



## Subject card

Subject name and code	Programming, PG_00021027						
Field of study	Mathematics						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2023/2024		
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. 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: Programowanie, lato 2023/2024 - Moodle ID: 36029 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=36029">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=36029</a>							
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_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			

Subject contents	<p>Lecture:</p> <ol style="list-style-type: none"> <li>1. Numbers in computer systems: Computer memory. Integer numbers. Floating-point numbers. Vectors and matrices.</li> <li>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.</li> <li>3. Alphabet and text: ASCII code and UNICODE. Characters. Strings. Searching and sorting of strings.</li> <li>4. Procedures and functions: Definition, parameters and local variables. Library of functions. Projects. Recursive algorithms</li> <li>5. Data structures: Definition of data structure. Dynamic memory management . Application of data structures</li> <li>6. Class and object: Class definition and application. Object. Constructor. Overloaded methods and operators. "Friend" functions. Inheritance.</li> </ol> <p>Laboratory:</p> <p>Implementation of iteration algorithm, program with own functions with teacher help. Three programs without teacher care.</p>														
Prerequisites and co-requisites															
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="454 1012 794 1039">Subject passing criteria</th> <th data-bbox="798 1012 1137 1039">Passing threshold</th> <th data-bbox="1141 1012 1482 1039">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="454 1043 794 1070">Lecture test</td> <td data-bbox="798 1043 1137 1070">50.0%</td> <td data-bbox="1141 1043 1482 1070">25.0%</td> </tr> <tr> <td data-bbox="454 1075 794 1102">Practical exercise</td> <td data-bbox="798 1075 1137 1102">50.0%</td> <td data-bbox="1141 1075 1482 1102">50.0%</td> </tr> <tr> <td data-bbox="454 1106 794 1133">Two tests</td> <td data-bbox="798 1106 1137 1133">50.0%</td> <td data-bbox="1141 1106 1482 1133">25.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Lecture test	50.0%	25.0%	Practical exercise	50.0%	50.0%	Two tests	50.0%	25.0%
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Recommended reading	<p>Basic literature</p> <p>Supplementary literature</p> <p>eResources addresses</p>	<p>Kernighan W., Ritchie B.W.: The ANSI C Programming Language (2nd Edition), Prentice Hall; (April 1, 1988)</p> <p>Eckel B.: Thinking in C++: Introduction to Standard C++, Volume One (2nd Edition), Prentice Hall; (March 25, 2000)</p> <p>D. Harel, <i>Algorithmics: The Spirit of Computing</i>, Addison-Wesley, Reading, MA, 1987. 3rd edition, 2004 (with Y. Feldman).</p> <p>Programowanie, lato 2023/2024 - Moodle ID: 36029  <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=36029">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=36029</a></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														