	Subject	Date
	Basics of C# Programming	
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
	Classes, Structs, Records and Namespaces	
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	
	Improve searching and designing knowledges	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	
	Delegates, Events, and Lambdas	
1.	Delegates and using of that	
2.	Action and Func Delegates	
3.	Anonymous Methods	
4.	Lambdas	
5.	Events	20.03.25
	Collections and LINQ queries	
1.	List<T>	
2.	Dictionary<Tkey, Tvalue>	
3.	ConcurrencyDictionary<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	
	Multithreading	01.04.25
1.	Introduction	
2.	Running Code Simultaneously	
3.	Processes	
4.	Threads	
5.	Parallelism	
	Asynchronous and Synchronous	03.04.25
1.	Introduction	
2.	Difference Between Concurrency, Parallelism, and Asynchrony	
3.	Async/await methods	
	Concurrency	07.04.25

1.	Introduction	
2.	Difference Between Concurrency and Multithreading	
3.	Avoid of concurrency issue	
4.	Lock statement	
5.	Concurrent collections	
6.	Semaphore and SemaphoreSlim	
7.	Mutex	
	Exam 1	
1.	Review of all passed items	10.04.25
2.	Tests	14.04.25
3.	Review projects	
	ASP.NET Core	17.04.25
1.	Introduction to ASP.NET Core	
2.	Creating a new project	
3.	Create custom Controller	
4.	Enable Swagger	
	Object-Oriented Programming (OOP)	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	
	REST and API	
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	
	Request and Response	
1.	Data transfer object (DTO)	
2.	Using record	
3.	Using the AutoMapper framework	08.05.25
4.	Using the Mapster framework	
	Data Validation in ASP.NET Core	12.05.25
1.	Introduction	
2.	Creating services for validation	
3.	Using the FluentValidation framework	
	Middlewares	
1.	Introduction	
2.	Working Middleware	
	Dependency injection (DI)	14.05.25
1.	Introduction	
2.	Dependency Lifecycle	
3.	Service provider	
4.	Creating your own services	
	Databases	
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

	Entity Framework Core (ORM)	26.05.25
1.	Entity Framework Core	
2.	Using Entity Framework Core in ASP.NET Core	
3.	Annotations vs fluent api	29.05.25
4.	Working with logging	
5.	Modeling and creating tables	
6.	Creating relationships between tables	02.06.25
7.	CRUD with Entity Framework Core	
8.	Working with Interceptors	
9.	Repository pattern for CRUD operation	
10.	Eager loading, Lazy loading and Explicit Loading	09.06.25
11.	IEnumerable<T> and IQueryable<T>	
12.	Migration management	11.06.25
	ASP.NET Core	12.06.25
1.	Investigation	
2.	Logging in ASP.NET Core	
3.	Serilog	
4.	Open Telemetry	16.06.25
5.	Jaeger	
	Memory Management in .NET	19.06.25
1.	Value and reference types	
2.	Stack and Heap	
3.	Mutable and Immutable classes	
4.	Boxing and Unboxing	
5.	Garbage collector	
6.	Small/Large Object Heap	
7.	Managed and unmanaged code	23.06.25
8.	Memory leak issue	
9.	Dispose Pattern	
10.	Finalizer	
1	**SOLID**	26.06.25
1.1	Single Responsibility Principle	

1.2	Open-closed Principle	
1.3	Liskov substitution Principle	
1.4	Interface Segregation Principle	
1.5	Dependency Inversion Principle	
2	DRY (Don't repeat yourself)	30.06.25
3	KISS (Keep it simple, stupid)	
4	YAGNI (You ain't gonna need it)	
	Software Architectures	03.07.25
1.	Layered Architecture	
2.	Client Server	
3.	Model View Controller	
4.	Event Driven/Event-bus Architecture	
5.	Monolithic Architecture	
6.	Microservices Architecture	
7.	Clean Architecture	
8.	Domain-Driven Design architectural/approach	
	Design Patterns	07.07.25
1.	Introduction	
2.	Creational design patterns	
3.	Structural design patterns	
4.	Behavioral design patterns	
5.	Repository, Strategy, Dependency Injection pattern	
	Authorization and authentication	
	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	
	MediatR and CQRS	
	Introduction	
	ASP.NET Core: Request Handling	
	Exam 2	
	Tests	
	Review projects	
	Test Driven Development Methodology	
	Creating a Project Using TDD	
	TDD principles	
	Practice: Creating a simple calculator using TDD	
	Unit testing	
	Using the NUnit framework	
	Using the xUnit framework	
	Mock testing	
	Mocking using Moq	
	Mocking using NSubstitute	
	Integration tests	
	Working with WebApplicationBuilderFactory	
	Creating an HttpClient from a WebApplicationBuilderFactory	
	EF Core configuration under different test environments	
	Using services from WebApplicationBuilderFactory	
	DevOps – project publication	
	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	