

SQL School TM

Quality Training Assured

Complete Practical; Real-time Job Oriented Training

SQL Server T-SQL Training Plans

	PLAN A	PLAN B	PLAN C
Applicable For	Data Analysts Data Engineers	SQL Developers App Programmers	Sr SQL Developers App Programmers
Completely Practical, Real-time	✓	✓	✓
Mock Interviews, Case Studies	✓	✓	✓
SQL Basics and Query Writing	✓	✓	✓
SQL DB Design, Table Design	✓	✓	✓
Normal Forms, Joins and Queries	✓	✓	✓
Indexes Basics and Stored Procedures	✓	✓	✓
Excel Integration and Pivot Charts	✓	✓	✓
Advanced Stored Procedures, TVP	X	✓	✓
Complex Functions & Triggers	X	✓	✓
CTE, PIVOT, XML and BLOB Data	X	✓	✓
Real-time Project [Banking]	X	✓	✓
In-depth Query Tuning, Exec” Plans	X	X	✓
Performance Tools, Locks, Isolations	X	X	✓
Tuning Tools: DTA, Perfmon	X	X	✓
XEL Graphs, Resource Governor, DOP	X	X	✓
Complex SProcs, MCSA - 70 761	X	X	✓
Azure SQL Database (Cloud)	X	X	✓
Azure SQL Database Migrations	X	X	✓
Elastic Query Processing, Shard Maps	X	X	✓
DB Deployments, MCSA 70-762	X	X	✓
Azure Tuning, Query Block, Az Search	X	X	✓
TOTAL DURATION	3 Weeks	4 + 1 Weeks	6 +1 Weeks

Trainer : Mr. Sai Phanindra T [13+ Yrs of Real-time Exp]. Profile @ [linkedin.com/in/saiphanindra](https://www.linkedin.com/in/saiphanindra)

SQL Server T-SQL Training

Course Plan

Training Module		Dur	Plan A	Plan B	Plan C
Module 1	SQL Basics, SQL Server Queries	3 W	✓	✓	✓
Module 2	T-SQL Queries, Programming Basics	2 W	✓	✓	✓
Module 3	Query Tuning & Azure SQL Development	2 W	X	X	X
Total Duration			3 W	5 W	7 W

Module 1: SQL Basics, SQL Server Concepts

Applicable for T-SQL Plans A, B, C

DAY 1: INTRODUCTION, INSTALLATION

Data, Databases and RDBMS Software; Database Types : OLTP,DWH, OLAP, HTAP; Microsoft SQL Server Advantages, DB Engine, BI, Data Science Components; SQL : Purpose, Real-time Usage Options; SQL Versus Microsoft T-SQL [MSSQL]; Microsoft SQL Server - Career Options; Real-time Projects & Job Responsibilities; Versions and Editions of SQL Server; SQL Server Pre-requisites : S/W, H/W; System Configuration Checker (SCC) Tool; SQL Server 2022 & 2019 : Installation; SSMS Tool Installation, Local Servers; Test Connection to Remote Servers

Day 2: DATABASE & SQL BASICS - Level 1

Server and Database Concepts; Database Objects and Basic Usage; SQL : Purpose and Real-time Usage; DDL, DML, SELECT, DCL and TCL; SQL Versus T-SQL : Basic Difference; Creating Databases & Tables. Int, Char Data Types; Single Row and Multi Row Inserts; INSERT Vs INSERT INTO; SELECT Statement for Table Retrieval; WHERE Conditions with =, OR, IN; AND, OR, NOT, IN, NOT IN Conditions; LIVE QUERY STATISTICS in SSMS; Table Scan Properties in SQL Server;

DAY 3: DATABASE & SQL BASICS - Level 2

Creating Databases: Files [MDF, LDF]; Single Row Inserts, Multi Row Inserts; SELECT. WHERE Conditions, Operators; AND, OR, NOT, Mathematical Operators; IN, NOT IN, BETWEEN, NOT BETWEEN; IS NULL, LIKE, NOT LIKE. % and _; CHAR Versus VARCHAR Data Types; GO Statement, SQL BATCH Concept; DISTINCT, TOP, FETCH, ORDER BY; Basic Sub Queries with SELECT; UPDATE and DELETE Statements; TRUNCATE, ALTER, ADD and DROP; Table Scans;

