Microsoft SQL Server For Everyone

HELLO!

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Software Engineer | Lecturer

Course Objectives

Learn Microsoft SQL Server Development

- Install SQL Server and SQL Server Management Studio
- Connect to a Database Instance
- Create a Database
- Create Tables
- Run Queries against Tables
- General use of the Management Studio
- Create Relationships (Normalization)
- Practical use of SQL

- Normalization
- Primary and Foreign Keys
- Advanced SQL Concepts
  - Functions
  - Stored Procedures
  - Triggers
  - Security

This course is for you if...

- You are a beginner with little to no experience.

- You are seeking to refresh your knowledge

- You are seeking to understand design principles in database development.

- You are seeking to learn Microsoft SQL Server technology

This Course Is For EVERYONE!

Benefits

▶ Database development will become second nature to you.

  ▷ We explore the tooling extensively

  ▷ We learn to troubleshoot errors

  ▷ We learn best practices and design principles

  ▷ We learn Structured Query Language (SQL)

  ▷ We learn keyboard shortcuts

▶ Increase your income and marketability!

▶ Learn a new skill

Welcome!

Let's get Started

Types of Data and Storage

Unstructured Data

- Documents, Files, Videos, Images, etc.
  - File Storage
    - Filing Cabinets – Hard Copies
    - Hard Drives – Digital Copies

Semi-Structured Data

- – File based storage (JSON, XML, etc.)
  - NoSQL Database
    - MongoDB
    - Azure CosmosDB
  - Digital Documents

JSON FILE EXAMPLE

```json
{
    "emp_details": [
        {
            "emp_name": "Shubham",
            "email": "ksingh.shubh@gmail.com",
            "job_profile": "intern"
        },
        {
            "emp_name": "Gaurav",
            "email": "gaurav.singh@gmail.com",
            "job_profile": "developer"
        },
        {
            "emp_name": "Nikhil",
            "email": "nikhil@geeksforgeeks.org'
            "job_profile": "Full Time"
        }
    ]
}
```

XML FILE EXAMPLE

```xml
<?xml version="1.0"?>
- <job>
    - <production>
        <ApprovalType>WebCenter</ApprovalType>
        <Substrate>carton 150 gr</Substrate>
        <SheetSize>220-140</SheetSize>
        <press>SuperFlat2</press>
        <finishing>standard</finishing>
        <urgency>normal</urgency>
    </production>
    - <customer>
        <name>FruitCo</name>
        <number>2712</number>
        <currency>USD</currency>
    </customer>
</job>
```

Structured Relational Data

- Tables, Rows and Columns
  - Microsoft SQL Server
  - Azure SQL
  - MySQL
  - PostgreSQL
  - OracleDB

Microsoft SQL Server

What

- A powerful relational database management system provided by Microsoft

- Used in many companies for simple and complex database operations

Why

- Perfect for beginners

- Employable skills

- Learn Best Practices

- Industry Standard Database Development and Management Software

What is SQL?

▸ SQL is a standard language for storing, manipulating, and retrieving data in databases.

▸ Short for Structured Query Language

  ▷ DDL – Data Definition Language

    ▷ Manipulates the database structures

    ▷ E.g. CREATE TABLE Lecturers (Id int Primary Key Identity);

  ▷ DML – Data Manipulation Language

    ▷ Manipulates the data in the database.

    ▷ E.g. DELETE FROM Students WHERE Id = 1

Azure DevOps

- Azure DevOps provides developer services for allowing teams to plan work, collaborate on code development, and build and deploy applications.

- Azure DevOps supports a collaborative culture and set of processes that bring together developers, project managers, and contributors to develop software.

Other Techhnologies

GitHub

▶ Source or Version Control is a system that records changes to files over time so that you can recall specific versions later

Microsoft Azure

Allow you to host .NET Web Applications.

Key Features

Use all the DevOps services or choose just what you need to complement your existing workflows

Azure Boards

Azure Pipelines

Azure Repos

Azure Test Plans

Azure Artifacts

Other Techhnologies

Blazor WebAssembly

- ▶ Used to create a simple client app to interface with our Function App

Microsoft Azure

Allow you to host .NET Web Applications.

Visual Studio 2022 and .NET 6

What

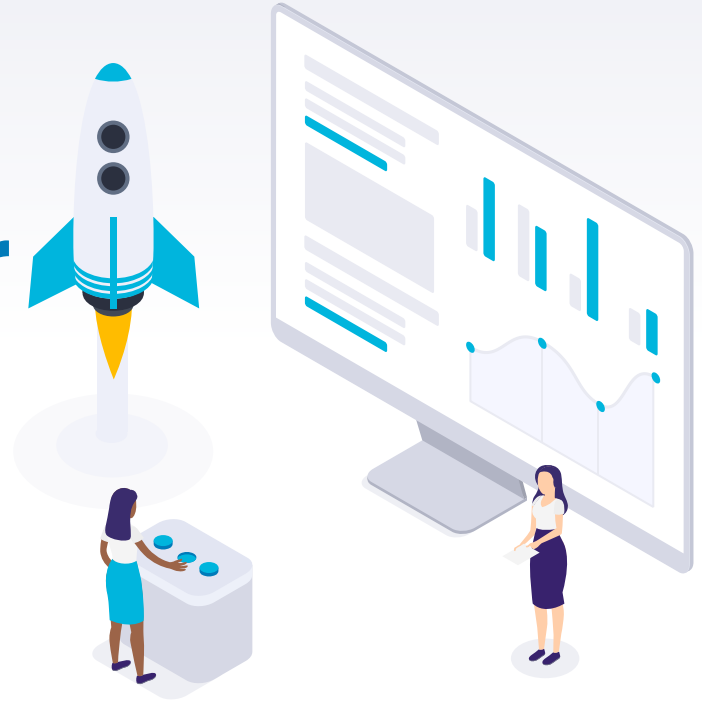A fully-featured, extensible, free IDE for creating modern applications for most devices and platforms.

