



## Subject card

Subject name and code	Integration and Visualisation of Automatics Systems, PG_00038286						
Field of study	Automation, Robotics and Control Systems						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2022/2023		
Education level	second-cycle studies	Subject group			Optional subject group 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	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			exam		
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						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	10.0	0.0	20.0	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		6.0		39.0	75
Subject objectives	Preparing students for the practical use of automation systems in industrial applications. Learning design and development of complex industrial automation systems with the use of PLC and SCADA.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K7_U10		Student can design selected automated system based on programmable controllers and a visualization system.		[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment		
	K7_W08		Student knows the principles of designing control and control systems based on drivers and visualization systems.		[SW1] Assessment of factual knowledge		
Subject contents	<p><b>LECTURE:</b> PLC systems and visualization of multi-layer automatic control. General characteristics of drivers and SCADA systems. Principles of programming and design automation system using PLC and SCADA. Communication with the user's control system. The control and visualization of industrial processes. The requirements of visualization systems. Visualization systems in the information structure. The components of visualization systems, communication protocols and communication systems visualization. Work of visualization systems in a computer network. Operation and configuration of visualization systems. The integration of visualization systems with the systems of decision-making. General principles for compiling a PLC and SCADA.</p> <p><b>EXERCISES:</b> an analysis of the selected automation system, develop a set of input and output ranges of variation of parameters, the technical assumptions, the functions implemented in the visualization system and a programmable controller, modeling in conjunction visualization system - the controller, control algorithm, the scope of research, checking the system, description of the modes, use the menu windows, gauges, indicators, buttons, alarms. Develop documentation.</p>						
Prerequisites and co-requisites	Knowledge of the Basics of of Automatics						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Project		50.0%		70.0%		
	Colloquium of the lectures contets		50.0%		30.0%		

Recommended reading	Basic literature	<ol style="list-style-type: none"> <li>1. Kwaśniewski J.: Programowalne sterowniki przemysłowe w systemach sterowania, ZP Roma-Pol, Kraków, 1999.</li> <li>2. Legierski T., Wyrwał J., Kasprzyk J., Hajda J.: Programowanie sterowników PLC, Wydawnictwo Pracownia Komputerowej Jacka Skalmierskiego, Gliwice, 1998.</li> <li>3. Seta Z.: Wprowadzenie do teorii sterowania. Wykorzystanie programowalnych sterowników PLC., Mikom, Warszawa, 2002.</li> <li>4. Winiecki W., Nowak J., Stanik S.: Graficzne zintegrowane środowiska programowe do projektowania komputerowych systemów pomiarowo – kontrolnych, Mikom, Warszawa, 2001.</li> <li>5. Jakuszewski R: Programowanie systemów SCADA, Pracownia komputerowa Jacka Skalmierskiego, Gliwice, 2006.</li> </ol>
	Supplementary literature	1. Users manual of PLC SAIA, Control Maestro and InTouch 7.0.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	The rules for creating programs and design automation using PLC and SCADA. Using technology to create web-like industrial applications. Designing the User Interface HMI.	
Work placement	Not applicable	