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# T-SQL Programming with SQL Server Training

5 days (35 hours)

## Overview

T-SQL programming with SQL Server is an essential skill for developing reliable, high-performance data processing solutions tailored to business needs.

Our T-SQL Programming with SQL Server training will enable you to master stored procedures, functions, triggers, transactions, and the optimization of complex queries.

You will learn how to structure your scripts, work with views and temporary tables, secure your processes, and implement advanced programmatic solutions.

By the end of the course, participants will be able to write and optimize T-SQL scripts.

Like all our courses, this one will introduce you to **the latest stable version** of the technology and its new features.

## Objectives

- Create stored procedures, functions, and triggers.
- Manage transactions efficiently.
- Optimize complex queries.
- Use views and temporary tables.
- Implement advanced programmatic solutions.

## Target Audience

- SQL Server developers

# Prerequisites

- Basic knowledge of SQL

# Technical prerequisites

- At least 8 GB of RAM; 16 GB recommended
- A Windows, macOS, or Linux computer with internet access
- Access to a test SQL Server instance: SQL Server Developer, SQL Server Express, Azure SQL, or a provided lab environment
- An SQL client: SQL Server Management Studio (SSMS) or Visual Studio Code with the MSSQL
- Sufficient permissions on a test database to create and modify tables, views, stored procedures, functions, triggers, transactions, and indexes
- A non-production environment dedicated to hands-on exercises and query optimization

# T-SQL Programming Training with SQL Server

## [Day 1 - Morning]

### Fundamentals of T-SQL Programming

- Understanding SQL Server architecture and the role of T-SQL
- Review of advanced SQL queries
- Introduction to T-SQL Scripts
- Variable Management and Control Structures
- Using System Functions
- Hands-on workshop: Writing T-SQL scripts with variables and conditions.

## [Day 1 - Afternoon]

### Control Structures and Procedural Logic

- Using IF / ELSE
- WHILE loops and iteration management
- Error handling with TRY...CATCH
- CASE statements and conditional logic
- Best practices for code structuring
- Hands-on workshop: Implementing business logic.

## [Day 2 - Morning]

## Advanced data manipulation

- Using temporary tables
- Variable tables and differences in usage
- Creating and using views
- Working with CTEs
- Managing intermediate datasets
- Hands-on workshop: Creating a view and temporary tables.

## [Day 2 - Afternoon]

## Stored procedures

- Creating stored procedures
- Input and output parameters
- Result Management
- Design best practices
- Security and Execution Rights
- Hands-on workshop: Developing a stored procedure.

## [Day 3 - Morning] User

## Functions

- Difference between scalar and tabular functions
- Creating custom functions
- Use in complex queries
- Optimizing functions
- Business use cases
- Hands-on workshop: Creating reusable functions.

## [Day 3 - Afternoon] Triggers

## and automation

- Understanding triggers
- Trigger use cases
- Database event management
- Limitations and best practices
- Impact on performance
- Hands-on workshop: Setting up a trigger.

## [Day 4 - Morning]

## Transactions and consistency management

- ACID Transaction Concepts
- BEGIN / COMMIT / ROLLBACK commands
- Lock management
- Transaction isolation
- Conflict management
- Hands-on workshop: Setting up transactions.

### [Day 4 - Afternoon] Query

### optimization

- Analysis of execution plans
- Indexing and performance
- Optimizing complex queries
- Reducing execution costs
- Best practices for tuning
- Hands-on workshop: Optimizing a query.

### [Day 5 - Morning]

### Advanced T-SQL techniques

- Using advanced joins
- Manipulating JSON and XML
- Dynamic queries
- Using cursors
- High-Performance Alternatives
- Hands-on workshop: Implementing a dynamic query.

### [Day 5 - Afternoon] Industrialization

### and best practices

- Organizing T-SQL code
- Versioning and deployment
- Testing and validation
- Script security
- Documentation and maintenance
- Hands-on workshop: Complete industrialized script.

## Target Audience

This training is intended for both individuals and companies, large or small, wishing to train their teams in a new advanced IT technology or to

acquire specific professional knowledge or modern methods.

## Placement upon enrollment

The pre-training assessment complies with Qualiopi quality standards. Upon final registration, the learner receives a self-assessment questionnaire that allows us to evaluate their estimated proficiency in various types of technologies, as well as their expectations and personal goals regarding the upcoming training, within the limits imposed by the selected format. This questionnaire also allows us to anticipate certain connection or internal security issues within the company (intra-company or virtual classroom) that could pose challenges for monitoring and ensuring the smooth running of the training session.

## Teaching Methods

Practical Course: 60% Practical, 40% Theory. Training materials distributed in digital format to all participants.

## Organization

The course alternates between theoretical input from the trainer, supported by examples and reflection sessions, and group work.

## Assessment

At the end of the session, a multiple-choice questionnaire is used to verify that the skills have been properly acquired.

## Certification

A certificate will be issued to each trainee who has completed the entire training program.