					A	jratilg	gan so	atlar	
					Offline	On	line	On	site
	#		Mavzu	o the body of the		Odatiy	Bootcamp	Odatiy	Bootcamp
			Jami		324	216	540	216	720
1			C# PROGRAMMI	NG LANGUAGE	108	72	180	72	240
	1.1		C	# Basics	36	24	60	24	80
		1.1.1	Tanishuv va Team building	Tanishuv va Team building	3	2	3	2	4
		1.1.2	.NETni o'rnatish va dasturlash muhitini s	1. Undestanding C# and .NET 2. Setup development environment 3NET SDK vs .NET Runtime 4NET CLI 5. The first Console Application	3	2	6	2	8
		1.1.3	Ma'lumot toifalari va o'zgaruvchilar	<ol> <li>C# gramatikasi.</li> <li>Variables</li> <li>Naming convention</li> <li>Primitive Data types</li> <li>Dynamic vs object types</li> <li>Getting and Setting default values</li> <li>Input/Output</li> </ol>	3	2	3	2	4
		1.1.4	Toifalar o'rtasida Casting va Converting	1. Implicit and explicit casting 2. System.Convert method 3. ToString() 4. Parse and TryParse	3	2	3	2	4

1.2		C	# intermediate	36	24	60	24	80
	1.1.11	Amaliyot va oraliq nazorat	Amaliyot va oraliq nazorat	3	2	3	2	4
	1.1.10		<ol> <li>One demensional</li> <li>Multi demensional</li> <li>Array class metodlari</li> </ol>	6	2	9	2	12
	1.1.9	Matnlar bilan ishlash	<ol> <li>String classi metodlari</li> <li>String formatting</li> <li>String interpolation</li> <li>Verbatim string</li> </ol>	3	2	9	2	12
	1.1.8	Funksiyalar bilan ishlash	<ol> <li>Funksiya nima?</li> <li>Funksiyaning kiruvchi parametrlari(ref and out)</li> <li>Qiymat qaytaradigan va qaytarmaydigan funksiyalar</li> <li>Rekursiv funksiyalar</li> <li>Debugging</li> </ol>	3	4	6	4	8
	1.1.7	Takrorlanish operatorlari	<ol> <li>for</li> <li>while</li> <li>do while</li> <li>foreach</li> <li>continue, break</li> </ol>	3	2	6	2	8
	1.1.6	Shart va tanlash operatorlari	1. If 2. If else 3. nested if 4. Ternary operator 5.switch	3	2	6	2	8
	1.1.5	Operatorlar	<ol> <li>Binary</li> <li>Unary</li> <li>Assignment</li> <li>Logical</li> <li>Conditional Logical</li> <li>Bitwise and binary shift</li> <li>Miscellaneous(nameof, sizeof)</li> </ol>	3	2	6	2	8

1.2.1	OOPga kirish	<ol> <li>OOP nima?</li> <li>Class, field, method, constructor, destructor</li> <li>Object instance hosil qilish, this keyword</li> <li>Access modifiers</li> </ol>	6	4	6	4	
1.2.2	OOP Concepts, Encapsulation	<ol> <li>OOP pillars</li> <li>Encapsulation</li> <li>getter and setter</li> </ol>	3	2	6	2	
1.2.3	Inheritence, base, static, sealed keyoword	1. Inheritence 2. base keyword 3. sealed class and methods 4. static class, static constructors	3	2	6	2	:
1.2.4	Polymorphism, Aggregation	<ol> <li>Polymorphism</li> <li>function and operator overloading</li> <li>Overriding</li> <li>Aggregation</li> </ol>	3	2	6	2	
1.2.5	Abstraction, Interface	<ol> <li>Abstraction, abstract class</li> <li>Interface</li> <li>nested classes</li> <li>partial class</li> </ol>	3	2	6	2	
1.2.6	Enum, struct va generic toifalari	<ul><li>1. Enum</li><li>2. Generics</li><li>3. struct</li></ul>	3	2	3	2	4
1.2.7	Collections(1-qism)	<ol> <li>Systems.Collections</li> <li>Array vs ArrayList</li> <li>List, LinkedList, SortedList</li> <li>Stack, Queue</li> <li>Dictionary vs HashTable</li> </ol>	3	2	6	2	{
1.2.8	Collections(2-qism)	<ol> <li>IEnumerable, ICollection, IList, IDictionary</li> <li>Indexer</li> <li>Iteration, yield operator</li> </ol>	3	2	6	2	

