GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Programming, PG_00021027		
Field of study	Mathematics		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2025/2026
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study Subject group related to scientific research 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	2	ECTS credits	5.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department Of Probability Theory And Biomathematics -> Faculty Of Applied Physics And Mathematics -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Paweł Wojda	
	Teachers	dr inż. Paweł Wojda mgr inż. Katarzyna Tessmer	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	30.0	0.0	0.0	60

E-learning hours included: 0.0

Adresy na platformie eNauczanie:

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

Mastering the ability to write simple algorithms in the selected programming language; compiling, starting and testing simple programs. Mastering the skill of analyzing simple algorithms.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_K03	Student in laboratory: - implements three independent programs.	[SK3] Assessment of ability to organize work [SK4] Assessment of communication skills, including language correctness [SK2] Assessment of progress of work
K6_W09	Student: - uses software development tools for C/C++, - uses internet to find information about C/C++ and programming	[SW1] Assessment of factual knowledge
K6_U07	Student: - designs simple algorithms and their tests.	[SU4] Assessment of ability to use methods and tools
K6_W08	Student: - recognizes elements of programs and explains their meaning - enumerates program quality criteria.	[SW1] Assessment of factual knowledge

<table>
<tr><td>Subject contents</td><td>Lecture:

1. Numbers in computer systems: Computer memory. Integer numbers. Floating-point numbers. Vectors and matrices.

2. Iteration: Processor. Conditional instruction. Switching instruction. Loops. Optimization. Searching a number and sorting numbers. Horner algorithm. Disc file operations. Algorithm complexity. Good style of programming. Program testing.

3. Alphabet and text: ASCII code and UNICODE. Characters. Strings. Searching and sorting of strings.

4. Procedures and functions: Definition, parameters and local variables. Library of functions. Projects. Recursive algorithms

5. Data structures: Definition of data structure. Dynamic memory management . Application of data structures

6. Class and object: Class definition and application. Object. Constructor. Overloaded methods and operators. "Friend" functions. Inheritance.

Laboratory:

Implementation of iteration algorithm, program with own functions with teacher help. Five programs without teacher care.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></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>Practical exercise</td><td>50.0%</td><td>80.0%</td></tr>
<tr><td>Lecture test</td><td>50.0%</td><td>20.0%</td></tr>
</table></td></tr>
<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>Kernighan W., Ritchie B.W.: The ANSI C Programming Language (2nd Edition), Prentice Hall; (April 1, 1988)

Eckel B.: Thinking in C++: Introduction to Standard C++, Volume One (2nd Edition), Prentice Hall; (March 25, 2000)

Olsson M., Modern C Quick Syntax Reference: A Pocket Guide to the Language, APIs, and Library, Second edition. Berkeley, CA: Apress L. P, 2018

Horton I., Van Weert P., Beginning C++17 : From Novice to Professional / by Ivor Horton, Peter Van Weert. (5th ed. 2018).</td></tr>
<tr><td>Supplementary literature</td><td>D. Harel, Algorithmics: The Spirit of Computing, Addison-Wesley, Reading, MA, 1987. 3rd edition, 2004 (with Y. Feldman).</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
</table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>To design an iterative algorithm employing Horner scheme and write a program, in C / C + +, implementing this algorithm.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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