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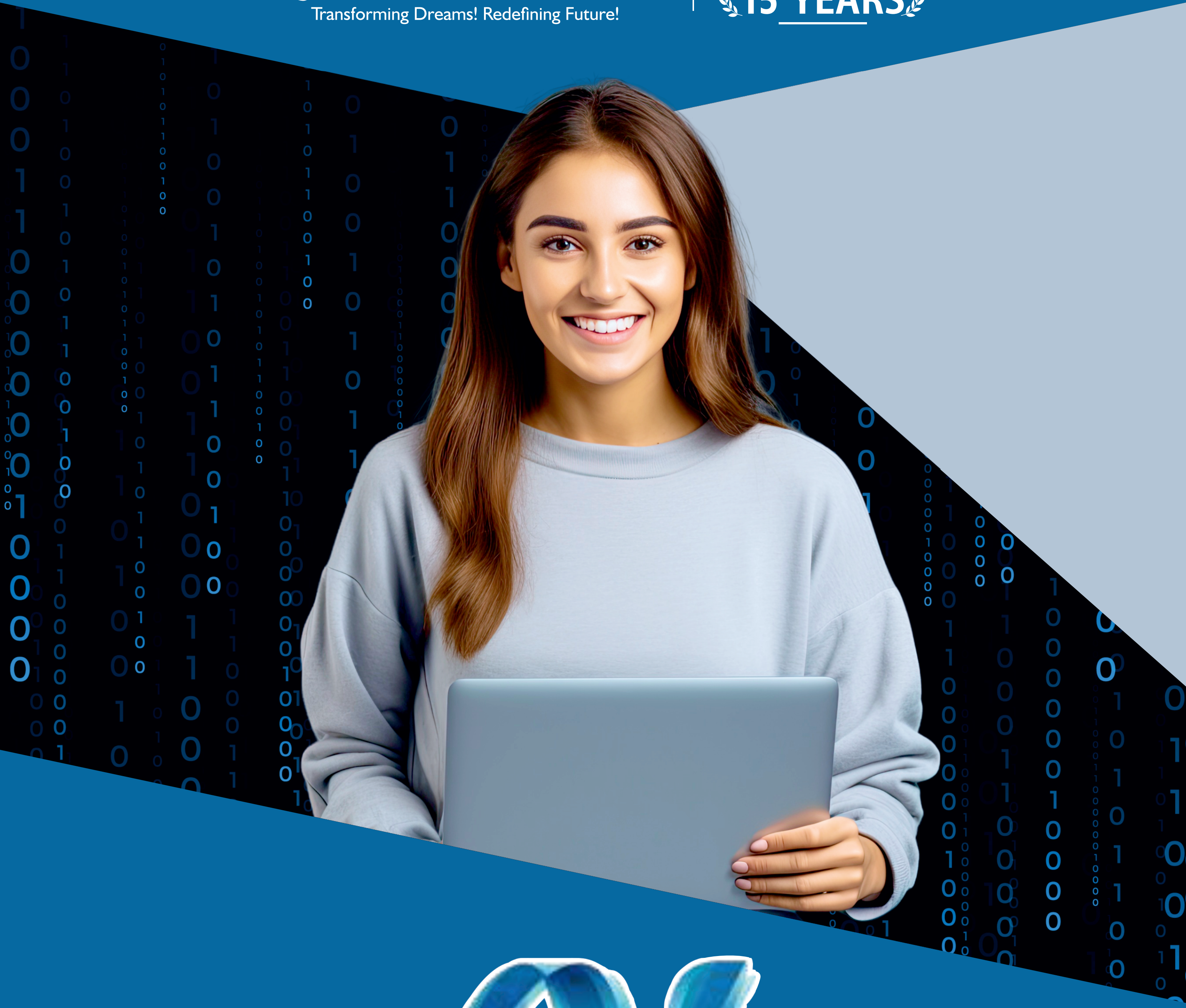

.NET Core Full Stack

with Angular & Azure DevOps

Introduction to .NET Framework 4.8

- What is .NET Platform?
- What is .NET Framework
- .NET Framework, Languages, and Tools
- .NET Framework Major Components
- Common Language Runtime (CLR)
- The CLS (Common Language Specification)
- The CTS (Common Type System)
- Value Types and Reference Types
- Compilation and Execution in .NET
- Understand the .NET Framework 4.8 stack

