

<b>Óbuda University</b> Bánki Donát Faculty of Mechanical and Safety Engineering		Insitute of Mechatronics and Vehicle Engineering			
<b>Subject title and code:</b>		<b>Algorithms and Data Structures, BMXAAE2BNF</b>			<b>Credits:</b> 4
Full-time study		2023/2024	ac. 2	semester	
		year			
<b>The course is available at:</b>		mechatronical engineering			
<b>Supervised by:</b>		Dr. habil Laufer Edit		<b>Instructors:</b> Dr. Frigyik András, Dr. habil Laufer Edit	
<b>Prerequisite (neptun code):</b>		-			
<b>Weekly number of lessons</b>					
Lecture: 1	Group seminar:	Lab: 3	Consultation:		
<b>Way of assessment:</b>		Midterm (Written) mark			
<b>Online consultation (in case it's required):</b> ... (BBB link)					
<b>Educational goal:</b>	Developing algorithmic thinking, introducing the basic tools of programming, which are needed during engineering work. The acquisition of basic algorithms and data structures. Show basic computer programming techniques and approaches. Students learn about the basic algorithms and data structures using an easy to learn programming language. This subject helps to solve complex engineering problems.				
<b>Schedule</b>					
Education week	<b>Topics</b>				
1.	<i>Theory:</i> The aim and tools of computer programming. Programming paradigms. Basic data structures and their operations. (integers, real, boolean). Conditional statement. <i>Practice:</i> Visual Studio environment Basic methods of Console class. Variables.				
2.	<i>Practice:</i> Application of mathematical functions. Conditional statement.				
3.	<i>Theory:</i> Loops. Array data structure. Value and reference types. <i>Practice:</i> Loops. Random number generator.				
4.	<i>Practice:</i> Array data structure. Operations with arrays.				
5.	<i>Theory:</i> Methods. Elementary programming theorems. <i>Practice:</i> Methods in practice. Application of elementary programming theorems.				
6.	<i>Practice:</i> <b>Test 1</b>				
7.	<i>Theory:</i> Character and string type. <i>Practice:</i> Character operations. Strings as character arrays.				
8.	<i>Practice:</i> String operations.				
9.	<i>Theory:</i> File management. <i>Practice:</i> Simple-structure text file management.				
10.	<i>Practice:</i> Delimited text file management.				
11.	<i>Theory:</i> Folder operations. Complex programming theorems. <i>Practice:</i> Folder operations.				
12.	<i>Practice:</i> Complex task.				
13.	<i>Theory:</i> <b>Test</b> <i>Practice:</i> <b>Test 2</b>				
14.	<i>Practice:</i> <b>Retake test</b>				
<b>Mid-semester requirements</b>					
Test		Assignment to be submitted		Lab measurement	
amount	dates	amount	deadlines	amount	dates
3	6,13				
According to the Study and Examination regulations of Óbuda University attendance of group seminars and lab exercises are mandatory.					
Other requirements for participation in sessions not covered by the regulations and restrictions on substitutions:					

All main areas of the course are evaluated by tests. The course is to be considered successfully executed and a **signature** is obtained if and only if both lab tests (separately), and the average of the small tests are higher than 40%.

Signature is **denied** if the student cannot justify the absence for the test, has failed to write any of the tests, or small tests more than twice, or absences exceed the number of classes specified in TVSZ.

**During the semester**, the signature requirements can be **replaced** in the following cases: one of the laboratory tests failed; illness. In this way, only one of the tests can be rewritten.

**Final grade is calculated** in the following way: 60% average score of the lab tests, 10% average of the small tests, 30% theory test.

Test		Assignment to be submitted		Lab measurement	
maximum points available	minimum score required to pass /test	maximum points available	minimum score required to pass / assignment	maximum points available	minimum score required to pass /lab
100points	40points	...points	...points	...points	...points

<b>Total number of points achievable in semester:</b> 100points				
<b>Grading thresholds</b>	<b>satisfactory</b> 40 % and above	<b>average</b> 55 % and above	<b>good</b> 70 % and above	<b>excellent</b> 85 % and above
Other evaluation criteria:				
<b>Receive a signature denied entry:</b>	if the student cannot justify the absence for the test, has failed to write any of the tests, or small tests more than twice, or absences exceed the number of classes specified in TVSZ.			
<b>Required references:</b>	Moodle materials			
<b>Recommended references:</b>	Computer Programming: The Bible: Learn From The Basics to Advanced of Python, C, C++, C#, HTML Coding, and Black Hat Hacking Step-by-Step, Createspace Independent Publishing Platform, 2018. Robert Ciesla, Programming basics, Getting Started with Java, C#, Python, Apress, 2021			
<b>Quality assurance methods of the subject:</b>				

Things, that are not included, can be found within the regulations of Óbuda University.