GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Microelectronic Programmable Systems, PG_00048107		
Field of study	Electronics and Telecommunications		
Date of commencement of studies	October 2021	Academic year of realisation of subject	2024/2025
Education level	first-cycle studies	Subject group	Optional subject group 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	4	Language of instruction	Polish
Semester of study	7	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Microelectronic Systems -> Faculty of Electronics, Telecommunications and Informatics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Marek Wójcikowski	
	Teachers	dr hab. inż. Marek Wójcikowski	

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	3.0	42.0	75

Subject objectives	Introduction to the design and capabilities of microelectronic programmable systems, built on an FPGA programmable circuits. The students will be taught how to create a full microprocessor system with a processor, buses, peripherals, and storage systems within a single FPGA. Introduction to methods of debugging of such systems.

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	knows how to design a programmable microelectronic system, knows how to add own hardware blocks to a programmable microelectronic system;	[SU1] Assessment of task fulfilment
	[K6_W32] Knows the parameters, functions and methods of analysis, design and optimization of analogue and digital circuits and electronic systems	knows the construction of digital programmable microelectronic systems; knows processors and peripheral systems implemented in FPGAs; knows the basic methods of starting programmable microelectronic systems;	[SW1] Assessment of factual knowledge
	[K6_W33] Knows programming languages and equipment description languages, as well as methods for the synthesis of combinational and sequential circuits and programmable systems	knows the structure and operation of basic blocks of programmable microelectronic systems;	[SW1] Assessment of factual knowledge
	[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	can write basic low-level software and drivers for hardware blocks of programmable microelectronic systems;	[SU1] Assessment of task fulfilment
Subject contents	1. Introduction, 2. Simple soft-processor, 3. Buses in SoC systems, 4. 32-bit soft-processor, 5. System development process, 6. IPIF bus interface block, 7. GPIO block, 8. Interrupts, 9. FSL interface, 10. SoC overview		
Prerequisites and co-requisites	Knowledge of VHDL (or Verilog) and C language is required.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Final exam	50.0%	50.0%
	Practical exercise	50.0%	50.0%
Recommended reading	Basic literature	J. Ganssle, The art of Designing Embedded Systems, Newnes; Edycja 2nd ed. (2008) AMD, www.amd.com Altera Inc. , www.altera.com Xilinx Inc, www.xilinx.com	
	Supplementary literature	No requirements	
	eResources addresses	Adresy na platformie eNauczanie: Mikroelektroniczne systemy programowalne 2024/2025 - Moodle ID: 41600 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=41600	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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