Introduction to .NET Core – Net8

- .NET Core – Overview
- Characteristics of .NET Core
- The .NET Core Platform
- .NET CORE architecture and Advantages
- Build and run Cross platform apps
- .NET Core – Environment Setup
- .NET Core – Code Execution
- IoC Container & Middleware
- .NET Core – Modularity
- .NET Core – Project Files
- IIS Self Hosting & different cross platform deployments
- Microservices using .NET Core
- .NET Core – Windows Runtime and Extension SDKs.
- .NET Core – Create .NET Standard Library.
- Comparison between .NET Framework & .NET Core
- Introduction to Dependency Injection

Introduction to C#

- Features of C#
- C# Compilation and Execution
- General Structure of a C# Program

Data Types and Arrays in C#

- Data Types in C#
- Value Types and Reference Types
- Boxing and UnBoxing
- Single Dimensional, Multi-Dimensional & Jagged arrays
- Nullable Types
- Implicitly Typed Local variables
- Var vs dynamic
- Is and as operator
- Ref vs out keywords
- The 'object' base class in .net
- Equals() vs ==
- String vs StringBuilder
- Various String class methods
- Default parameters, named parameters
- Parse() vs TryParse() vs Convert Class methods

Debugging in C#

- Various Types of .NET Projects
- Tracing, Debugging, Build
- Compile Options
- Using break points
- Using break conditions
- Debugging Exception
- Using watch and output window
- What are Diagnostics?
- Debug and Trace Classes
- Creating multiple projects within one solution
- Customizing Visual Studio Settings – Extensions, NUGet Package, Environmental Settings
- Using watch and output window
- Creating multiple projects within one solution
- Customizing Visual Studio Settings – Extensions, NUGet Package, Environmental Settings

OOP with C#

- Structures and enums
- The architecture of a class in C#
- Instance, Class & Reference variables
- Access Modifier
- Abstract Classes
- Constructors, Destructors, The GC
- .NET Base class library
- Inheritance in C#
- Method Overloading
- Method Overriding
- Operator Overloading
- Method Hiding

- Access modifiers : private, pubic, protected, internal, protected internal, new
- Anonymous types
- Abstract classes
- Sealed classes
- Creating Interfaces
- Implementing Interface inheritance
- Declaring properties within Interfaces
- Namespaces
- Creating and using Generic classes
- Indexers & Properties
- Auto Implemented properties
- Static Classes
- Property Accessors
- Partial types
- Extension methods
- Object Initializer

Evaluating Regular Expressions in C#

- RegEx Class
- Forming Regular Expression
- Methods for Regular Expression
- Exception Handling
- Exceptions in C#
- Exception class hierarchy
- Try block
- Multiple catch blocks
- Finally block
- Purpose of throw keyword
- Purpose of inner exception
- Creating Custom Exception

Garbage Collection in C#

- Role of a Garbage Collector
- Garbage Collection Algorithm
- Finalize vs Dispose
- Collections & Generics
- System.Collections Namespace
- Collection Interfaces
- Collection Classes
- The collection API
- Working with Generics
- Creating Generic class, Generic Methods, Interfaces, Delegates
- Collection Initializers
- Iterators
- IEnumerable, IEnumerator, Icomparor interfaces
- Constraints

Anonymous Types, Delegates, Events & Lambda

- Extension Methods
- Anonymous Type
- Var and Dynamic
- Introduction to Delegates
- Events in C#
- Anonymous Methods
- Lambda Expression
- Expression Tree

File I/O and Serialization

- Using StreamReader, StreamWritter
- Using BinaryReader, BinaryWriter
- Using File, FileInfo, Directory, DirectoryInfo
- Serialization modes: SOAP, XML
- JSON serialization

Introduction To Reflection and Attributes

- What is Reflection?
- Attributes.
- Pre-defined Attributes
- Custom Attributes.

