

20762C: Developing SQL 2016 Databases

Course Duration: 40 Hours (5 Days)

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.

Audience Profile

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.

Course Syllabus

Module 1: Introduction to Database Development

- Lesson 1: Overview of the SQL Server Platform
- Lesson 2: SQL Server Database Development Tasks

Module 2: Designing and Implementing Tables

- Lesson 1: Designing Tables
- Lesson 2: Understanding Data Types
- Lesson 3: Working with Schemas
- Lesson 4: Creating and Altering Tables
- Lab: Designing and Implementing Tables

Module 3: Advanced Table Designs

- Lesson 1: Data Partitioning
- Lesson 2: Data Compression
- Lesson 3: Temporal Tables
- Lab: Implementing Advanced Table Designs

Module 4: Ensuring Data Integrity Through Constraints

- Lesson 1: Enforcing Data Integrity
- Lesson 2: Implementing Data Domain Integrity
- Lesson 3: Implementing Entity and Referential Integrity
- Lab: Implementing Data Integrity with Constraints

Module 5: Introduction to Indexes

- Lesson 1: Core Indexing Concepts
- Lesson 2: Data Types and Indexes
- Lesson 3: Heaps, Clustered, and Non-Clustered Indexes
- Lesson 4: Single-Column and Composite Indexes
- Lab: Implementing Indexes

Module 6: Designing Optimized Index Strategies

- Lesson 1: Indexing Strategies
- Lesson 2: Managing Indexes
- Lesson 3: Execution Plans
- Lesson 4: Database Engine Tuning Advisor
- Lesson 5: Query Store
- Lab: Optimizing Indexes

Module 7: Columnstore Indexes

- Lesson 1: Introduction to Columnstore Indexes
- Lesson 2: Creating Columnstore Indexes

- Lesson 3: Managing Columnstore Indexes
- Lab: Working with Columnstore Indexes

Module 8: Designing and Implementing Views

- Lesson 1: Introduction to Views
- Lesson 2: Creating and Managing Views
- Lesson 3: Performance Considerations for Views
- Lab: Designing and Implementing Views

Module 9: Designing and Implementing Stored Procedures

- Lesson 1: Introduction to Stored Procedures
- Lesson 2: Working with Stored Procedures
- Lesson 3: Implementing Parameterized Stored Procedures
- Lesson 4: Controlling Execution Context
- Lab: Creating and Managing Stored Procedures

Module 10: Designing and Implementing User-Defined Functions

- Lesson 1: Overview of Functions
- Lesson 2: Designing and Implementing Scalar Functions
- Lesson 3: Designing and Implementing Table-Valued Functions
- Lesson 4: Considerations for Function Implementation
- Lesson 5: Alternatives to Functions
- Lab: Implementing User-Defined Functions

Module 11: Responding to Data Manipulation with Triggers

- Lesson 1: Designing DML Triggers
- Lesson 2: Implementing DML Triggers
- Lesson 3: Advanced Trigger Concepts
- Lab: Implementing DML Triggers

Module 12: Using In-Memory Tables

- Lesson 1: Memory-Optimized Tables
- Lesson 2: Natively Compiled Stored Procedures
- Lab: Utilizing In-Memory Database Capabilities

Module 13: Implementing Managed Code in SQL Server

- Lesson 1: Introduction to CLR Integration in SQL Server
- Lesson 2: Implementing and Publishing CLR Assemblies

- Lab: Implementing Managed Code in SQL Server

Module 14: Storing and Querying XML Data in SQL Server

- Lesson 1: Introduction to XML and XML Schemas
- Lesson 2: Storing XML Data and Schemas in SQL Server
- Lesson 3: Implementing the XML Data Type
- Lesson 4: Using the Transact-SQL FOR XML Statement
- Lesson 5: Introduction to XQuery
- Lesson 6: Shredding XML Data
- Lab: Storing and Querying XML Data

Module 15: Storing and Querying Spatial Data in SQL Server

- Lesson 1: Introduction to Spatial Data
- Lesson 2: Working with SQL Server Spatial Data Types
- Lesson 3: Using Spatial Data in Applications
- Lab: Implementing Spatial Data Solutions

Module 16: Storing and Querying BLOBs and Text Documents

- Lesson 1: Considerations for BLOB Data Storage
- Lesson 2: Working with FILESTREAM
- Lesson 3: Using Full-Text Search
- Lab: Managing BLOBs and Text Documents

Module 17: SQL Server Concurrency

- Lesson 1: Concurrency and Transactions
- Lesson 2: Locking Internals
- Lab: Managing Concurrency and Transactions

Module 18: Performance Monitoring and Optimization

- Lesson 1: Introduction to Extended Events
- Lesson 2: Working with Extended Events
- Lesson 3: Live Query Statistics
- Lesson 4: Optimizing Database File Configuration
- Lesson 5: Database Performance Metrics
- Lab: Monitoring and Performance Optimization