



## Subject card

Subject name and code	Programming of computer systems, PG_00055399						
Field of study	Mechatronics						
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			6.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Institute of Mechanics and Machine Design -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Marek Galewski					
	Teachers	dr inż. Yurii Tsybrii dr hab. inż. Marek Galewski					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	30.0	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	16.0		74.0		150
Subject objectives	Teaching students of structural (in C language) and object oriented programming (n Java) basics, relational databases and essentials of software engineering (software lifecycle, development methods, system modelling).						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W11] has a basic knowledge about the life cycle of mechatronic systems and objects	Student describes life cycle of IT systems and selected methods of development of such systems			[SW1] Assessment of factual knowledge		
	[K6_W06] has organized knowledge in terms of informatic and methods of analog and digital signal processing	Student understands basic principles of structural and object oriented programming			[SW1] Assessment of factual knowledge		
	[K6_U09] is able to formulate an algorithm, knows low and high level programming languages and appropriate IT tools for developing computer programmes to control mechatronic system	Student develops simple structural and object oriented programs in C and Java			[SU1] Assessment of task fulfilment		
[K6_U05] is able to use properly chosen tools to compare design solutions of elements and mechatronics systems according to given application and economic criteria (e.g. power demand, speed, costs)	Student presents basic skills in modern programming tools and techniques (e.g. C, Java, NetBeans, UML, SQL)			[SU4] Assessment of ability to use methods and tools			
Subject contents	Programming in C language: basic elements of the C language, basic elements of program, functions, conditional statements, loops, I/O operations, array operations, strings, pointers; Programming in Java language: basic elements of the Java language, elements of object oriented programming (Classes, objectd, inheritance), I/O operations, collections, programming for GUI ; UML modelling language; Software engineering: software life-cycle, development techniques Relational databases (SQL); Introduction to Artificial Intelligence algorithms						

Prerequisites and co-requisites	Passed Computer Systems course.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Exam	52.0%	60.0%
	Obligatory laboratory exercises	60.0%	20.0%
	Individual project	50.0%	20.0%
Recommended reading	Basic literature	[1] M. Galewski: Lecture materials published at the web site of the chair of Mechanics and Mechatronics [2] M. Galewski, P. Duba: Laboratory exercises handbooks	
	Supplementary literature	Kernighan B.W, Ritchie D.M, Język ANSI C. Programowanie. wyd. II, Helion, 2020 Horstmann C.S, Java. Podstawy. Helion, 2019 (ew. wcześniejsze, ale niezbyt stare wydania) Schmuller J., UML dla każdego, Helion 2003 Flasinski, M., Introduction to Artificial Intelligence, 2016 Rutkowska D., Piliński M., Rutkowski L., Sieci neuronowe, algorytmy genetyczne i systemy rozmyte, PWN, Warszawa, 1997	
	eResources addresses	Adresy na platformie eNauczanie: Programowanie Systemów Komputerowych, WP, MTR, I st., sem. 02, letni 2022/23 (PG_00055399) - Moodle ID: 26535 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=26535">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=26535</a>	
Example issues/ example questions/ tasks being completed	The list of sample questions for the exam (around 50) and laboratory individual projects (around 40) are given to the student during the semester. Sample examination questions: - How does type cast operation work? When do we use it and why? Provide examples of type casting in C. - What is pointer data type used for? When do we use it? What are its advantages? What danger it brings for a program? Provide an example of pointer declaration and initialization. - Describe principles of Object Oriented Analysis, Modelling and Design. - Describe basic elements of relational data model.		
Work placement	Not applicable		