Unit 1: Language Preliminaries (8 Hrs)

- Introduction to .NET Framework
- Compilation and Execution of .NET Applications
- Basic Language Constructs
- Constructor, Properties, Arrays, Strings
- Indexers, Inheritance, `base` Keyword
- Method Hiding and Overriding
- Polymorphism in Code Extensibility
- Structs and Enums
- Abstract Class, Sealed Class, Interface
- Delegate and Events
- Partial Class
- Collections, Generics
- File I/O
- LINQ Fundamentals
  - Lambda Expressions
- Exception Handling
  - Try Statements and Exceptions
- Attributes
  - Attribute Classes
  - Named and Positional Parameters
  - Attribute Targets
  - Multiple Attributes
- Asynchronous Programming
  - Principle of Asynchrony
  - Async/Await Patterns

Unit 2: Introduction to ASP.NET (3 Hrs)

- .NET and ASP.NET Frameworks
  - .NET, .NET Core, Mono
  - ASP.NET Web Forms, MVC, Web API, ASP.NET Core
- .NET Architecture and Design Principles
- Compilation and Execution
  - CLI, MSIL, CLR
- .NET Core in Detail
- .NET CLI Commands
  - build, run, test, deploy

Unit 3: HTTP and ASP.NET Core (3 Hrs)

- HTTP Protocol
- Request and Response Message Format
- Web Application Architectures
- MVC Pattern
- ASP.NET Core Architecture Overview
- Projects and Conventions
- ASP.NET vs ASP.NET MVC

Unit 4: Creating ASP.NET Core MVC Applications (10 Hrs)

- Setting up the Environment
- Controllers and Actions
  - Create Controllers
  - Create Actions and Action Results
- Rendering HTML with Views
  - Razor Syntax
  - Tag Helpers
- Models
  - Binding and Validations
- URL Routing and Features
- Web API Applications
  - API Controllers
  - JSON
- Dependency Injection and IoC Containers

The mind map shows:

Unit 5: Working with Database (6 Hrs)
- ADO.NET Basics — Connection, Command, Reader, Adapter
- Entity Framework (EF) Core
- Object-Relational Mapper (ORM)
- Adding EF Core to an Application — Database Provider, Data Models and Context
- CRUD Operations — Create, Read, Update, Delete

Unit 6: State Management in ASP.NET Core (4 Hrs)
- State Management on Stateless HTTP
- Server-side Strategies — Session State, TempData, HttpContext, Cache
- Client-side Strategies — Cookies, Query Strings, Hidden Fields

Unit 7: Client-side Development (4 Hrs)
- Client-side Web Technologies
- JQuery
- Forms and Validation
- SPA Frameworks — Angular, React

Unit 8: Securing ASP.NET Core Application (5 Hrs)
- Authentication — ASP.NET Core Identity, Adding Authentication and Identity Services
- Authorization — Roles, Claims, Policies
- Securing Controllers and Actions
- Common Vulnerabilities — Cross-site Scripting (XSS), SQL Injection, CSRF (Cross-site Request Forgery), Open Redirect Attacks

Unit 9: Hosting and Deploying (2 Hrs)
- App Servers and Hosting Models — IIS, Nginx, Apache, ASP.NET Core Module, Kestrel
- Docker and Containerization
- Publish to Azure Cloud

🗓 5-Day ASP.NET Core MVC Study Plan

Day 1 – Master the C# & .NET Language Fundamentals (Unit 1)

Goal: Understand the building blocks of .NET and C# programming.
Topics to Cover:

- Introduction to .NET Framework, CLR, MSIL

- Compilation & Execution of .NET applications

- Constructors, Properties, Arrays, Strings

- Inheritance, base keyword, Method Overriding, Polymorphism

- Structs, Enums, Abstract Classes, Sealed Classes, Interfaces

- Delegates, Events, Partial Classes

- Collections, Generics, File I/O