Why

▶ Powerful Web Tools to allow development with ASP.NET, jQuery, Bootstrap, among other popular frameworks.

▶ Git Integration – Manage your source code in Git repos hosted by any provider, including GitHub.
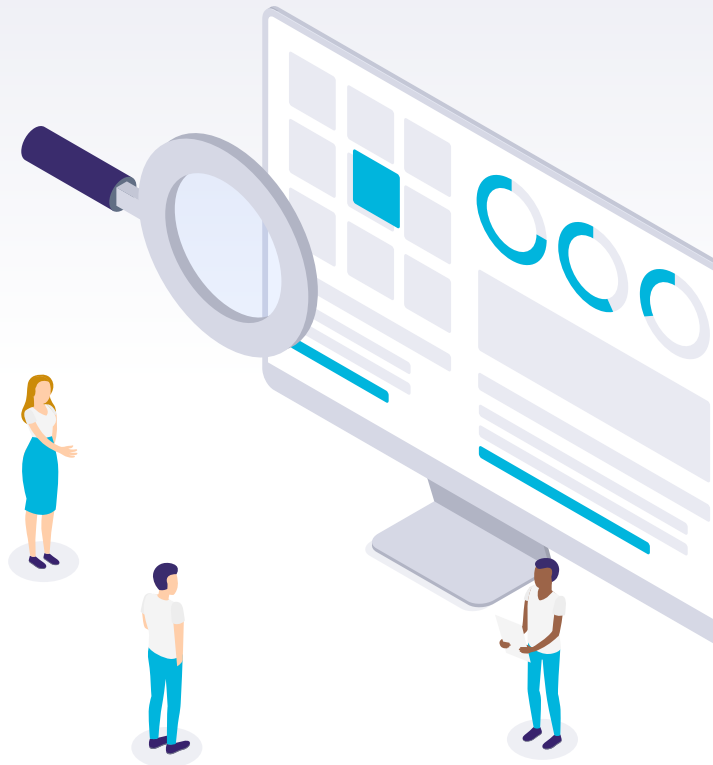
Why Learn .NET Core

Why Learn .NET Development

- The .NET language of choice to learn is C#, the most widely used language today.

- It is a general purpose programming language that can handle almost any problem, from desktop to mobile to dynamic web applications.

- There is a high demand across the world for .NET developers in a variety of industries.

Publish Your App

- Users need access
- Internal or External
- Options
  - Domain Hosting
  - Internal Server
  - Cloud Hosting (Azure, etc.)
- Continuous Integration and Deployment
  - GitHub Actions
  - Azure DevOps

Get Ready To Rumble!

And tables to compare data

	A	B	C
Yellow	10	20	7
Blue	30	15	10
Orange	5	24	16

89,526,124

Whoa! That's a big number, aren't you proud?

89,526,124$

That's a lot of money

185,244 users

And a lot of users

100%

Total success!

- ▸ **REST** is an acronym for **RE**presentational **S**tate **T**ransfer

- ▸ Architectural style for distributed hypermedia systems

- ▸ A Web API (or Web Service) conforming to the REST architectural style is a REST API.

Let's review some concepts

Uniform

By applying the principle of generality to the components interface, we can simplify the overall system architecture and improve the visibility of interactions.

Stateless

The server cannot take advantage of any previously stored context information on the server.

Cacheable

If the response is cacheable, the client application gets the right to reuse the response data later for equivalent requests and a specified period.

Layered

The layered system style allows an architecture to be composed of hierarchical layers by constraining component behavior.

Resources

For example, a REST resource can be a document or image, a temporal service, a collection of other resources, or a non-virtual object (e.g., a person).

Self-Descriptive

The client does not need to know if a resource is an employee or a device. It should act based on the media type associated with the resource.

HTTP Methods

GET

- Use GET requests to retrieve resource representation/information only – and not modify it in any way.

PUT

Use PUT APIs primarily to update an existing resource (if the resource does not exist, then API may decide to create a new resource or not).

- Use POST APIs to create new subordinate resources

POST

As the name applies, DELETE APIs delete the resources (identified by the Request-URI).

DELETE

HTTP Responses

1xx Status Codes

Communicates transfer protocol-level information.

+

2xx: Success

Indicates that the client's request was accepted successfully.

→

3xx: Redirection

Indicates that the client must take some additional action in order to complete their request.

4xx: Client Error

This category of error status codes points the finger at clients.

+

5xx: Server Error

The server takes responsibility for these error status codes.

Types of API Security

Network Level

- IP Whitelisting

- IP Blacklisting

Basic Authentication

Authenticate with each call to the API

- Issue an access key to client app.

Api Key Access

Issue an encoded token with a limited lifetime and reissue a new one when needed.

JSON Web Tokens (JWT)

Extra resources

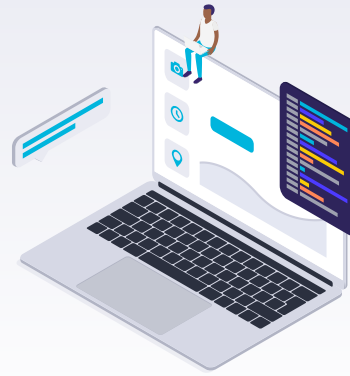Illustrations created by [Sergei Tikhonov](#).

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Other
Technologies

We will interact with quite
a few Azure Services along
the journey.

Section Overview

- Discuss Agile vs Waterfall

- Setup Azure DevOps Account

- Discuss Azure Devops main fetures

Microsoft SQL Server Development Bootcamp

Waterfall Methodology