GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Programmable Logic Controllers and Process Visualization, PG_00047577		
Field of study	Automatic Control, Cybernetics and Robotics		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2025/2026
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study 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	2	Language of instruction	Polish
Semester of study	4	ECTS credits	5.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Decision Systems and Robotics -> Faculty of Electronics, Telecommunications and Informatics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Tomasz Talaśka	
	Teachers	dr hab. inż. Tomasz Talaśka	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	30.0	0.0	0.0	60

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	60	5.0	60.0	125

Subject objectives

Acquainted with programmable logic controllers, their programming and the using in automation. Basic knowledge of supervising, data acquisition and process visualization systems (SCADA).

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W21] Knows and understands the basic methods of decision making as well as methods and techniques of design and operation of automatic regulation and control systems, computer applications for controlling and monitoring dynamic systems.	Knowledge about the use of programmable logic controllers in simple and complex automation systems.	[SW1] Assessment of factual knowledge
[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	Is able to program programmable logic controllers used in simple automation systems.	[SU4] Assessment of ability to use methods and tools
[K6_W03] knows and understands, to an advanced extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum	Knowledge about programmable logic controllers (PLC) and about supervisory control and data acquisition systems (SCADA).	[SW1] Assessment of factual knowledge

<table>
<tr><td>Subject contents</td><td>1. Preliminary information regarding propriety and application of Programmable Logic Controllers (PLC). 2. General controller architecture, operating system and program cycle. 3. Programming languages used in PLCs. 4. Logicmaster graphical programming language. 5. Basic rules of program creation. 6. Data and variables. 7. Switches, relays and connections. 8. Counters and time-based relays. 9. Mathematical functions and relations. 10. Data manipulation. 11. Control functions. 12. Programming examples. 13. Exemplary PLC hardware modules. 14. Digital inputs and outputs modules. 15. Analog inputs and outputs modules. 16. PLC controllers and networks. 17. Communication protocols. 18. Communication modules. 19. Industrial GENIUS network. 20. Collaboration of networks and PLCs. 21. SCADA (Supervisory Control and Data Acquisition) systems. 22. InTouch - creator of SCADA applications. 23. Windows creation - graphical editor. 24. Variables and animation connections. 25. Scripts. 26. Alarms. 27. Communication with PLCs. 28. Actual and historical trends. 29. Graphics import (Symbol Factory). 30. Ready-to-use applications managing.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>evaluation of laboratory</td><td>50.0%</td><td>60.0%</td></tr>
<tr><td>test</td><td>50.0%</td><td>40.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>1. T.Legierski, J.Kasprzyk, J.Wyrwał, J.Hajda, "Programowanie sterowników PLC", Wyd. Pracowni Komputerowej J.Skalmierskiego

2. A.Maczyński, "Sterowniki programowalne PLC. Budowa systemu i podstawy programowania. Astor</td></tr>
<tr><td>Supplementary literature</td><td>No requirements</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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