# .NET Complete Training Course (For Absolute Beginners)

## Beginner Level

### Module 1: Introduction to Programming & C# Basics

**Topics:**

- What is Programming?

- Introduction to C# and .NET Framework/Core

- Setting up Visual Studio

- Writing First Program: "Hello World"

- Variables and Data Types

- Operators (Arithmetic, Logical, Comparison)

- User Input and Output

- Conditional Statements (if, else, switch)

- Loops (for, while, do-while)

- Break and Continue

- Methods/Functions (Definition, Parameters, Return Types)

### Module 2: Deeper C# Fundamentals

**Topics:**

- Variable Scope and Lifetime

- Arrays (One-Dimensional, Multi-Dimensional)

- Array Operations (CRUD)

- Strings and String Methods

- Lists and Dictionaries

- Enums and Structs

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## Mini-Project 1: Contact Book (Console Application)

**Description**:

- Build a simple app to **add, view, edit, and delete contacts** using Lists/Dictionaries.

- **Skills Improved**: Data storage, loops, conditionals, CRUD operations.

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# Module 3: Object-Oriented Programming Concepts

## Topics:

- What is OOP? (Real-world examples)

- Classes and Objects

- Constructors and Overloaded Constructors

- Fields, Properties, and Methods

- Inheritance

- Method Overloading

- Interfaces and Abstract Classes

- Access Modifiers (public, private, protected)

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**Mini-Project 2: Student Management System**

**Description**:

- Manage student records using Classes, Inheritance, and Interfaces.

- **Skills Improved**: OOP design thinking, data modeling, working with relationships.

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# Intermediate Level

## Module 4: Exception Handling and Debugging

**Topics:**

- Introduction to Exceptions

- Try, Catch, Finally

- Custom Exceptions

- Debugging with Visual Studio (Breakpoints, Watch, Call Stack)

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## Module 5: File I/O (Working with Files)

**Topics:**

- Reading and Writing Files

- Handling Directories

- File Streams and StreamWriter/Reader

- JSON Serialization and Deserialization

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**Mini-Project 3: Payroll Manager (File-Based Storage)**

**Description**:

- Create a payroll system that **reads/writes employee salary records to a file**.

- **Skills Improved**: File operations, real-world persistence, exception handling.

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# Module 6: LINQ Fundamentals

**Topics:**

- Introduction to LINQ

- Where, Select, OrderBy, GroupBy

- Query Syntax vs Method Syntax

- Using LINQ with Collections

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# Module 7: Databases and SQL Basics

**Topics:**

- What is a Database?

- Introduction to SQL Server

- CRUD Operations with SQL

- Primary and Foreign Keys

- Database Relationships (One-to-Many)

- Basic Normalization Concepts

- Introduction to Entity Framework Core (Code-First Approach)

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# Module 8: Introduction to ASP.NET Core MVC (Web Development Basics)

**Topics:**

- Web Basics: HTTP, Client-Server Architecture

- Overview of ASP.NET Core MVC

- Creating Controllers and Actions

- Razor Views and Layouts

- Handling Forms (POST/GET)

- Basic Model Validation (Data Annotations)

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**Mini-Project 4: To-Do List Web App**
**Description:**

- Build a basic web app to **add, edit, and complete tasks** using MVC.

- **Skills Improved**: Web development basics, MVC pattern, database integration.

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# Advanced Level

# Module 9: Building REST APIs

**Topics:**

- What is a REST API?

- Creating APIs in ASP.NET Core

- Routing and Endpoints

- HTTP Methods (GET, POST, PUT, DELETE)

- Using Postman to Test APIs

- Adding Swagger Documentation

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# Module 10: Authentication and Authorization

**Topics:**

- Introduction to Authentication/Authorization

- Creating a Registration and Login System

- Role-Based Authorization

- Identity Basics in ASP.NET Core

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# Module 11: Advanced C# Concepts

**Topics:**

- Delegates and Events

- Lambda Expressions

- Func, Action, Predicate

- Generics (Generic Classes, Methods)

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# Module 12: Deployment and Cloud Basics

**Topics:**

- Publishing Web Apps to IIS

- Introduction to Azure Portal

- Deploying ASP.NET Apps to Azure

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# Capstone Projects

## Project 1: Online Course Management System

**Description**:

- Build a portal for students to **register, enroll in courses, and track progress**.

- **Skills Improved**: Web MVC, CRUD, authentication, database design, file storage.

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## Project 2: E-Commerce Store (Mini Version)

**Description**:

- Create a basic e-commerce platform with **product catalog, cart, checkout, admin dashboard**.

- **Skills Improved**: Full-stack skills, session management, complex CRUD, API integration.

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# Project 3: Hospital Appointment Booking System

**Description**:

- Book appointments, manage doctors/patients, user roles for admin/staff.

- **Skills Improved**: Multi-user systems, relational databases, authentication & role management.

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