



Subject card

Subject name and code	Programming, PG_00021027						
Field of study	Mathematics						
Date of commencement of studies	October 2021		Academic year of realisation of subject		2021/2022		
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						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Magdalena Chmara				
	Teachers		dr Adrian Myszkowski mgr inż. Jakub Ciesielski 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						
	Address on the e-learning platform: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=21056 Adresy na platformie eNauczanie: Programowanie lato 2021/2022 - Moodle ID: 21056 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=21056						
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_W08		Student: - recognizes elements of programs and explains their meaning - enumerates program quality criteria.		[SW1] Assessment of factual knowledge		
	K6_U07		Student: - designs simple algorithms and their tests.		[SU4] Assessment of ability to use methods and tools		
	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_K03		Student in laboratory: - implements programs every week.		[SK3] Assessment of ability to organize work [SK4] Assessment of communication skills, including language correctness [SK2] Assessment of progress of work		

Subject contents	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:		
	Lab 1: Introduction to C programming		
	Lab 2: Variables, Conditional and Choice Statements in C language		
	Lab 3: The for loop 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 ++		
	Lab 7: Strings in C ++		
	Lab 8: File handling in C ++		
	Lab 9: Data structures in C ++		
Lab 10: Classes and objects in C ++			
Lab 11: Inheritance in C ++			
Lab 12: GUI			
Lab 13: GUI			
Lab 14: Exceptions, debugging			
Lab.15: Summary			
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Exercises (during laboratories)	0.0%	65.0%
	Five longer practical tasks	0.0%	15.0%
	Lecture tests	50.0%	20.0%
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 Fifth Edition, APRESS 2018	
	Supplementary literature	Eckel B.: Thinking in C++: Introduction to Standard C++, Volume One (2nd Edition), Prentice Hall; (March 25, 2000) Brian W. Kernighan, Dennis M. Ritchie, C Programming Language, 2nd Edition, Prentice Hall International 2003	

	eResources addresses	<p>Podstawowe</p> <p>https://doi.org/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,</p> <p>Programowanie lato 2021/2022 - Moodle ID: 21056</p> <p>https://enauczanie.pg.edu.pl/moodle/course/view.php?id=21056</p>
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	