SQL Databases Developer Expert

SQL Server is a database server by Microsoft. The Microsoft relational database management system is a software product which primarily stores and retrieves data requested by other applications. Therefore, a SQL Server is a database server that implements the Structured Query Language (SQL). This course provides students with the knowledge and skills to develop a Microsoft SQL Server database. The course focuses on teaching individuals how to use SQL Server product features and tools related to developing a database.

You Must Know!

Duration:

40 Hours

Who should attend?

IT Professionals and Developers who want to become skilled on SQL Server product features and technologies for implementing a database

Prerequisites:

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

Main Topics:

- Designing and Implementing Tables
- Indexes
- Stored Procedures & User-Defined Functions
- Triggers
- In-Memory Tables
- Managed Code
- Storing and Querying XML Data & Spatial Data
- BLOBs and Text Documents
- Concurrency
- Performance and Monitoring

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Course Modules

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
- Hands-On Lab - Designing and Implementing Tables
    - Designing Tables
    - Creating Schemas
    - Creating Tables

Module 3 – Advanced Table Designs

- Partitioning Data
- Compressing Data
- Temporal Tables
- Hands-On Lab - Using Advanced Table Designs
    - Partitioning Data
    - Compressing Data

Module 4 – Ensuring Data Integrity through Constraints

- Enforcing Data Integrity
- Implementing Data Domain Integrity
- Implementing Entity and Referential Integrity
- Hands-On Lab - Using Data Integrity Through Constraints
    - Add Constraints
    - Test the Constraints

Module 5 – Introduction to Indexes

- Core Indexing Concepts
- Data Types and Indexes
- Heaps, Clustered, and Nonclustered Indexes
- Single Column and Composite Indexes
- Hands-On Lab - Implementing Indexes

- Creating a Heap
- Creating a Clustered Index
- Creating a Covered Index

Module 6 – Designing Optimized Index Strategies

- Index Strategies
- Managing Indexes
- Execution Plans
- The Database Engine Tuning Advisor
- Query Store
- Hands-On Lab - Optimizing Indexes
  - Using Query Store
  - Heaps and Clustered Indexes
  - Creating a Covered Index

Module 7 – Columnstore Indexes

- Introduction to Columnstore Indexes
- Creating Columnstore Indexes
- Working with Columnstore Indexes
- Hands-On Lab - Using Columnstore Indexes
  - Creating a Columnstore Index
  - Create a Memory Optimized Columnstore Table

Module 8 – Designing and Implementing Views

- Introduction to Views
- Creating and Managing Views
- Performance Considerations for Views
- Hands-On Lab - Designing and Implementing Views
  - Creating Standard Views
  - Creating an Updateable view

Module 9 – Designing and Implementing Stored Procedures

- Introduction to Stored Procedures
- Working with Stored Procedures
- Implementing Parameterized Stored Procedures
- Controlling Execution Context
- Hands-On Lab – Designing and Implementing Stored Procedures
  - Create Stored procedures
  - Create Parameterized Stored procedures

- Changes Stored Procedure 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
- Hands-On Lab – Designing and Implementing User-Defined Functions
  - Format Phone numbers
  - Modify an Existing Function

Module 10 – Responding to Data Manipulation via Triggers

- Designing DML Triggers
- Implementing DML Triggers
- Advanced Trigger Concepts
- Hands-On Lab - Responding to Data Manipulation by Using Triggers
  - Create and Test the Audit Trigger
  - Improve the Audit Trigger

Module 11 – Using In-Memory Tables

- Memory-Optimized Tables
- Natively Compiled Stored Procedures
- Hands-On Lab - Using In-Memory Database Capabilities
  - Using Memory-Optimized Tables
  - Using Natively Compiled Stored procedures

Module 12 – Implementing Managed Code in SQL Server

- Introduction to CLR Integration in SQL Server
- Implementing and Publishing CLR Assemblies
- Hands-On Lab - Implementing Managed Code in SQL Server
  - Assessing Proposed CLR Code
  - Creating a Scalar-Valued CLR Function
  - Creating a Table Valued CLR Function

Module 13 – 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
- Hands-On Lab - Storing and Querying XML Data in SQL Server
    - Determining when to use XML
    - Testing XML Data Storage in Variables
    - Using XML Schemas
    - Using FOR XML Queries
    - Creating a Stored Procedure to Return XML

Module 14 – Storing and Querying Spatial Data in SQL Server

- Introduction to Spatial Data
- Working with SQL Server Spatial Data Types
- Using Spatial Data in Applications
- Hands-On Lab - Working with SQL Server Spatial Data
    - Become Familiar with the Geometry Data Type
    - Add Spatial Data to an Existing Table
    - Find Nearby Locations

Module 15 – Storing and Querying BLOBs and Text Documents in SQL Server

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

- Hands-On Lab - Storing and Querying BLOBs and Text Documents in SQL Server
    - Enabling and Using FILESTREAM Columns
    - Enabling and Using File Tables
    - Using a Full-Text Index

Module 16 – SQL Server Concurrency

- Concurrency and Transactions
- Locking Internals
- Hands-On Lab - SQL Server Concurrency
    - Implement Snapshot Isolation
    - Implement Partition Level Locking

Module 17 – Performance and Monitoring

- Extended Events
- Working with extended Events
- Live Query Statistics
- Optimize Database File Configuration
- Metrics
- Hands-On Lab - Monitoring, Tracing, and Baselining
    - Collecting and Analyzing Data Using Extended Events
    - Implementing Baseline Methodology

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