KOENIG step forward

Microsoft Solutions Partner
Microsoft Cloud Training Services

KOENIG SOLUTIONS · COURSE OUTLINE

Advanced Querying and Database Optimization for SQL Developer

Learn to write advanced T-SQL queries and optimize SQL Server and Azure SQL Database performance.

5 Days	11	39
DURATION	MODULES	TOPICS

COURSE OVERVIEW

This course covers advanced querying with T-SQL, starting from basic retrieval, sorting and filtering before progressing to joins, subqueries and data aggregation. It then examines table expressions, window functions, pivoting, stored procedures, functions and triggers, alongside performance essentials such as execution plans, indexing, parameter sniffing, locking and isolation levels. Error handling and transactions are addressed before moving into performance monitoring and query optimization using Azure Portal, DMVs, Query Store and SSMS profiling. The course closes with topics on compression, page fill factor, SQL injection and query optimization techniques for Azure and on-premises databases.

WHO THIS COURSE IS FOR

- **SQL Developers**
- **Database Administrators**
- **Database Developers**
- **Data Analysts**
- **Azure SQL Database Administrators**

LEARNING OBJECTIVES

- Retrieve, sort and filter data using basic T-SQL queries
- Combine data from multiple tables using joins and subqueries
- Aggregate data with grouping functions and handle NULL values
- Apply common table expressions, recursive CTEs and derived tables
- Apply window functions for ranking, pivoting and unpivoting data
- Develop stored procedures, functions and triggers
- Analyse execution plans, indexing and parameter sniffing for performance
- Implement error handling, transactions and query optimization techniques

COURSE SYLLABUS

11 Modules, 39 Topics

DAY 1 Foundations of Advanced Querying

01 Introduction

TOPICS

- Benefits of Advanced Querying in SQL Databases
- Overview of T-SQL
- Tools Required for Advanced Querying (SSMS, Azure Data Studio, Azure Portal)

02 Basic Querying with T-SQL

TOPICS

Introduction to Basic Querying · Retrieving Data from Tables · Sorting Data · Filtering Data

DAY 2 Combining and Summarizing Data

03 Joins and Subqueries

TOPICS

Combining Data from Multiple Tables · Inner Joins, Outer Joins, Self Joins · Writing and Using Subqueries

04 Aggregating Data

TOPICS

Grouping Data · Aggregate Functions (SUM, AVG, COUNT, etc.) · Handling NULL Values in Aggregations

DAY 3 Advanced Data Structuring

05 Table Expressions

TOPICS

Common Table Expressions (CTEs) · Recursive CTEs · Derived Tables · Temporary Tables

06 Advanced Querying Techniques (Part 1)

TOPICS

Using Window Functions · Ranking Functions · Pivoting and Unpivoting Data

DAY 4 Procedural Programming & Performance Concepts

06
Advanced Querying Techniques (Part 2)

TOPICS

Creating Temporary Tables and Table Variables

07
Stored Procedures, Functions, and Triggers

TOPICS

Creating and Using Stored Procedures · User-defined Functions · Triggers for Automation and Auditing

Performance Essentials in SQL Databases

TOPICS

- Understanding Execution Plans (Advance to Detailed Analysis)
- Indexing in Detail (Clustered, Non-Clustered, Covering, Include Index)
- **Parameter Sniffing:** Identification and Mitigation
- Locking and Deadlock
- Isolation Level for SQL

DAY 5 Monitoring, Optimization & Azure SQL DB

08
Error Handling & Transactions

TOPICS

Error Handling with TRY-CATCH Blocks · **Transactions:** BEGIN, COMMIT, ROLLBACK

09
Performance Monitoring & Query Optimization

TOPICS

- Monitoring through Azure Portal
- DMVs in Azure SQL Database
- **Query Store:** Tracking & Forcing Plans
- Profiling with SSMS for Azure SQL DB (How to Read Graphs)
- Performance Testing Using Index, Execution Plan, Optimization Query
- Working on compression, Decompression and Page fill factor
- SQL Injection
- Query Optimization Techniques (Best Practices for Azure + On-Prem)

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

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

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