



Subject card

Subject name and code	Programming of ARM microcontrollers, PG_00031366						
Field of study	PROGRAMOWANIE MIKROKONTROLERÓW ARM						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2025/2026		
Education level	first-cycle studies		Subject group				
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		4.0		
Learning profile	general academic profile		Assessment form		assessment		
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	30.0	0.0	30.0	0.0	0.0	60
	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	60		5.0		35.0	100
Subject objectives	The aim of the course is to provide the ARM-core microcontrollers. The aim of the course is the discussion of the ARM architecture and its possible applications in automation and electrical engineering as well as in everyday life. Deepening programming skills in C by developing control functions. Programming by student the peripheral interface with STM32F407 processor allows to education programming skills of modern electronic devices.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_K01		The ability, need and awareness for self-education in microcontroller programming		[SK5] Ocena umiejętności rozwiązywania problemów występujących w praktyce [SK1] Ocena umiejętności pracy w grupie		
	K6_U09		Equipment for load and short-circuit conditions and the ability to use it		[SU1] Ocena realizacji zadania [SU3] Ocena umiejętności wykorzystania wiedzy uzyskanej w ramach przedmiotu		
	K6_K05		Health and safety measures and appropriate response in the event of a threat to health and life		[SK5] Ocena umiejętności rozwiązywania problemów występujących w praktyce [SK4] Ocena umiejętności komunikacji, w tym poprawności językowej [SK3] Ocena umiejętności organizacji pracy		
	K6_W10		Knowledge of the basics of electrical energy conversion and the basics of electric traction		[SW1] Ocena wiedzy faktograficznej [SW2] Ocena wiedzy zawartej w prezentacji [SW3] Ocena wiedzy zawartej w opracowaniu tekstowym i projektowym		

Subject contents	Course content – lecture 1. ARM architecture 2. ARM architecture 3. Input/Output ports 4. Programming in C 5. Series and paraller microcontroller interfeces (RS232, USART...) 6. A/C, C/A transducer 7. A/C, C/A transducer 8. Interruptions, timers, clocks... 9. The examples of the program functions 10. The examples of the program functions 11. Microcontroller cooperation with FPGA 12. The wire and wireless interfaces (I2C, I2S, CAN) 13. The wire and wireless interfaces (I2C, I2S, CAN) 14. Example applications 15. Example applications		
Prerequisites and co-requisites	The basic level of C/C++ programming skill.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	The laboratory reports	60.0%	80.0%
	Project	60.0%	20.0%

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	The internet resources, e.g.: www.st.com www.arm.com http://stm32f4-discovery.com https://my.st.com
	eResources addresses	
Example issues/ example questions/ tasks being completed	1. I/O ports programming 2. Timers, clocks and PWM programming 3. A/C transducer 4. USART communication 5. Interrupt controller	
Practical activities within the subject	Not applicable	

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