GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Essentials of Automatics, PG_00047537		
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
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish
Semester of study	3	ECTS credits	5.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Automatic Control -> Faculty of Electronics, Telecommunications and Informatics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Piotr Kaczmarek	
	Teachers	dr inż. Piotr Kaczmarek	

Lesson types and methods of instruction

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

Introduction of basic concepts of automatic control systems.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W05] Knows and understands, to an advanced extent, methods of supporting processes and functions, specific to the field of study	Student knows various quantitative measures of performance performance and understands their use in the specification and synthesis of control systems	[SW1] Assessment of factual knowledge
[K6_W01] knows and understands, to an advanced extent, mathematics necessary to formulate and solve simple issues related to the field of study	Student knows various methods of modeling of dynamic systems and understands how they are related to each other	[SW1] Assessment of factual knowledge
[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	Student knows the presented methods of analysis and synthesis of control systems and understands how they are related to each other	[SW1] Assessment of factual knowledge

<table>
<tr><td>Subject contents</td><td>Modeling of dynamic systems: differential equations, transfer functions, block diagrams, state-space models

Responses of first and second order plants; direct control quality indexes, dominant poles

BIBO and asymptotic stability

Steady-state performance

Root locus analysis and controller design

Frequency response and indirect control quality indexes

Stability in the frequency domain; Stability margins

Frequency-domain controller design</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Calculus, Complex Calculus, Algebra</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>Exercices</td><td>60.0%</td><td>50.0%</td></tr><tr><td>Exam</td><td>60.0%</td><td>50.0%</td></tr></table></td></tr>
<tr><td>Recommended reading</td><td><table><tr><td>Basic literature</td><td>N.S. Nise, Control Systems Engineering, Wiley, 2010.

R.C. Dorf, R.H. Bishop, Modern Control Systems, Prentice Hall, 2008.

F. Golnaraghi, B.C. Kuo, Automatic Control Systems, Wiley, 2009.</td></tr><tr><td>Supplementary literature</td><td>S. Skogestat, I, Postlethwaite, Multivariable Feedback Control: Analysis and Design, Wiley, 2005.</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></td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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