



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 2022		Academic year of realisation of subject		2023/2024		
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. Janusz Kozłowski				
			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		

Subject contents	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		
Prerequisites and co-requisites	Calculus, Complex Calculus, Algebra		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Exercices	60.0%	50.0%
	Exam	60.0%	50.0%
Recommended reading	Basic literature	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.	
	Supplementary literature	S. Skogestat, I, Postlethwaite, Multivariable Feedback Control: Analysis and Design, Wiley, 2005.	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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