

关。GDAŃSK UNIVERSITY 创 OF TECHNOLOGY

Subject card

Subject name and code	Integration and Visualisation of Automatics Systems, PG_00059282								
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			3.0			
Learning profile	general academic profile		Assessment form			assessment			
Conducting unit	Department of Control Engineering -> Faculty of Electrical and Control Engineering								
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Krzysztof Armiński						
	Teachers		dr inż. Krzysztof Armiński						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	aboratory Project		Seminar	SUM	
	Number of study hours	15.0	0.0	15.0	15.0		0.0	45	
	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	y 45		7.0		23.0		75	
Subject objectives	Preparing students to use automation systems in industrial applications and integrate them with information systems. Learning to design and program complex industrial automation systems using PLC and HMI/ SCADA.								
Learning outcomes	Course out	come	Subject outcome			Method of verification			
	K7_U10		The student learns the principles of describing control systems and analyzing their operation, learns the principles of creating and testing control programs and testing the created communication links			[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject			
			structures and principles of creating automation systems with programmable devices - PLC, HMI/ SCADA. The student analyzes the task and creates the concept of the control system, selects the hardware, functional and communication structure. He adopts the assumptions of the communication network. The student creates structured control programs in FBD and/or ladder language using standard structuring and programming techniques, creates ergonomic visualization interfaces. The student knows the principles of industrial equipment communication: physical connections, rules and parameters of network node configuration and data exchange programming.			knowledge			

Subject contents	Lecture:						
	Contemporary architecture (conceptual, functional, physical, integration, operational) of distributed systems and their design principles. Containerization as a tool to ensure separation and reliability in information systems. Running containers in a production environment. Network communication in automation systems as an integration tool: REST API on the server and client side. Principles of building visualization systems in automatic control structures. Laboratory and Project Configuration and programming of control systems using communication networks to implement control, protection and signaling functions. Programming of complex systems with PLC and frequency converters and drives, configuration and programming of the above control systems with visualization. Use of PC to simulate control objects as a tool to verify the correctness of control systems. Cooperation of PLC with						
Drereguinites	Knowledge of subjects: Eurodamentals of Automation, Continuous Process Control, Computer Science						
and co-requisites	Fundamentals of Digital Technology, Microprocessor Technology, Industrial Computer Networks, Programmable Controllers. PLC and PC programming skills. Basic knowledge of SCADA systems.						
Assessment methods	Subject passing criteria	Passing threshold	Percentage of the final grade				
and criteria	Lecture	50.0%	40.0%				
	Laboratory	50.0%	30.0%				
	Project	50.0%	30.0%				
Recommended reading	Basic literature	 Kwaśniewski J.: Programowalni systemach sterowania, ZP Rom Legierski T., Wyrwał J., Kasprzy sterowników PLC, Wydawnictw Skalmierskiego ,Gliwice, 1998. Seta Z.: Wprowadzenie do teor programowalnych sterowników Winiecki W., Nowak J., Stanik S środowiska programowe do pro systemów pomiarowo kontrolny Jakuszewski R: Programowani komputerowa Jacka Skalmiersi Bass L., Clements P., Kazman zastosowania. Wydanie II, 2011 	e sterowniki przemysłowe w na-Pol, Kraków, 1999. yk J., Hajda J.: Programowanie o Pracownia Komputerowej Jacka ii sterowania. Wykorzystanie PLC., Mikom, Warszawa, 2002. S.: Graficzne zintegrowane ojektowania komputerowych /ch, Mikom, Warszawa, 2001. e systemów SCADA, Pracownia kiego, Gliwice, 2006. R.: Docker. Praktyczne 9 ISBN: 978-83-283-5604-7				
	Supplementary literature	Documentation - user manual PLC SAIA, Control Maestro I InTouch 7.0.					
	eResources addresses	Adresy na platformie eNauczanie:					
Example issues/ example questions/ tasks being completed	 Establish communication between the PLC and your own PC program. Establish the connection between the PLC and the SCADA system. Development of a control system. And its implementation on the PLC. Preparation of the control object simulator. 						
Work placement	Not applicable						