GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Automation and Robotics, PG_00060459		
Field of study	Mechanical and Naval Engineering		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2024/2025
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	Part-time studies	Mode of delivery	blended-learning
Year of study	2	Language of instruction	Polish
Semester of study	3	ECTS credits	5.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Institute of Naval Architecture -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Mohammad Ghaemi	
	Teachers	mgr inż. Jacek Frost dr inż. Joanna Grochowalska dr inż. Mohammad Ghaemi	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	18.0	9.0	9.0	0.0	0.0	36

E-learning hours included: 18.0

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	36	8.0	81.0	125

Subject objectives

The aim is to get acquainted with the basis of control theory and with the structures and elements of basic automation systems, as well as general information on the design of control systems.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U05] is able to plant an experiment within the range of measuring the basic operating parameters of mechanical devices using a specialized equipment, interpret the results and reach the correct conclusions	The student is able to plan an experiment in the field of identification of basic control systems, using specialized equipment, conduct an interpretation of the results, and draw appropriate conclusions.	[SU4] Assessment of ability to use methods and tools
[K6_W06] possesses knowledge on automatics and robotics of mechanical systems	The student possesses knowledge in the field of basic control systems of mechanical control systems, including their operation, characteristics, parameters, and behaviour in both steady-state and transient states.	[SW1] Assessment of factual knowledge

<table>
<tr><td>Subject contents</td><td>1. Introduction and basic concepts

2. Classification of control systems

3. Modeling of mechanical dynamical systems and description of their elements

4. Types of mathematical models of dynamical systems: differential equation, transfer function, block diagram, linearization

5. Transition function and time characteristics

6. Feedback closed-loop control system

7. Analysis of control systems in the plot of time and in the plot of frequency

8. Stability of linear control systems

9. Controllers</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Prerequesties:

1. Mathematics

2. Physics</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>Laboratory</td><td>50.0%</td><td>25.0%</td></tr>
<tr><td>Lecture</td><td>50.0%</td><td>50.0%</td></tr>
<tr><td>Exercises</td><td>50.0%</td><td>25.0%</td></tr>
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</td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>Nise N. S., Control System Engineering, 8th Edition, John Whiley & Sons Inc., 2019.</td></tr>
<tr><td>Supplementary literature</td><td>- Friedland B., Control System Design, McGraw Hill Co., 1986.

- Ogata K., Modern Control Engineering, 4th edition, Prentice-Hall, 2009.

- Raven, F. H., Automatic control engineering, McGraw Hill Co., 1986.</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
<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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