



VINAY TECH HOUSE

## SQL Server Training

 **Trainer:** Mr. Sreedhar [7+ years of IT Exp, +5 in SQL]

 **Duration:** 30-35 hours, Daily 1 hour

 **Modes:** Normal / Fast Track / One on One

 **Fee:** (Normal track) 4000/-

### Institute Provides

- In-Depth **Theory & practical** Material
- Complete **Practical Oriented** Training
- **Mock Interviews**
- Daily **Live Class Videos** Shared
- Good Interaction with the Trainers
- **Resume Preparation** Sessions

#### Component

#### Duration

SQL Databases [Cloud & On-premises]	1 Hr
SQL Server Introduction	2 Hrs
SQL & T-SQL elements	2 Hrs
DDL, DML, DCL, TCL, DRL	8 Hrs
Joins, Sub Queries & Set	5 Hrs
Views, Procedures, & Fun	4 Hrs
Cursors & Triggers	3 Hrs
Temporary Tables	2 Hrs
Temporary Variables	2 Hrs
Dynamic SQL & Exceptions	2 Hrs
Miscellaneous	2 Hrs
RESUME PREP & FAQs	2 Hrs

#### SQL SERVER SCENARIOS

##### Case Study 1:

Sub Queries, Set Theory, & Joins based

##### Case Study 2:

Views, Procedures, & Functions based

##### Case Study 3:

CTE, Temporary Tables, & Variables based

#### SQL SERVER PROJECTS

##### A) BANKING PROJECT

with different tables, views, procedure, functions, and queries

**Real-time and Real-world examples tailored for better learning**

## MANDATORY Topic 1: DATA, DATABASE AND DATAWAREHOUSE FUNDAMENTALS

### Data and Database Fundamentals

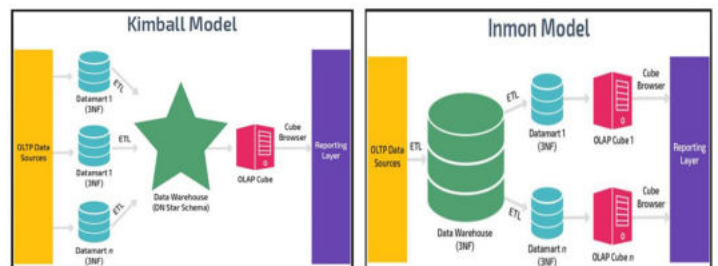
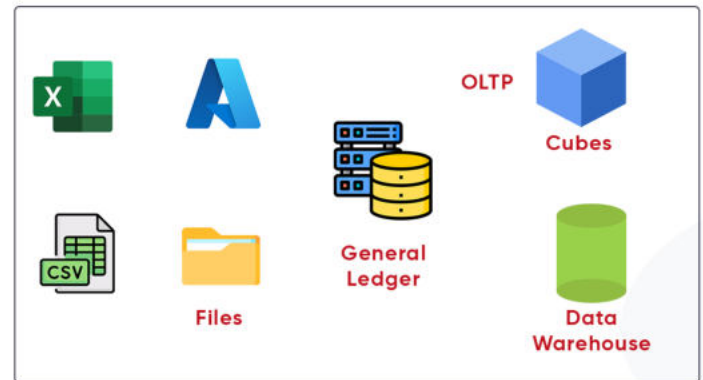
- > Data and Data Availability in IT
- > Database, Data Warehouse, and RDBMS
- > Data storage areas [structured, semi and unstructured]
- > RDBMS real-time projects and areas
- > Components of RDBMS
- > Normalized and de-normalized databases

[BI and non-BI]

- > SQL Versus T-SQL [MS SQL]
- > Other popular database in IT [ORACLE and TERADATA] and differences
- > SQL Server Job Market and Opportunities

