GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Basics of programming, PG_00061909		
Field of study	Materials Engineering, Materials Engineering		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2026/2027
Education level	first-cycle 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	2	Language of instruction	Polish
Semester of study	3	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Division of Electrochemistry and Surface Physical Chemistry -> Institute of Nanotechnology and Materials Engineering -> Faculty of Applied Physics and Mathematics -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Mateusz Cieślik	
	Teachers	dr inż. Mateusz Cieślik Michał Kibitlewski - Dominów	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	0.0	30.0	15.0	0.0	45

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	45	5.0	50.0	100

Subject objectives

The goal of the course is to introduce students to the world of programming by teaching the fundamentals of Python. Students will acquire skills in writing, analyzing, and running simple programs, as well as solving algorithmic problems. The course aims to develop logical thinking skills, understanding of program structure, and practical usage of Pythons popular libraries.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U04] Can use information and communication techniques used for the execution of typical engineering tasks, can apply learnt methods and mathematical and physical models to describe and explain chemical phenomena and processes.	The student writes simple programs that assist in solving problems related to the field of study.	[SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools
[K6_W05] Has the knowledge of mechanics, technology and electrical engineering, including engineering graphics and using computer aid, the use of databases in the design of technological processes.	The student examines and solves fundamental programming issues. They use high-level programming language constructs that are correct both syntactically and semantically. The student writes and modifies programs in this language, identifies and resolves program errors, and can explain and apply basic programming techniques.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects

<table>
<tr><td>Subject contents</td><td>Course content – laboratory

The course is designed to introduce students to the basics of Python programming with an emphasis on data science applications. The program covers the basics of the Python language, data manipulation, and the basics of data analysis.Students will be introduced to the basics of Python, starting with an introduction to the language, learning the basic components of the language, such as data types (numbers, text, lists, dictionaries, tuples) and operators and basic operations. They will also learn about control structures, including conditionals and loops, and functions, including their definition, arguments, and return values.Students will be introduced to libraries such as Numpy and Pandas, and learn basic operations on arrays and DataFrame and Series data structures. The next classes will focus on data manipulation, including loading and saving data (CSV, Excel) and data operations such as filtering, sorting, and grouping. The course will conclude with the basics of data visualization, including creating graphs with Matplotlib and advanced visualizations with Seaborn.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Computer literacy.</td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Laboratory</td><td>60.0%</td><td>50.0%</td></tr>
<tr><td>Project</td><td>60.0%</td><td>50.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>[1] Python : podstawy nauki o danych, Alberto Boschetti, Luca Massaron, Helion, Gliwice 2017

[2] Python for Data Analysis, William McKinney, Helion, Gliwice 2018</td></tr>
<tr><td>Supplementary literature</td><td>There are no requirements</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>1. Write a simple calculator2. Write a program using the matplotlib library to present measurement data3. Write a program to analyze environmental data based on data available online</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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