

KOENIG SOLUTIONS • COURSE OUTLINE

Basic to Advanced SQL

Learn to write and optimise SQL queries in MS SQL Server, from basic SELECT statements to stored procedures, triggers and transactions.

5 Days

DURATION

15

MODULES

64

TOPICS

27

HANDS-ON EXERCISES

COURSE OVERVIEW

Unlock the full potential of MS SQL Server with this intensive 5-day training course designed to elevate your querying skills from basic to advanced levels. This course offers a comprehensive exploration of SQL querying techniques and best practices, empowering you to efficiently retrieve, manipulate, and manage data within MS SQL Server.

WHO THIS COURSE IS FOR

SQL Server Users

Database Administrators

Data Analysts

LEARNING OBJECTIVES

- Retrieve and filter data using SELECT, WHERE, ORDER BY and TOP
- Manipulate data with INSERT, UPDATE and DELETE statements
- Declare and use variables, including table variables, in queries
- Summarise data with aggregate functions, GROUP BY and HAVING
- Combine data from multiple tables using various join types
- Apply subqueries, derived tables and common table expressions
- Create views, stored procedures and user-defined functions
- Implement triggers, dynamic SQL and transaction error handling

15 Modules, 64 Topics

01

Introduction to MS SQL Server

TOPICS

Overview of MS SQL Server · SQL Server Editions and Versions · SQL Server Management Studio (SSMS) Basics · Connecting to a Database

02

SQL Fundamentals

TOPICS

Basic SQL Syntax · Data Types

DATA MANIPULATION LANGUAGE (DML)

INSERT · UPDATE · DELETE

2 Exercises

03

Basic Queries and Data Retrieval

TOPICS

SELECT Statement · Filtering Data with WHERE Clause · Sorting Data with ORDER BY · DISTINCT for Filtering Unique Results · Limiting Results with TOP

2 Exercises

04

Working with Variables

TOPICS

Introduction to SQL Variables · Declaring and Setting Variables · Using Variables in Queries · Scope of Variables · Table Variables

2 Exercises

05

Aggregate Functions and Grouping

AGGREGATE FUNCTIONS

COUNT, SUM, AVG, MIN, MAX

GROUP BY Clause · HAVING Clause for Filtered Aggregates

Exercise

06

Joining Tables

TOPICS

INNER JOIN · LEFT JOIN · RIGHT JOIN · FULL OUTER JOIN · CROSS JOIN · SELF JOIN

2 Exercises

07

Subqueries and Derived Tables

TOPICS

Scalar Subqueries · Correlated Subqueries · EXISTS and NOT EXISTS · Derived Tables

2 Exercises

08

2 Exercises

Views

TOPICS

Introduction to Views · Creating and Managing Views · Updating Data Through Views · Indexed Views for Performance

09

2 Exercises

Common Table Expressions (CTEs)

TOPICS

Introduction to CTEs · Recursive CTEs

10

2 Exercises

Dynamic SQL

TOPICS

Introduction to Dynamic SQL · Constructing and Executing Dynamic SQL · SQL Injection Prevention in Dynamic Queries · Dynamic SQL in Stored Procedures

11

2 Exercises

Stored Procedures

TOPICS

Introduction to Stored Procedures · Creating and Executing Stored Procedures · Input and Output Parameters · Dynamic SQL in Stored Procedures · Error Handling in Stored Procedures

12

2 Exercises

User-Defined Functions (UDFs)

TOPICS

Introduction to UDFs · Scalar Functions vs. Table-Valued Functions · Creating and Using UDFs · Best Practices and Limitations

13

2 Exercises

Window Functions and Set Operations

WINDOW FUNCTIONS

ROW_NUMBER, RANK, DENSE_RANK, NTILE · LEAD and LAG

SET OPERATIONS

UNION, UNION ALL · INTERSECT · EXCEPT

14

2 Exercises

Triggers

TOPICS

Introduction to Triggers · Types of Triggers (AFTER, INSTEAD OF) · Writing and Testing Triggers · Managing Nested and Recursive Triggers

15

2 Exercises

Advanced Error Handling and Transactions

TOPICS

TRY...CATCH for Error Handling · Transactions and Rollbacks · THROW vs RAISERROR · Nested Transactions

Practise What You Learn

#	MODULE	ACTIVITY
02	SQL Fundamentals	- Basic SQL Queries - Simple Data Manipulation
03	Basic Queries and Data Retrieval	- Filtering and Sorting Data - Using DISTINCT and TOP
04	Working with Variables	- Using Variables in SQL Queries - Table Variable Implementation
05	Aggregate Functions and Grouping	Aggregate Functions and Grouping Queries
06	Joining Tables	- Join Operations - Combining Data from Multiple Tables
07	Subqueries and Derived Tables	- Writing Subqueries - Using Derived Tables for Complex Queries
08	Views	- Creating Views - Working with Indexed Views
09	Common Table Expressions (CTEs)	- Using CTEs for Simplifying Queries - Recursive CTEs for Hierarchical Data
10	Dynamic SQL	- Writing Dynamic SQL Queries - Securing Dynamic SQL
11	Stored Procedures	- Creating Stored Procedures - Dynamic SQL in Procedures
12	User-Defined Functions (UDFs)	- Writing Scalar and Table-Valued Functions - UDFs in Complex Queries
13	Window Functions and Set Operations	- Applying Window Functions - Using Set Operations
14	Triggers	- Writing Triggers for Auditing - Using Triggers for Data Validation
15	Advanced Error Handling and Transactions	- Error Handling in SQL - Working with Transactions for Data Integrity

WHAT IS INCLUDED

Everything You Need to Succeed

- Koenig course material for every module
- Delivery by certified instructors and subject matter experts
- Hands-on exercises throughout the course
- Course completion certificate from Koenig

ABOUT KOENIG

Who We Are

Established in 1993, Koenig Solutions is a globally recognised training provider with 35+ technology partnerships, 5,000+ training programmes and a network of certified instructors and subject matter experts, supporting individuals and enterprise teams worldwide.

FLEXIBLE DELIVERY

Learn the Way That Suits You

Classroom Training

Live Online Classes (ILO)

Fly-Me-A-Trainer (FMAT)

Flexi (Self-Paced)

1-on-1 Training

Ready to Get Started?

Talk to a learning advisor about schedules, group training and customised delivery.

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