



Subject card

Subject name and code	Fundamentals of programming, PG_00068804						
Field of study	Hydrogen Technologies and Electromobility						
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				3.0	
Learning profile	general academic profile	Assessment form				assessment	
Conducting unit	Department of Functional Materials Engineering -> Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. inż. Piotr Jasiński				
	Teachers		prof. dr hab. inż. Piotr Jasiński dr inż. Milena Marycz				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	30.0	0.0	0.0	45
	E-learning hours included: 0.0						
eNauczanie source address: https://enauczanie.pg.edu.pl/2025/course/view.php?id=1702							
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	3.0	27.0	75		
Subject objectives	The aim of the course is for students to acquire knowledge and skills in programming. The student should master the ability to create and analyse algorithms and the principles of programming in the C/C++ language: instructions, data types, operators and functions. Students should acquire knowledge of structures, pointers and other basic concepts related to programming in C/C++.						
Learning outcomes	Course outcome	Subject outcome	Method of verification				
	[K6_U09] is able to use their knowledge in the field of programming methods and techniques and select and apply appropriate programming methods and tools in creating computer software or programming devices or controllers using microprocessors or programmable elements or systems, characteristic for a given field of study	Develops and analyzes simple programs in C/C++ using conditional statements, loops, arrays, and functions. Applies basic programming techniques, including input/output operations, pointer manipulation, and dynamic memory allocation.	[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools				
	[K6_W14] knows and understands at an advanced level the principles, methods and techniques of programming and the principles of creating computer software or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, as well as the organization of the work of systems using computers or these devices	Describes the fundamental principles of programming in C/C++, including data types, operators, control statements, and functions. Explains the organization of computer programs and the use of data structures, arrays, and pointers.	[SW1] Assessment of factual knowledge				

Subject contents	<p>Course content – lecture</p> <ol style="list-style-type: none"> 1. Programming languages, alphabet, syntax and semantics. Translation. 2. Type classification. Integer and floating point types. 3. Arithmetic operators and expressions. 4. Selected standard functions. 5. Character types. Type casting. 6. Logical type. Logical operators and expressions. 7. Fundamentals of input/output handling. 8. Conditional instructions (if, switch) and conditional expressions. 9. Iterative instructions (for, while, do-while). Nested iterations. 10. Defining types. Constants. Enumeration type. 11. One-dimensional and multi-dimensional arrays. Writers. 12. Validity and lifetime of variables. 13. Functions. Range and lifetime of variables. Side effects. 14. Transfer of function parameters. 15. Pointer type. The arithmetic of pointers. 16. Pointers in communication between functions. 17. Dynamic memory allocation. 18. Structures. <hr/> <p>Course content – laboratory</p> <ol style="list-style-type: none"> 1. Introduction 2. Conditional statements 3. Loops 4. Arrays 5. Functions 6. Pointers
Prerequisites and co-requisites	

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Lecture	50.0%	50.0%
	Lab	50.0%	50.0%
Recommended reading	Basic literature	Stephen Prata, "Język C++. Szkoła programowania". Wydanie VI. Helion 2012 Mirosław J. Kubiak, "C++. Zadania z programowania z przykładowymi rozwiązaniami", Helion 2011	
	Supplementary literature	Stephen Prata, "Język C++. Szkoła programowania". Wydanie VI. Helion 2012 Mirosław J. Kubiak, "C++. Zadania z programowania z przykładowymi rozwiązaniami", Helion 2011	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Writing a programme that implements the given functionality. Analyse how the given programme works.		
Practical activities within the subject	Not applicable		

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