GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Programming, PG_00064129		
Field of study	Electronics and Telecommunications, Informatics, Automatic Control, Cybernetics and Robotics		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2025/2026
Education level	second-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	1	Language of instruction	English
Semester of study	1	ECTS credits	7.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department Of Algorithms And Systems Modelling -> Faculty Of Electronics Telecommunications And Informatics -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Marcin Jurkiewicz	
	Teachers	dr Marcin Jurkiewicz	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	30.0	20.0	0.0	80

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	80	11.0	84.0	175

Subject objectives

The aim of the course is to learn students programming and implementation of programs in the Linux/Visual Studio environment. Students should master C/C++ instructions, data types and structures, operators, functions and related algorithms. Students should acquire knowledge about structures, functions and other basic concepts related to programming in C/C++.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_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, making assessment and critical analysis of the prepared software as well as a synthesis and creative interpretation of information presented with it	A student is able to use the given knowledge (from the lecture), basic techniques of C/C++ and software in Linux/Visual Studio to write and compile programs.	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools
[K7_W04] knows and understands, to an increased extent, the principles, methods and techniques of programming and the principles of computer software development or programming devices or controllers using microprocessors or other elements or programmable devices specific to the field of study, and organization of work of systems using computers or such devices	A student knows the basic rules of C/C++ and data structures and algorithms.	[SW1] Assessment of factual knowledge

Subject contents

1. Programming languages, alphabet, syntax and semantics. Translation.
2. Classification of data types. Integer and floating point types.
3. Arithmetic expressions and operators.
4. Selected standard functions.
5. Character type. Casting of types.
6. Logical type. Logical operators and expressions.
7. Input/output basiscs.
8. Conditional statements (if, switch) and conditional expression.
9. Iteration statements (for, while, do-while), nested iterations.
10. Defining types. Constants. Enumerated type.
11. One- and multi-dimensional arrays. Null-terminated strings.
12. Basic rules for scope and lifetime of variables.
13. Functions. Scope and lifetime of variables. Side effect.
14. Passing parameters of a function.
15. Pointer type and pointer arithmetics.
16. Pointers for inter-function communication.
17. Dynamic memory allocation.
18. Structures.
19. Basics of complexity theory and O notation
20. Polynomial and NP-hard problems
21. Sorting algorithms
22. Heaps and heapsort
23. Stacks and queues
24. Hash tables
25. Algorytmy zachłanne, heuristics and exhaustive algorithms

Prerequisites and co-requisites

No requirements

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Project: correctness, algorithms, structures, runtime and universality.	50.0%	30.0%
Laboratory: correctness, algorithms, structures, runtime and universality.	50.0%	30.0%
Exam	50.0%	40.0%

Recommended reading

Basic literature	1. KERNIGHAN, Brian W.; RITCHIE, Dennis M. *The C programming language*, Prentice Hall, 2006
Supplementary literature	1. B. Stroustrup, *The C++ Programming Languag*e, Addison Wesley Longman, 2000
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed

What is the result of the following code?

```
int i;

for(i=0;i<3;i++);
   cout << i;
   cout << i+1;
```

a) 011223 b) 0124 c) 0123 d) 34 e) 124 f) 45

Work placement

Not applicable

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