

Subject card

Subject name and code	Introduction to Embedded Systems and Data Acquisition, PG_00210513						
Field of study	Informatics						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2026/2027		
Education level	Master's studies		Subject group				
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish pl		
Semester of study	2		ECTS credits		2.0		
Learning profile	academic		Assessment form		credit		
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Krzysztof Dorywalski				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	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		0.0		20.0	50
Subject objectives	The aim of the course is to familiarize students with the fundamentals of embedded systems architecture, as well as with methods and techniques for the acquisition, processing, and analysis of measurement data from the physical environment. The course is intended to develop the ability to integrate hardware, software, and mathematical algorithms in order to design and implement autonomous monitoring and control systems.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[INFMU2_K04] is ready to recognize the importance of knowledge in solving cognitive and practical problems and to seek expert advice in the event of difficulties in solving a problem independently		The student is prepared to recognize the key role of theoretical knowledge (in the fields of computer science, electronics, and mathematical models) in diagnosing and solving problems related to the design and commissioning of embedded systems; in the event of errors that are difficult to identify independently, the student is able to precisely formulate the problem and is prepared to seek expert advice and use specialized engineering communities.		[SK2] presentation/project/paper/report [SK5] implementation of a problem task [SK6] demonstration of practical skills		
	[INFMU2_W04] knows and understands in depth the principles of designing and implementing complex software systems, the impact of system architecture on its concurrency, performance and scalability, concurrent and parallel processing models and their application in modern systems		The student knows and understands the principles of embedded systems software design, with particular emphasis on the impact of hardware constraints on system performance and scalability.		[SW2] presentation/project/paper/report [SW5] implementation of a problem task		

Subject contents	Introduction to embedded systems Operation of digital input/output devices Acquisition of analog signals: A/D converters Presentation of measurement data: displays, UART communication Communication interfaces Computer-based control of actuators: DC motors, servo drives Elements of digital signal processing		
Prerequisites and co-requisites	Fundamental knowledge of electrodynamics. Basic programming skills in a selected high-level programming language.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		51.0%	50.0%
		51.0%	50.0%
Recommended reading	Basic literature	A.1. Used during classes: - Instructions and materials provided by the instructor A.2. Studied independently by the student: - S. Monk, Arduino dla początkujących. Podstawy i szkice. Wydanie II. Helion, 2018 - M. Evans, J. Noble, J. Hochenbaum, Arduino w akcji. Helion 2014 - S. Monk, Arduino dla początkujących. Kolejny krok. Helion, 2015	
	Supplementary literature	- Paprocki M., <i>Mikrokontrolery STM32 w praktyce</i> , Wydawnictwo BTC, Legionowo 2019 - P. Horowitz, H. Winfield, <i>Sztuka elektroniki</i> , WKŁ, 2018	
	eResources addresses		
	Example issues/ example questions/ tasks being completed	Design and implement a simple microcontroller-based system for the acquisition of an analog signal, its processing, and the presentation of results on a computer or display.	
Work placement	Not applicable		

Document generated electronically. Does not require a seal or signature.