



## Subject card

Subject name and code	Fundamentals of Computing II, PG_00056028						
Field of study	Electrical Engineering						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2023/2024		
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_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		
	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		

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	<table border="1" data-bbox="451 595 1487 633"> <thead> <tr> <th data-bbox="451 595 794 633">Subject passing criteria</th> <th data-bbox="794 595 1137 633">Passing threshold</th> <th data-bbox="1137 595 1487 633">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="451 633 794 663">Laboratory</td> <td data-bbox="794 633 1137 663">50.0%</td> <td data-bbox="1137 633 1487 663">50.0%</td> </tr> <tr> <td data-bbox="451 663 794 701">Lecture</td> <td data-bbox="794 663 1137 701">50.0%</td> <td data-bbox="1137 663 1487 701">50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Laboratory	50.0%	50.0%	Lecture	50.0%	50.0%
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Recommended reading	Basic literature	<ol style="list-style-type: none"> <li>1. Kernighan B.W., Ritchie D.M., Język ANSI C. Programowanie. Helion, Gliwice, 2020</li> <li>2. Prata. S., Język C++. Szkoła programowania. Helion, Gliwice, 2020</li> <li>3. Perry G., Język C w przykładach, Warszawa, 2000</li> <li>4. Grębosz J., Symfonia C++, Oficyna Kallimach, Kraków 1999</li> <li>5. Sokół R., Tablice informatyczne. C. Helion 2018</li> </ol>										
	Supplementary literature	<ol style="list-style-type: none"> <li>1. Oualline S., Język C w programowaniu urządzeń. Helion, 2020</li> <li>2. Peter P., Tony C., Język C w pigułce. Kompletny przewodnik. APN Promise, 2015</li> <li>3. Kamran A., Ekstremalny kod w języku C. Współbieżność i programowanie zorientowane obiektowo. Helion, 2021</li> <li>4. Preschern Ch., Mistrz języka C. Najlepsze zasady, praktyki i wzorce. Helion, 2023</li> <li>5. Paul J.D., Harvey D., Język C. Solidna wiedza w praktyce. Helion, 2020</li> </ol>										
	eResources addresses	Adresy na platformie eNauczanie: INFORMATYKA II [ET][2023/24] - Moodle ID: 32121 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32121">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32121</a>										
Example issues/ example questions/ tasks being completed												
Work placement	Not applicable											