### Data warehouse Fundamentals

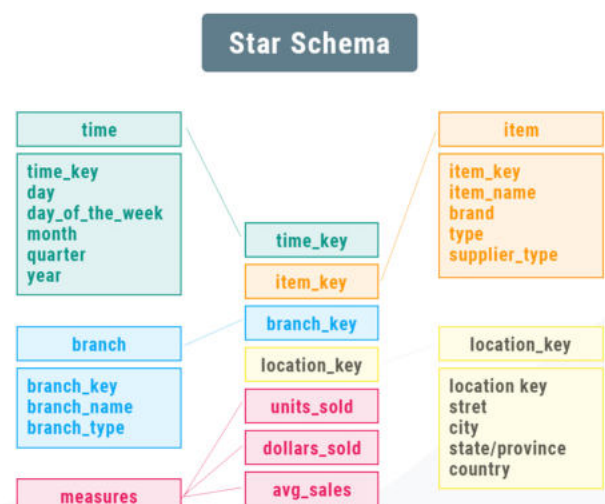
- > Data warehouse, Data Mart & differences
- > Types of data marts & real-time usage
- > ODS, Stage, EDW, and DW definitions
- > Data Lake and Blob Storages
- > DWH Life Cycles
- > DWH Approaches (INMON and KIMBALL)
- > Data Granularity, Data movement stages



## MANDATORY Topic 2: DATA MODEL FUNDAMENTALS [E-R MODEL AND DIMENSIONAL MODEL]

### [Theory and Complete Practical]

- > Dimension, Dimension Table & types
- > Fact, Fact Table & measures types
- > Fact less fact table
- > Schemas (Star, Snow Flake, Galaxy & Hybrid)
- > Surrogate key and usages in real time
- > Business, Conceptual, Logical, Physical Data Models
- > 1:1, 1: Many, Many: Many relationships
- > Active, Inactive relationships
- > Single and Bidirectional relationships
- > Cross filtering relationship
- > Role Playing real-time usage
- > Surrogate key live usages with practical



## TOPIC 1: INSTALLATION [SQL Server Instance]

- > Installing SQL Server Instance and multiple Instances
- > Installing SQL Server usage client components
- > SSMS Installation
- > Azure Data Studio understanding
- > SQL Developer and Operations Studio
- > SQL Server Service Starting

## TOPIC 2: SQL Language understanding

- > What is SQL?
- > How many areas we can use SQL to communicate with Databases?
- > SQL usage in OLTP, ETL, Reporting & Analysis Process
- > Azure Data Studio understanding
- > SQL Versus T-SQL
- > Various Tools and Utilities to write SQL

## TOPIC 3: SQL Server Editions, Databases, and Tables

- > Server name or Instance name & authentication
- > Versions and Editions in SQL Server
- > Connections [Local and Remote]
- > Editions of SQL Server
  - Enterprise Edition
  - Standard Edition
  - Developer Edition
  - Work Group Edition
  - Express Edition
- > SQL Server and SSMS Installation
- > SQL Server Management Studio
  - Object Explorer
  - Query Editor
- > System Databases and User Databases
- > System tables and User tables

## TOPIC 4: DATABASES AND TABLES

- > System Defined Databases and usages
- > User defined databases and usages
- > Master, MSDB, TEMPDB and others real-time usage
- > Database creation GUI and Code [MDF & LDF files]
- > SQL Server Agent usage
- > Windows Vs. SQL Server Authentication
- > System tables and User tables

## TOPIC 5: COMMAND, QUERY, AND SQL SERVER ARCHITECTURE

- > Differences between command and query
- > Query and command execution in SQL Server
- > Parser, Compiler, Syntaxer, Optimizer, and CLR
- > Storage Engine [SQL Engine]
- > Lock, File, Transaction Manager, and Buffer Manager
- > Buffers and Threads
- > Buffers and Threads

## TOPIC 6: SQL SUB LANGUAGES

- > SQL Server Data Definition Language [DDL]
- > SQL Server Data Manipulation Language [DML]
- > SQL Server Data Control Language [DCL]
- > SQL Server Transaction Dictionary Language [TCL]
- > SQL Server Data Retrieval Language [DRL]

