Óbuda University Bánki Donát Faculty of Mechanical and Safety Engineering				Institute of Mechatronics and Vehicle Engineering			
Subject title and code:		**Python Programming BMVPYE4BNF**				**Credits:**	*5*
Full-Time Study	2024/2025	*ac. year*	2.	*semester*			
The course is available at:		Mechatronic Engineering					
Supervised by:		Dr. habil Edit Laufer		**Lecturers:**	Bence Varga		
Prerequisite (neptun code):		-					
Weekly number of lessons							
Lecture:	2	Exercise:	-	Laboratory ex.:	-	Consultation	-
Way of assessment:		Midterm Grade	(Writing)				
***Online Consulatation (in case it's required)*:**				*https://bbb2.banki.hu/b/var-3hq-469 (BBB link)*			
Educational goal:	*The aim of the course is to familiarize students with the basics of the Python programming language, the steps of programming, and the ability to develop applications independently. The course will help them to deal with more complex engineering problems. In the first half of the semester, students will learn the features of the Python programming language from the basics (no prior programming knowledge is required), while in the second half of the semester, they will deepen and extend their knowledge in a practice-oriented way through some interesting applications (data table processing, data visualisation, API operations, image processing and machine vision basics).*						

Schedule

Education week	**Topics**
1.	Introduction to Python, language basics, python interpreter. The print function.
2.	Types, type conversion. Variable handling in Python.
3.	Program flow control, if-else statements and loops.
4.	Data structures (lists, sets, tuples and dictionaries)
5.	Python methods.
6.	Introduction to Object Oriented Programming in Python. (Classes and objects)
7.	Python Libraries I: Numpy (matrix operations, linear algebra basics)
8.	Python Libraries II: Pandas (data processing, advanced file management), CSV files
9.	Python Libraries III: Matplotlib (data visualization)
10.	Python Libraries IV: JSON (JSON serialization, API query)
11.	Python Libraries V: OpenCV - image processing
12.	Python Libraries V: OpenCV - edge and shape detection
13.	Midterm Test
14.	Retake Test

Mid-semester requirements

Test		Assignment to be submitted		Lab measurements	
Amount	Schedule	Amount	Deadline	Amount	Schedule
1pcs.	13. week	-	-	-	-

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:

As per the schedule above, students are expected to take one midterm tests during the semester.

A student will be withdrawn from the course:

- if the absences exceed the threshold given by the regulations and they are unable to provide a justification or;
- the student failed to participate on both midterm- or retake test.

Final grade is calculated based on the scores obtained from the midterm test as shown below.

The midterm tests can be retaken on the 14. week of education.

Students with signature denied entry are eligible for a signature retake exam that can be taken in the first two weeks of the exam period.

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
100 points	40 points	-	-	-	-

Total number of points achievable in semester:	100 points

Grading thresholds	**Pass** from 40 %	**Average** from 55 %	**Good** from 70 %	**Excellent** from 85 %

Other evaluation criteria: -

Receive a signature denied entry:	If a student's absences exceed the threshold given by the regulations and they are unable to provide a justification, or the student failed to participate on both midterm- or retake test.
Required references:	MOODLE
Recommended references:	Mark Lutz: Learning Python Web: https://www.python.org/ https://www.w3schools.com/python/

Quality assurance methods of the subject:	

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