

Outline for T-SQL Fundamentals for SQL Server by Itzik Ben-Gan

5-Day (TSQL Fundamentals 2022.1)

Description

Developed and delivered by Itzik Ben-Gan, this T-SQL Fundamentals course is intended for T-SQL developers, DBAs, data scientists, analysts, and power users. Those who work with SQL Server or Azure SQL and need to write queries and develop code using Transact-SQL—SQL Server’s dialect of the ISO/IEC and ANSI standards for the language SQL. The course covers querying topics, including retrieving and modifying data, and also provides an overview of programmable objects supported by SQL Server.

This course is intended both for people who just started working with SQL Server, as well as those with some experience. If you are self-taught, and gained your knowledge “by the seat of your pants,” this course can fill the gaps in your knowledge and teach you how to think correctly in SQL terms. This course focuses on the foundations of T-SQL explaining the logic behind the language and its elements.

There are many aspects of SQL that are very different than in other programming languages. This course will help you adopt the right state of mind and get a true understanding of the language elements. You will learn how to think in terms of sets and follow good SQL programming practices.

The course is not version specific; it does, however, cover language elements that were introduced in recent versions of SQL Server. For recently added elements, the instructor will specify the version in which the element was introduced.

The topics covered in the course include: Background to T-SQL Querying and Programming; Single-Table Queries; Joins; Subqueries; Table Expressions; Set Operators; T-SQL for Data Analysis; Data Modification; Temporal Tables; Transactions and Concurrency; SQL Graph Overview; Overview of Programmable Objects.

To complement the learning experience, students will be provided with exercises that will enable them to practice what they’ve learned.

* Note: If you are an experienced T-SQL practitioner and are looking for an Advanced T-SQL course that dives deeply into the complexities of T-SQL Querying and Programming including coverage of performance and query tuning aspects, please see the course *Advanced T-SQL Querying, Programming and Tuning for SQL Server* by Itzik Ben-Gan.

Itzik Ben-Gan

Course Materials

Each student will receive:

- A course Workbook
- A digital copy of Itzik Ben-Gan's best-selling book T-SQL Fundamentals (MSPress)
- A copy of the course's source code

Author

This course was developed by Itzik Ben-Gan, author of award-winning books about T-SQL, a columnist in sqlperformance.com, a Microsoft Data Platform MVP since 1999, and a regular speaker in SQL Server related events.

Target Audience

This course is intended for:

- T-SQL Programmers and DBAs, Data Scientists, Architects, Analysts and Power Users
- Those who need to write or review code in SQL Server and/or Azure SQL

Prerequisites

It is recommended that students are familiar with basic relational database concepts and SQL.

Course Objectives

Upon completion of this course, the student will:

- Understand the logic behind T-SQL and thinking in terms of sets
- Be able to write T-SQL code to create tables and define data integrity
- Be able to write queries against single and multiple tables
- Be able to write T-SQL statements that modify data
- Get familiar with T-SQL programmable objects

Course Outline

Module 01: Background to T-SQL Querying and Programming

- Theoretical Background
- SQL Server Architecture
- SQL Server Management Studio
- Creating Tables
- Defining Data Integrity

LAB 01

Itzik Ben-Gan

Module 02: Single-Table Queries

- Elements of the SELECT Statement
- Predicates and Operators
- CASE Expressions
- NULLs
- The GREATEST and LEAST Functions
- All-At-Once Operations
- Working with Character Data
- Working with Date and Time Data
- Querying Metadata

LAB 02

Module 03 - Joins

- Joins
- Cross Joins
- Inner Joins
- More Join Examples
- Outer Joins

LAB 03

Module 04: Subqueries

- Self-Contained Subqueries
- Scalar Subqueries
- Multivalued Subqueries
- Correlated Subqueries
- The EXISTS Predicate
- Returning Previous or Next Values
- Using Running Aggregates
- Dealing with Misbehaving Subqueries

LAB 04

Module 05: Table Expressions

- Derived Tables
- Common Table Expressions
- Views
- Inline Table-Valued Functions
- The APPLY Operator

LAB 05

Itzik Ben-Gan

Module 06: Set Operators

- Set Operators, Described
- The UNION Operator
- The INTERSECT Operator
- The EXCEPT Operator
- Precedence
- Circumventing Unsupported Logical Phases

LAB 06

Module 07 - T-SQL for Data Analysis

- Window Functions
- Pivoting Data
- Unpivoting Data
- Grouping Sets
- Time Series

LAB 07

Module 08: Data Modification

- Inserting Data
- Deleting Data
- Updating Data
- Merging Data
- Modifying Data through Table Expressions
- Modifications with TOP / OFFSET-FETCH
- The OUTPUT Clause

LAB 08

Module 09: Temporal Tables

- Temporal Tables, Described
- Creating Tables
- Modifying Data
- Querying Temporal Tables

LAB 09

Itzik Ben-Gan

Module 10: Transactions and Concurrency

- Transactions
- Locks and Blocking
- Isolation Levels
- Deadlocks

LAB 10

Module 11: SQL Graph Overview

- Considerations for SQL Graph Modeling
- Example of Traditional vs Graph Modeling
- Creating Tables
- Querying Data

Module 12: Programmable Objects

- Variables
- Batches
- Flow Elements
- Cursors
- Temporary Tables
- Dynamic SQL
- Routines
- Error Handling