GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Dynamic Systems, PG_00038123		
Field of study	Automation, Robotics and Control Systems		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2024/2025
Education level	first-cycle studies	Subject group	Optional subject group 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	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Intelligent and Decision Support Systems -> Faculty of Electrical and Control Engineering		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Robert Piotrowski	
	Teachers	dr hab. inż. Robert Piotrowski mgr inż. Tomasz Ujazdowski	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	15.0	0.0	0.0	0.0	30

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	30	3.0	17.0	50

Subject objectives

Presentation of contemporary forms of description of dynamic systems and methods of analysis of their properties.
Different categories of systems, methods of describing them, ways of studying their properties will be presented.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W10] has basic knowledge related to mechatronics and robotics systems	The student is able to analyse dynamic systems.	[SW3] Assessment of knowledge contained in written work and projects
[K6_U08] can design and build systems and devices in the field related to mechatronics and robotics systems	The student is able to develop a model of a dynamic system and analyse it.	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools

Subject contents

1 Signals and systems.

2. Interchangeability of the form of description of dynamical systems.

3. Discretisation of models in the form of differential equations and based on the operator transmittance.

4 System responses.

5. Stability of the system.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Written pass	50.0%	70.0%
Exercises	50.0%	30.0%

Recommended reading	Basic literature	1. Buck J.R., Daniel M.M., Singer A.C. (2002). Computer Explorations in Signals and Systems Using MATLAB®. 2nd edition, Prentice-Hall, New Jersey. 2. Byrski W. (2007). Obserwacja i sterowanie w systemach dynamicznych. Uczelniane Wydawnictwa Naukowo Dydaktyczne Akademii Górniczo Hutniczej, Kraków. 3. Czemplik A. (2021). Dynamika układów. Wprowadzenie do modelowania, analizy i symulacji. Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław. 4. Heij Ch., Ran A., van Schagen F. (2000). Introduction to Mathematical Systems Theory. Linear Systems, Identification and Control. Birkhäuser Verlag. 5. Karris S.T. (2003). Signals and Systems with MATLAB® Applications. Second Edition. Orchard Publications, Fremont, California. 6. Oppenheim A.V., Willsky A.S., Nawab S.H. (1997). Signals and Systems. 2nd edition, Prentice-Hall, New Jersey. 7. Wojciechowski J. (2008). Sygnały i systemy. Wydawnictwa Komunikacji i Łączności, Warszawa.
	Supplementary literature	Mitkowski W. (2019). Zarys teorii sterowania. Uczelniane Wydawnictwa Naukowo Dydaktyczne Akademii Górniczo Hutniczej, Kraków.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	1. Find a description in state space (equations of state and equation of output) and draw a diagram using an iterative method. 2. Check analytically that the system satisfies the additivity condition.	
Work placement	Not applicable	

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