# Course duration

- 4 days

# Course Benefits

- Learn to describe the high level architectural overview of SQL Server and its various components.
- Learn to describe the SQL Server execution model, waits and queues.
- Learn to describe core I/O concepts, Storage Area Networks and performance testing.
- Learn to describe architectural concepts and best practices related to data files for user databases and TempDB.
- Learn to describe architectural concepts and best practices related to Concurrency, Transactions, Isolation Levels and Locking.
- Learn to describe architectural concepts of the Optimizer and how to identify and fix query plan issues.
- Learn to describe architectural concepts, troubleshooting scenarios and best practices related to Plan Cache.
- Learn to describe architectural concepts, troubleshooting strategy and usage scenarios for Extended Events.
- Learn to explain data collection strategy and techniques to analyze collected data.
- Learn to understand techniques to identify and diagnose bottlenecks to improve overall performance.

Available Delivery Methods

**Public Class**
Public expert-led online training from the convenience of your home, office or anywhere with an internet connection. Guaranteed to run .

**Private Class**
Private classes are delivered for groups at your offices or a location of your choice.

Microsoft Certified Partner

Webucator is a Microsoft Certified Partner for Learning Solutions (CPLS). This class uses official Microsoft courseware and will be delivered by a Microsoft Certified Trainer (MCT).

# Course Outline

1. SQL Server Architecture, Scheduling, and Waits
    1. SQL Server Components and SQL OS
    2. Windows Scheduling vs SQL Scheduling
    3. Waits and Queues
    4. Lab: SQL Server Architecture, Scheduling, and Waits
2. SQL Server I/O
    1. Core Concepts
    2. Storage Solutions
    3. I/O Setup and Testing
    4. Lab: Testing Storage Performance
3. Database Structures
    1. Database Structure Internals
    2. Data File Internals
    3. TempDB Internals
    4. Lab: Database Structures
4. SQL Server Memory
    1. Windows Memory
    2. SQL Server Memory
    3. In-Memory OLTP
    4. Lab: SQL Server Memory
5. Concurrency and Transactions
    1. Concurrency and Transactions
    2. Locking Internals
    3. Lab: Concurrency and Transactions
6. Statistics and Index Internals
    1. Statistics Internals and Cardinality Estimation
    2. Index Internals
    3. Columnstore Indexes
    4. Lab: Statistics and index Internals
7. Query Execution and Query Plan Analysis
    1. Query execution and optimizer internals
    2. Analyzing query plans
    3. Lab: Query execution and query plan analysis
8. Plan Caching and Recompilation
    1. Plan cache internals
    2. Troubleshooting plan cache issues
    3. Query store
    4. Lab: Plan caching and recompilation
9. Extended Events
    1. Extended events core concepts
    2. Implementing extended events
    3. Lab: Extended events
10. Monitoring, Tracing, and Baselining
    1. Monitoring and tracing
    2. Baselining and benchmarking

3. Lab: Monitoring, Tracing and Baselining

# Class Materials

Each student will receive a comprehensive set of materials, including course notes and all the class examples.

Class Prerequisites

Experience in the following *is required* for this SQL Server class:

- Basic knowledge of the Microsoft Windows operating system and its core functionality.
- Working knowledge of database administration and maintenance.
- Working knowledge of Transact-SQL.