GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Informatics I, PG_00038090		
Field of study	Electrical Engineering		
Date of commencement of studies	October 2021	Academic year of realisation of subject	2021/2022
Education level	first-cycle studies	Subject group	
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	4.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	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	30.0	0.0	15.0	0.0	0.0	45

E-learning hours included: 0.0

Adresy na platformie eNauczanie:

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

Transfer of fundamental concepts of number systems used in computer science. Acquainting a student with the basic components of the computer system and development and analysis of basic algorithms. Learning the basics of programming in C and C++.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_W07	The student disposes over the knowledge on foundations of computer arithmetic, logic circuits, design of simple algorithms, fundamental elements of computers systems and C language.	[SW3] Assessment of knowledge contained in written work and projects
K6_K01	The student is is able to find and utilize sources of information on programming languages, has the ability to work in a group.	[SK4] Assessment of communication skills, including language correctness [SK1] Assessment of group work skills [SK2] Assessment of progress of work
K6_U01	The student is able to retrieve information from the literature, can perform basic arithmetic operation in the natural binary system and two's complement system, design simple logic circuits and write simple programs using C language.	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools

Subject contents	Overview of informatics, its main areas and basic concepts. Languages ANSI C and C + +. Examples of simple programs. Definition of variables. The assignment operator. Integer types and arithmetic operators. I / O operations for integer types. Relational and logical operators. Relational and logical expressions. Real type and operators of real arithmetic. I / O operations for real types. Grouping instruction. If statement. Else if statement. Nested if statement. While loop . For and while loops. Switch statement. Break statement. Continue statement. Goto statement. Identifiers. Keywords. The conditional operator. Comma operator. Increment and decrement operators. Standard arithmetic functions. Cast operator. Arithmetic conversions. Print formatting. One-dimensional and two-dimensional arrays. Basic operations on arrays. Representation of characters. Character types. I / O operations for character types. Character arrays. Fixed. Priorities operators. Boolean algebra. Logical functions. Basic logic functors. Elements of assembly language . Representation of information in computer systems. Number systems. Binary, hexadecimal and octal systems.. Conversions between number systems. Arithmetic in natural binary system. Representations sign-magnitude, one's complement and two's complement. Arithmetic operations in two's complement. Representation of real numbers. Von Neumann architecture. Architecture and operation of a simple microprocessor. Algorithms. Methods of algorithms notation. Flowcharts. The principles of creating flow charts. Selected algorithms. Elements of algorithm analysis. Elements of computer technology. MOS transistor. Simple CMOS. Basic combinational circuits. Full adder and half-adder. Ripple-carry adder. Multiplexer. Decoder. Flip-flop. Register. Counter. ROM and RAM. 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
classroom exercises	60.0%	33.0%
lecture	60.0%	34.0%
laboratory	60.0%	33.0%

Recommended reading

Basic literature

1. W. Stallings, Computer system organization and architecture, WNT, W-wa, 2000.

2. M.Czyżak, Elements of computer arithmetic, KETI PG, 2011.

3. M.Czyżak, Lectures in basics of ANSI C, KETI PG, 2010.

4. R.Smyk, M.Czyżak, A.Opaliński, Selected mechanisms of programming in C i C++,

KETI PG, 2011.

	Supplementary literature	1. S. Chalk, Computer architecture and organization, WNT, W-wa, 1998. 2. N. Wirth, Algorithms and data structures=programs, WNT, W-wa, 1979. (continuously reprinted in Biblioteka Klasyki Informatyki) 3. A. R. Neibauer, C/C++, Your first program, Help, 1995 (now ed. IV) 4. C. Sexton, C - it's simple, RM, W-wa, 2001. 5. G. Perry, C in examples, Que, W-wa, 2000. 6. Brian W. Kernighan, Dennis M. Ritchie, ANSI C, Programming, Helion, Gliwice, 2010 (wyd.II).
	eResources addresses	

Example issues/ example questions/ tasks being completed	Computer arithmetic Computer arithmetic - convert a decimal to binary - convert a decimal fraction to a binary fraction - convert binary number to hexadecimal / octal - perform addition, subtraction, multiplication and division of two binary numbers - calculate the value of the binary number in the register after shifting a given number of positions - find the sign-magnitude, one's complement and two's complement representations of a decimal number . - perform addition and subtraction of two numbers in two's complement, verify overflow. Logic functions and logic gates - for a logic function given in the table form find the SOP and POS forms - for a logic function given in the SOP form draw a NAND logic network - Simplify the logic expression using Boolean algebra laws Programming - Write a program in C that calculates the value of an arithmetic expression - Write a program in C that reverses the item order in an one-dimensional array - Write a program that finds the frequency of appearance of each item in an array
Work placement	Not applicable