

# SQL SERVER 2019 Database

*Start learning how to work with SQL Server 2019*

## About the Course & Importance of SQL SERVER 2019

This SQL Server training teaches developers all the Transact-SQL skills they need to create database objects like Tables, Views, Stored procedures & Functions and triggers in SQL Server. Gives idea about writing Queries & Sub-queries, working with Joins, etc. As well as database management skills like backup, restore, etc.

There are 4 phases to learn SQL SERVER 2019.

1. Introduction to Databases
2. Querying Data with Transact-SQL
3. Developing SQL Databases
4. Updating Your Skills to SQL Server 2019

*Computer programming is really fun in general.*

Pre-Requisites : No Prior Experience is Presumed.	Duration : 45 days
Course Materials & Textbooks : 1. Running Notes in class, 2. Pdfs, 3. HandOuts, 4. Certification Material in Pdfs will be provided for this course.	
Reference Websites: <a href="http://www.dotnetgurukul.com">www.dotnetgurukul.com</a>	
Instructor: <b>Praveen Kumar M</b> Learning from Praveen Sir, is always different and you will experience it within few sessions – you attend and work regularly as per given guidance then you will be best in any team that you work in any company – assured.	

# SQL SERVER Course Syllabus by Praveen Kumar M

## Phase I - Introduction to Databases



### **Introduction to Databases**

- ▮ Introduction to Relational Databases
- ▮ Other Types of Databases and Storage
- ▮ Data Analysis
- ▮ Database Languages in SQL Server
- ▮ Lab: Exploring and Querying SQL Server Databases using T-SQL



### **Introduction to Microsoft SQL Server 2019 Tools**

- ▮ The Basic Architecture of SQL Server 2019
- ▮ SQL Server Editions and Versions
- ▮ Getting Started with SQL Server Management Studio
- ▮ Lab: Working with SQL Server 2019 Tools



### **Introduction to SQL Server 2019 Installation**

- ▮ SQL Server 2019 Editions and Components
- ▮ Installing SQL Server 2019
- ▮ SQL Server Management Studio Enhancements
- ▮ Lab: Exploring SQL Server 2019



### **Data Modeling**

- ▮ Data Modeling
- ▮ ANSI-SPARC Database Model
- ▮ Entity Relationship Modeling
- ▮ Lab: Identify Components in Entity Relationship Modeling



### **Normalization**

- ▮ Fundamentals of Normalization
- ▮ Normal Form
- ▮ Denormalization
- ▮ Lab: Normalizing Data



### **Relationships and Types**

- ▮ Introduction to Relationships
- ▮ Planning Referential Integrity
- ▮ Lab: Planning and Implementing Referential Integrity



### **Performance**

- ▮ Indexing
- ▮ Query Performance
- ▮ Concurrency
- 🔒 Lab: Performance Issues








### **Introduction to Database Objects**






- 🔒 Tables
- 🔒 Views
- 🔒 Stored Procedures, Triggers, and Functions
- 🔒 Lab: Using SQL Server

## Phase II – Querying Data with Transact-SQL






## Introduction to T-SQL Querying

-  Introducing T-SQL
-  Understanding Sets
-  Understanding Predicate Logic
-  Understanding the Logical Order of Operations in SELECT Statements
-  Lab: Introduction to T-SQL Querying






## Writing SELECT Queries

-  Writing Simple SELECT Statements
-  Eliminating Duplicates with DISTINCT
-  Using Column and Table Aliases
-  Writing Simple CASE Expressions
-  Lab: Writing Basic SELECT Statements





## Querying Multiple Tables

-  Understanding Joins
-  Querying with Inner Joins
-  Querying with Outer Joins
-  Querying with Cross Joins and Self Joins
-  Lab: Querying Multiple Tables





## Sorting and Filtering Data

-  Sorting Data
-  Filtering Data with Predicates
-  Filtering Data with TOP and OFFSET-FETCH
-  Working with Unknown Values
-  Lab: Sorting and Filtering Data






## Working with SQL Server Data Types

-  Introducing SQL Server Data Types
-  Working with Character Data
-  Working with Date and Time Data
-  Lab: Working with SQL Server 2016 Data Types


