

ASP.NET 8 & Microservices

Course 3374 | 40 Hours



JOHN BRYCE

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Overview

.NET is a free and open-source managed computer software framework for Windows, Linux, and macOS operating systems. .NET Core is the Future of .NET.

Microservices are modular, small and independently deployable services that allow programmers to architecturally isolate each service, and thus create integrated applications in which pieces of code can be separately administrated, tested and enhanced.

Docker containers simplify deployment and testing by bundling a service and its dependencies into a single unit, which then runs in an isolated environment.

With .NET we can create and deploy microservices that implement all the current best practices, including Docker, containers and "Visual Studio for containers".

On Completion Delegates will be able to

- Understand the difference between a .NET framework and .NET (Core)
- Understand ASP.NET Core pipeline
- Create a Web API with validation, authentication, authorization, etc.
- Understand Docker and containers and how to use it
- Understand the needs and the challenges of micro-services world and solutions for those challenges

Who Should Attend?

This course is intended for experienced .NET developers who wish to upgrade their skills to the new Microsoft technologies & platform.

Prerequisites

Basic C# knowledge is a must.

Course Contents

Module 1 - .NET Platform Overview

- .NET Platform Overview
- .NET Implementations
- .NET Standard
- Runtimes and Class Libraries
- Application Frameworks and Common Tooling
- The Future of .NET

Module 2 - Introduction to .NET Core

- Introduction to .NET Core
- .NET Core Runtimes and SDKs
- .NET Core CLI
- SDK-Style Projects
- NuGet Packages

Module 3 - Unit Testing in .NET Core

- What is Unit Testing
- Why Unit Testing
- NUnit
- xUnit
- Test Doubles
- Moq

Module 4 – ASP.NET Core Fundamentals

- Startup class
- Dependency Injection
- Middleware
- Host
- Servers
- Configurations
- Options Pattern
- Environments

Module 5 – ASP.NET Core Web API

- Controllers and Actions
- Minimal API & MapGroup
- Model Binding and Formatting
- Action Return Types
- Content Negotiation
- Testing Web APIs with Postman
- Unit Testing Controllers

- Unit Testing Middleware
- Unit Testing Minimal API

Module 6 - Data Access with EF Core

- Object-Relational Mapping (ORM)
- EF Core Fundamentals
- Database Providers
- Code First Model Configuration
- Working with DbContext
- Code First Schema Migrations
- Command Line Tools
- Query and Persist Data
- Unit Testing

Module 7 - Microservice Architecture

- Microservice Architecture
- Monolithic vs. Microservices

Module 8 - Microservices Value Proposition

- Business Goals
- Key Benefits
- Deriving Business Value

Module 9 - Microservices Challenges

- Microservices Challenges
- Ways to Fail at Microservices

Module 10 - Microservices Design Principles

- The Systems Approach
- Microservices Design Model
- Standardization and Coordination
- Focus on Communication
- Embracing Change

Module 11 - Microservices Patterns Overview

- Microservice Architecture Patterns
- DDD (Domain Driven Design)

Module 12 - Domain Driven Design (DDD)

- Architecture vs Design
- What is Domain Driven Design
- Building Domain Knowledge
- The Ubiquitous Language

- Model Driven Design
- Refactoring Toward Deeper Insight
- Avoid Agile Pitfalls
- The Perfect Combo

Module 13 - Domain Modeling for Microservices

- Identifying Microservices Boundaries
- DDD Tactical and Strategic Patterns
- Model Unification
- Preserving Model Integrity
- Bounded Contexts
- Context Maps
- Domain Modeling Process

Module 14 - Behavior Driven Development (BDD)

- What is BDD
- The BDD Process
- Given When Then
- Motivation / Benefits
- The Perfect Combo

Module 15 - Communication Patterns

- Smart Endpoints and Dumb Pipes
- Communication Types
- Communication Styles

Module 16 – Designing and Building RESTful APIs

- Building RESTful APIs
- REST Architectural Style
- REST Maturity Model (RMM)
- Designing RESTful APIs
- JSON API Specification

Module 17 – Event Driven Architecture

- Event Driven Architecture (EDA)
- Messaging
- Architectural Principles
- Messaging Patterns
- Events and Commands
- Sagas
- Brokers and Queues

Module 18 – External API

- API Gateway
- Backend for Frontend (BFF)

Module 19 - Identity and Access Management (IAM)

- Identity and Access Management (IAM)
- JSON Web Token (JWT)
- JSON Object Signing and Encryption (JOSE)
- Bearer Tokens
- OAuth 2.0
- OpenID Connect (OIDC)
- Security Token Service (STS)

Module 20 – ASP.NET Core Security

- Authentication
- Authorization
- IdentityServer4

Module 21 – Production Readiness

- What is Production Readiness?
- Benefits of Production Readiness
- Challenges to Production Readiness
- Production Readiness Checklist

Module 22 - Reliability

- What is Reliability
- Why Reliability Matters
- Design Resilient and Fault Tolerant Systems
- 8 Fallacies of Distributed Systems
- Errors and Exception Handling
- Reliability Patterns
- ASP.NET Core Error Handling

Module 23 - Observability

- What is Observability
- Why Observability Matters
- Observability Patterns
- ASP.NET Core Health-Checks
- ASP.NET Core Logging

Module 24 – API Management

- API Management
- Well-Defined APIs
- OpenAPI and Swagger

- AsyncAPI
- API Management Tools
- API-First Approach

Module 25 - Deployment Patterns

- Service Deployment Platforms
- Docker Overview
- Kubernetes Overview
- Sidecar
- Service Mesh
- Cloud Services
- Serverless

Module 26 - Dockerize ASP.NET Core Applications

- Dockerfile
- Build a Docker Image
- Official .NET Core Images
- Multi-Stage Build
- Container Tools in Visual Studio
- Add Docker Support to ASP.NET Core Project
- Publish an Image to a Registry

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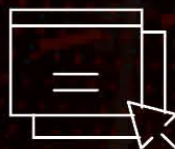
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