University of Gdańsk

Subject card

Subject name and code	Fundamentals of automatics - laboratory classes , PG_00131475		
Field of study	Marine Hydrography		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2025/2026
Education level	Bachelor's studies	Subject group	Obligatory subject group in the field of study Subject group related to practical vocational preparation
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish polish
Semester of study	3	ECTS credits	0.0
Learning profile	practical	Assessment form	credit

Conducting unit		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Bogdan Żak
	Teachers	prof. dr hab. inż. Bogdan Żak

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	8.0	0.0	0.0	0.0	8

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	8	1.0	2.0	11

Subject objectives

To impart knowledge of the construction and principle of operation of automatic control systems; To learn and consolidate methods of analytical determination of dynamic characteristics of automatic control elements and systems; To learn and consolidate methods of transformation of UAR block diagrams, To develop the ability to practically use criteria for evaluating stability and quality of regulation. Developing the ability to perform mathematical analysis of automatic control systems.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[HML3-U01] plan and conduct experiments, including computer simulations, interpret the results obtained and draw conclusions	can: - Describe the behavior of a control object and a control system in the time and frequency domain. - Present practical examples of basic control systems. - Perform calculations to determine the dynamic characteristics of automatic control systems and evaluate their stability and control quality.	[SU6] demonstration of practical skills
[HML3-U18] work individually and in team, manage the work of the team, in particular comply with health and safety regulations and ergonomics	can: - Interact and work in a practice group, - Individually solve UAR analysis tasks	[SU6] demonstration of practical skills

Subject contents

Exercises: Solving differential equations by Laplace transform. Determination of time characteristics of UAR. Determination of frequency characteristics of UARs. Block diagram algebra and stability criteria.

Prerequisites and co-requisites

<table>
<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>colloquium</td><td>51.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>1. BEŃSKI J., KICIŃSKI W., ŻAK B.: Automatics. Part III. Laboratory exercises. AMW, Gdynia 1990.
2. KACZOREK T.: Fundamentals of control theory. WNT, Warsaw 2005.
3. KITOWSKI Z.: Automatics. Accounting exercises. AMW, Gdynia 1989.</td></tr>
<tr><td>Supplementary literature</td><td>OGATA K.: Modern Control Engineering. Wiley and Sons, 2013.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">From the operator transmittance of the system, determine its dynamic characteristics; Investigate the stability of the system using stability criteria; Determine the transmittances of the system from its block diagram;</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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