GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	IT and AI Tools for the Engineer, PG_00067988		
Field of study	Biomedical 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	1.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Biomedical Engineering -> Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Anna Węsierska	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	0.0	15.0	0.0	0.0	15

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	15	1.0	9.0	25

Subject objectives

The aim of the course is to acquire practical programming skills and the ability to use basic artificial intelligence tools for engineers.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U04] can apply knowledge of programming methods and techniques as well as select and apply appropriate programming methods and tools in computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study	The learning outcome is the acquisition of the following skills: - writing a program with correct Python syntax (script execution, comments, control statements, operators) - using basic Python data types (variables and assignments, type casting) - using basic data structures (lists, tuples, dictionaries, sets) - writing functions in Python - working with external libraries in Python - performing basic file operations - writing a program that uses recursion	[SU1] Assessment of task fulfilment
[K6_U07] can apply methods of process and function support, specific to the field of study	The learning outcome is the acquisition of the following skills: - creating high-quality reports, documentation, scientific papers, and technical documents using LaTeX-based tools - applying artificial intelligence tools in engineering work	[SU4] Assessment of ability to use methods and tools
[K6_U12] can analyze the operation of components, circuits and systems related to the field of study, as well as measure their parameters and examine technical specifications, and plan and conduct experiments related to the field of study, including computer simulations and measurements, and interpret obtained results and draw conclusions	The learning outcome is the acquisition of the following skills: - visualizing technical characteristics using 2D/3D plots in Python - logging results to a file in Python - documenting and reporting results through automatically generated reports using Jupyter Notebook	[SU1] Assessment of task fulfilment

<table>
<tr><td>Subject contents</td><td>Course content – laboratory
Laboratory class program:
1. Writing a program with correct Python syntax (script execution, comments, control statements, operators)
2. Using basic Python data types (variables and assignments, type casting)
3. Using basic data structures (lists, tuples, dictionaries, sets)
4. Writing functions in Python
5. Working with external libraries in Python
6. Performing basic file operations
7. Writing programs that use recursion
8. Visualizing technical characteristics using 2D/3D plots in Python
9. Documenting and reporting results in the form of automatically generated reports using Jupyter Notebook
10. Logging results to a file in Python
11. Creating reports, documentation, scientific papers, and technical documents at a high level using LaTeX-based tools
12. AI tools supporting programmers, e.g., GitHub Copilot, Cursor for team programming
13. AI tools supporting engineers, e.g., Text to CAD</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Basic computer skills; Basic logic; Understanding of fundamental mathematical concepts</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 class</td><td>51.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td>Recommended reading</td><td><table><tr><td>Basic literature</td><td>Lee, Kent D., and Steve Hubbard. Data structures and algorithms with python. Vol. 363. Berlin/Heidelberg, Germany: Springer, 2015.

Stephenson, Ben. The Python Workbook. SPRINGER INTERNATIONAL PU, 2016.
Hunt, John. A beginners guide to Python 3 programming. Springer, 2019.

Hunt, John. Advanced guide to Python 3 programming. Berlin: Springer, 2019.

Kottwitz, Stefan. LaTeX Beginner's Guide: Create visually appealing texts, articles, and books for business and science using LaTeX. Packt Publishing Ltd, 2021.</td></tr><tr><td>Supplementary literature</td><td>Guthals, Sarah, and Phil Haack. GitHub For Dummies. John Wiley & Sons, 2019.</td></tr><tr><td>eResources addresses</td><td></td></tr></table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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