



Learning Solutions



# Developing SQL 2016 Databases (MOC20762)

## Course 21762 – 32 Hours

### Overview

This four-day instructor-led course provides students with the knowledge and skills to develop a Microsoft SQL Server 2016 database. The course focuses on teaching individuals how to use SQL Server 2016 product features and tools related to developing a database.

### On Completion, Delegates will be able to

- Design and Implement Tables.
- Describe advanced table designs
- Ensure Data Integrity through Constraints.
- Describe indexes, including Optimized and Columnstore indexes
- Design and Implement Views.
- Design and Implement Stored Procedures.
- Design and Implement User Defined Functions.
- Respond to data manipulation using triggers.
- Design and Implement In-Memory Tables.
- Implement Managed Code in SQL Server.
- Store and Query XML Data.
- Work with Spatial Data.
- Store and Query Blobs and Text Documents.

### Who Should Attend

The primary audience for this course is IT Professionals who want to become skilled on SQL Server 2016 product features and technologies for implementing a database.

The secondary audiences for this course are individuals who are developers from other product platforms looking to become skilled in the implementation of a SQL Server 2016 database.

### Prerequisites

- Basic knowledge of the Microsoft Windows operating system and its core functionality.
- Working knowledge of Transact-SQL.
- Working knowledge of relational databases.

### Course Contents

#### Module 1: Introduction to Database Development

This module is used to introduce the entire SQL Server platform and its major tools. It will cover editions, versions, basics of network listeners, and concepts of services and service accounts.

- Introduction to the SQL Server Platform
- SQL Server Database Development Tasks



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## Module 2: Designing and Implementing Tables

This module describes the design and implementation of tables. (Note: partitioned tables are not covered).

- Designing Tables
- Data Types
- Working with Schemas
- Creating and Altering Tables

## Module 3: Advanced Table Designs

This module describes more advanced table designs.

- Partitioning data
- Compressing Data
- Temporal Tables

## Module 4: Ensuring Data Integrity through Constraints

This module describes the design and implementation of constraints.

- Enforcing data Integrity
- Implementing Domain Integrity
- Implementing Entity and Referential Integrity

## Module 5: Introduction to Indexes

This module describes the concept of an index and discusses selectivity, density and statistics. It covers appropriate data type choices and choices around composite index structures.

- Core Indexing Concepts
- Data Types and Indexes
- Single Column and Composite Indexes

## Module 6: Designing Optimized Index Strategies

This module includes covering indexes and the INCLUDE clause, hints, padding / fillfactor, statistics. It also execution plans and the DTE .

- Covering Indexes
- Managing Indexes
- Execution Plans
- Using the DTE

## Module 7: Columnstore Indexes

This module introduces Columnstore indexes.

- Introduction to Columnstore indexes
- Creating Columnstore indexes
- Working Columnstore indexes

## Module 8: Designing and Implementing Views

This module describes the design and implementation of views.

- Introduction to views
- Creating and managing views
- Performance considerations for views



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### **Module 9: Designing and Implementing Stored Procedures**

This module describes the design and implementation of stored procedures.

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

### **Module 10: Designing and Implementing User-Defined Functions**

This module describes the design and implementation of functions, both scalar and table-valued. (Also discusses where they can lead to performance issues).

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

### **Module 11: Responding to Data Manipulation via Triggers**

This module describes the design and implementation of triggers.

- Designing DML Triggers
- Implementing DML Triggers
- Advanced Trigger Concepts

### **Module 12: Using In-Memory Tables**

This module covers the creation of in-memory tables and native stored procedures. Furthermore, advantages of in-memory tables are discussed, for example the removal of transaction blocking.

- In-Memory tables
- Native Stored Procedures

### **Module 13: Implementing Managed Code in SQL Server**

This module describes the implementation of and target use-cases for SQL CLR integration.

- Introduction to SQL CLR Integration
- Importing and Configuring Assemblies
- Implementing SQL CLR Integration

### **Module 14: Storing and Querying XML Data in SQL Server**

This module covers the XML data type, schema collections, typed and un-typed columns and appropriate use cases for XML in SQL Server.

- Introduction to XML and XML Schemas
- Storing XML Data and Schemas in SQL Server
- Implementing the XML Data Type
- Using the T-SQL FOR XML Statement
- Getting Started with xQuery



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### **Module 15: Working with SQL Server Spatial Data**

This module describes spatial data and how this data can be implemented within SQL Server.

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

### **Module 16: Storing and Querying Blobs and Text Documents in SQL Server**

This module covers full text indexes and queries.

- Considerations for BLOB Data
- Working with FileStream
- Using Full-Text Search