



Subject card

Subject name and code	, PG_00056084						
Field of study	Mechanical and Medical Engineering						
Date of commencement of studies	October 2021	Academic year of realisation of subject			2023/2024		
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	5	ECTS credits			1.0		
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	10.0	0.0	5.0	0.0	0.0	15
	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	15		0.0		0.0	15
Subject objectives	Presenting students essential information about applications of microprocessors in medicine						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_U08] he/she is able to assess whether proposed methods and tools can be used in practice to solve simple engineering task related to machine design, manufacturing and utilization	Student selects parameters and/or elements of a simple embedded system for medical applications			[SU5] Assessment of ability to present the results of task		
	[K6_U06] he/she has skills to work in industry and follow the rules of safety regulations, he/she is able to analyze basic economics problems to delineate the direction of solution by using engineering methods	Student understands requirements and constraints applied on medical electronic systems			[SU3] Assessment of ability to use knowledge gained from the subject		
	[K6_W13] he/she has knowledge related to application of engineering approaches in medicine or application of medical devices and rehabilitation devices	Student describes selected elements of the architecture of MCU based embedded systems			[SW1] Assessment of factual knowledge		
	[K6_W07] he/she is able to design, manufacture and utilize machine parts and technical devices, he/she can prepare a technical documentation	Student describes the process of design and manufacturing of embedded system			[SW1] Assessment of factual knowledge		
Subject contents	Introduction Applications and characteristics of microprocessor systems Computer system work principles (including: binary system; CPU work principles; memory) System elements and data transmission (including: system elements cooperation; interrupts; GPIO; timers; basics of data transmission; SPI, I2C, UART (RS232), USB interfaces) Signal processing (including: ADC, DAC, basics of DSP; PWM signals) Development and manufacturing of microprocessor systems						
Prerequisites and co-requisites							

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Written test	53.0%	75.0%
	Performing exercises during laboratory classes	53.0%	25.0%
Recommended reading	Basic literature	Lecture materials and laboratory instructions at eNauczanie	
	Supplementary literature	<p>Galewski M. STM32. Aplikacje i ćwiczenia w języku C z biblioteką HAL, BTC, Legionowo, 2019</p> <p>Kurczyk A. Mikrokontrolery STM32 dla początkujących. BTC, Legionowo 2019</p> <p>Leśnicki A., Technika cyfrowego przetwarzania sygnałów, Wydawnictwo PG, Gdańsk, 2016</p> <p>Smith S.W., Cyfrowe przetwarzanie sygnałów: praktyczny poradnik dla inżynierów i naukowców, BTC, Legionowo, 2007</p>	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	List of exemplary questions will be presented before the end of the semester - at least 4 weeks ahead of the final test		
Work placement	Not applicable		