



# TRAINING TRAINS

IT Services and IT Consultancy \ Internship-Inplant Training \ Software Training Institute

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உங்கள் கண்ட மற்றும் வியாபாரத்திற்கு ஏற்ற Website & Andriod App மற்றும் Software மிகச்சிறந்த முறையில் செய்து கொடுக்கப்படும்.

Expertise : AI, Machine Learning & Data Science \ Cybersecurity & Ethical Hacking  
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W3 App Developers

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# ASP.NET Core – 100+ Lab Exercises (Basic, Intermediate, Advanced)

## □ Basic Level (30+ Exercises)

### □ Getting Started with ASP.NET Core

- Set up ASP.NET Core SDK and Visual Studio/VS Code.
- Create your first **ASP.NET Core MVC Web App**.
- Understand the **Startup.cs** and **Program.cs** pipeline.
- Implement a basic **Hello World** endpoint using Razor Pages.
- Create a **Model-View-Controller** (MVC) structure from scratch.

### □ Request Handling & Routing

- Build endpoints using **attribute routing**.
- Use **conventional routing** in **Startup.cs**.
- Create and consume **query strings and route parameters**.

### □ Forms & Models

- Create a **form submission** using Razor Pages.
- Bind form data to a **C# model**.
- Add **model validation** using Data Annotations.

### □ Authentication Basics

- Implement **cookie-based authentication**.
- Create basic **login, logout, and register** functionality.
- Setup **role-based access** with `[Authorize(Roles="Admin")]`.

### □ CRUD Operations

- Create a **Product Management** CRUD module.
- Use **Entity Framework Core (EF Core)** to:
  - Create a DB Context.
  - Add/update/delete records.
  - Run migrations and seed data.



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## □ Intermediate Level (40+ Exercises)

### □ Entity Framework Core Deep Dive

- Scaffold models from an existing database.
- Use **LINQ** queries for filtering and projection.
- Implement **soft deletes** and **tracking behavior**.
- Add **one-to-many** and **many-to-many** relationships.

### □ Middleware & Services

- Create and register **custom middleware**.
- Inject and use **dependency injection** (DI) for services.
- Create a reusable **repository pattern**.

### □ Advanced Routing & Filters

- Use **action filters** and **global exception filters**.
- Build **custom model binders**.
- Implement **localized routing** for multi-language support.

### □ Authentication & Authorization (Advanced)

- Implement **Identity Framework**.
- Integrate **JWT-based authentication**.
- Add **external login** using Google or Microsoft accounts.
- Secure Web APIs using `[Authorize]` and policies.

### □ Razor Pages & Blazor (Optional)

- Convert MVC views to **Razor Pages**.
- Build a basic **Blazor Server** component.
- Use **Blazor forms** with validation and dependency injection.

## □ Advanced Level (40+ Exercises)

### □ Building RESTful APIs



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- Create a **REST API** using **ASP.NET Core Web API**.
- Use **Swagger/OpenAPI** to document your API.
- Implement versioning (`/api/v1/...`) and custom response formats.
- Add **rate limiting middleware**.

## □ Unit Testing & Integration Testing

- Write **unit tests** for controllers and services using **xUnit**.
- Mock dependencies with **Moq**.
- Implement **integration testing** for full API flows.

## □ Performance Optimization & Caching

- Add **in-memory and distributed caching** (**Redis**).
- Profile API using **MiniProfiler** or **Application Insights**.
- Add **response compression** and **GZip**.

## □ Background Tasks & Hosted Services

- Create a **background worker** using **IHostedService**.
- Schedule recurring tasks with **Quartz.NET**.
- Send emails via **background jobs** (**Hangfire**, **Serilog**).

## □ Microservices, Docker & DevOps

- Containerize your app using **Docker**.
- Deploy using **Azure App Service** or **AWS Elastic Beanstalk**.
- Use **Consul** for service discovery.
- Implement **gRPC services** for microservice communication.

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## □ Capstone Projects

- **E-Commerce Admin Portal** (Blazor or Razor Pages + Web API + EF Core + JWT)
  - **Job Application Tracker** (REST API + Authentication + Caching)
  - **School Management System** (Razor + MVC + Multi-role Authorization + DB-first)
  - **Healthcare Appointment System** (gRPC + Hosted Services + API Gateway)
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## □ Tools & Technologies

- **Languages:** C#
- **Framework:** ASP.NET Core 6/7/8, EF Core
- **IDEs:** Visual Studio 2022, VS Code
- **Testing:** xUnit, Moq, FluentAssertions
- **Database:** SQL Server, PostgreSQL, SQLite
- **DevOps:** Docker, Azure Pipelines, GitHub Actions