

<b>Óbuda University</b> Bánki Donát Faculty of Mechanical and Safety Engineering		Institute 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		2024/2025	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>	To develop algorithmic thinking, introduce the basic tools of programming, which are needed during engineering work. To acquire of basic algorithms and data structures. To 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	Topics				
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> Rector's holiday				
11.	<i>Theory:</i> Complex programming theorems. <i>Practice:</i> Delimited text file management.				
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			8	2,3,4,5,7,8,9,11
<i>According to the Study and Examination regulations of Óbuda University attendance of group seminars and lab exercises are mandatory.</i>					
Other requirements for participation in sessions not covered by the regulations and restrictions on substitutions:					

During the semester, in accordance with the schedule above, a student can make up one of the midterms if they have a valid official absence note (from a doctor or from a coach). The make up test for theory will happen during the semester at a separately assigned time. The blitz quizzes cannot be made up.

All main areas of the course are evaluated by tests. For the midterms only those solution elements (data or control structures and algorithms) are acceptable that were covered either in the lectures or at the lab sessions. Those problems that can be solved by using programming theorems are expected to be solved that way.

The course is to be considered successfully executed and a **midterm grade** is obtained if and only if both lab tests (separately), and the theory test results 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 miss blitz quizzes more then twice, or the number of absences exceeds the number specified in SRS.

**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.

Percentage-wise contribution of the different tests to the final grade: Lab midterms together 60%, theory midterm 40%. Blitz quizzes provide extra points: 4-4 points to lab and theory midterms, respectively.

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 smalls tests more then twice, or absences exceed the number of classes specified in SRS.			
<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.