GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Industrial electronics and automation, PG_00062732		
Field of study	Technologies for Industry 5.0		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2027/2028
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	3	Language of instruction	Polish
Semester of study	5	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department Of Biomedical Engineering -> Faculty Of Electronics Telecommunications And Informatics -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Grzegorz Jasiński	
	Teachers		

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	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	45	5.0	25.0	75

Subject objectives

The aim of the course is to provide theoretical and practical knowledge in the construction, design and servicing of automated workstations and processes in an industrial setting using professional computer hardware and engineering software.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W05] demonstrates practical knowledge related to technological processes, utilized devices and systems, has knowledge regarding selected processes monitoring tools	The student is familiar with methods of designing simple control systems of various physical quantities in industrial conditions.	[SW1] Assessment of factual knowledge
[K6_U02] identifies and solves problems related to signal processing and transmission, integrates measurement and control systems, manages electronic systems in the context of intelligent production processes	The student solves tasks in the field of design, modelling and simulation of objects, processes, systems and control systems.	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools
[K6_W02] demonstrates knowledge and understanding of electronics, automation and telecommunications and systems theory, that enables identification of problems and formulation of solutions appropriate for the fourth and fifth industrial revolutions	The student identifies and classifies typical technical objects. The student presents basic methods of modelling and simulation of objects, processes and control systems.	[SW1] Assessment of factual knowledge
[K6_U05] interprets phenomena occurring around the technological process and processes occurring in the life cycle of devices and systems, makes a critical assessment of the functioning of existing solutions	The student will freely use simulation programmes in the field of modelling of objects and control systems. The student develops programmes for implemented in PLCs or industrial computers.	[SU1] Assessment of task fulfilment [SU5] Assessment of ability to present the results of task

<table>
<tr><td>Subject contents</td><td>Classification of control and regulation systems. Examples of industrial control systems. Models of control objects, measuring and implementing elements of their properties, static and dynamic characteristics. Methods of identification of industrial objects, system elements and control systems. Structures of control systems for industrial objects. Types of industrial control devices. Selection of control devices, measuring and actuating devices in technology. Control evaluation criteria for complex control systems and control systems. Examples of applied solutions of complex control systems and control systems in industry. Design of automation systems and systems. Identification and development of models of selected objects, selection of controller, measuring devices and actuators, design of automatic control systems using PLCs.</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>Reports on completed laboratory exercises</td><td>50.0%</td><td>30.0%</td></tr>
<tr><td>Project documentation</td><td>50.0%</td><td>20.0%</td></tr>
<tr><td>Test</td><td>50.0%</td><td>50.0%</td></tr>
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</td></tr>
<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>Findeisen W.: Technika regulacji automatycznej. Warszawa: PWN 1976.
Kaczorek T.: Teoria układów regulacji automatycznej, Warszawa: WNT 1977.
Tatjewski P.: Sterowanie zaawansowane obiektów przemysłowych. Struktury i algorytmy. Warszawa: EXIT 2002.
Mitkowski W.: Stabilizacja systemów dynamicznych. Kraków: AGH 1996.
Piegat A.: Modelowanie i sterowanie rozmyte. Warszawa: EXIT 1999.</td></tr>
<tr><td>Supplementary literature</td><td>Raven F.H.: Automatic Control Engineering. McGraw-Hill 1988.</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
</table>
</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>Develop an algorithm for controlling a lift in a four-storey building.

Select PID controller settings to control a specific object.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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