University of Gdańsk

Subject card

Subject name and code	Introduction to Programming, PG_00153241		
Field of study	Mathematical Modeling and Data Analysis		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2024/2025
Education level	Bachelor's studies	Subject group	Obligatory subject group in the field of study
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	1	ECTS credits	5.0
Learning profile	academic	Assessment form	credit
Conducting unit	Institute of Mathematics -> Faculty of Mathematics, Physics and Informatics -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Iwona Krzyżanowska	
	Teachers	dr Iwona Krzyżanowska dr hab. Maciej Mroczkowski	

Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	60.0	0.0	0.0	60
	E-learning hours included: 0.0						

Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
	Number of study hours	60	5.0	60.0	125

Subject objectives	Students acquire the ability to algorithmize simple problems and implement them in a high-level, general-purpose programming language, e.g. Python, based on the basic elements of this language. Developing the ability to control and verify one's own and other people's reasoning and source code. Preparation for in-depth intellectual, literary and technical exploration of IT problems for which simple tools are not sufficient.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[MMiADL3_U09] is able to use the learned software package or the learned programming language to solve selected problems from the known fields, in particular from mathematical analysis, linear algebra and statistics	The student is able to formulate an algorithm for a simple problem, e.g. mathematics or data analysis, and is able to implement this algorithm in Python by selecting appropriate data types and control instructions. The student is able to design the structure of the program, separating subroutines (functions).	[SU2] presentation/project/paper/ report [SU3] text preparation/written work
[MMiADL3_U13] knows how to use computer programmes in the field of data analysis	The student is able to formulate an algorithm for a simple problem, e.g. mathematics or data analysis, and is able to implement this algorithm in Python by selecting appropriate data types and control instructions. The student is able to design the structure of the program, separating subroutines (functions).	[SU2] presentation/project/paper/ report [SU3] text preparation/written work
[MMiADL3_U11] knows how to arrange and analyse an algorithm in accordance with the specification and save it in the selected programming language	The student is able to formulate an algorithm for a simple problem, e.g. mathematics or data analysis, and is able to implement this algorithm in Python by selecting appropriate data types and control instructions. The student is able to design the structure of the program, separating subroutines (functions).	[SU2] presentation/project/paper/ report [SU3] text preparation/written work
[MMiADL3_W09] knows and understands the basics of computational and programming techniques supporting mathematician's work and understands their limitations	The student knows and understands the basic types of variables, expressions, basic control statements, how to define functions and basic input-output operations in Python. The student understands their limitations.	[SW2] presentation/project/paper/ report [SW3] text preparation/written work
[MMiADL3_U12] can compile, run and test a self-written computer programme	The student is able to compile, run and test a computer program written independently.	[SU2] presentation/project/paper/ report [SU3] text preparation/written work [SU8] observation of student's independent or team work
[MMiADL3_K03] is ready to work in a team; understands the need for systematic work on all projects that have a long-term character	The student is ready for teamwork; understands the need to systematically work on all long-term projects.	[SK8] observation of student's independent or team work
[MMiADL3_U10] is able to recognise problems, including practical issues, that can be solved algorithmically; can make a specification of such a problem	The student is able to formulate an algorithm for a simple problem, e.g. mathematics or data analysis, and is able to implement this algorithm in Python by selecting appropriate data types and control instructions. The student is able to design the structure of the program, separating subroutines (functions).	[SU2] presentation/project/paper/ report [SU3] text preparation/written work

Subject contents

1. Preparing the environment.
2. Basic types of variables (lists, dictionaries, tuples, sets).
3. Creating simple scripts.
4. Conditional if statement.
5. Pseudo-random numbers.
6. For, while loops.
7. Working with a file, writing, reading, modifying.
8. Testing and error handling.
9. Writing your own functions.
10. GUI graphical user interface, e.g. tkinter module, graphics.py
11. Introduction to the classes.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
tests and/or project	0.0%	100.0%
observation of the student's attitude	100.0%	0.0%

Recommended reading

Basic literature	1. https://docs.python.org/3/ 2. Lutz M., Python. Wprowadzenie.

	Supplementary literature	• Heinold B., A Practical Introduction to Python Programming • McKinney W., Python w analizie danych. Przetwarzanie danych za pomocą pakietów Pandas i NumPy oraz środowiska IPython
	eResources addresses	
Example issues/ example questions/ tasks being completed	none	
Work placement	Not applicable	

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