20762: Developing SQL Databases (5 Days)

About this Course

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 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.

Prerequisite

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

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.

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 Domain Integrity
- Implementing Entity and Referential Integrity

Module 5: Introduction to Indexes
- Core Indexing Concepts
- Data Types and Indexes
- Single Column and Composite Indexes

Module 6: Designing Optimized Index Strategies
- Covering Indexes
- Managing Indexes
- Execution Plans
- Using the DTE

Module 7: Columnstore Indexes
- Introduction to Columnstore indexes
- Creating Columnstore indexes
- Working 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
- Implementation Considerations for 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
- In-Memory tables
- Native Stored Procedures

Module 13: Implementing Managed Code in SQL Server
- Introduction to SQL CLR Integration
- Importing and Configuring Assemblies
- Implementing SQL CLR Integration

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 T-SQL FOR XML Statement
- Getting Started with xQuery

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