GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Microcontroller programming, PG_00059839		
Field of study	Automation, Robotics and Control Systems		
Date of commencement of studies	February 2027	Academic year of realisation of subject	2027/2028
Education level	second-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	2.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Electric Drives and Energy Conversion -> Faculty of Electrical and Control Engineering -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Marcin Morawiec	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	0.0	15.0	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	15.0	5.0	50

Subject objectives

The aim of the course is to discuss selected microcontrollers with ARM core. Discussion of the ARM architecture and the possibility of using it in automation systems. Deepening the skills of programming in the C language by developing control functions. The programming of peripheral devices of the interface with the STM32 processor by the student allows the student to develop programming skills of modern electronic devices.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_U04] has the ability for self-directed learning in order to improve his/her professional qualifications, and is able to identify directions for further learning		
[K7_W06] has an extended knowledge of the design of automation components and devices, control and decision support systems control and decision support systems and complex mechatronic systems		

Subject contents	Course content – lecture 1.ARM architecture 2. ARM architecture. 3.I/O Ports 4. Programming in C and operations on bits 5. Microcontroller interfaces (serial, parallel) 6. A/C and D/A converter 7. A/C and C/A converter continued. 8. Interrupts, Timers, Clocks, etc. 9. Overview of sample programs 10. Discussion of sample programs cont.
Prerequisites and co-requisites	Basic programming skill in C/C++

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Laboratory	60.0%	75.0%
Lecture	50.0%	25.0%

Recommended reading

Basic literature	1.Pełka R.: "Mikrokontrolery - architektura, programowanie, zastosowania". Wydawnictwa Komunikacji i Łączności, Warszawa 2003. 2.Baranowski R.: "Mikrokontrolery AVR ATmega w praktyce", BTC, Warszawa 2006. 3. Doliński J.: "Mikrokontrolery AVR w praktyce". BTC, Warszawa, 2004. 4. Paprocki K. "Mikrokontrolery STM32 w praktyce", Wydawnictwo BTC 2009. 5. www.arm.com 6. www.st.com 7. Yiu J.:The Definitive Guide to ARM® Cortex®-M3 and Cortex®-M4 Processors, Third Edition 2013.

	Supplementary literature	1. www.st.com 2. www.arm.com 3. http://stm32f4-discovery.com 4. https://my.st.com
	eResources addresses	
Example issues/ example questions/ tasks being completed	1. Software I/O ports 2. Timers, clocks, PWM software 3. A/C converter 4. USART serial communication 5. Interrupt controller	
Practical activites within the subject	Not applicable	

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