DOT NET

introduction to .NET Framework

- Overview of .NET framework architecture
- Common Language Runtime (CLR)
- Common Type System (CTS)
- Common Language Specification (CLS)
- Framework Class Library (FCL)

C# Programming Language

- Basics of C# syntax and semantics
- Object-oriented programming concepts in C#
- Generics, collections, and LINQ
- Asynchronous programming with async/await
- Exception handling

ASP.NET Core

- Overview of ASP.NET Core framework
- MVC (Model-View-Controller) pattern
- Razor pages
- Middleware architecture
- Dependency Injection in ASP.NET Core

- Authentication and authorization (Identity framework)
- Web API development
- Real-time applications with SignalR

Entity Framework Core (EF Core)

- Introduction to ORM (Object-Relational Mapping)
- Code-first and database-first approaches
- LINQ to Entities
- Migrations and seeding data
- Advanced querying and performance tuning

NET Core and .NET Standard

- Understanding .NET Core vs .NET Framework
- Creating cross-platform applications with .NET Core
- Introduction to .NET Standard

Web Technologies

- HTML, CSS, and JavaScript basics
- Front-end frameworks and libraries (React, Angular, Vue.js)
- Integrating front-end frameworks with ASP.NET Core

Testing in .NET

- Unit testing with MSTest, xUnit, or NUnit
- Integration testing in ASP.NET Core
- Mocking frameworks (Moq)

Deployment and Hosting

- Publishing ASP.NET Core applications
- Docker containers and .NET applications
- Azure deployment and hosting options

Security

- Secure coding practices
- Authentication and authorization techniques
- OWASP Top 10 vulnerabilities and mitigation strategies

Performance Optimization

- Monitoring and profiling .NET applications
- Caching strategies
- Performance best practices

Advanced Topics

- Microservices architecture with .NET
- Serverless computing with Azure Functions
- Blockchain development with .NET
- Machine learning with ML.NET

Tools and IDEs

- Visual Studio and Visual Studio Code
- ReSharper and other productivity tools
- Azure DevOps for CI/CD pipelines

Version Control Systems

- Git and GitHub
- Branching strategies

Software Development Life Cycle (SDLC)

- Agile methodologies
- Scrum and Kanban practices

- Continuous Integration and Continuous Deployment (CI/CD)

Best Practices and Design Patterns

- SOLID principles
- Design patterns (Factory, Singleton, etc.)
- Clean code practices

Documentation and Reporting

- XML documentation in .NET
- Swagger for API documentation

Data Access

- ADO.NET
- Dapper
- NoSQL databases (MongoDB, Redis) with .NET

Cloud Computing

- Azure services (Azure Storage, Azure Cosmos DB, etc.)
- AWS and Google Cloud Platform integrations