Threading, Parallel and Async programming with C#

- Task Parallel Library
- Threads Vs. Tasks
- Thread state
- Task Based Asynchronous Model
- Async and Await
- Using Locks

Packaging and Deployment

- File System Editor
- Registry Editor
- File Types Editor
- User Interface Editor
- Custom Actions
- Launch Condition Editor
- Creating Uninstall Shortcut

New Features in C# 10.0

- ➪ Record structs
- ➪ Improvements of structure types
- ➪ Interpolated string handlers
- ➪ global using directives
- ➪ File-scoped namespace declaration
- ➪ Extended property patterns
- ➪ Improvements on lambda expressions
- ➪ Allow const interpolated strings
- ➪ Record types can seal ToString()
- ➪ Improved definite assignment
- ➪ Allow both assignment and declaration in the same deconstruction
- ➪ Allow AsyncMethodBuilder attribute on methods
- ➪ CallerArgumentExpression attribute
- ➪ Enhanced #line pragma
- ➪ Warning wave 6

C# 11 Features

- ➪ Generic attributes
- ➪ UTF-8 string literals
- ➪ Newlines in string interpolation expressions
- ➪ List patterns
- ➪ File-local types
- ➪ Required members
- ➪ Auto-default structs
- ➪ Pattern match Span<char> on a constant string
- ➪ Extended nameof scope
- ➪ ref fields and scoped ref
- ➪ Warning wave 7

C# 12 Features

- ➪ Primary constructors
- ➪ Collection expressions
- ➪ Inline arrays
- ➪ Optional parameters in lambda expressions
- ➪ ref read only parameters
- ➪ Alias any type
- ➪ Experimental attribute
- ➪ Interceptors

Automated Testing with MSTest and Nunit

- ➪ Using Asserts to Pass or Fail Tests
- ➪ Controlling and Customizing Test Execution
- ➪ Creating Data Driven Tests
- ➪ Reducing Code Duplication and Increasing Test Readability
- ➪ Writing Your First NUnit Test
- ➪ Understanding NUnit Tests
- ➪ Asserting on Different Types of Results
- ➪ Controlling Test Execution
- ➪ Creating Data Driven Tests and Reducing Test Code Duplication

DevOps Concepts

- ➪ Introduction to DevOps :
- ➪ What is DevOps
- ➪ Evolution of DevOps
- ➪ Agile Methodology
- ➪ Why DevOps
- ➪ Agile vs DevOps
- ➪ DevOps Principles
- ➪ DevOps Lifecycle
- ➪ DevOps Tools
- ➪ Benefits of DevOps
- ➪ Continuous Integration and Delivery pipeline

Cloud Azure

1. Azure
   - ➪ Agile and Scrum
   - ➪ Cloud Computing

2. Version Control & Code Management:
   - ➪ Git
   - ➪ Azure Repos

3. Continuous Integration and Continuous Delivery (CI/CD):
   - ➪ Azure Pipelines: Designing & implementing CI/CD pipelines for automated builds, testing, and deployment.
   - ➪ Build Automation
   - ➪ Release Management: Managing deployments, releases, and environments.

4. Azure DevOps Tools:
   - ➪ Azure Boards
   - ➪ Azure Test Plans
   - ➪ Azure Artifacts

5. Infrastructure as Code & Automation
   - ➪ Infrastructure as Code (IaC)
   - ➪ Configuration Management

   - ➪ Automation Tools: Using tools like Terraform to manage infrastructure.
6. Testing & Quality:
   - ➪ Unit Testing
   - ➪ Code Coverage
   - ➪ Testing Strategies

7. Security & Compliance:
   - ➪ Security Practices: Implementing security measures within Azure DevOps.

8. Collaboration & Communication:
   - ➪ Communication: Using various communication channels within Azure DevOps.
   - ➪ Collaboration: Facilitating teamwork & knowledge sharing.

9. Advanced Topics:
   - ➪ Containerization (Docker): Understanding & using Docker for containerized applications.
   - ➪ Orchestration (Kubernetes):

Git

- ➪ Getting Started with Git
- ➪ Install the Git Tools
- ➪ Clone an Existing Repository
- ➪ Add Files to a Repository
- ➪ Edit Files in a Git Repository
- ➪ Create and Merge Branches
- ➪ Rewrite History in a Git Repository
- ➪ Resolve Merge Conflicts

RDBMS & SQL Server

- ➪ Introduction to RDBMS
- ➪ Introduction to databases
- ➪ Data Models in Database
- ➪ Properties of RDBMS
- ➪ Normalization
- ➪ CODD's Relational Database Rules
- ➪ Data Integrity
- ➪ T-SQL Language

