SQL Databases Developing

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

Course Modules

Module 1 – Introduction to Database Development

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

Module 2 – Designing and Implementing Tables

- o Designing Tables
- o Data Types
- o Working with Schemas
- o Creating and Altering Tables
- o Hands-On Lab - Designing and Implementing Tables
    - o Designing Tables
    - o Creating Schemas
    - o Creating Tables

Module 3 – Advanced Table Designs

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

Module 4 – Ensuring Data Integrity through Constraints

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

Module 5 – Introduction to Indexes

- o Core Indexing Concepts
- o Data Types and Indexes
- o Heaps, Clustered, and Nonclustered Indexes
- o Single Column and Composite Indexes
- o Hands-On Lab - Implementing Indexes
    - o Creating a Heap
    - o Creating a Clustered Index
    - o Creating a Covered Index

Module 6 – Designing Optimized Index Strategies

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

Module 7 – Columnstore Indexes

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

Module 8 – Designing and Implementing Views

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

Module 9 – Designing and Implementing Stored Procedures

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

Module 10 – Designing and Implementing User-Defined Functions

- o Overview of Functions
- o Designing and Implementing Scalar Functions
- o Designing and Implementing Table-Valued Functions
- o Considerations for Implementing Functions
- o Alternatives to Functions
- o Hands-On Lab – Designing and Implementing User-Defined Functions
    - o Format Phone numbers
    - o Modify an Existing Function

Module 10 – Responding to Data Manipulation via Triggers

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

Module 11 – Using In-Memory Tables

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

Module 12 – Implementing Managed Code in SQL Server

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

Module 13 – Storing and Querying XML Data in SQL Server

- o   Introduction to XML and XML Schemas
- o   Storing XML Data and Schemas in SQL Server
- o   Implementing the XML Data Type
- o   Using the Transact-SQL FOR XML Statement
- o   Getting Started with XQuery
- o   Shredding XML
- o   Hands-On Lab - Storing and Querying XML Data in SQL Server
    - o   Determining when to use XML
    - o   Testing XML Data Storage in Variables
    - o   Using XML Schemas
    - o   Using FOR XML Queries
    - o   Creating a Stored Procedure to Return XML

Module 14 – Storing and Querying Spatial Data in SQL Server

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

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

- o Considerations for BLOB Data
- o Working with FILESTREAM
- o Using Full-Text Search
- o Hands-On Lab - Storing and Querying BLOBs and Text Documents in SQL Server
  - o Enabling and Using FILESTREAM Columns
  - o Enabling and Using File Tables
  - o Using a Full-Text Index

Module 16 – SQL Server Concurrency

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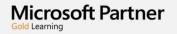 - o Implement Partition Level Locking

Module 17 – Performance and Monitoring

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

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המרכז הבינלאומי
ללימודי הייטק וחדשנות

מתקדמים
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ראול ולנברג 36	רחוב אופנהיימר 5	רחוב יפו 34	רחוב האנרגיה 77
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