



## Subject card

Subject name and code	Digital embedded and programmable systems, PG_00059226						
Field of study	Automation, Robotics and Control Systems						
Date of commencement of studies	February 2023		Academic year of realisation of subject		2023/2024		
Education level	second-cycle studies		Subject group				
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish		
Semester of study	2		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Controlled Electric Drives -> Faculty of Electrical and Control Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Arkadiusz Lewicki				
	Teachers		dr hab. inż. Arkadiusz Lewicki  dr inż. Filip Wilczyński				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	15.0	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		5.0		15.0	50
Subject objectives	Presentation of programmable logic structures, presentation of programming methods and methods to control of peripheral devices						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K7_W03		Student is able to analyze documentation and on their basis develop digital structure with given parameters.		[SW3] Assessment of knowledge contained in written work and projects		
	K7_U05		Student is able to select equipment and make electrical measurements, can use information and communication techniques to carry out engineering tasks related to programmable logic devices.		[SU1] Assessment of task fulfilment		
	K7_U11		Student is able to design and implement simple process control systems using computer systems		[SU4] Assessment of ability to use methods and tools		
	K7_K02		Student is able to work in a group taking different roles in it		[SK2] Assessment of progress of work		
Subject contents	The structures of programmable devices: PLD (SPLD, CPLD) and FPGA. Programming methods, methods of logical structure design. Preparing of complex functional blocks. Basics of HDL languages. Cooperation with external digital devices.						
Prerequisites and co-requisites	Knowledge in the field of digital technology.						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Examination of the lecture		60.0%		20.0%		
	The projects designed during laboratory exercises		60.0%		80.0%		

Recommended reading	Basic literature	<ol style="list-style-type: none"> <li>1. Robert Betz: Hardware Description Languages.</li> <li>2. Ducek: Digital Design with CPLD Application and VHDL.</li> <li>3. Uwe Meyer-Baese: Digital signal processing with Field Programmable Gate Array.</li> <li>4. K. Parnell, N.Metha: Programmable Logic Design.</li> <li>5. S.Shjiva: Introduction to logic design.</li> <li>6. P. Chu: RTL hardware design using VHDL.</li> </ol>
	Supplementary literature	No special recommendations
	eResources addresses	<p>Adresy na platformie eNauczanie:</p> <p>Cyfrowe układy wbudowane i programowalne [2023/24] - Moodle ID: 11154</p> <p><a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=11154">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=11154</a></p>
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> <li>1. Describe the structure of the FPGA.</li> <li>2. Describe the structure of logic macrocell.</li> <li>3. Design the logical structure to control of selected device.</li> </ol>	
Work placement	Not applicable	