

**40 HORAS**

## INTRODUCTION

This five-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.

## AUDIENCE

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.

## AT COURSE COMPLETION

After completing this course, students 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.

## PREREQUISITES

Before attending this course, students must have:

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

## COURSE OUTLINE

### Module 1: Introduction to Database Development

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

### Module 2: Designing and Implementing Tables

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

### Module 3: Advanced Table Designs

- Partitioning Data
- Compressing Data
- Temporal Tables

### Module 4: Ensuring Data Integrity through Constraints

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

### Module 5: Introduction to Indexes

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

### Module 6: Designing Optimized Index Strategies

- Index Strategies
- Managing Indexes
- Execution Plans
- The Database Engine Tuning Advisor
- Query Store

### Module 7: Columnstore Indexes

- Introduction to Columnstore Indexes
- Creating Columnstore Indexes
- Working with Columnstore Indexes

### Module 8: Designing and Implementing Views

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

### Module 9: Designing and Implementing 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**

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

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

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

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

- Memory-Optimized Tables
- Natively Compiled Stored Procedures

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

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

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

- 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
- Getting Started with XQuery
- Shredding XML

**Module 15: Storing and Querying Spatial Data in 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**

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

**Module 17: SQL Server Concurrency**

- Concurrency and Transactions
- Locking Internals

**Module 18: Performance and Monitoring**

- Extended Events
- Working with extended Events
- Live Query Statistics
- Optimize Database File Configuration
- Metrics