Working with Data Types, Tables & Data Integrity covering DDL, DML, DCL statements

- Working with Data Types (Only Basics of Data Types)
- Working with Schema
- Working with Tables
- Implementing Data Integrity

Beginning with Transact-SQL

- Transact-SQL
- System Functions
- Advanced T-SQL Queries`
- Advanced T-SQL Statements
- Other T-SQL Statements
- Set Operators
- Transact-SQL
- System Functions
- Advanced T-SQL Queries
- Advanced T-SQL Statements
- Other T-SQL Statements

Working with Joins & Subqueries

- What are Joins?
- Types of joins
- Subqueries

Database Objects: Indexes & Views

- Introduction to Index in SQL Server
- Introduction to Views in SQL Server

Stored Procedures

- Stored Procedure
- Implementing Stored Procedure
- Exception handling using TRY-CATCH

ADO.NET + LINQ + EF Core

- ADO.NET Architecture
- .NET Data Providers
- DB Connectivity Architectures in .NET
- Elements of .NET Data Providers
- Introduction to SQL Server
- Namespaces in ADO.NET
- Using server explorer window
- Connection class
- Command class
- Direct Command execution against database
- Using Parameters in command
- Performing CRUD operations

LINQ

- Language Integrated Query
- Introduction , LINQ Syntax
- Introduction to System.LINQ.Queryable
- Query Operators
- Select, from, Where
- ofType
- OrderBy
- ThenBy
- GroupBy, into
- Select
- SelectMany
- Take, TakeWhile
- First
- FirstOrDefault
- Single
- SingleOrDefault
- Aggregate functions Sum, Min, Max, Average, Count
- Distinct
- Intersect
- Except
- Join
- LINQ projection
- Deferred execution vs immediate execution
- Let keyword
- LINQ to Object
- LINQ to DataTable

Entity Framework Core

- Overview of ORM Products
- Entity Framework introduction
- Using Database first Approach
- Using Code First approach
- Implementing Repository Pattern
- Introduction & Benefits
- Repository Pattern implementation

- Setting up Entities in EFCore
- Using LINQ to Entities to perform CRUD operations
- SQL Query Logging
- Migration & Database Update
- Eager Loading Vs Explicit Loading Vs Lazy Loading
- Raw SQL And Stored Procedures

ASP.NET Core Web API

- ASP .Net Core Fundamentals
- ASP.NET Core - Project.Json
- ASP.NET Core – Configuration
- Middleware Pipeline

Introduction to .Net Core WebAPI

- Introduction to Web Service
- Introduction to REST API
- Introduction to Web API
- Difference between Web Service, WCF Service and Web API
- HTTPS Verbs
- Web API Routing
- Configuring WebApi
- Testing the Web API Project with Postman and Swagger
- Building first ASP.NET Core Web API
- Fluent Validation

Working with Relational Data using Entity Framework Core

- Relationships in EF Core
- HTTP Response Status Codes
- Try-Catch-Finally block
- Throwing custom exceptions
- Global error handling
- Custom global error handling
- DML Manipulation using Repository Pattern

Controller Action Return Types

- Introduction to Controller Action Return Types
- Specific Type
- IActionResult
- ActionResult<Type>
- Custom Return Type

- Web API Versioning
- Web API Logging
- Unit Testing in Web API

Security on Web API

- Configuring Identity services
- Configuring authentication
- Preventing Cross Site Scripting
- Enabling Cross-Origin Requests (CORS)
- JWT Token Authentication

Microservices Fundamentals

- Microservices Fundamentals
- Basic
- ASP.NET Core Microservices
- Advance
- Introduction to Docker
- Choosing Between .NET 6 and .NET Framework for Docker Containers
- Architecting container and microservice-based applications
- Development environment for Docker apps
- Designing and Developing Multi-Container and Microservice-Based .NET Applications
- Implement reads/queries in a CQRS microservice
- Implementing resilient applications in .net
- Implement authentication in .NET microservices and web applications

Web Basics – HTML, CSS, JavaScript, Es6 & TypeScript

JavaScript

- Introduction to JavaScript
- Data Types, Literals, Variables & Constants
- Control Flow, Expression & Operators
- Functions & Variable Scope
- JavaScript Object & Object-Oriented Programming
- Exceptions & Error Handling
- Iterators & Generators