DAY 4: SQL BASICS 3, EXCEL IMPORTS

Schemas : Real-time Usage, Security; Schemas Creation, Usage with Tables; Schema - Table Transfer. 2P, 3P Naming; Temporary Tables : Real-time Use; Local and Global Temporary Tables; Temp Tables and Session Scope; Temp Tables and Connection Scope; Excel File Imports into SQL Database; Using Import / Export Wizard in SSMS; Import Data @ Multiple Excel Sheets; Working

with Microsoft JET Driver; SQL Native Client (SNAC) Connections; GUI for Database and Tables Creation; GUI Limitations for Big Data Inserts;

DAY 5: SQL SERVER ARCHITECTURE

TCP IP; Named Pipes; Shared Memory; Query Processing and Storage Engines; Parse; Compile; Optimize & Execute; Query Optimizer (QO) and SQL Manager; Database Manager; Memory Manager; Buffer Manager; Buffer Pool – Use; File Manager and Database Manager; Transaction Manager and Lock Manager; Buffer Manager, SQL OS and IO Buffer; Synchronization Services and Usage; Thread Scheduler in SQL OS Component; MDAC and CLR Components in SQL OS; Checkpoint, Lazy Writer, WAL Threads;

DAY 6: CONSTRAINTS, INDEXES Basics

Constraints and Keys - Data Integrity; NULL; NOT NULL Property on Tables; UNIQUE KEY Constraints: Importance; PRIMARY KEY Constraint: Importance; FOREIGN KEY Constraint: Importance; REFERENCES; CHECK and DEFAULT; Candidate Keys and Identity Property; Database Diagrams and ER Models; Indexes : Basic Types and Creation; Index Sort Options; Search Advantages; Automated Indexes; Manual Indexes; Clustered & NonClustered Indexes; Primary Key & Unique Key Indexes; Comparing Keys; Indexes @ Performance; Need for Indexes;

DAY 7: JOINS, T-SQL QUERIES - Level 1

JOINS - Table Comparisons Queries; INNER JOIN - Examples, WHERE, ON; OUTER JOIN - Examples, WHERE, ON; Left Outer Joins with Example Queries; Right Outer Joins with Example Queries; FULL Outer Joins - Real-time Scenarios; MERGE, LOOP, HASH Join Options; Big Table Versus Small Table Joins; Join Types Versus Join Options in T-SQL; CROSS JOIN Versus CROSS APPLY; Using Joins for DB Metadata Audits; Joining more than 2 Tables in T-SQL; Joining Tables with Query Conditions; Joining Unrelated Tables, Join Options;

DAY 8: JOINS, T-SQL QUERIES - Level 2

GROUP BY Queries and Aggregations; GROUP BY Queries with Having Clause; Group By Queries - Query Design Rules; ROLLUP() & CUBE() Summary Values; GROUPING() Function for Row Status; Replacing Nulls: ISNULL, COALESCE; Using Joins with Nested Sub Queries; Sub Queries with Joins and Group By; UNION and UNION ALL; Nested Sub Queries with Group By, Joins; WHERE, HAVING Conditions; Date & Time Functions; DATEADD, DATEDIFF, Year, Month, Day; CAST, CONVERT, STRING Functions; PIVOT Functions and Normalization; RANK, DENSE_RANK, ROW_NUMBER; PARTITION BY and MERGE Statement; MERGE with IIF and CASE Statement;

DAY 9: VIEWS, FUNCTIONS, PROCEDURE BASICS

Views : Types; Usage in Real-time; System Predefined Views; Audits; Listing Databases; Tables; Indexes; Functions : Types; Usage in Real-time; Scalar; Inline and Multi-Line Functions; System Predefined Functions; Audits; DBId; DBName; ObjectID; ObjectName; Variables & Parameters in SQL Server; Procedures : Types, Usage in Real-time; User & System Predefined Procedures; Parameters and Dynamic SQL Queries; Sp_help, Sp_helpdb and sp_helptext; Sp_recompile, sp_pkeys, sp_rename; Compare Views, SPs and Functions;

DAY 10: TRIGGERS, TRANSACTIONS, DTC

Triggers - Purpose; Real-world Usage; FOR/AFTER Triggers - Real time Use; INSTEAD OF Triggers - Real time Use; INSERTED; DELETED Memory Tables; Enable Triggers and Disable Triggers; Database Level; Server Level Triggers; Transactions : Types; ACID Properties; Transaction Types and Auto Commits; EXPLICIT & IMPLICIT Transactions; COMMIT and ROLLBACK Statements; Query Blocking Scenarios @ Real-time; NOLOCK and READPAST Lock Hints;

