

	Subject	Date
	<b>Basics of C# Programming</b>	
1.	Introduced agenda of C# course	24.02.25
2.	C# language and .NET platform	
3.	Variables	27.02.25
4.	Data types	
5.	Static variables and constants	
6.	Working with the console application	
7.	Arrays	
8.	C# arithmetic/comparison operations	
9.	If else and Switch case constructions	03.03.25
10.	Loops (For, Foreach, While, Do-while)	
11.	Methods	
12.	Method with params parameter	
13.	Ref and Out keywords in methods	
14.	Local and recursive function	
15.	Tuple and Enum	06.03.25
	<b>Classes, Structs, Records and Namespaces</b>	
1.	Classes and objects	
2.	Constructors, initializers, and destructors	
3.	Fields and properties	
4.	Method and static method in class	10.03.25
5.	Structs	
6.	Record type	
7.	Namespace and global namespace	
8.	Partial and extended classes	
9.	Value types and reference types	13.03.25
10.	Mutable And Immutable	
11.	Boxing and Unboxing	
12.	Nullability in value types and reference types	
13.	Accessibility of the class and class members	
	<b>Improve searching and designing knowledges</b>	17.03.25
1.	How to search/find what you need?	

2.	How to use AI chats correctly?	
3.	Select a project to atomize your organization	
	<b>Delegates, Events, and Lambdas</b>	
1.	Delegates and using of that	
2.	Action and Func Delegates	
3.	Anonymous Methods	
4.	Lambdas	
5.	Events	20.03.25
	<b>Collections and LINQ queries</b>	
1.	List<T>	
2.	Dictionary<Tkey, Tvalue>	
3.	ConcurrentDictionary<Tkey, Tvalue>	
4.	Span<T>	
5.	Queue<T>	
6.	Stack<T>	24.03.25
7.	HashSet<T>	
8.	IEnumerable<T> and IQueryable<T>	
9.	LINQ-queries	
	<b>Multithreading</b>	01.04.25
1.	Introduction	
2.	Running Code Simultaneously	
3.	Processes	
4.	Threads	
5.	Parallelism	
	<b>Asynchronous and Synchronous</b>	
1.	Introduction	
2.	Difference Between Concurrency, Parallelism, and Asynchrony	
3.	Async/await methods	
	<b>Concurrency</b>	

1.	Introduction	
2.	Difference Between Concurrency and Multithreading	
3.	Avoid of concurrency issue	
	<b>Exam 1</b>	
1.	Review of all passed items	
2.	Tests	
3.	Review projects	
	<b>Object-Oriented Programming (OOP)</b>	
	What is OOP and its concepts in C#?	
	Inheritance	
	Abstract Classes	
	Read-only Properties in a Class	
	Virtual Methods and Properties	
	Hiding, Overriding, and Abstract Methods	
	Interfaces	
	Interface Inheritance	
	Generic Classes	
	Generic Methods	
	Generic Properties	
	<b>Entity Framework Core (ORM)</b>	
	Entity Framework Core	
	Using Entity Framework Core in ASP.NET Core	
	Modeling and creating tables	
	Creating relationships between tables	
	CRUD with Entity Framework Core	
	Repository pattern for CRUD operation	
	Approaches for obtaining data: Eager, Lazy loading	
	Migration management	
	<b>ASP.NET Core</b>	
	Introduction to ASP.NET Core	
	Rules for creating routes	

	Logging in ASP.NET Core	
	<b>REST and API</b>	
	Introduction to REST	
	Basic principles	
	Http methods and responses	
	<b>Memory Management in .NET</b>	
	Value and reference types	
	Stack and Heap	
	Mutable and Immutable classes	
	Boxing and Unboxing	
	Garbage collector	
	Small/Large Object Heap	
	Managed and unmanaged code	
	Dispose Pattern	
	Finalizer	
	<b>SOLID</b>	
	Single Responsibility Principle	
	Open-closed Principle	
	Liskov substitution Principle	
	Interface Segregation Principle	
	Dependency Inversion Principle	
	Use SOLID in real use cases	
	<b>Architectural/Design Patterns</b>	
	<a href="#">Introduction</a>	
	Architectural patterns	
	Creational design patterns	
	Structural design patterns	
	Behavioral design patterns	
	Repository, Strategy, Dependency Injection pattern	

	<b>Dependency injection (DI)</b>	
	Introduction	
	Dependency Lifecycle	
	Service provider	
	Creating your own services	
	<b>Middlewares</b>	
	Introduction	
	Creating a simple Middleware	
	<b>Authorization and authentication</b>	
	Introduction	
	Authorization and authentication methods	
	Authorization and Authentication in REST	
	Adding Authentication to ASP.NET Core (Bearer)	
	Adding Authorization in ASP.NET Core	
	JWT tokens	
	Role of JWT in REST	
	Header, Payload, Signature in JWT	
	Creating a server for generating JWT tokens	
	<b>Request and Response</b>	
	Data transfer object (DTO)	
	Using record	
	Using the AutoMapper framework	
	<b>Data Validation in ASP.NET Core</b>	
	Introduction	
	Creating services for validation	
	Using the FluentValidation framework	
	<b>MediatR and CQRS</b>	
	Introduction	
	ASP.NET Core: Request Handling	

	<b>Exam 2</b>	
	Tests	
	Review projects	
	<b>Test Driven Development Methodology</b>	
	Creating a Project Using TDD	
	TDD principles	
	Practice: Creating a simple calculator using TDD	
	<b>Unit testing</b>	
	Using the NUnit framework	
	Using the xUnit framework	
	Mock testing	
	Mocking using Moq	
	Mocking using NSubstitute	
	<b>Integration tests</b>	
	Working with WebApplicationBuilderFactory	
	Creating an HttpClient from a WebApplicationBuilderFactory	
	EF Core configuration under different test environments	
	Using services from WebApplicationBuilderFactory	
	<b>DevOps – project publication</b>	
	Introducing Azure	
	Creating resources on Azure	
	Create Azure Key Vault	
	Creating a Resource API	
	Creating SQL Server and Database	
	Creating a Blazor Static Web App	
	Creating a CI-CD for publishing	

