



# ABHISHYANDH GLOBAL SOLUTIONS



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## .NET DEVELOPMENT

### Net Development Course Content

Topics	Subtopics
Overview of .NET Framework	Evolution, .NET Core vs .NET Framework, .NET 5/6/7
Common Language Runtime (CLR)	CLR Architecture, Just-In-Time Compilation (JIT), Garbage Collection
.NET Assemblies and Memory Management	Assemblies, Global Assembly Cache (GAC), Memory Management
.NET Standard and .NET Core	.NET Standard Libraries, Cross-Platform Development
Development Environment Setup	Visual Studio Setup, Command Line Tools, .NET CLI
Introduction to C#	Syntax and Structure, Data Types, Variables, Operators
Control Structures	Conditional Statements, Loops (for, foreach, while, do-while)
Object-Oriented Programming in C#	Classes and Objects, Inheritance, Polymorphism, Abstraction, Encapsulation
Exception Handling	Try, Catch, Finally, Throw
Collections and Generics	Arrays, Lists, Dictionaries, Sets, Stacks, Queues, Generics

<b>Delegates and Events</b>	Delegates, Lambda Expressions, Anonymous Methods, Events and Event Handling
<b>LINQ (Language Integrated Query)</b>	LINQ Basics, LINQ to Objects, LINQ to XML, LINQ to SQL
<b>Introduction to .NET Core</b>	Overview, Features, Installation, CLI Commands
<b>Project Structure</b>	Solution and Project Files, Program.cs, Startup.cs
<b>Dependency Injection</b>	Introduction, DI in .NET Core, Service Lifetimes
<b>Configuration Management</b>	AppSettings.json, Environment Variables, User Secrets
<b>Logging and Monitoring</b>	Built-in Logging, External Logging Providers (Serilog, NLog)
<b>Introduction to ASP.NET Core</b>	ASP.NET Core MVC vs Web API, Project Templates
<b>MVC Architecture</b>	Models, Views, Controllers, Routing, Middleware
<b>Razor Pages</b>	Introduction, Razor Syntax, Tag Helpers, Partial Views
<b>Web API Development</b>	Creating RESTful APIs, Attribute Routing, HTTP Verbs, Content Negotiation, Versioning
<b>Entity Framework Core</b>	Code First vs Database First, Migrations, LINQ Queries, Relationships (One-to-One, One-to-Many, Many-to-Many)
<b>Security in ASP.NET Core</b>	Authentication and Authorization, Identity, OAuth2, JWT, Data Protection
<b>SignalR</b>	Real-time Web Communication, Hub, Clients, Scalability
<b>Testing in ASP.NET Core</b>	Unit Testing, Integration Testing, Test Frameworks (xUnit, MSTest), Mocking
<b>Windows Forms</b>	Form Design, Controls, Event Handling, Data Binding
<b>WPF (Windows Presentation Foundation)</b>	XAML, Data Binding, MVVM Pattern, Animation, Styles and Templates

<b>UWP (Universal Windows Platform)</b>	Overview, App Lifecycle, Adaptive UI, UWP Controls
<b>Introduction to Blazor</b>	Blazor Server vs Blazor WebAssembly, Project Structure, Components
<b>Component Communication</b>	Cascading Parameters, Event Callbacks, Dependency Injection
<b>Routing and Navigation</b>	Navigation Manager, Route Templates, Parameters in Routes
<b>Forms and Validation</b>	Data Annotations, Fluent Validation, Custom Validation
<b>State Management</b>	Component State, Application State, Local Storage, Session Storage
<b>JavaScript Interoperability</b>	Calling JavaScript from Blazor, Calling Blazor Methods from JavaScript
<b>Introduction to Microservices</b>	Microservices Architecture, Benefits, Challenges, .NET Support for Microservices
<b>Building Microservices with .NET</b>	API Gateways, Docker Integration, Communication between Microservices (REST, gRPC)
<b>Service Discovery and Load Balancing</b>	Consul, Eureka, Nginx, Kubernetes
<b>Monitoring and Logging</b>	Distributed Tracing, Metrics, Logging Strategies (ELK Stack, Prometheus, Grafana)
<b>Securing Microservices</b>	Authentication, Authorization, Security Best Practices
<b>Introduction to Cloud Services</b>	Cloud Concepts, Cloud Providers (Azure, AWS, Google Cloud)
<b>Deploying .NET Applications to Azure</b>	Azure App Service, Azure Functions, Azure DevOps, CI/CD Pipelines
<b>Azure Functions and Serverless Computing</b>	Creating Serverless Functions, Triggers and Bindings, Scaling, Monitoring
<b>Introduction to DevOps</b>	DevOps Principles, Benefits, CI/CD Pipeline, Tools (Azure DevOps, Jenkins)

<b>Containerization with Docker</b>	Docker Basics, Creating Docker Images, Docker Compose, Kubernetes
<b>Continuous Integration and Deployment</b>	Build Pipelines, Release Pipelines, Artifact Management, Automated Testing
<b>Advanced C# Concepts</b>	Reflection, Attributes, Dynamic Types, Interoperability
<b>Performance Optimization</b>	Asynchronous Programming (async/await), Caching, Profiling, Code Optimization
<b>Parallel Programming</b>	Task Parallel Library (TPL), PLINQ, Async and Await, Threading
<b>Memory Management and Garbage Collection</b>	Memory Leaks, GC Tuning, Memory Profiling
<b>Unit Testing</b>	Writing Unit Tests, Test-Driven Development (TDD), Test Frameworks
<b>Debugging Techniques</b>	Debugging Tools, Breakpoints, Watch, Immediate Window, Remote Debugging
<b>Code Analysis and Code Quality Tools</b>	Static Code Analysis, Code Metrics, Code Coverage Tools
<b>Coding Standards and Conventions</b>	Naming Conventions, Code Readability, SOLID Principles, DRY, KISS, YAGNI
<b>Design Patterns</b>	Singleton, Factory, Dependency Injection, Repository, Unit of Work
<b>Clean Architecture</b>	Layered Architecture, Onion Architecture, CQRS
<b>Version Control</b>	Git Basics, Branching Strategies, Pull Requests, Code Reviews



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