GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Built-in systems, PG_00055453						
Field of study	Mechatronics						
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	5		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Institute of Mechanics and Machine Design -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Marek Galewski				
	Teachers						

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	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	Teaching students basic concepts of embedded systems and microcontrollers programming i C language

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U09] is able to formulate an algorithm, knows low and high level programming languages and appropriate IT tools for developing computer programmes to control mechatronic system	Student writes simple software for MCU	[SU1] Assessment of task fulfilment
	[K6_W06] has organized knowledge in terms of informatic and methods of analog and digital signal processing	Student describes selected elements of embedded systemes architecture, especiilay based in MCUs	[SW1] Assessment of factual knowledge

Subject contents	Definitions of embeded systems, ways of implementation Microcontrollers - types, structure, ARM family Peripherals of micronotroller and it's main features - GPIO, IRQ, timers, DMA, ADC, data transmission Designs and manufacturing of mebeded systems

Prerequisites and co-requisites	Basic C programming skills (passed Computer Systems Programming course)

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratory execrcises	51.0%	35.0%
	Written exam	51.0%	65.0%

Recommended reading	Basic literature	Galewski M. STM32. Aplikacje i ćwiczenia w języku C z biblioteką HAL, BTC, Legionowo, 2019 Huss E., The C Library Reference Guide http://www.ehuss.org/c_guide/ Kernigham B. W., Ritchie D. M., Język ANSI C, WNT Warszawa, 2000 www.arm.com www.st.com/stonline/
	Supplementary literature	Martin T., The Insider's Guide to the STM32 ARM Based Microcontroller, Hitex, 2008
	eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	What is an Embedded System?
	What is a microcontroller? Present it's most characteristic features and elements
	What are the most important features or ARM Cortex architecture?
	What elements are neede to build an embedded system based on microcontroller
	What are GPIO used for?
	Full list of example questions are presented to students before the end of semester
Work placement	Not applicable