GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Microcontrollers and Distributed Microsystems - laboratory, PG_00047586		
Field of study	Automatic Control, Cybernetics and Robotics		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2024/2025
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	3	Language of instruction	Polish
Semester of study	6	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Metrology and Optoelectronics -> Faculty of Electronics, Telecommunications and Informatics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Zbigniew Czaja	
	Teachers	dr inż. Michał Kowalewski dr hab. inż. Zbigniew Czaja	

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	0.0	0.0	30
	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	30	2.0	18.0	50

Subject objectives	Getting to know the PIC18, the AVR and the MCS51 microcontrollers families and the bases related to the configuration and control their peripherals. Acquisition of skills of the IDE software for these families of microcontrollers (creating projects, assembling, compiling, software simulation, programming of microcontrollers). Skill of writing simple programs to handle peripherals of microcontrollers in an assembly language and a C language.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U03] can design, according to required specifications, and make a simple device, facility, system or carry out a process, specific to the field of study, using suitable methods, techniques, tools and materials, following engineering standards and norms, applying technologies specific to the field of study and experience gained in the professional engineering environment	Student uses IDE software for compilation, program simulation and programming of microcontrollers.	[SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
[K6_U21] can individually carry out an analysis of a managing and controlling problem and is able to individually design, tune and operate automatic regulation and control systems, and use computers to control and monitor dynamic systems	Student describes the principle of operation and control of microcontrollers. Student analyzes program codes written in an assembler and a C language written for microcontrollers.	[SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
[K6_U04] can apply knowledge of programming methods and techniques as well as select and apply appropriate programming methods and tools in computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study	The student can write programs in an assembly language and a C language for microcontrollers. Student uses the IDE software for microcontrollers.	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment

Subject contents

1. Practicing of the IDE MPLAB 8 environment to activating of programs written in the assembler for the PIC18F452 microcontroller of Microchip
2. Realization of the software in the assembler for the PIC18F452
3. Using of the MPLAB C18 language to writing of programs for the PIC18F452
4. Project and implementation of the program in the MPLAB C18 language for the PIC18F452
5. Realization of the software in the assembler for the ATmega16 microcontroller of Atmel
6. Writing of the program in the assembler for the ATmega16
7. Using of the C language to writing of the programs for the ATmega16
8. Writing in the C language the program for the ATmega16
9. Creating of programs in the assembler for the P89C51RC microcontroller of Philips
10. Realization in the assembler of own program for the P89C51RC
11. Writing of the software with using of the C language for the P89C51RC
12. To write the program in the C language for the P89C51RC

Prerequisites and co-requisites

No requirements

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Practical exercise	50.0%	100.0%

Recommended reading

Basic literature	Czaja Z.:Instrukcje do ćwiczeń laboratoryjnych, http://www.pg.gda.pl/~zbczaja, Gdańsk 2014.
Supplementary literature	Baranowski R.: Mikrokontrolery AVR ATmega w praktyce, Wyd. BTC, Warszawa 2005. Bogusz J.: Lokalne interfejsy szeregowe w systemach cyfrowych, Wyd. BTC, Warszawa 2004. Hadam P.: Projektowanie systemów mikroprocesorowych, Wyd. BTC, Warszawa 2004. Bogusz J.: Lokalne interfejsy szeregowe w systemach cyfrowych, Wyd. BTC, Warszawa 2004. Baranowski R.: Mikrokontrolery AVR ATmega w praktyce, Wyd. BTC, Warszawa 2005.
eResources addresses	Adresy na platformie eNauczanie: Mikrosterowniki i mikrosystemy rozproszone - laboratorium 2025 - Moodle ID: 36625 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=36625

Example issues/ example questions/ tasks being completed

Work placement

Not applicable

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