



Subject card

Subject name and code	Programming, PG_00021027						
Field of study	Mathematics						
Date of commencement of studies	October 2022		Academic year of realisation of subject		2022/2023		
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	Instytut Matematyki Stosowanej -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Magdalena Chmara				
	Teachers		dr Adrian Myszkowski dr inż. Paweł Wojda dr inż. Magdalena Chmara				
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						
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_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_W08		Student: - recognizes elements of programs and explains their meaning - enumerates program quality criteria.		[SW1] Assessment of factual knowledge		
	K6_K03		Student in the laboratory: - implements some simple programs and do five more complex programs at home.		[SK3] Assessment of ability to organize work [SK4] Assessment of communication skills, including language correctness [SK2] Assessment of progress of work		
	K6_U07		Student: - designs simple algorithms and their tests.		[SU4] Assessment of ability to use methods and tools		

Subject contents	Lab 1: Introduction to C programming Lab 2: Variables, conditional instructions in C language. Lab 3: For loops in C language Lab 4: While and do-while loops in C language Lab 5: Functions and recursion in C language Lab 6: Arrays in C++ language Lab 7: Pointers Lab 8: Character strings Lab 9: File handling in C++ Lab 10: Data structures in C++ language Lab 11: Classes and objects in C++ language Lab 12: Inheritance in C++ Lab 13: Overloading operators Lab 14: Exception handling, debugging Lab 15: Summary of the semester Lecture: Numbers in computer systems: Computer memory. Integer numbers. Floating-point numbers. Vectors and matrices. 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. Alphabet and text: ASCII code and UNICODE. Characters. Strings. Searching and sorting of strings.Procedures and functions: Definition, parameters and local variables. Library of functions. Projects. Recursive algorithms Data structures: Definition of data structure. Dynamic memory management . Application of data structures Class and object: Class definition and application. Object. Constructor. Overloaded methods and operators. "Friend" functions. Inheritance.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	2 Lecture tests	50.0%	25.0%
	Practical exercise	50.0%	75.0%
Recommended reading	Basic literature	1. Mikael Olsson, Modern C Quick Syntax Reference: A Pocket Guide to the Language, APIs and Library, APRESS 2019 2. Ivor Horton Peter Van Weert, Beginning C++17, From Novice to Professional, APRESS 2018	
	Supplementary literature	Robert C. Seacord, Effective C: An Introduction to Professional C Programming, No Starch Press 2020	
	eResources addresses	Podstawowe https://link.springer.com/book/10.1007/978-1-4842-4288-9 - Mikael Olsson, Modern C Quick Syntax Reference: A Pocket Guide to the Language, APIs and Library, APRESS 2019 https://link.springer.com/book/10.1007/978-1-4842-3366-5 - Ivor Horton Peter Van Weert, Beginning C++17, From Novice to Professional, APRESS 2018 Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	To design an iterative algorithm employing Horner scheme and write a program, in C / C + +, implementing this algorithm.		
Work placement	Not applicable		