## TOPIC 7: DDL [DATA DEFINITION LANGUAGE]

- > Creating Table Definitions [CREATE]
- > Modifying Table Definitions [ALTER]
- > Removing Table Definitions [DROP AND TRUNCATE]
- > TRUNACTE and DROP performance differences
- > SQL Server Data Types
- > Create table from another table

## TOPIC 8: DML [DATA MANIPULATION LANGUAGE]

- > Inserting data into table [SELECT, INSERT and SELECT]
- > Single Insert and Multiple Inserts
- > Modifying table data [UPDATE]
- > Removing table data [DELETE]
- > BULK INSERT and BCP [Bulk Copy Program]
- > MERGE command operation and Incremental Load [SCD and CDC]
- > SQL Server Data Types
- > Insert table from another table

## TOPIC 9: DCL [DATA CONTROL LANGUAGE]

- > Providing privileges [GRANT]
- > Removing privileges [REVOKE AND DENY]

## TOPIC 10: TCL [TRANSACTION CONTROL LANGUAGE]

- > Saving work [COMMIT]
- > Restore work [ROLLBACK]
- > Saving period of work [SAVEPOINT]

## TOPIC 11: DRL [DATA RETRIEVAL LANGUAGE]

- > Working on SELECT statement
- > Working on WHERE, GROUP BY, HAVING, and ORDER BY
- > Column and Table Aliases usage

## TOPIC 12: DATA FILTERING CLAUSES

- > =, !=, <>, >, <, <=, =< etc... comparison Operators
- > AND, OR, NOT Logical operators
- > +, -, \*, /, Mod, Exp etc...Mathematical Operators
- > Order By, Top, Where, From and Like
- > Group by and Having
- > IN, NOT IN, BETWEEN and NOT BETWEEN
- > ISNULL and NOT ISNULL

## TOPIC 13: MULTI TABLE OPERATIONS [COLUMN-WISE]

- > Simple Sub Query
- > Correlated Sub Query
- > Differences between simple and correlated
- > Nested Sub Query
- > Working on TOP, MAX, and MIN real time queries

## TOPIC 14: MULTI TABLE OPERATIONS [ROW-WISE SET THEORY]

- > Set theory generic protocols
- > INTERSECT
- > UNION
- > UNION ALL
- > EXCEPT
- > Working on incremental loading

## TOPIC 15: MULTI TABLE OPERATIONS [COLUMN WISE-JOINS]

- > JOINS real time usage
- > CROSS JOIN and CROSS APPLY
- > INNER JOIN [EQUI, NON EQUI]
- > NATURAL JOIN
- > SELF JOIN
- > INNER Vs. OUTER JOIN
- > LEFT OUTER JOIN
- > RIGHT OUTER JOIN
- > FULL OUTER JOIN
- > Working on ON and WHERE clauses
- > MERGE JOIN
- > LOOP JOIN
- > HASH JOIN
- > Unmatched data retrieval
- > Incremental load in real time using Joins

## TOPIC 16: BUSINESS DATA CONSTRAINTS AND DATA RULES

- > CHECK, NOT NULL, AND DEFAULT – Domain Integrity
- > Primary Key usage and limitations
- > Unique Key usage and limitations
- > Referential Integrity and FOREIGN KEY
- > Candidate key and Alternate key
- > Normal column and Identity column
- > Surrogate key and Identity column usage
- > CASCADING OPTIONS
  - ON DELETE CASCADE, ON UPDATE CASCADE, ON DELETE SET NULL,
  - ON UPDATE SET NULL, ON UPDATE SET NO ACTION(Default)