DAY 11: ER MODELS, NORMAL FORMS

Self Referencing Keys and Self Joins; Composite Keys and Composite Indexes; Adding Keys to Existing Tables; JOINS and GROUP BY in T-SQL; Joining 2, 3 & 4 Tables with Group By; Joins with Having, Sub Queries; Joining with Nested Sub Queries; ER Diagrams; Normal Forms; First, Second, Third Normal Forms; Boycee-Codd Normal Form; Functional Dependency; Multi-Valued & Transitive Dependencies; 4 NF, EKNF and ETNF Differences and Usage;

DAY 12 : Real-time Case Study (Sales & Retail)

Phase 1:

Objective : DB Design, Table Design, Relations; Involves Purchases, Products, Customers and Time Data with Various Data Types; Involves Schemas, Relations, Keys.

Phase 2:

Objective: Query Writing, Excel Integration. Writing Queries Generate Excel Pivot Tables. Excel Pivot Charts, Data Formatting, ODC Connections, Charts, Data Labeling.

Module 2: Complex SPs, Real-time Projects

Applicable for T-SQL Plans B, C

DAY 13: STORED PROCEDURES - Level 2

Table Valued Parameters (TVP) - Usage; SQL Injection Attacks - Type Precautions; READONLY Parameters - Stored Procedures; OUTPUT Parameters - Stored Procedures; User Defined Data Types, Real-time Use; Dynamic Data Insertions with Stored Procs; Table Cloning, Data Inserts @ Table Variables; CTE : Common Table Expressions; Real-time Scenarios with CTEs; ROW_NUMBER() with CTE Queries; CTEs for Avoiding Self Joins; Using CTEs for Avoiding Sub Queries; Recursive CTEs, ANCHOR Element; Termination Checks in Recursive CTEs;

DAY 14: STORED PROCEDURES - Level 3

Views on Tables - SCHEMABINDING; ENCRYPTION and CHECK OPTION; Cascaded Views, Encrypted Views; Updatable Views, Joins with Triggers; Error Handling in T-SQL: TRY & CATCH; Error Handling, THROW in Procedures; Stored Procedures - WITH RESULT SETS; Cursors - Benefits, Cursors in SProcs; ForwardOnly, Scroll & Local Cursors; Static, Dynamic & Global Cursors; Keyset Cursors and @@FetchStatus; Nesting of Stored Procedures - Dynamic; Data Formatting and WHILE Loops; Using Temporary Tables for Formatting;

DAY 15: FUNCTIONS - Level 2

Functions : Types, Real-world Usage; Inline Functions, Multi Line Functions; Looping Concepts in SQL Server; WHILE Loop Queries and UNPIVOT; GROUPING SETS and OUTPUT Function; EXISTS and RAISEERROR Functions; TRY_CONVERT, TRY_PARSE Functions; Using BULK INSERT & BULKCOLUMN; OPENROWSET For Data Import, CAST; OPENJSON For JSON Data Formats; JSON Files - Data Import into SQL DB; Json \$Tag Notations, SELECT .. INTO; XML Options in T-SQL Queries, Joins; XML AUTO, XML RAW and XML PATH;

Day 16: Database, Index Architecture

Database Architecture - Detailed; Primary File, Secondary Files [mdf, ndf]; Database Log Files (T-LOG) For Audits [ldf]; Data Files, Log Files, LSN & VLF; Transaction Log File [LDF] & LSN; Filegroups : ReadWrite & Read Only; Indexes: Architecture and Types; Clustered and Non Clustered Indexes; Included and ColumnStore Indexes; FILTERED and COVERING Indexes; UNIQUE Indexes, Online Indexes; B Tree Structure, IAM Page [Root]; Indexed Views / Materialized Views; Pages, Extents, and Checkpoints;

DAYS 17 - 20: REAL-TIME PROJECT (BANKING)

Includes 2500 Lines of Code (COMPLETELY SOLVED).

