

	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>	03.04.25
1.	Introduction	
2.	Difference Between Concurrency, Parallelism, and Asynchrony	
3.	Async/await methods	
	<b>Concurrency</b>	07.04.25

1.	Introduction	
2.	Difference Between Concurrency and Multithreading	
3.	Avoid of concurrency issue	
4.	<a href="#">Lock statement</a>	
5.	<a href="#">Concurrent collections</a>	
6.	<a href="#">Semaphore</a> and <a href="#">SemaphoreSlim</a>	
7.	<a href="#">Mutex</a>	
	<b>Exam 1</b>	
1.	Review of all passed items	10.04.25
2.	Tests	14.04.25
3.	Review projects	
	<b>ASP.NET Core</b>	17.04.25
1.	Introduction to ASP.NET Core	
2.	Creating a new project	
3.	Create custom Controller	
4.	Enable Swagger	
	<b>Object-Oriented Programming (OOP)</b>	21.04.25
1.	What is OOP and its concepts in C#?	
2.	Inheritance	
3.	Abstract Classes	
4.	Read-only Properties in a Class	
5.	Virtual Methods and Properties	
6.	Hiding, Overriding, and Abstract Methods	
7.	Interfaces	24.04.25
8.	Interface Inheritance	
9.	Generic Classes	
10.	Generic Methods	
11.	Generic Properties	
	<b>REST and API</b>	
1.	Introduction to REST	
2.	Basic principles	

3.	Rules for creating routes	
4.	Stateful vs Stateless communication	
5.	Http methods and responses	05.05.25
6.	RESTful APIs with CRUD operations	
7.	Minimal APIs	07.05.25
8.	CRUD operations with Repository pattern	
	<b>Request and Response</b>	
1.	Data transfer object (DTO)	
2.	Using record	
3.	Using the AutoMapper framework	08.05.25
4.	Using the Mapster framework	
	<b>Data Validation in ASP.NET Core</b>	12.05.25
1.	Introduction	
2.	Creating services for validation	
3.	Using the FluentValidation framework	
	<b>Middleware</b>	
1.	Introduction	
2.	Working Middleware	
	<b>Dependency injection (DI)</b>	14.05.25
1.	Introduction	
2.	Dependency Lifecycle	
3.	Service provider	
4.	Creating your own services	
	<b>Databases</b>	
1.	Relational databases (MySQL, SQL Server, PostgreSQL, Oracle ...)	15.05.25
2.	Non-Relational Databases (MongoDB, Redis, Elasticsearch ...)	
3.	Work with SQL server and Postgres databases	19.05.25
4.	Work with Redis and Elasticsearch databases	22.05.25

	<b>Entity Framework Core (ORM)</b>	26.05.25
1.	Entity Framework Core	
2.	Using Entity Framework Core in ASP.NET Core	
3.	Modeling and creating tables	
4.	Creating relationships between tables	
5.	CRUD with Entity Framework Core	
6.	Repository pattern for CRUD operation	
7.	Approaches for obtaining data: Eager, Lazy loading	
8.	Migration management	
	<b>ASP.NET Core</b>	
	Investigation	
	Logging in ASP.NET Core	
	Serilog	
	Open Telemetry	
	Jaeger	
	<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>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>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	