## TOPIC 17: INDEXES [BASICS-ADVANCED]

- > Clustered Index Design and Structures
- > Nonclustered Index Design and Structures
- > Unique Index Design
- > Index with Included Columns
- > Column storage index
- > Full-Text Index population
- > Filtered Index Design
- > Covering Index Design
- > B-Tree and Online Indexes
- > Indexed views Vs. Materialized views
- > Fill Factor, TEMPDB, Pat\_Index

## TOPIC 18: SCHEMAS, SYNONYMS, SYSTEM DEFINED VIEWS AND PROCEDURES

- > What is Schema? and real time advantages with practical.
- > What is Synonym? and real time advantages with practical.
- > System Defined Procedures usage with examples  
sp\_help, sp\_helpdb, sp\_helptext, sp\_rename, sp\_recompile, sp\_tables
- > System Defined Views usage with examples  
sys.tables sysjobactivity, sysssislog

## TOPIC 19: DISTINCT, GROUP BY, ROLLUP, AND CUBE

- > Differences between GROUP BY and DISTINCT and performance impact
- > GROUP BY and HAVING usages to identify and eliminate duplicates
- > ROLLUP and CUBE usages
- > Generating FULL TOTALS and SUB TOTALS
- > Comparing ROLLUP, CUBE and GROUP functions

## TOPIC 20: VIEWS [USER DEFINED]

- > Advantages of Views in SQL
- > Tables Vs. Views
- > Simple View (Updatable View)
- > Complex View (Non-Updatable View)
- > Materialized View and real time usage
- > Encrypted views Vs. Cascading views
- > Limitations of Views

## TOPIC 21: FUNCTIONS [ SYSTEM, USER DEFINED, AND ANALYTICAL]

- > Date and Time Formats and Functions
- > Scalar - Valued Functions
- > Table - Valued Functions
- > String Functions  
SUBSTRING, REPLICATE, REPLACE  
REVERSE, CHARINDEX  
LEFT, RIGHT, LEN  
DIFFERENCE, SOUNDEX  
STRING\_SPLIT
- > Mathematical Functions  
ABS, ROUND, LOG  
FLOOR, CEILING  
SUM, AVG, MAX, MIN, COUNT  
SQUARE ROOT, SQUARE  
SIN, TAN, COS

- > Date Functions
  - DATEADD, DATE DIFF, DATE PART
  - FLOOR, CEILING
  - GETUTCDATE, GETDATE, CURRENT\_TIMESTAMP, SYSDATETIME
  - DATE NAME, ISDATE
  - WEEKDAY, MONTHNAME, WEEKDAYNAME
  - SECOND, MINUTE, HOUR, ISDATE
- > Other Generic Functions
  - COALESCE, NULL IF, CURRENT USER, IIF
  - ISNULL, NULLIF, SESSION\_USER
  - SESSIONPROPERTY, SYSTEM\_USER, USER\_NAME
  - FORMAT, INSTR, CONCAT
- > Cast and Convert Functions
- > IF, ELSE, CASE, WHEN & END
- > PIVOT & UNPIVOT
- > ANALYTICAL FUNCTIONS
  - ROW\_NUMBER () and real time examples
  - RANK () and real time examples
  - DENSE RANK () and OVER () usages
  - NTILE advantage
  - PARTITION BY advantage
  - Using Group BY along with Analytical Partition
- > User Defined Functions Create
- > User Defined Functions Calling
- > Differences between Function & Procedure

## TOPIC 22: STORED PROCEDURES [USER DEFINED]

- > Use in Real Time and Types
- > System Defined and User Defined Procedures
- > Dynamic SQL Queries in Procedures
- > IN, OUT, INOUT Parameters
- > Compare Procedures and Functions
- > READONLY Parameters
- > Dynamic Data Insertions with Procedures
- > Table Variables, Cloning & Data Inserts
- > Using TEMP tables in procedures
- > Stored Procedure inside Stored Procedure
- > Optimizing tips for procedure



