

# Full Stack ASP.NET Core 6 Development with React

**Course Duration: 40 Hours (5 Days)**

## Overview

The Full Stack ASP.NET Core 6 Development with React course is designed to equip learners with the skills to build robust web applications using the latest technologies in Microsoft's ASP.NET Core 6 framework and the popular front-end library, React. Through a comprehensive curriculum, students will delve into various aspects of web development, from setting up their development environment to deploying full-fledged applications. By following the structured modules, participants will gain practical experience in creating RESTful APIs, working with Entity Framework Core for data access, and mastering React for the front end. They'll also learn important concepts such as Authentication and Authorization, and how to employ Azure services for cloud deployment. Additionally, the course covers containerization with Docker and Kubernetes, ensuring applications are scalable and maintainable. Learners will benefit from hands-on lessons in Testing and Debugging, ensuring quality and performance. Advanced topics will further enhance their understanding of Routing, Middleware, Security, and integration with React, making them well-rounded full-stack developers. By the end of the course, participants will be adept at deploying ASP.NET Core 6 applications with confidence and troubleshooting any issues that arise, setting them up for success in the field of web development.

## Audience Profile

Target Audience and Job Roles for the Full Stack ASP.NET Core 6 Development with React Course:

- Web Developers looking to upgrade their skills to full-stack capabilities.
- Software Engineers interested in learning ASP.NET Core 6 and React integration.
- Backend Developers aiming to expand their expertise to include front-end development with React.
- Front-End Developers who want to become proficient in ASP.NET Core 6 for backend development.
- Full Stack Developers seeking to update their knowledge with the latest ASP.NET Core 6 and React techniques.
- IT Professionals wanting to learn about deploying web applications using Azure, Docker, and Kubernetes.
- System Architects designing and implementing end-to-end solutions with ASP.NET Core 6 and React.
- Technical Leads responsible for guiding development teams in building web applications.
- DevOps Engineers focusing on the deployment and continuous integration of ASP.NET Core web applications.
- Application Developers building RESTful APIs and web services.
- Computer Science Students and Graduates aspiring to specialize in modern web development technologies.
- Freelancers looking to offer comprehensive web development services with ASP.NET Core 6 and React.

- Technical Project Managers seeking a deeper understanding of the development stack for effective project oversight.

## Course Syllabus

### Module 1: Introduction to ASP.NET Core 6

- Module 1 introduces Full Stack ASP.NET Core 6 development with React. It covers the fundamentals of ASP.NET Core 6, including the .NET Core framework, the MVC pattern, and the Razor view engine. Additionally, students will learn the basics of React, including components, props, and state. The module also covers setting up a development environment and deploying an ASP.NET Core 6 application.

#### Lessons:

- Overview of ASP.NET Core 6
- Setting up the Development Environment
- Working with Controllers and Views
- Working with Models and Data
- Working with React Components
- Integrating React with ASP.NET Core 6
- Working with Services and Dependency Injection
- Implementing Authentication and Authorization
- Configuring Logging and Application Settings
- Deploying ASP.NET Core 6 Applications

#### After completing this module, students will be able to:

- Understand the fundamentals of ASP.NET Core 6 and its components.
- Create a basic ASP.NET Core 6 application with React.
- Utilize the ASP.NET Core 6 framework to build a web application.
- Implement authentication and authorization in an ASP.NET Core 6 application with React.

### Module 2: Building a RESTful API with ASP.NET Core 6

- Module 2 focuses on building a RESTful API using ASP.NET Core 6. Students will learn how to set up the project, create models and controllers, and use Entity Framework Core to interact with a database. Additionally, the module covers API documentation with Swagger and securing APIs with authentication and authorization.

#### Lessons:

- Introduction to ASP.NET Core 6 and RESTful APIs
- Setting up the ASP.NET Core 6 Project

- Designing API Endpoints
- Implementing API Endpoints
- Testing API Endpoints
- Securing the API with Authentication and Authorization
- Deploying the API to Production
- Consuming the API with React Components
- Optimizing API Performance
- Troubleshooting and Debugging API Issues

**After completing this module, students will be able to:**

- Understand the fundamentals of building a RESTful API with ASP.NET Core 6.
- Develop a secure and robust API using ASP.NET Core 6.
- Utilize the latest features of ASP.NET Core 6 to create scalable and maintainable APIs.
- Integrate React with ASP.NET Core 6 to build modern web applications.

## **Module 3: Working with Entity Framework Core 6**

- Module 3 focuses on using Entity Framework Core 6 for database management. Students will learn how to create and configure databases, map models to databases, and perform CRUD operations. The module also covers advanced Entity Framework Core features, performance tuning, and database migrations.

**Lessons:**

- Introduction to Entity Framework Core 6
- Configuring Entity Framework Core 6
- Working with Database Contexts
- Querying Data with LINQ
- Creating and Updating Data
- Managing Relationships
- Advanced Entity Framework Core Features
- Performance Tuning with Entity Framework Core 6
- Deploying Entity Framework Core 6 Applications
- Troubleshooting Entity Framework Core 6 Issues

**After completing this module, students will be able to:**

- Understand the fundamentals of Entity Framework Core 6.
- Implement Entity Framework Core 6 in an ASP.NET Core 6 application.
- Query and manipulate data efficiently using Entity Framework Core 6.
- Create and manage database migrations.