Phase 1: DATABASE DESIGN

Understanding Project Requirements; End to End Project Work Flow; Naming Conventions in Real-time; Table Schemas : Creation and Use; Implementing Normal Forms (OLTP); Computed Columns and Data Types; SQL_Variant, Bit, sysname Data Types; Email and Phone Number Validations; Data Types Conversions, Validations;

Phase 2: QUERY DESIGN

Joining Tables for Reports; Views with JOIN Options; Implementing Indexed Views; Using PIVOT Tables in Queries; Using Functions for Queries; Dynamic Conditions in Queries; Parameterized Queries in T-SQL;

Phase 3: PROGRAMMING

Event Handling , Error Handling; Stored Procedures with Transactions; Error Handling, Event Handling Options; Transaction Nesting, Save Points; Stored Procedures with Tables; Stored Procedures with Views; Stored Procedures with Functions; Automating DML with Triggers; Project Deployments, Project FAQ;

Module 3: Performance Tuning & Azure SQL Developer

Applicable for T-SQL Plan C

Day 21: Tuning 2 - AUDITS, PARTITIONS

Audit Long Running Queries : DMVs; DMFs; Activity Monitor Tool; Query Statistics; Logical & Physical I/O; DB IO; Waits; Recent and Active Expensive Queries; Server Dashboards and Built-In Reports; Memory Usage Reports; IO Statistics; DB Query Store : PAUSE; MAX_DURATION; Partition Mechanism : Database Filegroups; Partition Functions & Partition Schemes; Aligned / Indexed Partitions – Importance; Partition SPLIT and MERGE; NextUsed; Partition Compression : ROW; PAGE; Data Archival and Partition SWITCH;

Day 22: Tuning 3 - FTS, STATISTICS

Full Text Search (FTS) – Architecture; StopWords; Stemmer; Thesaurus For FTS; Indexer; Query Processor & Compilation; Full Text Catalogs and Filter Daemon; FDHost.Exe and Daemon Threads for FTI; Full Text Indexes (FTI); Crawler Threads; Change Tracking (CT) and Data Population; CONTAINS(); FREETEXT() with SELECT; In-Memory Tables : Creation; Tuning; Memory Snapshots at DB and Table Level; FileStream Files and MOT Filegroups; MEMORY_OPTIMIZED_ELEVATE Snapshot; Stats Updates : FullScan; NoRecompute; Temporal Tables Usage & History Tracking; Statistics : Index and Column Statistics;

Day 23: Tuning 4 - INDEX MANAGEMENT

Index Management : Performance Tuning; Internal and External Fragmentation; Fragmentation Audits : DMFs; Thresholds; Proactive; Reactive Approach For Indexes; Index Reorganization Process; Audits; Index Rebuilding Process and Audits; Resumable Indexes: ONLINE; RESUME; PAUSE & RESUME Options : Index Rebuilds; Database Maintenance Plans (DMP) Jobs; Proactive Index Reorganization Process; Index Page Count and Index Condition; Degree Of Parallelism [DOP] Settings; DOP Settings with Index Management; Recently Used Indexes and Statistics; Fast; Detailed Scans. Statistics Updates;

Day 24: Tuning 5 - TUNING TOOLS

Tuning Tools : Workload and Trace Files; SQL Profiler Tool - Tuning Template; Events; DTA Tool with Profiler : Recommendations; DTA with Procedure Cache & .SQL Files; Execution Plans - Internals. Spooling; Estimated; Actual; LIVE Execution Plan; Query Costs : IO Cost and CPU Cost; Query Costs : SubTree Cost; Operator Cost; Numa Nodes; Boost Priority; Tempdb Issues and Solutions; Log File Issues and Solutions; Memory Issues and Solutions; Important DMVs and DMFs For Query Audits;

Day 25: Tuning 6 - LOCKS, ISOLATIONS

LOCKS : Types; Concurrency Control; Lock Types and Lock Escalations; X; S; IS; IX;U; MD; Sch-M; Sch-S; Lock Audits : SP_WHO2; SP_LOCK; sysprocesses and Lock Waits; Auditing and Avoiding Blocking; Deadlock Simulation and Prevention; Deadlock Audits & Events in Profiler; Deadlock Graphs and XDL Files; Isolation Levels and Query Blocking; Row Versions and Page Versions; ReadComitted; UnComitted; Snapshot; Repeatable Reads and Phantom Reads; Read Committed Snapshot Isolation Level; Performance Tuning Checklist Activities;

Day 26: AZURE CLOUD & AZURE SQL DATABASE

Introduction to Cloud. Need for Cloud, Advantages; Cloud Architecture Basics - Iaas, PasS and SaaS; Advantages of Microsoft Cloud - Azure Platform; Azure Products and Azure Services - Marketplace; Comparing Azure with Google Cloud for SQL Server; Comparing Azure with AWS Cloud for SQL Server; Azure Sources - Types, Microsoft Market Place; SQL Database Implementations in Azure Platform; Logical Servers, Virtual Machines, Managed Instances; Lab Plan; Install Azure Data Studio