HTML

- ➪ HTML-Introduction
- ➪ HTML-Basic Formatting Tags
- ➪ HTML-Grouping Using Div Span
- ➪ HTML-Lists
- ➪ HTML-Images
- ➪ HTML-Hyperlink
- ➪ HTML-Table
- ➪ HTML-Form
- ➪ HTML-Headers
- ➪ New Form Elements
- ➪ Understand the new HTML form elements such as date, number, range, email, search and datalist
- ➪ Understand audio, video, article tags

CSS 3

- ➪ CSS-Introduction
- ➪ Syntax
- ➪ Selectors
- ➪ Color Background Cursor
- ➪ Text Fonts
- ➪ Box Model
- ➪ Display Positioning
- ➪ CSS Floats
- ➪ CSS Floats

Introducing TypeScript

- ➪ TypeScript Syntax
- ➪ Programming Editors
- ➪ The Type System – Defining Variables
- ➪ The Type System – Defining Arrays
- ➪ Type in Functions
- ➪ Type Inference
- ➪ Defining Classes
- ➪ Class Methods
- ➪ Visibility Control
- ➪ Class Constructors
- ➪ Class Constructors – Alternate Form
- ➪ Interfaces

Working with ES6 Modules

- ➪ var vs let
- ➪ Arrow Functions
- ➪ Arrow Function Compact Syntax
- ➪ Template Strings
- ➪ Generics in Class ,
- ➪ Generics in Function

Angular 18

Introducing Angular

- ➪ What is Angular?
- ➪ Central Features of the Angular Framework
- ➪ Appropriate Use Cases
- ➪ Building Blocks of an Angular Application
- ➪ Basic Architecture of an Angular Application
- ➪ Installing and Using Angular
- ➪ Anatomy of an Angular Application
- ➪ Running the Application
- ➪ Building and Deploying the Application

Components & Templates

- ➪ Creating a Component Using Angular CLI
- ➪ The Component Class
- ➪ The @Component Decorator
- ➪ Registering a Component to Its Module
- ➪ Component Template
- ➪ Using a Component
- ➪ Component Hierarchy
- ➪ Component Lifecycle Hooks
- ➪ Template Location
- ➪ The Mustache {{ }} Syntax
- ➪ Setting DOM Element Properties
- ➪ Setting Element Body Text
- ➪ Event Binding
- ➪ Expression Event Handler
- ➪ Attribute Directives
- ➪ Structural Directives
- ➪ Looping Using ngFor
- ➪ Grouping Elements
- ➪ Template Reference Variable
- ➪ @Output() - Child Component
- ➪ @Output() - Parent Component
- ➪ Full Two Way Binding
- ➪ Setting up Two Way Data Binding in Parent

Template Driven & Reactive Forms

- Template Driven Forms
- Importing Forms Module
- Two Way Data Binding
- Form Validation
- Angular Validators
- Displaying Validation State Using Classes
- Additional Input Types
- Reactive Forms Overview
- Import ReactiveFormsModule
- Getting Input Values
- Setting Form Values
- Validation
- Using a Custom Validator
- Sub FormGroups - Component Class
- Sub FormGroups - HTML Template

Services & Dependency Injection

- The Service Class
- What is Dependency Injection?
- Injecting a Service Instance
- Injectors
- Dependency Injection in Other Artifacts
- Providing an Alternate Implementation

Pipes & Data Formatting

- Built-In Pipes
- Using Pipes in HTML Template
- Chaining Pipes
- Using a Pipe with ngFor
- A Filter Pipe

Angular Routing & Angular Modules

- The Router Component
- The Angular Router API
- Creating a Router Enabled Application
- Passing Route Parameters
- Anatomy of a Module Class
- @NgModule Properties
- Using One Module from Another

HTTP Client

- The Angular HTTP Client
- Importing HttpClientModule
- Service Using HttpClient
- Making a GET Request
- Observable Object
- Error Handling & Customizing the Error Object
- Returning an HttpResponse Object
- Creating New Observables
- Observable Operators
- The map and filter Operators

Observables & RxJS Library

- Observables Overview
- Observables in Angular
- Introduction to RxJS library
- Angular Authentication
  with JSON Web Tokens (JWT

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