SQL SERVER 2022 Database

Start learning how to work with SQL Server 2022

About the Course & Importance of SQL SERVER 2022

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 2022.

1. Introduction to Databases
2. Querying Data with Transact-SQL
3. Developing SQL Databases
4. Updating Your Skills to SQL Server 2022

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:www.dotnetgurukul.com
Instructor: **Praveen Kumar M** 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 2012 Tools**
  - The Basic Architecture of SQL Server 2022
  - SQL Server Editions and Versions
  - Getting Started with SQL Server Management Studio
  - Lab: Working with SQL Server 2022Tools

- **Introduction to SQL Server 2012 Installation**
  - SQL Server 2022 Editions and Components
  - Installing SQL Server 2022
  - SQL Server Management Studio Enhancements
  - Lab: Exploring SQL Server 2022

- **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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- Lab: Using Table Expressions

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

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- Considerations for BLOB Data

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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 Baselining

Phase IV (Updating Your Skills to SQL Server 2022)

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 2022 with SQL Server 2022
- 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