	1.2.9	Tuple va Nullable types	<ol> <li>Tuple</li> <li>ValueTuple</li> <li>Nullable types</li> <li>Null-coalescing operator</li> </ol>	3	2	3	2	4
	1.2.10	Event va Delegate types	<ol> <li>Delegate</li> <li>Event</li> <li>Anonymous methods</li> <li>Lambda expression</li> </ol>	3	2	9	2	12
	1.2.11	Amaliyot va oraliq nazorat	Amaliyot va oraliq nazorat	3	2	3	2	4
1.3			C# advanced	36	24	60	24	80
	1.3.1	Exception handling	<ol> <li>Exceptions</li> <li>try, catch, final</li> <li>throw</li> </ol>	3	2	3	2	4
	1.3.2	Working with text	<ol> <li>StringBuilder</li> <li>Regex</li> <li>String comparison</li> </ol>	6	4	6	4	8
	1.3.3	Vaqt bilan ishlash	<ol> <li>DateTime class</li> <li>Date, DateOnly, TimeOnly</li> <li>TimeStamp</li> </ol>	3	2	6	2	8
	1.3.4	File I/O	<ol> <li>File, FileInfo</li> <li>StreamWriter, StreamReader</li> <li>MemoryStream, FileStream</li> <li>Directory, DirectoryInfo</li> <li>DriveInfo</li> <li>Path</li> </ol>	3	2	6	2	8
	1.3.5	Object serialization, JSON	<ol> <li>JsonSerializer</li> <li>XmlSerializer</li> <li>BinaryFormatter</li> </ol>	3	2	6	2	8
	1.3.6	Workin with network(API)	1. System.Net, WebClient 2. API connections, URI 2. HttpClient, HttpMethod	3	2	6	2	8

		1.3.7	MultiThreading, Parallel and Asynchronous programming	<ol> <li>MultiThreading</li> <li>Asynchronous Programming</li> <li>Paraller Programming</li> </ol>	6	4	9	4	12
		1.3.8	TelegramBotApi	<ol> <li>Polling vs Webhook</li> <li>SendMessage, SendSticker, SendPhoto</li> <li>ReplyKeyboardMarkup and InlineKeyboardMarkup</li> </ol>	6	4	15	4	20
		1.3.9	Amaliyot va oraliq nazorat	Amaliyot va oraliq nazorat	3	2	3	2	4
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	2.1		Po	stgreSQL	36	24	60	24	80
		2.1.1	PostgreSQL MOBT	1. Database 2. Database Management Systems (DBMS) (Postgresql, Oracle) 3. Database types(relational, nosql) 4. PostgreSQL and PgAdmin install 5. Tablespace, Schema, Table, User	3	2	3	2	4
		2.1.2	Data types and Constraints	<ol> <li>Connect To a PostgreSQL Database</li> <li>Server</li> <li>Data types</li> <li>Constraints =&gt; NOT NULL, UNIQUE, PK, FK, CHECK</li> </ol>	3	2	6	2	8
		2.1.3	SQL so'rovlar tili, DDL, DML buyruqlari	1. DDL(CREATE, ALTER, TRUNCATE, DROP) 2. DML(INSERT, SELECT, UPDATE, DELETE)	3	2	6	2	8
		2.1.4	DSL, TCL, Build Structure	1. DCL (Grant, Revoke) 2. TCL(Commit, Rollback, Savepoint) 3. Build Structure(ONE to ONE, ONE to MANY, MANY to ONE, MANY to MANY)	3	2	6	2	8
		2.1.5	Opertorlar, PostgreSQL fundamentals	1. Operators(Arithmetic, Comparison, Logic) 2. PostgreSQL fundamentals (select distinct, order by, where, limit, fetch, in, between, like, is null, table and column aliases)	3	2	6	2	8

