



Subject card

Subject name and code	Dynamic Systems, PG_00038123						
Field of study	SYSTEMY DYNAMICZNE						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2025/2026		
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 -> Wydział Politechniki Gdańskiej						
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	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_U08] can design and build systems and devices in the field related to mechatronics and robotics systems	Analyses dynamic systems.			[SU3] Ocena umiejętności wykorzystania wiedzy uzyskanej w ramach przedmiotu		
	[K6_W10] has basic knowledge related to mechatronics and robotics systems	Develops a dynamic system model and conducts its analysis.			[SW3] Ocena wiedzy zawartej w opracowaniu tekstowym i projektowym		

Subject contents	<p>Lectures:</p> <ol style="list-style-type: none"> 1. Signals and systems 2. System responses 3. Interchangeability of dynamic system descriptions 4. Stability of dynamic systems 5. Graphical methods of dynamic system analysis <p>Exercises:</p> <ol style="list-style-type: none"> 1. Time responses of continuous dynamic systems 2. Time responses of discrete dynamic systems 3. Interchangeability of dynamic system descriptions. 4. Stability of dynamic systems 5. Graphical methods of dynamic system analysis 											
Prerequisites and co-requisites												
Assessment methods and criteria	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">Subject passing criteria</th> <th style="width: 30%;">Passing threshold</th> <th style="width: 30%;">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>Written pass</td> <td>50.0%</td> <td>70.0%</td> </tr> <tr> <td>Exercises</td> <td>50.0%</td> <td>30.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Written pass	50.0%	70.0%	Exercises	50.0%	30.0%
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Written pass	50.0%	70.0%										
Exercises	50.0%	30.0%										
Recommended reading	Basic literature	<ol style="list-style-type: none"> 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											
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> 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. 											
Practical activities within the subject	Not applicable											

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