(ADS) Tool; Creating Azure Account, Adding Subscription; Azure SQL Database Architecture Components; Creating Azure SQL Server (Logical Server); Azure Regions Selection, Pricing Calculator; Firewall Settings for Azure SQL Server (Logical Server); Adding Firewall Rules - IP for Remote Access; Password Resets, Azure SQL Server Formats, Status; Azure Server Access from SSMS, ADS and Portal;

Day 27: AZURE SQL DATABASES & ON-PREMISE

Creating Azure SQL Databases and Pricing Tiers; Creating Azure SQL Databases using Portal; Creating Azure SQL Databases using SSMS Tool; Free, Basic, Standard, Premium Plans; Service Level Objective (SLO) in SSMS; Editions and Versions. Compatibility Settings; Virtual Core (vCore) Purchasing Options; General Purpose, Hyperscale, Business Critical; Gen 4 and Gen 5. Provisioned and Serverless; Collation Settings and DB Creation Scripts; Azure SQL Server Architecture Differences; Network Protocols and DB Engine Differences; File Structure and Filegroup Allocations; Secondary Files and FileStream Differences; Table Architecture for Partitions, Full Text Queries; Query Processing Differences with TDS Packets; Query Monitoring and Resources - Dashboards; Unsupported Commands with T-SQL Queries;

Day 28 : AZURE DATABASE MIGRATIONS

Data Migration Assistant (DMA) Tool; DMA Tool : Installation and Real-time Usage; DMA Assessment Projects & Migration Projects; On-premise to Azure SQL Database Migration; Schema Generation and Compatibility For Migration; Generating Data Scripts & Assessment Reports; Generate and Validate Schemas. Migrations; Migration Scopes : Schema, Data, Schema & Data; Compatibility Checks and Assessment Checks; Resolving Database Migration Compatibility Issues; Stretch Databases in Azure SQL Databases; Stretch Databases - Tuning Benefits, Cautions; Table Level Migrations with Azure SQL Databases; Compute Performance Levels and DSU Pricing; Data Storage and Azure Database Snapshots; Remote Data Archive Configuration in Azure; Database Master Key [DMK] and Cold Data Migration;

Day 29: AZURE SQL DATABASE ARCHIECTURE

DTU : Data Transaction Units : Architecture, Pools; DTU - Memory and IO Resources for Reads & Writes; Bounding Box Model for Optimal Performance; Static Pools (DTU) and Elastic Pools (eDTU); eDTUs and Elastic Pool, per Database Settings; EDTU Cost, eDTU max/min Limits and Performance; Configuring Elastic Pools for Azure SQL Databases; Elastic Pools & Tier Selection - Recommendations; Elastic Scale for Azure SQL Database - Strategies; Vertical Partitioning and Horizontal Partitioning;

Day 30: Azure SQL DATABASE TUNING - 1

Azure SQL Server Level Tuning Options; Azure SQL Database Level Tuning Options; Automated Tuning Options and Peak-Loads; Force Plan, Create Index and Drop Index; Query Performance Insight, Intelligence; Index Recommendations with CPU and IO; IO Metrics, CPU Metrics & Query Statistics; Data File IO, Log File IO, Custom Reports; Identify Long Running Queries, Intensive Queries; Query Level Recommendations and Query Costs; Azure Search Service - Configuration, Pricing Tiers; Azure Search for Data Import and Indexer Options; Suggester and Analyzer Index Modes for Tuning; Retrievable, Facetable, Filterable Indexes; Facetable and Searchable Indexes for Tuning; Change Tracking Options, Watermark Columns;

Day 31: Azure SQL DATABASE TUNING - 2

SQL Traces : Creation and Audits. Limitations; Extended Events and Traces for T-SQL Query Analysis; Extended Events Packages, Targets, Actions, Sessions; TSQL and SP Debug Events with XEL Files for EventInfo; Global Fields and Event Filters with XEL Files @ Traces; XE Profiler - Default Templates for Event Profiling; Important System Views For Azure SQL Queries; Important System Functions for Azure SQL Queries; Selection of Correct Service Tier (SLO); CPU, IO and Query Analysis in Azure SQL Databases; Notifications Center, Activity Logs and Dashboards; Custom Logs (Audits) and Query Performance Impact; Transparent Data Encryption (TDE) and Performance; TDE Settings and Server Level and Database Level;

Resume Preparation & Project Interview FAQs

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