GDAŃSK UNIVERSITY OF TECHNOLOGY

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 2026	Academic year of realisation of subject	2026/2027
Education level	second-cycle studies	Subject group	Specialty 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 -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Krzysztof Armiński	
	Teachers		

Lesson types

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] is able to apply the known mathematical tools and methods and computer techniques to analyse and evaluate automation and robotics components, devices, systems and systems	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] has in-depth knowledge of program development and design of complex systems automation systems using PLC and SCADA, transmission and processing of signals occurring in a variety of physical objects	Student knows the principles of designing control and control systems based on drivers and visualization systems.	[SW1] Assessment of factual knowledge

Subject contents

Course content – lecture

LECTURE: PLC systems and visualization of multi-layer automatic control. General characteristics of drivers and SCADA systems. Priciples 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.

Course content – laboratory

EXERCISES: 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.

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="2">Knowledge of the Basics of of Automatics</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Project</td><td>50.0%</td><td>70.0%</td></tr>
<tr><td>Colloquium of the lectures contets</td><td>50.0%</td><td>30.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>1. Kwaśniewski J.: Programowalne sterowniki przemysłowe w systemach sterowania, ZP Roma-Pol, Kraków, 1999.
2. Legierski T., Wyrwał J., Kasprzyk J., Hajda J.: Programowanie sterowników PLC, Wydawnictwo Pracownia Komputerowej Jacka Skalmierskiego ,Gliwice, 1998.
3. Seta Z.: Wprowadzenie do teorii sterowania. Wykorzystanie programowalnych sterowników PLC., Mikom, Warszawa, 2002.
4. Winiecki W., Nowak J., Stanik S.: Graficzne zintegrowane środowiska programowe do projektowania komputerowych systemów pomiarowo – kontrolnych, Mikom, Warszawa, 2001.
5. Jakuszewski R: Programowanie systemów SCADA, Pracownia komputerowa Jacka Skalmierskiego, Gliwice, 2006.</td></tr>
<tr><td>Supplementary literature</td><td>1. Users manual of PLC SAIA, Control Maestro and InTouch 7.0.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">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.</td></tr>
<tr><td>Practical activites within the subject</td><td colspan="2">Not applicable</td></tr>
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