

# Advanced administration for MS SQL Server 2019

**Duration :** 6 days(48 hours)

## **Training Objective:**

This training program is designed to provide participants with a comprehensive understanding of advanced features and best practices in Microsoft SQL Server 2019. The course will cover high availability, disaster recovery, security, performance tuning, and monitoring strategies, equipping participants with the skills necessary to effectively manage and optimize SQL Server environments.

## **Target Audience:**

- Database Administrators (DBAs)
- SQL Server Developers
- IT Professionals involved in SQL Server management
- System Architects interested in high availability and disaster recovery

## **Prerequisites:**

Participants should have a basic understanding of SQL Server, including familiarity with SQL queries, database concepts, and fundamental administrative tasks.

## **Content Covered :**

### **Module 1: Selecting Authentication or Mixed-Mode Security**

- Overview of SQL Server Authentication Modes
- Configuring Windows and SQL Server Authentication
- Mixed-Mode Security Considerations
- Best Practices for Securing SQL Server
- Auditing and Monitoring Authentication Methods

## **Module 2: Managing SQL Server Roles via T-SQL**

- Introduction to SQL Server Roles and Permissions
- Creating and Assigning Roles Using T-SQL
- Managing Role Memberships via T-SQL
- Auditing and Reviewing Role Permissions
- Best Practices for Role Management in SQL Server

## **Module 3: Log Shipping Architecture**

- Introduction to Log Shipping
- Components of Log Shipping
- Configuring Log Shipping
- Log Shipping Operational Process
- Advantages and Limitations of Log Shipping
- Security Considerations in Log Shipping

## **Module 4: Monitoring Log Shipping**

- Log Shipping Monitoring Overview
- Configuring Alerts for Log Shipping Failures
- Viewing Log Shipping Reports
- Troubleshooting Common Log Shipping Issues

## **Module 5: Database Mirroring**

- Introduction to Database Mirroring
- Mirroring Modes: High Safety, High Performance
- Configuring Database Mirroring
- Monitoring Database Mirroring
- Automatic Failover in Database Mirroring
- Managing and Troubleshooting Mirroring Sessions

## **Module 6: Transactional Replication**

- Overview of Transactional Replication
- Configuring Publishers, Distributors, and Subscribers
- Managing Transactional Replication
- Monitoring and Tuning Replication Performance
- Conflict Resolution in Transactional Replication
- Troubleshooting Common Replication Issues

## **Module 7: Peer to Peer Replication**

- Introduction to Peer to Peer Replication
- Peer to Peer Topology and Architecture
- Setting Up Peer to Peer Replication
- Managing Data Consistency Across Peers
- Conflict Detection and Resolution
- Scaling Peer to Peer Replication
- Best Practices for Peer to Peer Replication

## **Module 8: Always On Availability Group Architecture Setups**

- Introduction to Always On Availability Groups
- Availability Group Architecture
- Prerequisites and Considerations
- Configuring Always On Availability Groups
- Monitoring Availability Groups
- Failover Strategies in Always On Availability Groups
- Handling Availability Group Failures and Errors

## **Module 9: Clustering Architecture**

- Introduction to SQL Server Clustering

- Types of Clustering in SQL Server
- Configuring Failover Clustering
- Managing Clustered SQL Server Instances
- Troubleshooting Cluster Failovers
- High Availability Solutions with Clustering

#### **Module 10: How to Failover**

- Introduction to SQL Server Failover
- Manual vs. Automatic Failover
- Failover Process in Log Shipping, Mirroring, and Always On
- Performing a Manual Failover
- Post-Failover Checklist and Validation
- Troubleshooting Failover Issues

#### **Module 11: Patching and Upgrading MS SQL Server**

- Understanding SQL Server Patch Types
- Pre-Patching Considerations and Best Practices
- Applying Patches and Cumulative Updates
- Upgrading SQL Server Versions
- Rolling Back Failed Patches and Upgrades
- Post-Upgrade Testing and Validation

#### **Module 12: Managing Blockings and Deadlocks**

- Understanding Blocking in SQL Server
- Identifying and Resolving Blocked Processes
- Deadlock Detection and Resolution
- Configuring Deadlock Priority and Handling
- Monitoring and Preventing Deadlocks
- Best Practices for Minimizing Blockings and Deadlocks

### **Module 13: Reorganize and Rebuild Indexes**

- Understanding Index Fragmentation
- Choosing Between Reorganize and Rebuild
- Automated Index Maintenance Strategies
- Monitoring and Analyzing Index Performance
- Best Practices for Index Maintenance

### **Module 14: Partitioning**

- Understanding Table Partitioning in SQL Server
- Benefits and Considerations of Partitioning
- Configuring Partition Schemes and Functions
- Managing and Maintaining Partitions
- Monitoring and Optimizing Partition Performance
- Handling Partition Switching and Merging

### **Module 15: SQL Profiler**

- Introduction to SQL Profiler
- Configuring and Running SQL Profiler Traces
- Analyzing SQL Profiler Results
- Capturing Long-Running Queries with SQL Profiler
- Storing and Replaying SQL Profiler Traces

### **Module 16: SQL Profiler: Longest Running Query**

- Identifying Long-Running Queries Using SQL Profiler
- Analyzing Query Performance
- Optimizing Long-Running Queries
- Best Practices for Monitoring Query Performance

### **Module 17: Audit Logins**

- Introduction to SQL Server Auditing
- Configuring Audit Specifications for Logins
- Monitoring and Reviewing Audit Logs
- Securing and Archiving Audit Data
- Compliance and Regulatory Considerations

### **Module 18: SQL Profiler with Index Tuning**

- Using SQL Profiler for Index Analysis
- Integrating SQL Profiler with Database Engine Tuning Advisor
- Analyzing and Applying Index Recommendations
- Continuous Index Tuning Strategies

### **Module 19: SQL Profiler Best Practices**

- Optimizing SQL Profiler for Performance
- Minimizing Profiler Impact on Production Systems
- Configuring Effective Trace Filters
- Storing and Managing Profiler Data
- Security Considerations When Using SQL Profiler

### **Module 20: SQL Server Side Trace**

- Introduction to Server Side Tracing
- Configuring Server Side Traces
- Storing and Analyzing Trace Data
- Comparing Server Side Trace with SQL Profiler
- Automating Server Side Trace Processes

### **Module 21: Database Engine Tuning Advisor**

- Introduction to Database Engine Tuning Advisor (DTA)

- Preparing Workloads for Analysis
- Running Tuning Sessions with DTA
- Interpreting Tuning Recommendations
- Applying and Validating Index and Partition Recommendations
- Best Practices for Using DTA

## **Module 22: Setting Up Alerts for Severity Errors**

- Introduction to SQL Server Alerts
- Configuring Alerts for Severity Levels
- Automating Responses to Alerts
- Monitoring Alert History and Performance