		3.1.1	Introduction to ASP.NET Core Web API	<ol> <li>Introduction to REST</li> <li>What is ASP.NET Web API?</li> <li>First application</li> <li>Startup va Program filelari</li> </ol>	3	2	6	2	8
	3.1		ASP.NET Core	e Web API Introduction	36	24	60	24	80
3			.NET B	Backend	108	72	180	72	240
		2.1.12	Kurs ishi va Oraliq nazorat	Kurs ishi va Oraliq nazorat	3	2	3	2	4
		2.1.11	Postgresql Advanced Features	<ol> <li>JSON, JSONB</li> <li>Indexing</li> <li>Postgres Cron</li> <li>CREATING TABLE PARTITIONS</li> <li>Vertical table</li> </ol>	3	2	6	2	8
		2.1.10	Triggers, Lock and Privileges	<ol> <li>Triggers</li> <li>Crypto</li> <li>Lock</li> <li>Privileges</li> </ol>	3	2	6	2	8
		2.1.9	Funksiyalar bilan ishlash	<ol> <li>Functions(aggregate, math, String, Date)</li> <li>SQL functions</li> <li>PL/PgSql functions</li> </ol>	3	2	6	2	8
		2.1.8	Viewlar bilan ishlash	<ol> <li>Views(Simple, Complex, Inline, Materialized)</li> <li>Managing PostgreSQL Views(CREATE, DROP, UPDATABLE)</li> </ol>	3	2	3	2	4
		2.1.7	Extra fundamentals for table	<ol> <li>Subquery, ANY, ALL, EXISTS, Set</li> <li>Operations (UNION, Intersect, Except)</li> <li>CONDITIONAL EXPRESSIONS &amp; OPERATORS (case, coalesce, nullif, cast)</li> </ol>	3	2	3	2	4
		2.1.6	Joining Multiple Tables	<ol> <li>Joining Multiple Tables (join, cross join, natural join)</li> <li>AGGREGATE FUNCTIONS (count, avg, max, min, sum)</li> <li>Grouping Data (group by, having)</li> </ol>	3	2	6	2	8

3.2		ASP.NET Core Web	API, WebMVC additional	36	24	60	24	8
	3.1.10	Amaliyot va Oraliq nazorat		3	2	3	2	
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	3.1.7	RESTful API with Repository Pattern	<ol> <li>What is RESTful api?</li> <li>Repository Pattern haqida</li> <li>Implement RESTful api with RP</li> </ol>	6	4	9	4	1
	3.1.6	CRUD operations	<ol> <li>Get metodi bilan ishlash</li> <li>Post metodi bilan ishlash</li> <li>Put va Patch metodlari</li> <li>Delete metodi</li> </ol>	6	4	9	4	1
	3.1.5	Model binding and validation	<ol> <li>Model binding</li> <li>Model Validation</li> <li>Handling validation errors</li> </ol>	3	2	6	2	
	3.1.4	Global error handling and Logging	<ol> <li>ILogger interfeysi</li> <li>Serilog configuration</li> <li>Error handling</li> </ol>	3	2	6	2	
	3.1.3	Middleware, Request pipeline, DI Container	<ol> <li>Middleware nima?</li> <li>Request pipeline</li> <li>Dependency Injection</li> <li>DI Container</li> <li>Registering services</li> </ol>	3	2	6	2	
	3.1.2	Controller, Action, Routing	<ol> <li>Controller nima?</li> <li>Action bilan ishlash</li> <li>IActionResult, ActionResult</li> <li>Routing nima?</li> <li>Fallback routes</li> </ol>	3	2	6	2	

