Course Title:

Enterprise DevOps with ASP.NET Core, Azure & CI/CD

Duration: 5 Days (40 Hours)
Target Audience: .NET Developers, Full Stack Developers, Cloud Developers, DevOps Engineers
Prerequisites:

C# and ASP.NET Core basics
REST API development knowledge
Basic Git knowledge (recommended)
Basic Azure concepts

Module 1: Introduction to DevOps & Azure DevOps Platform

Topics Covered

Understanding DevOps culture and practices
Traditional software development vs DevOps
DevOps lifecycle
Continuous Integration (CI)
Continuous Delivery / Deployment (CD)
Azure DevOps overview
Azure DevOps services:
Azure Boards
Azure Repos
Azure Pipelines

Azure Test Plans
Azure Artifacts

Hands-on Lab

Create Azure DevOps Organization
Create Azure DevOps Project
Explore Azure DevOps Portal
Configure project settings

Module 2: Agile Planning with Azure Boards

Topics Covered

Agile methodology overview
Work items in Azure Boards
Epic
Feature
User Story
Task
Bug
Backlogs
Sprint planning
Kanban boards
Work item tracking

Hands-on Lab

Create project planning structure:

Customer Order Management System

Epic
|
Feature

|
User Story
|
Task

Module 3: Source Control with Git & Azure Repos

Topics Covered

- Version control concepts
- Git architecture
- Repository management
- Clone repository
- Commit and push changes
- Pull and fetch
- Branching strategies
- Merge conflicts
- Pull Requests
- Code reviews

Hands-on Lab

- Create Azure Repository
- Connect ASP.NET Core project
- Push code to Azure Repos
- Create feature branches
- Submit Pull Request
- Perform code review

Module 4: Building ASP.NET Core Application for DevOps

Topics Covered

- ASP.NET Core Web API architecture
- Project structure
- Dependency Injection
- Configuration management
- Entity Framework Core integration
- Repository pattern
- Logging
- Exception handling
- Unit testing introduction

Hands-on Lab

Build application:

Customer Order Management API

Customer
|
Order
|
Product

SQL Server Database

Implement:

- CRUD APIs
- Entity Framework Core
- Swagger documentation
- Unit tests

Module 5: Continuous Integration using Azure Pipelines

Topics Covered

- CI concepts
- Pipeline architecture
- Azure Pipeline components
- Build agents
- Hosted vs Self-hosted agents
- YAML pipelines
- Pipeline triggers
- Build stages

Hands-on Lab

Create CI Pipeline:

Developer
|
Git Commit
|
Azure Pipeline
|
Restore Packages
|
Build Solution
|
Run Tests
|
Generate Artifact

Module 6: YAML Pipeline Development

Topics Covered

- YAML syntax
- Pipeline structure
- Stages
- Jobs
- Steps
- Tasks
- Variables
- Parameters
- Conditions

Hands-on Lab

Create:

azure-pipelines.yml

Pipeline performs:

- .NET Restore
- Build
- Unit Testing
- Publish Application
- Generate Artifact

Module 7: Automated Testing & Code Quality

Topics Covered

Importance of automated testing
Unit testing with xUnit
Test execution in pipelines
Code coverage
Quality checks

Hands-on Lab

Create unit tests
Integrate tests into pipeline
View test reports
Analyze failures

Module 8: Continuous Deployment with Azure DevOps

Topics Covered

CD concepts
Deployment strategies
Azure environments
Release management
Deployment approvals
Deployment history
Rollback strategies

Hands-on Lab

Create deployment flow:

Build Artifact

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Development Environment

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Testing Environment

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Production Environment

Module 9: Deploy ASP.NET Core Application to Azure

Topics Covered

- Azure App Service overview
- App Service configuration
- Deployment options
- Service connections
- Environment variables
- Deployment slots

Hands-on Lab

Deploy:

ASP.NET Core API

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Azure App Service

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Public Endpoint

Configure:

- Connection strings
- Application settings
- Deployment slots

Module 10: Secure DevOps Practices

Topics Covered

- Managing secrets in DevOps
- Variables and variable groups
- Azure Key Vault integration
- Service connections
- Managed Identity
- Secure authentication

Hands-on Lab

Secure:

Application

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Azure DevOps

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Azure Key Vault

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Secrets

Store:

- Database connection strings
- API keys
- Certificates

Module 11: Monitoring & Troubleshooting DevOps Pipelines

Topics Covered

- Pipeline monitoring
- Build failures
- Deployment failures
- Logs analysis
- Azure Monitor
- Application Insights
- Debugging production issues

Hands-on Lab

- Analyze failed build

Fix deployment issue
Monitor application health

Module 12: Final Enterprise DevOps Project

Project: Customer Order Management System

Participants implement complete lifecycle:

Requirement
|
Azure Boards
|
Development
|
Git Repository
|
Pull Request
|
CI Pipeline
|
Testing
|
Artifact
|
CD Pipeline
|
Azure Deployment
|
Monitoring

Final Outcomes

Participants will be able to:

- ☑ Manage .NET projects using Azure DevOps
- ☑ Implement Git-based workflows
- ☑ Create CI/CD pipelines
- ☑ Automate build and deployment
- ☑ Deploy ASP.NET Core applications to Azure
- ☑ Manage secrets securely
- ☑ Monitor and troubleshoot applications