GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Control engineering, PG_00058308		
Field of study	Automation, Robotics and Control Systems		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2026/2027
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	6	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. Jacek Zawalich	
	Teachers		

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	0.0	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	3.0	27.0	75

Subject objectives

The aim of the course is to provide theoretical and practical knowledge in the field of construction, design and maintenance of automated posts and processes in an industrial environment with the use of professional hardware and software engineering.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U07] can build and analyze models of systems and systems in the field related to control systems and automation	The student solves tasks in the field of design, modeling and simulation of objects, processes, systems and control systems. The student freely uses simulation programs in the field of object modeling and control systems. The student develops programs to be implemented in PLCs or industrial computers.	[SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools
[K6_W07] has basic knowledge related to control and automation systems	Student identifies and classifies typical technical objects. The student presents the basic methods of modeling and simulation of objects, processes and control systems. The student knows the methods of designing simple control systems of various physical quantities in industrial conditions.	[SW3] Assessment of knowledge contained in written work and projects

Subject contents

LECTURE

Classification of control and regulation. Examples of industrial control systems. Control object models, the sensing elements and implementing their properties, static and dynamic characteristics. Methods for identifying industrial, systems, components and controls. Structure of an industrial control systems. Types of industrial control devices. The choice of control devices, measuring and implementing technical designs. Criteria for assessing control complex control and regulation systems. Examples of applicable solutions to complex control systems and control systems in the industry. Designing automation systems.

LABORATORY

Identify and develop models of selected objects, the choice of regulator, measuring devices and actuators, designing of automatic control systems using PLC.

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="3">Knowledge of Fundamentals Automation</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Reports of laboratory exercises</td><td>100.0%</td><td>40.0%</td></tr>
<tr><td>Colloquium</td><td>50.0%</td><td>60.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">1. Findeisen W.: Technika regulacji automatycznej. Warszawa: PWN 1976.
2. Kaczorek T.: Teoria układów regulacji automatycznej, Warszawa: WNT 1977.
3. Tatjewski P.: Sterowanie zaawansowane obiektów przemysłowych. Struktury i algorytmy. Warszawa: EXIT 2002.
4. Mitkowski W.: Stabilizacja systemów dynamicznych. Kraków: AGH 1996.
5. Piegat A.: Modelowanie i sterowanie rozmyte. Warszawa: EXIT 1999.
6. Nowakowski J.: Podstawy automatyki. Tom I. Gdańsk: Wyd. PG 1992.
7. Ogata K.: Modern Control Engineering. 4th edition. Prentice Hall 2002.</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">1. Próchnicki W., Dzida M.: Zbiór zadań z podstaw automatyki. Gdańsk: Wyd. PG 1993.
2. Urbaniak A.: Automatyzacja w inżynierii sanitarnej. Poznań: Wyd. Pol. Poznańskiej 1985.
3. Raven F.H.: Automatic Control Engineering. McGraw-Hill 1988.</td></tr>
<tr><td>eResources addresses</td><td colspan="2">Adresy na platformie eNauczanie:</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">Prepare model of the temperature control of the water tank.
Perform the analysis stability control system in the reservoir water level with a delay.
Design a heating control system in the warehouse for storage of vegetables and fruits.
Prepare a lift control algorithm in a four-storey building.</td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
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