

Workshop	
Name	Synergetics-Standard SQL Server 2012 PTO
Duration	3 days
Objective	Participants will learn various ways of tuning servers and how to write an effective query using T-SQL language which is used to interact with SQL Server Database.
Participants' Entry Profile	Participants attending this course must have worked on: RDBMS Concepts and be proficient in writing SQL Scripts
Training Methodology	The workshop will follow Synergetics methodology of <ul style="list-style-type: none"> Concept Visualization Active Experimentation Application Development. The workshop will be 100% Hands-On with each participant having access to system during the session
Setup Requirements	
Hardware and Software Requirements	Participant's as well as Trainer's Machine are required to have : Hardware Intel Core I5 and above 4 GB RAM LAN Connectivity 500 MB HDD (Free Space) Software Visual Studio .Net 2010 Microsoft Windows 2008R2 Server Internet Explorer 7.0 Microsoft SQL 2012 Enterprise Server Microsoft SQL 2012 Client tool
Training Lab Requirements	Whiteboard 6 feet by 4 feet (minimum) Whiteboard markers – Red, Blue, Green, Black Video Projector (1024 X 768 resolutions)

Course Contents**Day 1**

- **Components of the SQL Server Architecture**
 - Protocols used for communication with SQL Server
 - Relational Engine Components Overview
 - Storage Engine Components Overview
 - The SQL OS
 - Understanding the Buffer Cache Components
 - Observing Engine Behavior and Memory using DMVs and DMFs

- **Physical Database Architecture**
 - Pages and Extents
 - Space Allocation and Reuse
 - Table and Index Architecture
 - Transaction Log Architecture

- **Creating and Managing Databases**
 - Storage structures
 - Examining disc structures
 - Creating databases and transaction logs
 - Defining file groups
 - FileStreams / FileTables
 - Managing database space
 - Permitting automatic database growth
 - Adding database files to expand databases
 - Specifying database options
 - Understanding tempdb database
 - Available database options and Recovery Models
 - Understanding Collation
 - Moving databases
 - Detaching and attaching databases
 - Contained Database

- **Managing Transactions, Locking, and Blocking**
 - Transactional Basics
 - Transactional Integrity
 - The ACID Properties
 - Transactional Faults
 - Isolation Levels
 - Transaction-Log Architecture
 - Transaction Log Sequence
 - Transaction-Log Recovery
 - Understanding SQL Server Locking
 - Lock Granularity
 - Lock Mode
 - Lock Duration

- Monitoring Locking and Blocking
- Using Profiler
- Controlling SQL Server Locking
 - Setting the Connection Isolation Level
 - Using Database Snapshot Isolation
 - Using Locking Hints
 - Index-Level Locking Restrictions
 - Controlling Lock Timeouts
 - Evaluating Database Concurrency Performance
 - Application Locks
- Deadlocks
 - Creating a Deadlock
 - Automatic Deadlock Detection
 - Handling Deadlocks
 - Minimizing Deadlocks
- Application Locking Design
 - Implementing Optimistic Locking
 - Lost Updates
- Transaction Performance Strategies

Day 2

- **Monitoring SQL Server Performance**
 - Using the Performance Monitor Tool
 - Monitoring Events with SQL Trace and event notifications
 - Monitoring with Dynamic Management Views
 - Hardware Resource Bottlenecks
 - Memory Bottleneck Analysis
 - Disk Bottleneck Analysis and Resolution
 - Processor Bottleneck Analysis and Resolution
- **Performance Tuning of T-SQL**
 - Gathering Database I/O Information
 - Understanding Join Algorithms
 - Overview of Index Access Methods
 - Understanding DML Query Plans
 - Understanding Partitioned Table Query Plans
 - Gathering Query Plans for Analysis with SQL Trace
 - Database Tuning Advisor
- **Statistics Analysis**
 - The Role of Statistics in Query Optimization
 - Statistics on an Indexed Column
 - Analyzing Statistics
 - Statistics Maintenance
 - Analyzing the Effectiveness of Statistics for a Query

➤ **Fragmentation Analysis**

- Causes of Fragmentation
- Analyzing the Amount of Fragmentation & Resolution
- Significance of Fill Factor

Day 3

➤ **Monitoring and Configuring SQL Server**

- Using sp_configure
- Monitoring Activity
- sp_monitor
- Viewing and Modifying Database Options
- Monitoring User Activity
- Monitoring and Managing the Integrity of the Database
- Using Dynamic Management Views

➤ **Managing Workload with Resource Governor**

Resource Governor Concepts
Configuring Resource Governor
Resource Governor DDL and System Views

➤ **Extended Events**

Introduction to Extended Events
Overview of Extended Events Architecture
Handling Events

➤ **SQL Audit**

Overview of SQL Server Audit
Creating SQL Server Audit Objects
Implementing Server Audit Specification objects
Implementing Database Audit Specification objects

➤ **Automating SQL Server**

- Automation Components
- SQL Server Agent Security
- Configuring SQL Server Agent
- Database Mail
- Multiserver Administration

➤ **Using SQL Server Profiler**

- Introduction to Server Profiler
- Monitoring Events
- Event Categories
- Security Audit

- Data Columns
- Create a Trace Template
- Creating a Sample Trace
- Reading the Trace File Replaying it