### TOPIC 23: DIFFERENT TYPES OF TABLES, VARIABLES, AND CTE

- > Local variables vs Global variables with examples
- > Local variables Vs. Temp variables and real time usage
- > TEMPORARY table usages in real time
- > Inline View Vs. Normal View
- > CTE: Common Table Expressions
- > CTE usage in real time
- > Multiple examples using CTE
- > ROW\_NUMBER () with CTE Queries
- > Recursive CTE

### TOPIC 24: TRIGGERS

- > Use in Real Time and Types
- > SCHEMA BINDING
- > Triggers Vs. Procedures
- > Types of triggers
  - DML TRIGGERS, DDL TRIGGERS, FOR TRIGGERS, INSTEAD OF TRIGGERS
- Rel-time usage of triggers at events

### TOPIC 25: CURSORS [USER DEFINED]

- > What is cursor and advantages of it.
- > Cursor Vs. Stored Procedure
- > Working on different types of cursors
- > Types of triggers
  - Static Cursors, Dynamic Cursors, Global Cursors, Local Cursors,
  - Forward only Cursors, Scroll Cursors, Keyset Cursors

### TOPIC 26: TRANSACTIONS, CHECKPOINT, AND DTC

- > What is Transaction? usage of it?
- > What is DTC [Distributed Transaction Coordinator]
- > What is Checkpoint? usage of it?
- > Transactions Vs. Checkpoint

### TOPIC 27: PROGRAMMING AND ERROR HANDLING INSTRUCTIONS

- > IF, IIF, CASE
- > Error Handling in T-SQL
- > WHILE, WHEN
- > Try, Catch, Throw

## TOPIC 28: DYNAMIC SQL IMPLEMENTATION

- > Creating Dynamic SELECT statement
- > Passing dynamic table names
- > Create a procedure with dynamic table names and variables
- > Normal SQL Vs. Dynamic SQL

## TOPIC 29: FUNCTIONS [ User Defined]

- > Functions Vs. Procedures
- > Functions returning tables
- > Functions returning normal variables
- > Calling inline functions

## TOPIC 30: PERFORMANCE TUNING AND OPTIMIZATION PROCESS

- > Examples of performance issues in real time
- > DTA (DB Engine Tuning Advisor)
- > Audit Long Running Queries using DMVs and DMFs
- > Activity Monitor Tool and Query Statistics Reports
- > Logical I/O, Physical I/O and Database I/O, Wait Time
- > Partition Functions and Partition Schemes - Usage
- > Index Management : Internal, External Fragmentation
- > Index Page Count and Index Condition Checks
- > ONLINE and RESUME Options
- > Fast, Detailed Scans and Stats NoRecompute usages
- > Creating Workload Files and Trace Files
- > DTA with Query Cache (Procedure Cache) & .SQL File Inputs advantage
- > Full Text Search (FTS) Mechanism advantage
- > Processor, Disk, Memory, Transactions, Database Counters
- > Query Costs : IO, CPU Cost, SubTree Cost, Operator Cost
- > Parameter Sniffing and OPTIMIZE Options
- > Spooling Mechanism and Spool Types for Query LoadS
- > Execution Plan Issues with Parameter Sniffing
- > Query Blocking Scenarios and Lock Monitors
- > Serializable, Snapshot, Repeatable Read Isolation /li>
- > Deadlock Simulation and Deadlock Prevention usage
- > Full Text (FT) Indexes: Query Tuning. Filter Daemon Host
- > Histograms and Event Handling Options
- > Working with SQL SERVER Profiler
- > Using Perfmon Tool and AM Tool
- > Implementing Compressions for Read Only Data
- > Parameter Sniffing and OPTIMIZE Options
- > Implementing environment areas in the real time [DEV, TEST, UAT, and PROD]
- > Real time scenarios and many important tips



**A BIG**  
*Thank you!*

check out our demos on **Youtube**

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<https://www.youtube.com/@vinaytechhouse4466/videos>

Our Institute provides **Top Tier Training** in the below  
**Career-Making Courses**

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