Developing SQL Databases

Course: 20762

Course Details

Audience(s): IT Professional(s)

Technology: Microsoft SQL Server 2016

Duration: 40 HRs.

About This Course

This forty hours 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 Profile

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.

Course Content

Module 1: Introduction to Database Development

Lessons

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

Module 2: Designing and Implementing Tables

Lessons

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

Lab: Designing and Implementing Tables

Module 3: Advanced Table Designs

Lessons

- Partitioning Data
- Compressing Data
- Temporal Tables

Lab: Using Advanced Table Designs

Module 4: Ensuring Data Integrity through Constraints

Lessons

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

Lab: Using Data Integrity Through Constraints

Module 5: Introduction to Indexes

Lessons

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

Lab: Implementing Indexes

Module 6: Designing Optimized Index Strategies

Lessons

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

Lab: Optimizing Indexes

Module 7: Columnstore Indexes

Lessons

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

Lab: Using Columnstore Indexes

Module 8: Designing and Implementing Views

Lessons

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

Lab: Designing and Implementing Views

Module 9: Designing and Implementing Stored Procedures

Lessons

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

Lab: Designing and Implementing Stored Procedures

Module 10: Designing and Implementing User-Defined Functions

Lessons

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

Lab: Designing and Implementing User-Defined Functions

Module 11: Responding to Data Manipulation via Triggers

Lessons

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

Lab: Responding to Data Manipulation by Using Triggers

Module 12: Using In-Memory Tables

Lessons

- Memory-Optimized Tables
- Natively Compiled Stored Procedures

Lab: Using In-Memory Database Capabilities

Module 13: Implementing Managed Code in SQL Server

Lessons

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

Lab: Implementing Managed Code in SQL Server

Module 14: Storing and Querying XML Data in SQL Server

Lessons

- 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

Lab: Storing and Querying XML Data in SQL Server

Module 15: Storing and Querying Spatial Data in SQL Server

Lessons

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

Lab: Working with SQL Server Spatial Data

Module 16: Storing and Querying BLOBs and Text Documents in SQL Server

Lessons

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

Lab: Storing and Querying BLOBs and Text Documents in SQL Server

Module 17: SQL Server Concurrency

Lessons

- Concurrency and Transactions
- Locking Internals

Lab: SQL Server Concurrency

Module 18: Performance and Monitoring

Lessons

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

Lab: Monitoring, Tracing, and Baselining

At This Course Completion

At completing this course the student 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.