



## Developing SQL Databases

This five-day instructor-led course provides participants 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

### Who Should Attend:

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 audience 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 Prerequisites:

**Before attending this course, participants must have, in addition to their professional experience:**

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

### Course Objectives:

**After completing this course, participants will be able to:**

- Design & Implement Tables
- Describe advanced table designs
- Ensure Data Integrity through Constraints
- Describe indexes, including Optimized & Columnstore indexes
- Design & Implement Views
- Design & Implement Stored Procedures
- Design & Implement User Defined Functions
- Respond to data manipulation using trigger
- Design & Implement In-Memory Tables
- Implement Managed Code in SQL Server
- Store & Query XML Data
- Work with Spatial Data
- Store & Query Blobs & Text Documents

**Course Code:** 20762B

**Course Duration:** 5 Days

### Course Summary

**Module 1:** Introduction to Database Development

**Module 2:** Designing & Implementing Tables

**Module 3:** Advanced Table Designs

**Module 4:** Ensuring Data Integrity through Constraints

**Module 5:** Introduction to Indexes

**Module 6:** Designing Optimized Index Strategies

**Module 7:** Columnstore Indexes

**Module 8:** Designing and Implementing Views

**Module 9:** Designing and Implementing Stored Procedures

**Module 10:** Designing and Implementing User-Defined Functions

**Module 11:** Responding to Data Manipulation via Triggers

**Module 12:** Using In-Memory Tables

**Module 13:** Implementing Managed Code in SQL Server

**Module 14:** Storing and Querying XML Data in SQL Server

**Module 15:** Working with SQL Spatial Data

**Module 16:** Storing & Querying BLOBs & Text Documents

**Module 17:** SQL Server Concurrency

**Module 18:** Performance & Monitoring

### Microsoft Partner

Gold Data Analytics  
Gold Data Platform  
Silver Learning

[www.wardyit.com](http://www.wardyit.com)

[contact@wardyit.com](mailto:contact@wardyit.com)

Call 1300 927 394 to register for this course today as places are strictly limited.



## Course Outline

### Module 1: Introduction to Database Development

This module is used to introduce the entire SQL Server platform and its major tools. It will cover editions, versions, basics of network listeners, and concepts of services and service accounts.

#### Lessons

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

#### Lab

- SQL Server Database Development Tasks

### Module 2: Designing and Implementing Tables

This module describes the design and implementation of tables. (Note: partitioned tables are not covered).

#### Lessons

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

#### Lab

- Designing and Implementing Tables

### Module 3: Advanced Table Designs

This module describes more advanced table designs

#### Lessons

- Partitioning data
- Compressing Data
- Temporal Tables

#### Lab

- Using Advanced Table Designs

### Module 4: Ensuring Data Integrity through Constraints

This module describes the design and implementation of constraints

#### Lessons

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

#### Lab

- Ensuring Data Integrity through Constraints

### Module 5: Introduction to Indexes

This module describes the concept of an index and discusses selectivity, density and statistics. It covers appropriate data type choices and choices around composite index structures.

#### Lessons

- Core Indexing Concepts
- Data Types and Indexes
- Single Column and Composite Indexes

#### Lab

- Implementing Indexes

### Module 6: Designing Optimized Index Strategies

This module includes covering indexes and the INCLUDE clause, hints, padding / fillfactor, statistics. It also execution plans and the DTE Lessons

#### Lessons

- Covering Indexes
- Managing Indexes
- Execution Plans
- Using the DTE

#### Lab

- Designing Optimised Index Strategies

### Module 7: Columnstore Indexes

This module introduces Columnstore Indexes

#### Lessons

- Introduction to Columnstore indexes
- Creating Columnstore indexes
- Working Columnstore indexes

#### Lab

- Performing Ongoing Database Maintenance

### Module 8: Designing and Implementing Views

This module describes the design and implementation of views

#### Lessons

- Introduction Views
- Creating and managing views
- Performance considerations for views

#### Lab

- Designing and Implementing Views



### Module 9: Designing and Implementing Stored Procedures

This module describes the design and implementation of 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 & Implementing User-Defined Functions

This module describes the design and implementation of functions, both scalar and table-valued. (Also discusses where they can lead to performance issues).

#### Lessons

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

#### Lab

- Designing & Implementing User-Defined Functions

### Module 11: Responding to Data Manipulation via Triggers

This module describes the design and implementation of triggers

#### Lessons

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

#### Lab

- Responding to Data Manipulation via Triggers

### Module 12: Using In-Memory Tables

This module covers the creation of in-memory tables and native stored procedures. Furthermore, advantages of in-memory tables are discussed, for example the removal of transaction blocking.

#### Lessons

- In-Memory tables
- Native Stored Procedures

#### Lab

- In-Memory OLTP

### Module 13: Implementing Managed Code in SQL Server

This module describes the implementation of and target use-cases for SQL CLR integration

#### Lessons

- Introduction to SQL CLR Integration
- Importing and Configuring Assemblies
- Implementing SQL CLR Integration

#### Lab

- Implementing Managed Code in SQL Server

### Module 14: Storing and Querying XML Data in SQL Server

This module covers the XML data type, schema collections, typed and un-typed columns and appropriate use cases for XML 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 T-SQL FOR XML Statement
- Getting Started with xQuery

#### Lab

- Storing and Querying XML Data in SQL Server

### Module 15: Working with SQL Server Spatial Data

This module describes spatial data and how this data can be implemented within SQL Server

#### Lessons

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

#### Lab

- Working with Spatial Data in Applications



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

Traditionally, databases have been used to store information in the form of simple values—such as integers, dates, and strings—that contrast with more complex data formats, such as documents, spreadsheets, image files, and video files.

As the systems that databases support have become more complex, administrators have found it necessary to integrate this more complex file data with the structured data in database tables.

For example, in a product database, it can be helpful to associate a product record with the service manual or instructional videos for that product. SQL Server provides several ways to integrate these files—that are often known as Binary Large Objects (BLOBs)—and enable their content to be indexed and included in search results. In this module, you will learn how to design and optimize a database that includes BLOBs.

##### Lessons

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

##### Lab

- Storing & Querying BLOBs & Text Documents in SQL Server

#### **Module 17: SQL Server Concurrency**

This module explains how to name, declare, assign values to, and use variables. It also describes how to store data in an array.

Concurrency control is a critical feature of multiuser database systems; it allows data to remain consistent when many users are modifying data at the same time. This module covers the implementation of concurrency in Microsoft SQL Server.

You will learn about how SQL Server implements concurrency controls, and the different ways you can configure and work with concurrency settings

##### Lessons

- Concurrency and Transactions
- Locking Internals

##### Lab

- SQL Server Concurrency

#### **Module 18: Performance & Monitoring**

This module looks at how to measure and monitor the performance of your SQL Server databases. The first two lessons look at SQL Server Extended Events, a flexible, lightweight event-handling system built into the Microsoft SQL Server Database Engine.

These lessons focus on the architectural concepts, troubleshooting strategies and usage scenarios

##### Lessons

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

##### Lab

- Monitoring, Tracing & Baselineing