## Using DML to Modify Data

-  Adding Data to Tables
-  Modifying and Removing Data
-  Generating Automatic Column Values
-  Lab: Using DML to Modify Data

## Using Built-In Functions

-  Writing Queries with Built-In Functions
-  Using Conversion Functions
-  Using Logical Functions
-  Using Functions to Work with NULL
-  Lab: Using Built-in Functions

## Grouping and Aggregating Data

-  Using Aggregate Functions

- 🔒 Using the GROUP BY Clause
- 🔒 Filtering Groups with HAVING
- 🔒 Lab: Grouping and Aggregating Data



### Using Subqueries

- 🔒 Writing Self-Contained Subqueries
- 🔒 Writing Correlated Subqueries
- 🔒 Using the EXISTS Predicate with Subqueries
- 🔒 Lab: Using Subqueries



### Using Table Expressions

- 🔒 Using Views
- 🔒 Using Inline TVFs
- 🔒 Using Derived Tables
- 🔒 Using CTEs
- 🔒 Lab: Using Table Expressions



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### Using Set Operators

- 🔒 Writing Queries with the UNION Operator
- 🔒 Using EXCEPT and INTERSECT
- 🔒 Using APPLY
- 🔒 Lab: Using Set Operators



### Using Window Ranking, Offset, and Aggregate Functions

- 🔒 Creating Windows with OVER
- 🔒 Exploring Window Functions
- 🔒 Lab: Using Window Ranking, Offset, and Aggregate Functions



### Pivoting and Grouping Sets

- 🔒 Writing Queries with PIVOT and UNPIVOT
- 🔒 Working with Grouping Sets
- 🔒 Lab: Pivoting and Grouping Sets



### Executing Stored Procedures

- 🔒 Querying Data with Stored Procedures
- 🔒 Passing Parameters to Stored Procedures
- 🔒 Creating Simple Stored Procedures
- 🔒 Working with Dynamic SQL
- 🔒 Lab: Executing Stored Procedures



### Implementing Error Handling

- 🔒 Implementing T-SQL Error Handling
- 🔒 Implementing Structured Exception Handling
- 🔒 Lab: Implementing Error Handling



## Implementing Transactions

- 📁 Transactions and the Database Engine
- 📁 Controlling Transactions
- 📁 Lab: Implementing Transactions

# Phase III (Developing SQL Databases)



## Designing and Implementing Tables

- 📁 Designing Tables
- 📁 Data Types
- 📁 Working with Schemas
- 📁 Creating and Altering Tables
- 📁 Lab: Designing and Implementing Tables



## Advanced Table Designs

- 📁 Partitioning Data
- 📁 Compressing Data
- 📁 Temporal Tables
- 📁 Lab: Using Advanced Table Designs



## Introduction to Indexes

- 📁 Core Indexing Concepts
- 📁 Data Types and Indexes
- 📁 Heaps, Clustered, and Non-clustered Indexes
- 📁 Single Column and Composite Indexes
- 📁 Lab: Implementing Indexes



## Designing Optimized Index Strategies

- 📁 Index Strategies
- 📁 Managing Indexes
- 📁 Execution Plans.
- 📁 The Database Engine Tuning Advisor
- 📁 Query Store
- 📁 Lab: Optimizing Indexes



## Columnstore Indexes

- 📁 Introduction to Columnstore Indexes
- 📁 Creating Columnstore Indexes
- 📁 Working with Columnstore Indexes
- 📁 Lab: Using Columnstore Indexes



## Designing and Implementing Views

- 📁 Introduction to Views
- 📁 Creating and Managing Views
- 📁 Performance Considerations for Views
- 📁 Lab: Designing and Implementing Views



## Designing and Implementing Stored Procedures

- 📁 Introduction to Stored Procedures
- 📁 Working with Stored Procedures

- 📄 Implementing Parameterized Stored Procedures
- 📄 Controlling Execution Context
- 📄 Lab: Designing and Implementing Stored Procedures



### **Designing and Implementing User-Defined Functions**

- 📄 Overview of Functions
- 📄 Designing and Implementing Scalar Functions
- 📄 Designing and Implementing Table-Valued Functions
- 📄 Considerations for Implementing Functions
- 📄 Alternatives to Functions
- 📄 Lab: Designing and Implementing User-Defined Functions



