GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Fundamentals of Computing II, PG_00056028
Field of study	Electrical Engineering

Date of commencement of studies	October 2021	**Academic year of realisation of subject**	2022/2023
Education level	first-cycle studies	**Subject group**	
Mode of study	Full-time studies	**Mode of delivery**	at the university
Year of study	2	**Language of instruction**	Polish
Semester of study	3	**ECTS credits**	4.0
Learning profile	general academic profile	**Assessment form**	assessment

Conducting unit	Department of Power Electronics and Electrical Machines -> Faculty of Electrical and Control Engineering	
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Daniel Wojciechowski
	Teachers	dr hab. inż. Daniel Wojciechowski

Lesson types and methods of instruction	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						

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	10.0	45.0	100

Subject objectives	To teach the basic concepts of number systems used in computer science, to familiarize with the operation of basic computer components and the creation and analysis of basic algorithms. Learning the basics of programming in C and C++ languages.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	K6_W01	Knows the basics of computer arithmetic and logic circuits, the basics of designing simple algorithms, the basic elements of computer systems and the main elements of the C language.	[SW3] Assessment of knowledge contained in written work and projects
	K6_K01	Able to obtain information from the literature, able to perform basic arithmetic operations in the natural binary system and in the system with addition to 2, design simple logic circuits, write simple programs in the C language.	[SK5] Assessment of ability to solve problems that arise in practice [SK2] Assessment of progress of work
	K6_U01	Can find and use sources of information on programming languages, has the ability to work in groups.	[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task

Subject contents	Overview of computer science departments and basic concepts. ANSI C and C++ languages. Examples of simple programs. Definition of variables. Assignment operator. Integer types and integer arithmetic operators. Input/output operations for integer types. Relational and logical operators. Relational and logical expressions. Real types and real arithmetic operators. Input/output operations for real types. Complex instructions. The if statement. The if else instruction. Nested if statement. The while instruction. The do while instruction. The for instruction. The switch instruction. The break instruction. The continue instruction. The goto instruction. Identifiers. Keywords. Conditional operator. Comma operator. Increment and decrement operators Standard arithmetic functions. The projection operator. Arithmetic conversions. Print formatting. One-dimensional and two-dimensional arrays. Basic operations on arrays. Representation of characters. Character types. Input/output operations for character types. Character arrays. Constants. Priorities of operators. Boolean algebra. Boolean functions. Basic logic functors. Elements of assembly language. Representation of information in computer systems. Number systems. Binary, octal and hexadecimal systems. Inter-system conversions. Arithmetic operations in NKB. Character-module representations, U1, U2. Arithmetic operations in the U2 system. Representation of real numbers. The von Neumann architecture. Architecture and operation of a simple microprocessor. Algorithms. Methods of writing algorithms. Action network. Principles of creating a network of actions. Selected algorithms. Elements of analysis of algorithms. Elements of computer technology. MOS transistor. Simple CMOS circuits. Basic combinational circuits. Single-bit adder and half adder. Serial combiner. Multiplexer. Decoder. A flip-flop. Register. Counter. ROM and RAM memories. Selected features of modern processors.
Prerequisites and co-requisites	Basic knowledge of mathematics and physics at the high school level.

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Lecture	50.0%	50.0%
	Laboratory	50.0%	50.0%

Recommended reading	Basic literature	1. Kernighan B.W., Ritchie D.M., Język ANSI C. Programowanie. Helion, Gliwice, 2020
		2. Prata. S., Język C++. Szkoła programowania. Helion, Gliwice, 2020
		3. Perry G., Język C w przykładach, Warszawa, 2000
		4. Grębosz J., Symfonia C++, Oficyna Kallimach, Kraków 1999
		5. Sokół R., Tablice informatyczne. C. Helion 2018
	Supplementary literature	1. Oualline S., Język C w programowaniu urządzeń. Helion, 2020
		2. Peter P., Tony C., Język C w pigułce. Kompletny przewodnik. APN Promise, 2015
		3. Kamran A., Ekstremalny kod w języku C. Współbieżność i programowanie zorientowane obiektowo. Helion, 2021
		4. Preschern Ch., Mistrz języka C. Najlepsze zasady, praktyki i wzorce. Helion, 2023
		5. Paul J.D., Harvey D., Język C. Solidna wiedza w praktyce. Helion, 2020
	eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	
Work placement	Not applicable

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