## **Module 4: Building a React Front-End with ASP.NET Core 6**

- Module 4 focuses on developing a React front-end integrated with ASP.NET Core 6. Students will learn how to build reusable React components, manage state, and work with APIs. Additionally, the module covers React Router, Redux, and front-end deployment strategies.

### **Lessons:**

- Setting up a React Project
- Working with Components
- Using Props and State
- Handling Forms and Events
- Integrating React with ASP.NET Core 6
- Consuming APIs with React
- Implementing Authentication and Authorization
- Deploying the React Front-End
- Optimizing Performance
- Troubleshooting and Debugging

### **After completing this module, students will be able to:**

- Build a dynamic user interface with React.
- Integrate React with ASP.NET Core 6 to create a full-stack application.
- Implement authentication and authorization using ASP.NET Core Identity.
- Deploy a full-stack application to a cloud hosting provider.

## **Module 5: Authentication and Authorization with ASP.NET Core 6**

- This module covers authentication and authorization in ASP.NET Core 6, including IdentityServer4, role-based authentication, securing APIs, and integrating third-party authentication providers.

### **Lessons:**

- Introduction to Authentication and Authorization
- Setting up Authentication and Authorization in ASP.NET Core 6
- Implementing Role-Based Authorization
- Securing APIs with Authentication and Authorization
- Working with Claims-Based Authentication
- Integrating Third-Party Authentication Providers (Google, Facebook, etc.)
- Troubleshooting Authentication and Authorization Issues
- Best Practices for Secure Authentication and Authorization

**After completing this module, students will be able to:**

- Understand authentication and authorization in ASP.NET Core 6.
- Implement authentication and authorization using ASP.NET Core Identity.
- Create custom authorization policies and roles.
- Secure ASP.NET Core 6 applications effectively.

## **Module 6: Deploying an ASP.NET Core 6 Application**

- This module covers deploying an ASP.NET Core 6 application, including setting up a web server, configuring deployment, automating with Azure DevOps, and troubleshooting deployment issues.

**Lessons:**

- Preparing the Application for Deployment
- Configuring Deployment Settings
- Deploying to a Web Server
- Configuring the Web Server
- Troubleshooting Deployment Issues
- Automating Deployment with CI/CD
- Securing the Application for Production
- Monitoring and Logging in Production
- Updating Applications in Production

**After completing this module, students will be able to:**

- Deploy an ASP.NET Core 6 application to a production environment.
- Utilize Azure App Service for deployment.
- Configure applications for efficient deployment and monitoring.
- Troubleshoot deployment-related issues.

## **Module 7: Working with Azure Services**

- This module covers integrating Azure services into ASP.NET Core 6 applications, including Azure App Service, Azure Storage, Azure Cosmos DB, and Azure Functions.

**Lessons:**

- Introduction to Azure Services
- Setting up an Azure Account
- Deploying Applications to Azure
- Configuring Azure Storage
- Using Azure App Services
- Integrating Azure Active Directory

- Working with Azure Cognitive Services
- Implementing Serverless Computing with Azure Functions
- Continuous Integration and Delivery with Azure DevOps
- Monitoring and Troubleshooting Azure Applications

## Module 8: Working with Docker and Kubernetes

- This module teaches containerization with Docker and application scaling with Kubernetes.

### Lessons:

- Introduction to Docker and Kubernetes
- Setting up Docker Containers
- Working with Kubernetes Clusters
- Deploying ASP.NET Core Applications with Docker and Kubernetes
- Managing Containers with Kubernetes
- Scaling Applications with Kubernetes
- Integrating React with Docker and Kubernetes
- Troubleshooting Issues
- Security Best Practices
- Advanced Docker and Kubernetes Topics

## Module 9: Testing and Debugging ASP.NET Core 6 Applications

- This module focuses on debugging and testing techniques using xUnit, Selenium, Moq, and Postman.

### Lessons:

- Unit Testing with xUnit
- Integration Testing with Selenium
- Debugging with Visual Studio
- Troubleshooting Common Issues
- Performance Testing
- Automated Testing with CI/CD

## Module 10: Advanced Topics in ASP.NET Core 6 Development

- Module 10 of the *Full Stack ASP.NET Core 6 Development with React* course covers advanced topics in ASP.NET Core 6 development. It includes authentication and authorization, working with Entity Framework Core, and deploying ASP.NET Core applications. Additionally, it covers advanced concepts such as using SignalR, creating custom middleware, and implementing dependency injection. This module provides a comprehensive overview of the advanced features of ASP.NET Core 6 and how to leverage them in applications.

**Lessons:**

- Advanced Routing and Middleware in ASP.NET Core 6
- Advanced Security and Authentication in ASP.NET Core 6
- Advanced Data Access with Entity Framework Core 6
- Advanced Caching and Performance Optimization in ASP.NET Core 6
- Advanced Dependency Injection and Service Registration in ASP.NET Core 6
- Advanced Configuration and Settings in ASP.NET Core 6
- Advanced Logging and Error Handling in ASP.NET Core 6
- Advanced Deployment Strategies for ASP.NET Core 6
- Advanced Testing Strategies for ASP.NET Core 6
- Advanced Integration with React in ASP.NET Core 6

**After completing this module, students will be able to:**

- Develop advanced web applications using ASP.NET Core 6 and React.
- Utilize the latest features of ASP.NET Core 6 to build secure and scalable web applications.
- Implement authentication and authorization using ASP.NET Core 6 Identity.
- Integrate React components into ASP.NET Core 6 applications.