### **Responding to Data Manipulation Via Triggers**

- 📄 Designing DML Triggers
- 📄 Implementing DML Triggers
- 📄 Advanced Trigger Concepts
- 📄 Lab: Responding to Data Manipulation by Using Triggers



### **Using In-Memory Tables**

- 📄 Memory-Optimized Tables
- 📄 Natively Compiled Stored Procedures
- 📄 Lab: Using In-Memory Database Capabilities



### **Implementing Managed Code in SQL Server**

- 📄 Introduction to CLR Integration in SQL Server
- 📄 Implementing and Publishing CLR Assemblies
- 📄 Lab: Implementing Managed Code in SQL Server



### **Storing and Querying XML Data in SQL Server**

- 📄 Introduction to XML and XML Schemas
- 📄 Storing XML Data and Schemas in SQL Server
- 📄 Implementing the XML Data Type
- 📄 Using the Transact-SQL FOR XML Statement
- 📄 Getting Started with XQuery
- 📄 Shredding XML
- 📄 Lab: Storing and Querying XML Data in SQL Server



### **Storing and Querying Spatial Data in SQL Server**

- 📄 Introduction to Spatial Data
- 📄 Working with SQL Server Spatial Data Types
- 📄 Using Spatial Data in Applications
- 📄 Lab: Working with SQL Server Spatial Data



### **Storing and Querying BLOBs and Text Documents in SQL Server**

- 📄 Considerations for BLOB Data
- 📄 Working with FILESTREAM
- 📄 Using Full-Text Search
- 📄 Lab: Storing and Querying BLOBs and Text Documents in SQL Server



### **Storing and Querying BLOBs and Text Documents in SQL Server**

- 📄 Considerations for BLOB Data

- 📁 Working with FILESTREAM
- 📁 Using Full-Text Search
- 📁 Lab: Storing and Querying BLOBs and Text Documents in SQL Server

### **SQL Server Concurrency**

- 📁 Concurrency and Transactions
- 📁 Locking Internals
- 📁 Lab: Concurrency and Transactions

### **Performance and Monitoring**

- 📁 Extended Events
- 📁 Working with Extended Events
- 📁 Live Query Statistics
- 📁 Optimize Database File Configuration
- 📁 Metrics
- 📁 Lab: Monitoring, Tracing, and Baselineing

## Phase IV (Updating Your Skills to SQL Server 2019)

### **What's New in SQL Server Performance?**

- 📁 Operational Analytics
- 📁 In-Memory OLTP Enhancements
- 📁 Query Store
- 📁 Live Query Statistics
- 📁 Native JSON
- 📁 Temporal Tables
- 📁 Lab: Implementing SQL Server 2016 Performance Improvements

### **What's New in SQL Server Security**

- 📁 Using Always Encrypted
- 📁 Row-Level Security
- 📁 Dynamic Data Masking
- 📁 Lab: SQL Server 2016 Security Improvements

### **What's New in SQL Server Availability and Scalability?**

- 📁 Enhanced Always On Availability Groups
- 📁 What's New with tempdb?
- 📁 Use Windows Server 2019 with SQL Server 2019
- 📁 Lab: Monitoring tempdb

### **What's New in SQL Server Reporting and BI**

- 📁 Reporting Services Enhancements
- 📁 Power BI Enhancements
- 📁 Mobile Report Publisher
- 📁 Lab: Implementing Power BI

### **What's New in SQL Server Data Access?**

- 📁 PolyBase
- 📁 What's New in Integration Services?
- 📁 Working with SSIS and Azure
- 📁 Lab: Exploring the New Features of SQL Server Integrated Services (SSIS)

### **New and Enhanced Features in SQL Server OLAP**

- 📁 New and Enhanced Features in SQL Server OLAP
- 📁 What's New in SQL Server Analysis Services?
- 📁 Lab: OLAP with SQL Server

## **What's New for SQL Server in the Cloud?**

- 📄 Stretch Database
- 📄 Enhanced Backup to Azure
- 📄 What's New in Azure SQL Database?
- 📄 Lab : Using Stretch Database