



Subject card

Subject name and code	Programming of Microcontrollers, PG_00051467						
Field of study	Automation, Robotics and Control Systems						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2026/2027		
Education level	second-cycle studies		Subject group				
Mode of study	Part-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish		
Semester of study	1		ECTS credits		3.0		
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	10.0	0.0	0.0	0.0	10.0	20
	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	20		10.0		45.0	75
Subject objectives	The aim of the course is to familiarize students with basic microcontroller architectures and manufacturer-specific functions, as well as to learn programming.						
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		Learning self-education to improve programming competences		[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject [SU5] Assessment of ability to present the results of task		
	[K7_W08] has in-depth knowledge of program development and design of complex systems automation systems using PLC and SCADA, transmission and processing of signals occurring in a variety of physical objects		Ability to program advanced automation systems such as converters		[SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects		
	[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		Ability to design automation components and devices, control systems, and decision-support systems.		[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects		

Subject contents	Course content – lecture		
	1. ARM architecture 2. ARM architecture 3. I/O ports 4. C programming and bitwise operations 5. Microcontroller interfaces (serial, parallel) 6. ADC and DAC 7. ADC and DAC (continued) 8. Interrupts, timers, clocks, etc. 9. Review of example programs 10. Review of example programs (continued)		
	Course content – seminar		
	1. I/O port software 2. AC/DC converter software 3. Frequency converter software		
Prerequisites and co-requisites	Knowledge of C programming		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Lecture	60.0%	100.0%
Recommended reading	Basic literature	1. Pelka 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	Materials published by the instructor on the website	
	eResources addresses		
Example issues/ example questions/ tasks being completed	1. I/O port programming 2. Programming timers, clocks, and PWMs 3. ADC (Analog-to-Digital Converter) 4. USART serial communication 5. Interrupt controller		
Practical activities within the subject	Not applicable		

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