table expressions
- Use UNION, INTERSECT, EXCEPT and APPLY on multiple sets of data
- Implement window functions in queries
- Use PIVOT and grouping sets in queries
- Use stored procedures in queries
- Implement programming features in Transact-SQL
- Add error handling to queries
- Use transactions in queries

Audience

This course is intended for novice database developers, database administrators, Business Intelligence developers, report creators, and application developers who have an understanding of relational database concepts and have basic Windows navigation skills.

Prerequisites

- Basic understanding of relational databases.
- Basic Windows knowledge.

Duration

Five days

MOC 55366AC Querying Microsoft SQL Server with Transact-SQL

Course Outline

I. *Introduction to Transact-SQL*

This module explains how to write and execute simple Transact-SQL queries.

- A. What is Transact-SQL
- B. The SELECT statement
- C. The WHERE clause
- D. Sorting results
- E. Calculations
- F. CASE expressions
- G. Lab 1: Introduction to Transact-SQL
 1. Run a query
 2. Search for text strings
 3. Sort the results

II. *Joining tables with Transact-SQL*

This module explains how to query multiple tables and join the results together in a single recordset.

- A. The JOIN clause
- B. Inner joins
- C. Outer joins
- D. Self joins and cross joins
- E. Lab 1: Joining tables with Transact-SQL
 1. Query two tables
 2. Query many tables
 3. Implement an outer join
 4. Implement a self join
 5. Implement a cross join

III. *Filtering and sorting results*

This module explains how to filter results to find specific records and how to sort the resulting recordset.

- A. Implement the ORDER BY clause
- B. Filter data with the WHERE clause
- C. Limit the number of rows returned by a query
- D. Implement NULL logic
- E. Lab 1: Filtering and sorting results
 1. Filter data with a WHERE clause
 2. Sort data with ORDER BY
 3. Limit the number of rows returned by a query

IV. *SQL Server data types*

This module explains how SQL Server uses data types. It's essential to understand data types for comparing data and also for inserting and updating records.

- A. Understand data types?
- B. Implement string data types
- C. Implement temporal data types
- D. Lab 1: SQL Server data types
 1. Create queries with string data
 2. Implement string functions
 3. Create queries with temporal data
 4. Implement temporal functions

V. *Inserting, updating and deleting data*

This module explains how to use Transact-SQL Data Manipulation Language (DML) to insert, update and delete data.

- A. Insert new records
- B. Update existing records
- C. Delete data
- D. Lab 1: Inserting, updating and deleting data
 1. Insert new records
 2. Update existing records
 3. Delete data

VI. *Using SQL Server functions with Transact-SQL*

This module explains how to alter the output or search criteria with built-in functions.

- A. Understand function types in SQL Server
- B. Convert data using functions
- C. Implement logical functions
- D. Work with NULL data using functions
- E. Lab 1: Using SQL Server functions with Transact-SQL
 1. Convert data using functions
 2. Implement logical functions
 3. Work with NULL data using functions

VII. *Aggregating data with Transact-SQL*

This module explains how to group matching data and then aggregate numeric values for these groupings.

- A. Implement aggregation in SQL Server
- B. Group records in SQL Server
- C. Filter aggregated data
- D. Lab 1: Aggregating data with Transact-SQL
 1. Implement aggregation in SQL Server
 2. Group records in SQL Server
 3. Filter aggregated data

MOC 55366AC Querying Microsoft SQL Server with Transact-SQL

Course Outline (cont'd)

VIII. Implement subqueries with Transact-SQL

This module explains how to use the output from one query as the input to another query.

- A. Implement scalar and multi-valued subqueries
- B. Implement correlated subqueries
- C. Implement existence checks with subqueries
- D. Lab 1: Implement subqueries with Transact-SQL
 1. Implement scalar and multi-valued subqueries
 2. Implement correlated subqueries
 3. Implement existence checks with subqueries

IX. Create queries that use table expressions

This module explains how to use table expressions to extend the capabilities of sub-queries. Table expressions essentially name the results of a sub-query and allow them to be referenced as if they were a table.

- A. Create views
- B. Create table-valued functions
- C. Implement derived tables
- D. Implement common table expressions
- E. Lab 1: Create queries that use table expressions
 1. Create views
 2. Create table-valued functions
 3. Implement derived tables
 4. Implement common table expressions

X. Use UNION, INTERSECT, EXCEPT and APPLY on multiple sets of data

This module explains how to combine the results of multiple queries rather than join them. In a simple UNION query both result sets are returned as one, with all the rows of each result set, but you can perform more complex operations and adjust how the multiple result sets interact.

- A. Write queries with the UNION operator
- B. Write queries with the INTERSECT and EXCEPT operators
- C. Write queries with the APPLY operator
- D. Lab 1: Use UNION, INTERSECT, EXCEPT and APPLY on multiple sets of data
 1. Write queries with the UNION operator
 2. Write queries with the INTERSECT and EXCEPT operators

XI. Implement window functions in queries

This module explains how to use windowing functions to create result sets with features, such as row numbers or running totals, that are complex or even impossible in traditional T-SQL.

- A. Understand window functions
- B. Implement window functions
- C. Lab 1: Implement window functions in queries
 1. Implement window ranking functions
 2. Implement window offset functions
 3. Implement window aggregate functions

XII. Use PIVOT and grouping sets in queries

This module explains how to change the output of queries in more sophisticated ways. PIVOT enables you to change the orientation of recordsets and grouping sets allow you to apply multiple levels of aggregation.

- A. Implement PIVOT in queries
- B. Implement grouping sets in queries
- C. Lab 1: Use PIVOT and grouping sets in queries
 1. Implement PIVOT in queries
 2. Implement UNPIVOT in queries
 3. Implement grouping sets in queries

XIII. Use stored procedures in queries

This module explains how to use existing stored procedures and to create simple stored procedures. Stored procedures are encapsulated blocks of T-SQL code that can return recordsets as well as insert, update and delete data.

- A. Query data with stored procedures
- B. Interact with stored procedures using input and output parameters
- C. Write simple stored procedures
- D. Pass dynamic SQL to SQL Server
- E. Lab 1: Use stored procedures in queries
 1. Query data with stored procedures
 2. Interact with stored procedures using input and output parameters
 3. Write simple stored procedures

MOC 55366AC Querying Microsoft SQL Server with Transact-SQL

Course Outline (cont'd)

XIV. Implement programming features in Transact-SQL

This module explains how to implement programming constructs seen in procedural programming languages such as loops and conditional execution.

- A. Understand T-SQL programming elements
- B. Implement loops and conditions in T-SQL queries
- C. Lab 1: Implement programming features in Transact-SQL
 - 1. Implement variables in T-SQL
 - 2. Implement loops and conditions in T-SQL
 - 3. Implement variables in dynamic SQL statements

XV. Add error handling to queries

This module explains how to implement error handling in T-SQL. Some errors are inevitable, such as a date value being passed to a numeric field, but these errors can be handled and resolved with proper error handling.

- A. Understand SQL Server error handling
- B. Implement structured exception handling
- C. Lab 1: Add error handling to queries
 - 1. Implement structured exception handling
 - 2. Pass errors to client applications

XVI. Use transactions in queries

This module explains how to implement transactions to control how multiple connections to SQL Server interact with each other.

- A. Understand database transactions
- B. Implement transactions in T-SQL
- C. Lab 1: Use transactions in queries
 - 1. Implement transactions in T-SQL
 - 2. Combine transactions with error handling