

C# & ASP.NET Core – Complete Learning Roadmap

1. C# Fundamentals

Variables, data types, control flow, methods, classes, objects, OOP principles (Encapsulation, Inheritance, Polymorphism, Abstraction), Interfaces, Structs, Records, Enums, Exceptions, Async/Await.

2. LINQ (Language Integrated Query)

Query syntax vs method syntax, Select, Where, First/FirstOrDefault, Any, All, OrderBy, GroupBy, Join, Deferred execution, LINQ to Objects vs LINQ to Entities.

3. Entity Framework Core

DbContext, DbSet, CodeFirst approach, Migrations, Relationships (One-to-One, One-to-Many, Many-to-Many), Tracking vs NoTracking, Lazy vs Eager loading, Performance basics.

4. ASP.NET Core Fundamentals

Minimal APIs, MVC, Controllers, Routing, Middleware, Dependency Injection, Configuration, Logging, Environment handling.

5. Web API Development

REST principles, HTTP verbs, Status codes, DTOs, Validation, Model binding, Filters, Pagination, Versioning, Error handling.

6. Security & Auth

Authentication vs Authorization, JWT, Identity, Role-based access, CORS, HTTPS, Secure password hashing.

7. Advanced Topics

Caching (Memory, Redis), Background services, SignalR, Testing (Unit & Integration), Clean Architecture, Performance tuning, Deployment basics.

Final Advice: Focus on building small projects after each section. ASP.NET Core + EF Core + LINQ + SQL is a strong, job-safe stack.