GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Embedded Systems and Microprocessors, PG_00058917		
Field of study	Informatics		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2026/2027
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	Part-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish
Semester of study	4	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Microelectronic Systems -> Faculty of Electronics Telecommunications and Informatics -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Maciej Kokot	
	Teachers	dr inż. Maciej Kokot	

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	4.0	66.0	100

Subject objectives

Getting familar with architectures, construction and examples of nowadays microprocessors and microcontrollers

Acquire skills programming PIC microcontrollers.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U03] can design, according to required specifications, and make a simple device, facility, system or carry out a process, specific to the field of study, using suitable methods, techniques, tools and materials, following engineering standards and norms, applying technologies specific to the field of study and experience gained in the professional engineering environment	Student programs the PIC family of microcontrollers in assembler code.	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment
[K6_U04] can apply knowledge of programming methods and techniques as well as select and apply appropriate programming methods and tools in computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study	Student programs the PIC family of microcontrollers in assembler code.	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment

Subject contents	Microprocessor. History and development of microprocessors. Basic functional components of microprocessor. Programming model of microprocessor. Von Neumann and Harvard architectures. CISC and RISC processors, assembler programming. Intel/AMD, IA-32, AMD64 (x86-64), IA-64, Itanium microprocessors family. Explicitly Parallel Instruction Computing. Branch Predication. ARM, POWER, SPARC microprocessors family. Performance improvement techniques: pipeline processing, cache memory, multithreading, multicore, parallel processing of instructions and data Microcontrollers. Architecture and usage. Microcontrollers families. Microchip"s PIC microcontrollers familly. Instruction set, examples of code, memory architecture, special registers. Serial communication ports, SPI, I2C, RS232, CAN, USB. Program and EEPROM memory. A/D and D/A converters, interrupts, timers and counters.
Prerequisites and co-requisites	
Assessment methods and criteria	

Subject passing criteria	Passing threshold	Percentage of the final grade
Midterm colloquium	50.0%	33.0%
Practical exercise	50.0%	67.0%

Recommended reading	Basic literature	1. J. Crisp: Introduction to Microprocessors and Microcontrollers. Newnes 2004 2. Pietraszek S.: Mikrokprocesory jednoukładowe PIC. Wyd. Helion, Gliwice 2002. 3. J. Bogusz: Lokalne interfejsy szeregowe. BTC, Warszawa, 2004.
	Supplementary literature	1. www.microchip.com
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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