

KOENIG SOLUTIONS · COURSE OUTLINE

Full Stack React Application Development with .NET 8

Learn to build full stack applications with React and .NET 8, from components and APIs to authentication, testing and deployment.

10 Days

DURATION

10

MODULES

39

TOPICS

29

HANDS-ON LABS

COURSE OVERVIEW

This course covers full stack development using React and .NET 8, starting with environment setup, TypeScript, and REST API and MVC fundamentals. It then builds React skills including components, hooks, state management, routing, forms and performance optimisation, alongside .NET 8 Web API development with Minimal APIs, dependency injection and EF Core. Later modules connect the React front end to the .NET API, add JWT-based authentication and authorization, and construct a full stack CRUD application with state management and React Query. The course concludes with unit testing, CI/CD, real-time features with SignalR, background jobs with Hangfire, and a capstone project applying these practices.

WHO THIS COURSE IS FOR

Full Stack Developers

Front-End Developers

Back-End Developers

.NET Developers

React Developers

LEARNING OBJECTIVES

- Explain full stack development concepts using React and .NET 8
- Build React components with hooks and Context API state management
- Implement Minimal APIs and CRUD operations with .NET 8 and EF Core
- Connect a React front end to a .NET 8 API using Axios
- Apply routing, form validation and performance optimisation in React
- Implement JWT authentication and authorization across React and .NET 8
- Develop a full stack CRUD application with Redux Toolkit and React Query
- Configure testing, CI/CD, real-time features and deployment strategies

10 Modules, 39 Topics

DAY 1 Introduction to React and .NET 8

01

3 Labs

TOPICS

- Overview of Full Stack Development
- Understanding React and .NET 8
- Setting up the Development Environment (Node.js, .NET SDK, VS Code/Visual Studio)
- Introduction to TypeScript for React
- Overview of REST APIs and MVC architecture in .NET 8

DAY 2 React Basics and State Management

02

3 Labs

TOPICS

JSX and Components in React · Props and State in React · **React Hooks:** useState, useEffect · Component Lifecycle · Basic State Management with Context API

DAY 3 .NET 8 Web API Fundamentals

03

3 Labs

TOPICS

Understanding .NET 8 Minimal APIs · Dependency Injection in .NET · Controllers vs Minimal APIs · Working with EF Core and Database Connections · CRUD Operations in .NET 8

DAY 4 Connecting React with .NET 8 API

04

3 Labs

TOPICS

Fetching Data from .NET API in React · Using Fetch API & Axios · Handling Async Operations and Errors · CORS and Cross-Origin Communication

05

3 Labs

TOPICS

- React Router for Navigation
- Forms and Form Handling in React
- Validation with React Hook Form
- Optimizing Performance with React.memo and useCallback

06

4 Labs

TOPICS

- Introduction to JWT Authentication
- Securing APIs with Authentication & Authorization in .NET 8
- Implementing User Login & Registration in React
- Using React Context for Authentication State

07

3 Labs

TOPICS

- Creating a Full Stack CRUD app (React + .NET 8)
- Managing State with Redux Toolkit (Optional)
- Optimizing API Calls with React Query

08

3 Labs

TOPICS

- Unit Testing in .NET 8 with xUnit
- Testing React Components with Jest & React Testing Library
- CI/CD Basics for React & .NET Apps

09

2 Labs

TOPICS

- WebSockets with SignalR for Real-Time Communication
- Implementing Background Jobs with Hangfire
- Optimizing Performance in React and .NET 8

10

2 Labs

TOPICS

- Project Planning & Architecture
- Best Practices for Scalable Full Stack Applications
- Code Review & Deployment Strategies

HANDS-ON LABS

Practise What You Learn

#	MODULE	ACTIVITY
01	Introduction to React and .NET 8	■ Install Node.js, .NET 8 SDK, and required dependencies ■ Create a simple React app using Vite or Create React App ■ Set up a .NET 8 Web API project
02	React Basics and State Management	■ Create functional components in React ■ Implement state management with hooks ■ Build a simple counter app using useState and useEffect
03	.NET 8 Web API Fundamentals	■ Set up Entity Framework Core with SQLite/PostgreSQL ■ Create a Minimal API with GET, POST, PUT, DELETE endpoints ■ Test APIs using Postman or Swagger
04	Connecting React with .NET 8 API	■ Consume the .NET API in a React app ■ Display data using React state and hooks ■ Implement error handling for API calls
05	Advanced React Concepts	■ Implement a multi-page app using React Router ■ Create a form with validation for user input ■ Optimize components using React.memo

#	MODULE	ACTIVITY
06	Authentication & Authorization	■ Implement JWT-based authentication in .NET 8 ■ Secure API endpoints with authentication ■ Create login and registration UI in React ■ Store and manage authentication tokens
07	Full Stack CRUD Application	■ Implement a full CRUD app (Users/Products Management) ■ Use Redux Toolkit or React Context for state management ■ Optimize API interactions with React Query
08	Deployment & Testing	■ Write and run unit tests in .NET and React ■ Deploy the React app and .NET API to cloud platforms ■ Set up CI/CD pipeline using GitHub Actions
09	Real-Time Features & Advanced Topics	■ Implement a real-time notification system with SignalR ■ Optimize API performance using caching techniques
10	Capstone Project	■ Build and present a final project (e.g., Task Management App) ■ Implement best practices for security and performance

WHAT IS INCLUDED

Everything You Need to Succeed

- Koenig course material for every module
- Hands-on exercises throughout the course
- Delivery by certified instructors and subject matter experts
- Course completion certificate from Koenig

Who We Are

Established in 1993, Koenig Solutions is a globally recognised training provider with 35+ technology partnerships, 5,000+ training programmes and a network of certified instructors and subject matter experts, supporting individuals and enterprise teams worldwide.

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✉ info@koenig-solutions.com