

SQL Server Development 2016 Training

Duration: 5 Days

Objectives:

1. Learn to describe key capabilities and components of SQL Server.
2. Learn to describe T-SQL, sets, and predicate logic.
3. Learn to write a single table SELECT statement.
4. Learn to write a multi-table SELECT statement.
5. Learn to write SELECT statements with filtering and sorting.
6. Learn to describe how SQL Server uses data types.
7. Learn to write DML statements.
8. Learn to write queries that use built-in functions.
9. Learn to write queries that aggregate data.
10. Learn to write subqueries.
11. Learn to create and implement views and table-valued functions.
12. Learn to use set operators to combine query results.
13. Learn to create and implement stored procedures.
14. Learn to add programming constructs such as variables, conditions, and loops to T-SQL code.

Outline:

1. Introduction to Microsoft SQL Server 2016

1. The Basic Architecture of SQL Server
2. SQL Server Editions and Versions
3. Getting Started with SQL Server Management Studio
4. Lab: Working with SQL Server 2016 Tools
 1. Working with SQL Server Management Studio
 2. Creating and Organizing T-SQL Scripts

B. Introduction to T-SQL Querying

- I. Introducing T-SQL
- II. Understanding Sets

- III. Understanding Predicate Logic
- IV. Understanding the Logical Order of Operations in SELECT statements
- V. Lab: Introduction to T-SQL Querying
 - 1. Executing Basic SELECT Statements
 - 2. Executing Queries that Filter Data using Predicates
 - 3. Executing Queries That Sort Data Using ORDER BY

B. Writing SELECT Queries

- I. Writing Simple SELECT Statements
 - II. Eliminating Duplicates with DISTINCT
 - III. Using Column and Table Aliases
 - IV. Writing Simple CASE Expressions
 - V. Lab: Writing Basic SELECT Statements
 - 1. Writing Simple SELECT Statements
 - 2. Eliminating Duplicates Using DISTINCT
 - 3. Using Column and Table Aliases
 - 4. Using a Simple CASE Expression

B. Querying Multiple Tables

- I. Understanding Joins
 - II. Querying with Inner Joins
 - III. Querying with Outer Joins
 - IV. Querying with Cross Joins and Self Joins
 - V. Lab: Querying Multiple Tables
 - 1. Writing Queries that use Inner Joins
 - 2. Writing Queries that use Multiple-Table Inner Joins
 - 3. Writing Queries that use Self-Joins
 - 4. Writing Queries that use Outer Joins
 - 5. Writing Queries that use Cross Joins

B. Sorting and Filtering Data

- I. Sorting Data
 - II. Filtering Data with Predicates
 - III. Filtering Data with TOP and OFFSET-FETCH
 - IV. Working with Unknown Values
 - V. Lab: Sorting and Filtering Data
 - 1. Writing Queries that Filter Data using a WHERE Clause
 - 2. Writing Queries that Sort Data Using an ORDER BY Clause
 - 3. Writing Queries that Filter Data Using the TOP Option

B. Working with SQL Server 2016 Data Types

- I. Writing Queries that Return Date and Time Data
 - II. Writing Queries that use Date and Time Functions
 - III. Writing Queries That Return Character Data
 - IV. Writing Queries That Return Character Functions

B. Using DML to Modify Data

- I. Inserting Data
 - II. Modifying and Deleting Data
 - III. Lab: Using DML to Modify Data
 - 1. Inserting Data
 - 2. Updating and Deleting Data

B. Using Built-In Functions

- I. Writing Queries with Built-In Functions
 - II. Using Conversion Functions
 - III. Using Logical Functions
 - IV. Using Functions to Work with NULL
 - V. Lab: Using Built-In Functions

1. Writing Queries That Use Conversion Functions
 2. Writing Queries that use Logical Functions
 3. Writing Queries that Test for Nullability

B. Grouping and Aggregating Data

- I. Using Aggregate Functions
 - II. Using the GROUP BY Clause
 - III. Filtering Groups with HAVING
 - IV. Lab: Grouping and Aggregating Data
 1. Writing Queries That Use the GROUP BY Clause
 2. Writing Queries that Use Aggregate Functions
 3. Writing Queries that Use Distinct Aggregate Functions
 4. Writing Queries that Filter Groups with the HAVING Clause

B. Using Subqueries

- I. Writing Self-Contained Subqueries
 - II. Writing Correlated Subqueries
 - III. Using the EXISTS Predicate with Subqueries
 - IV. Lab: Using Subqueries
 1. Writing Queries That Use Self-Contained Subqueries
 2. Writing Queries That Use Scalar and Multi-Result Subqueries
 3. Writing Queries That Use Correlated Subqueries and an EXISTS Clause

B. Using Table Expressions

- I. Using Views
 - II. Using Inline Table-Valued Functions
 - III. Using Derived Tables
 - IV. Using Common Table Expressions
 - V. Lab: Using Table Expressions

1. Writing Queries That Use Views
 2. Writing Queries That Use Derived Tables
 3. Writing Queries That Use Common Table Expressions (CTEs)
 4. Writing Queries That Use Inline Table-Valued Expressions

A. Executing Stored Procedures

- I. Querying Data with Stored Procedures
 - II. Passing Parameters to Stored procedures
 - III. Creating Simple Stored Procedures
 - IV. Working with Dynamic SQL
 - V. Lab: Executing Stored Procedures
 1. Using the EXECUTE statement to Invoke Stored Procedures
 2. Passing Parameters to Stored procedures
 3. Executing System Stored Procedures

B. Programming with T-SQL

- I. T-SQL Programming Elements
 - II. Controlling Program Flow
 - III. Lab: Programming with T-SQL
 1. Declaring Variables and Delimiting Batches
 2. Using Control-Of-Flow Elements
 3. Using Variables in a Dynamic SQL Statement
 4. Using Synonyms

B. Implementing Error Handling

- I. Implementing T-SQL error handling
 - II. Implementing structured exception handling
 - III. Lab: Implementing Error Handling
 1. Redirecting errors with TRY/CATCH
 2. Using THROW to pass an error message back to a client

B. Implementing Transactions

- I. Transactions and the database engines
 - II. Controlling transactions
 - III. Lab: Implementing Transactions
 - 1. Controlling transactions with BEGIN, COMMIT, and ROLLBACK
 - 2. Adding error handling to a CATCH block