3.3		ASP.NI	ET Advanced	36	24	60	24	80
	3.2.9	Amaliyot va Oraliq nazorat	Amaliyot va Oraliq nazorat	3	2	3	2	4
	3.2.8	Authorization server with IdentityServer4	<ol> <li>IdentityServer options</li> <li>Identity resource</li> <li>API scope, API resource, API client</li> <li>Authorization</li> </ol>	6	4	9	4	1
	3.2.7	Cookies	<ol> <li>What is Cookies?</li> <li>Setting and getting cookies</li> </ol>	3	2	6	2	
	3.2.6	ASP.NET Identity	<ol> <li>Create IdentityDbContext</li> <li>Register, Login, Logout</li> <li>Identity services</li> </ol>	3	2	6	2	
	3.2.5	Authentication with JWT	<ol> <li>Authentication</li> <li>JWT(JSON Web token)</li> <li>Authentication with JWT</li> </ol>	6	4	9	4	1
	3.2.4	ASP.NET Core MVC	<ol> <li>MVC haqida</li> <li>Views, Strongly typed views</li> <li>Layout, ViewStart, ViewImport</li> <li>Tag helpers</li> <li>Statik fayllar bilan ishlash</li> <li>Razor view</li> </ol>	6	4	9	4	1
	3.2.3	CORS	<ol> <li>What is CORS?</li> <li>Enabling CORS</li> <li>Setting CORS origins and HTTP methods</li> <li>Creating a custom CORS policy</li> </ol>	3	2	6	2	
	3.2.2	Caching, Rate limiting	<ol> <li>Cache types</li> <li>Cache-store, Expiration model, Validation model</li> <li>Etag</li> <li>Rate limiting</li> </ol>	3	2	6	2	
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	4.1			Algorithms	12	8	24	8	32
4			Data Structur	res and Algorithms	36	24	60	24	80
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		3.3.8	Agile, Jira, Trello	1. Agile 2. Jira 3. Trello	3	2	6	2	8
		3.3.7	Devops	<ol> <li>What is CI/CD</li> <li>Github actions</li> </ol>	3	2	6	2	8
		3.3.6	Dockerizing ASP.NET Core app	<ol> <li>Create dockerfile</li> <li>Docker container</li> <li>Docker image</li> <li>Docker hub</li> </ol>	6	4	9	4	12
		3.3.5	Azure	<ol> <li>Azure services</li> <li>Publish and Deploy the app</li> </ol>	3	2	6	2	8
		3.3.4	Deploy to IIS Server	<ol> <li>IIS Server overview</li> <li>IIS Modules</li> <li>Publish to IIS</li> </ol>	3	2	6	2	8
		3.3.3	Software Testing	<ol> <li>Unit Testing</li> <li>AAA pattern</li> <li>FIRST pattern</li> <li>TDD</li> <li>Test Controllers</li> <li>Mock tests</li> </ol>	6	4	9	4	12
		3.3.2	Clean Design	1. SOLID 2. DRY 3. GoF	6	4	9	4	12
		3.3.1	Coding Standards	Clean Code     Refactoring	3	2	6	2	8

	7	<b>Fuzuvch</b>	ni:	X. Abduxoshimov					
5				Amaliyot	36	24	60	24	80
		4.2.8	Graph (Undirected)	Graph (Undirected)	3	2	6	2	8
		4.2.7	Graph (Directed)	Graph (Directed)	3	2	6	2	8
		4.2.6	Trie	Trie	3	2	3	2	4
		4.2.5	Tree	Tree	3	2	6	2	8
		4.2.4	HashTable	HashTable	3	2	3	2	4
		4.2.3	Stack and Queue	LinkedList	3	2	3	2	4
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	4.2	4.2.1	Asymptotic Analysis	Asymptotic Analysis	3	2	3	2	40
	4.2	4.1.4	Array and Matrix Algorithms  Dynamic Programming	2. Valid Parentheses  1. Single Number 2. Move Zeros  1. Fibonacci Number 2. Iterative Method 3. Recursive Method 4. Recursive-Make it work 5. DP-Make it efficient 6. Memoization-Top Down 7. Tabulation-Top Down 8. Coin Change 2	3 3	2 2	6	2 2	8 8
		4.1.1	Number Algorithms String Algorithms	<ol> <li>Five Websites for DSA,</li> <li>LeetCode Platform, LeetCode Problems</li> <li>Power of Two</li> <li>Valid Perfect Square</li> <li>Valid Anagram</li> </ol>	3	2	6	2	8