	Subject	Date
1	**Basics of C# Programming**	
	Introduced agenda of C# course	24.02.25
1.1	C# language and .NET platform	
1.2	Variables	27.02.25
1.3	Data types	
1.4	Static variables and constants	
1.5	Working with the console application	
1.6	Arrays	
1.7	C# arithmetic/comparison operations	
1.8	If else and Switch case constructions	03.03.25
1.9	Loops (For, Foreach, While, Do-while)	
1.10	Methods	
1.11	Method with params parameter	
1.12	Ref and Out keywords in methods	
1.13	Local and recursive function	
1.14	Tuple and Enum	06.03.25
2	**Classes, Structs, Records and Namespaces**	
2.1	Classes and objects	
2.2	Constructors, initializers, and destructors	
2.3	Fields and properties	
2.4	Method and static method in class	
2.5	Structs	
2.6	Record type	
2.7	Namespace and global namespace	
2.8	Partial and extended classes	
2.9	Value types and reference types	
2.10	Nullability in value types and reference types	
2.11	Accessibility of the class and class members	
3	Improve searching and designing knowledges	
3.1	How to search/find what you need?	
3.2	How to use AI chats correctly?	
3.3	Select a project to atomize your organization	

4	**Delegates, Events, and Lambdas**	
4.1	Delegates and using of that	
4.2	Action and Func Delegates	
4.3	Anonymous Methods	
4.4	Lambdas	
4.5	Events	
5	**Object-Oriented Programming (OOP)**	
5.1	What is OOP and its concepts in C#?	
5.2	Inheritance	
5.3	Abstract Classes	
5.4	Read-only Properties in a Class	
5.5	Virtual Methods and Properties	
5.6	Hiding, Overriding, and Abstract Methods	
5.7	Interfaces	
5.8	Interface Inheritance	
5.9	Generic Classes	
5.10	Generic Methods	
5.11	Generic Properties	
6	**Collections and LINQ queries**	
6.1	List<T>	
6.2	Dictionary<Tkey, Tvalue>	
6.3	ConcurrencyDictionary<Tkey, Tvalue>	
6.4	Span<T>	
6.5	Queue<T>	
6.6	Stack<T>	
6.7	HashSet<T>	
6.8	IEnumerable<T> and IQueryable<T>	
6.9	LINQ-queries	
	Exam 1	
	Tests	
	Review projects	

7	**Entity Framework Core (ORM)**	
7.1	Entity Framework Core	
7.2	Using Entity Framework Core in ASP.NET Core	
7.3	Modeling and creating tables	
7.4	Creating relationships between tables	
7.5	CRUD with Entity Framework Core	
7.6	Repository pattern for CRUD operation	
7.7	Approaches for obtaining data: Eager, Lazy loading	
7.8	Migration management	
8	**ASP.NET Core**	
8.1	Introduction to ASP.NET Core	
8.2	Rules for creating routes	
8.3	Logging in ASP.NET Core	
9	**REST and API**	
9.1	Introduction to REST	
9.2	Basic principles	
9.3	Http methods and responses	
10	**Multithreading**	
10.1	Introduction	
10.2	Running Code Simultaneously	
10.3	Processes	
10.4	Threads	
11	**Parallelism**	
11.1	Introduction	
11.2	Difference Between Concurrency and Parallelism	
11.3	Launching a New Thread	
12	**Asynchronous and Synchronous**	
12.1	Introduction	

12.2	Difference Between Concurrency, Parallelism, and Asynchrony	
12.3	Async/await methods	
13	**Concurrency**	
13.1	Introduction	
13.2	Difference Between Concurrency and Multithreading	
13.3	Avoid of concurrency issue	
14	**Memory Management in .NET**	
14.1	Value and reference types	
14.2	Stack and Heap	
14.3	Mutable and Immutable classes	
14.4	Boxing and Unboxing	
14.5	Garbage collector	
14.6	Small/Large Object Heap	
14.7	Managed and unmanaged code	
14.8	Dispose Pattern	
14.9	Finalizer	
15	**SOLID**	
15.1	Single Responsibility Principle	
15.2	Open-closed Principle	
15.3	Liskov substitution Principle	
15.4	Interface Segregation Principle	
15.5	Dependency Inversion Principle	
15.6	Use SOLID in real use cases	
16	**Architectural/Design Patterns**	
16.1	Introduction	
16.2	Architectural patterns	
16.3	Creational design patterns	
16.4	Structural design patterns	
16.5	Behavioral design patterns	
16.6	Repository, Strategy, Dependency Injection pattern	

17	**Dependency injection (DI)**	
17.1	Introduction	
17.2	Dependency Lifecycle	
17.3	Service provider	
17.4	Creating your own services	
18	**Middlewares**	
18.1	Introduction	
18.2	Creating a simple Middleware	
19	**Authorization and authentication**	
19.1	Introduction	
19.2	Authorization and authentication methods	
19.3	Authorization and Authentication in REST	
19.4	Adding Authentication to ASP.NET Core (Bearer)	
19.5	Adding Authorization in ASP.NET Core	
19.6	JWT tokens	
19.7	Role of JWT in REST	
19.8	Header, Payload, Signature in JWT	
19.9	Creating a server for generating JWT tokens	
20	**Request and Response**	
20.1	Data transfer object (DTO)	
20.2	Using record	
20.3	Using the AutoMapper framework	
21	**Data Validation in ASP.NET Core**	
21.1	Introduction	
21.2	Creating services for validation	
21.3	Using the FluentValidation framework	
22	**MediatR and CQRS**	
22.1	Introduction	

22.2	ASP.NET Core: Request Handling	
	Exam 2	
	Tests	
	Review projects	
23	**Test Driven Development Methodology**	
23.1	Creating a Project Using TDD	
23.2	TDD principles	
23.3	Practice: Creating a simple calculator using TDD	
24	**Unit testing**	
24.1	Using the NUnit framework	
24.2	Using the xUnit framework	
24.3	Mock testing	
24.4	Mocking using Moq	
24.5	Mocking using NSubstitute	
25	**Integration tests**	
25.1	Working with WebApplicationBuilderFactory	
25.2	Creating an HttpClient from a WebApplicationBuilderFactory	
25.3	EF Core configuration under different test environments	
25.4	Using services from WebApplicationBuilderFactory	
26	**DevOps – project publication**	
26.1	Introducing Azure	
26.2	Creating resources on Azure	
26.3	Create Azure Key Vault	
26.4	Creating a Resource API	
26.5	Creating SQL Server and Database	
26.6	Creating a Blazor Static Web App	
26.7	Creating a CI-CD for publishing	