

KOENIG SOLUTIONS • COURSE OUTLINE

20762C: Developing SQL 2016 Databases

Learn to design, implement and optimise SQL Server databases, from tables and indexes to stored procedures and in-memory tables.

5 Days

40 HOURS

18

MODULES

62

TOPICS

17

HANDS-ON LABS

COURSE OVERVIEW

The 20762C: Developing SQL 2016 Databases course is a comprehensive program designed for professionals seeking to enhance their skills in Developing Microsoft SQL Server databases. It covers a broad range of topics essential for effective database development, including Designing and implementing tables, enforcing data integrity, optimizing indexes, and utilizing advanced features such as in-memory tables and stored procedures. Through a series of modules and hands-on labs, learners will gain practical experience in Managing and maintaining databases, which is crucial for pursuing MCSA SQL Database Administration certification. The knowledge gained from this course will equip individuals to build robust, high-performance databases, making them valuable assets in the field of database development and administration.

Who Should Attend

Course 20762C: Developing SQL 2016 Databases is designed for IT professionals who want to enhance their skills in building and implementing databases using SQL Server 2016.

Database Developers – Professionals responsible for designing and developing SQL Server databases

Database Analysts – Individuals analyzing and managing database structures to optimize performance

SQL Server Programmers – Developers who write and optimize T-SQL queries and stored procedures

IT Professionals – Those responsible for database development and management within their organizations

Software Engineers – Developers integrating SQL Server databases into applications

Data Architects – Experts designing and optimizing database schemas for enterprise solutions

System Administrators – Professionals involved in database setup, maintenance, and security

Technical Consultants – Specialists implementing database solutions for clients

Business Intelligence Professionals – Analysts working with SQL Server data structures for reporting and insights

Data Scientists – Professionals requiring database development skills for data analysis and processing

Database Administrators – Individuals looking to deepen their knowledge of database development techniques

LEARNING OBJECTIVES

- Design and implement tables, schemas and data types
- Enforce data integrity through constraints
- Implement clustered, non-clustered and columnstore indexes
- Design optimised indexing strategies using execution plans
- Create and manage views and stored procedures
- Implement user-defined functions and DML triggers
- Configure in-memory tables and natively compiled procedures
- Monitor and optimise database performance using extended events

18 Modules, 62 Topics

01

Introduction to Database Development

TOPICS

Overview of the SQL Server Platform · SQL Server Database Development Tasks

02

Designing and Implementing Tables

TOPICS

Designing Tables · Understanding Data Types · Working with Schemas · Creating and Altering Tables

Lab

03

Advanced Table Designs

TOPICS

Data Partitioning · Data Compression · Temporal Tables

Lab

04

Ensuring Data Integrity Through Constraints

TOPICS

Enforcing Data Integrity · Implementing Data Domain Integrity · Implementing Entity and Referential Integrity

Lab

05

Introduction to Indexes

TOPICS

Core Indexing Concepts · Data Types and Indexes · Heaps, Clustered, and Non-Clustered Indexes · Single-Column and Composite Indexes

Lab

06

Designing Optimized Index Strategies

TOPICS

Indexing Strategies · Managing Indexes · Execution Plans · Database Engine Tuning Advisor · Query Store

Lab

07

Columnstore Indexes

TOPICS

Introduction to Columnstore Indexes · Creating Columnstore Indexes · Managing Columnstore Indexes

Lab

08

Designing and Implementing Views

TOPICS

Introduction to Views · Creating and Managing Views · Performance Considerations for Views

Lab

09**Lab**

Designing and Implementing Stored Procedures

TOPICS

Introduction to Stored Procedures · Working with Stored Procedures · Implementing Parameterized Stored Procedures · Controlling Execution Context

10**Lab**

Designing and Implementing User-Defined Functions

TOPICS

- Overview of Functions
- Designing and Implementing Scalar Functions
- Designing and Implementing Table-Valued Functions
- Considerations for Function Implementation
- Alternatives to Functions

11**Lab**

Responding to Data Manipulation with Triggers

TOPICS

Designing DML Triggers · Implementing DML Triggers · Advanced Trigger Concepts

12**Lab**

Using In-Memory Tables

TOPICS

Memory-Optimized Tables · Natively Compiled Stored Procedures

13**Lab**

Implementing Managed Code in SQL Server

TOPICS

Introduction to CLR Integration in SQL Server · Implementing and Publishing CLR Assemblies

14**Lab**

Storing and Querying XML Data in SQL Server

TOPICS

Introduction to XML and XML Schemas · Storing XML Data and Schemas in SQL Server · Implementing the XML Data Type · Using the Transact-SQL FOR XML Statement · Introduction to XQuery · Shredding XML Data

15

Lab

Storing and Querying Spatial Data in SQL Server

TOPICS

Introduction to Spatial Data · Working with SQL Server Spatial Data Types · Using Spatial Data in Applications

16

Lab

Storing and Querying BLOBs and Text Documents

TOPICS

Considerations for BLOB Data Storage · Working with FILESTREAM · Using Full-Text Search

17

Lab

SQL Server Concurrency

TOPICS

Concurrency and Transactions · Locking Internals

18

Lab

Performance Monitoring and Optimization

TOPICS

Introduction to Extended Events · Working with Extended Events · Live Query Statistics · Optimizing Database File Configuration · Database Performance Metrics

HANDS-ON LABS

Practise What You Learn

#	MODULE	ACTIVITY
02	Designing and Implementing Tables	Designing and Implementing Tables
03	Advanced Table Designs	Implementing Advanced Table Designs
04	Ensuring Data Integrity Through Constraints	Implementing Data Integrity with Constraints
05	Introduction to Indexes	Implementing Indexes
06	Designing Optimized Index Strategies	Optimizing Indexes
07	Columnstore Indexes	Working with Columnstore Indexes
08	Designing and Implementing Views	Designing and Implementing Views
09	Designing and Implementing Stored Procedures	Creating and Managing Stored Procedures
10	Designing and Implementing User-Defined Functions	Implementing User-Defined Functions



#	MODULE	ACTIVITY
11	Responding to Data Manipulation with Triggers	Implementing DML Triggers
12	Using In-Memory Tables	Utilizing In-Memory Database Capabilities
13	Implementing Managed Code in SQL Server	Implementing Managed Code in SQL Server
14	Storing and Querying XML Data in SQL Server	Storing and Querying XML Data
15	Storing and Querying Spatial Data in SQL Server	Implementing Spatial Data Solutions
16	Storing and Querying BLOBs and Text Documents	Managing BLOBs and Text Documents
17	SQL Server Concurrency	Managing Concurrency and Transactions
18	Performance Monitoring and Optimization	Monitoring and Performance Optimization

WHAT IS INCLUDED

Everything You Need to Succeed

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

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