

.NET: C#, ASP.NET Core MVC & EF Core with JWT

Learn to build data-driven web applications with C#, ASP.NET Core MVC and EF Core, secured with JWT and deployed via IIS or Docker.

6 Days

DURATION

52

TOPICS

15

HANDS-ON ACTIVITIES

COURSE OVERVIEW

This course covers SQL database operations, including creating and querying databases and tables, before introducing C# and object-oriented programming concepts alongside collections, LINQ and ADO.NET database connectivity. It then moves into ASP.NET MVC fundamentals, covering models, views, controllers, routing and Web API, followed by asynchronous programming patterns and ASP.NET Core basics such as middleware, dependency injection and controllers. It continues with Entity Framework Core for data access and migrations, and security topics including ASP.NET Core Identity, JWT authentication and role-based authorization. The course concludes with hosting ASP.NET Core applications on IIS and containerizing them with Docker.

WHO THIS COURSE IS FOR

.NET Developers

Web Developers

Backend Developers

Software Engineers

API Developers

LEARNING OBJECTIVES

- Create and query relational databases using SQL statements
- Apply object-oriented programming concepts and LINQ in C#
- Connect to databases using ADO.NET and Entity Framework
- Build MVC applications with models, views, controllers and routing
- Implement asynchronous programming using async/await patterns
- Configure middleware, dependency injection and APIs in ASP.NET Core
- Develop data access layers with EF Core and migrations
- Secure Web APIs using JWT and role-based authorization

52 Topics

DAY 1 SQL Database Operations

TOPICS

3 Lab Problems

- Database concepts and normalization
- Creating, altering, and dropping databases
- Creating, renaming, and dropping tables
- Data types and constraints (Foreign Key, Unique, Check)
- Insert, update, and delete operations
- Select statements, sorting, and grouping
- Data retrieval from multiple tables

DAY 2 C# and Object-Oriented Programming (OOP)

TOPICS

3 Lab Problems

- Introduction to C# and OOP concepts (class, object, inheritance, polymorphism)
- Conditional and looping constructs
- Exception handling
- File operations
- N-tier architecture and debugging techniques
- Collections and LINQ
- DB Connection Using ADO.NET
- Using SqlConnection, SqlCommand, SqlDataAdapter
- DB Connection Using Entity Framework

DAY 3 Working with ASP.NET

TOPICS

2 Lab Projects

What is MVC? · Hello World with MVC · View/Partial View in MVC · Models, View and Controller · Web API · Routing in MVC · View Bag vs View Data

Async Programming in .NET Core

2 Labs

TOPICS

- Overview of synchronous vs asynchronous programming
- Task-based Asynchronous Pattern (TAP)
- Implementing async/await in .NET Core
- Handling exceptions and cancellation tokens in async operations
- Performance considerations with asynchronous programming

ASP.NET Core Basics

TOPICS

- ASP.NET Core project structure
- The request processing pipeline
- Middleware, routing, and services
- Dependency Injection (DI) in ASP.NET Core
- Creating simple MVC controllers and views
- Building basic APIs using controllers and action methods

Entity Framework Core

3 Labs

TOPICS

- Introduction to EF Core and ORM (Object-Relational Mapping)
- Code-first and database-first approaches
- Configuring DbContext and defining models
- LINQ for querying data
- Relationships (one-to-one, one-to-many, many-to-many)
- Migrations and database updates

Security in .NET Core

TOPICS

- ASP.NET Core Identity for user authentication
- JWT (JSON Web Token) for securing Web APIs
- Role-based and policy-based authorization
- Protecting data with encryption and Data Protection API
- Best practices for securing .NET Core applications (e.g., HTTPS, CORS, CSRF)

Hosting with IIS

2 Labs

TOPICS

- Overview of web hosting and IIS
- Setting up IIS for hosting ASP.NET Core applications
- Configuring application pools, environment variables, and bindings
- Deploying applications to IIS

Docker for .NET Core

TOPICS

- Introduction to Docker and its use in microservices architecture
- Containerizing .NET Core applications
- Creating Dockerfiles and working with .dockerignore

HANDS-ON ACTIVITIES

Practise What You Learn

MODULE	ACTIVITY
SQL Database Operations	LAB PROBLEMS ■ Student Database: Create a SQL database for a student management system. Include tables for students, courses, and enrollments. ■ SQL Data Queries: Write SQL queries to insert student records, update their course enrollments, and delete student entries if they leave the program ■ JOIN Queries: Use JOIN operations to display which students are enrolled in which courses, along with sorting by student names
	LAB PROBLEMS ■ Library System: Implement a C# program that models a library with classes for Book, Member, and Transaction. Allow members to borrow and return books. ■ File Handling: Create a C# program that reads data from a text file containing student names and writes their attendance status into another file ■ LINQ Queries: Write a C# program to filter and display a list of books whose titles contain the word "Programming" using LINQ
Working with ASP.NET	LAB PROJECT ■ Create a MV Project ■ Add /Edit/Delete/Listing Records including Search and Pagination and Sorting
Async Programming in .NET Core & ASP.NET Core Basics	LAB ■ Create an ASP.NET Core application that performs both synchronous and asynchronous operations for HTTP calls and file I/O ■ Build basic MVC controllers and a simple API endpoint

MODULE	ACTIVITY
Entity Framework (EF) Core & Security in .NET Core	LAB
	■ Build a simple CRUD application using EF Core to manage a “Customer” and “Order” system
	■ Implement JWT-based authentication to secure the API
	■ Implement role-based authorization to restrict access to specific actions
Hosting .NET Core Apps with IIS & Docker	LAB
	■ Deploy an ASP.NET Core application on IIS, configure the hosting environment, and troubleshoot issues
	■ Dockerize the ASP.NET Core API and run it inside a container

WHAT IS INCLUDED

Everything You Need to Succeed

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

ABOUT 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.

FLEXIBLE DELIVERY

Learn the Way That Suits You

Classroom Training

Live Online Classes (ILO)

Fly-Me-A-Trainer (FMAT)

Flexi (Self-Paced)

1-on-1 Training

Ready to Get Started?

Talk to a learning advisor about schedules, group training and customised delivery.

Visit koenig-solutions.com

✉ info@koenig-solutions.com