



## 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	<p>Modeling of dynamic systems: differential equations, transfer functions, block diagrams, state-space models</p> <p>Responses of first and second order plants; direct control quality indexes, dominant poles</p> <p>BIBO and asymptotic stability</p> <p>Steady-state performance</p> <p>Root locus analysis and controller design</p> <p>Frequency response and indirect control quality indexes</p> <p>Stability in the frequency domain; Stability margins</p> <p>Frequency-domain controller design</p>											
Prerequisites and co-requisites	Calculus, Complex Calculus, Algebra											
Assessment methods and criteria	<table border="1" data-bbox="448 786 1498 887"> <thead> <tr> <th data-bbox="448 786 794 819">Subject passing criteria</th> <th data-bbox="794 786 1141 819">Passing threshold</th> <th data-bbox="1141 786 1498 819">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 819 794 853">Exercices</td> <td data-bbox="794 819 1141 853">60.0%</td> <td data-bbox="1141 819 1498 853">50.0%</td> </tr> <tr> <td data-bbox="448 853 794 887">Exam</td> <td data-bbox="794 853 1141 887">60.0%</td> <td data-bbox="1141 853 1498 887">50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Exercices	60.0%	50.0%	Exam	60.0%	50.0%
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Recommended reading	<p>Basic literature</p> <p>Supplementary literature</p> <p>eResources addresses</p>	<p>N.S. Nise, Control Systems Engineering, Wiley, 2010.</p> <p>R.C. Dorf, R.H. Bishop, Modern Control Systems, Prentice Hall, 2008.</p> <p>F. Golnaraghi, B.C. Kuo, Automatic Control Systems, Wiley, 2009.</p> <p>S. Skogestad, I. Postlethwaite, Multivariable Feedback Control: Analysis and Design, Wiley, 2005.</p> <p>Adresy na platformie eNauczanie:</p>										
Example issues/ example questions/ tasks being completed												
Work placement	Not applicable											