



## Subject card

Subject name and code	Control Theory, PG_00057473						
Field of study	Automation, Robotics and Control Systems						
Date of commencement of studies	February 2024	Academic year of realisation of subject			2023/2024		
Education level	second-cycle studies	Subject group					
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			Polish		
Semester of study	1	ECTS credits			5.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Katedra Inteligentnych Systemów Sterowania i Wspomagania Decyzji -> 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 dr hab. inż. Kazimierz Duzinkiewicz mgr inż. Mateusz Czyżniewski				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	45.0	0.0	0.0	15.0	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		10.0		55.0	125
Subject objectives	The aim of the course is to present the current achievements of the control theory for the different categories of control systems, e.g.: continuous - discrete, linear - nonlinear, deterministic - stochastic. It will be present the results of modern control theory and the most important results of control theory.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K7_W06	1. The student knows the classical and modern control methods. 2. The student designs and analyzes the effect of the selected control system.			[SW3] Assessment of knowledge contained in written work and projects		
	K7_U07	1. The student selects the control algorithm to the control task. 2. The student examines the control systems (simulation tests).			[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject		
Subject contents	Properties of a dynamic system (lecture, project). Control design in state space (lecture, project). Elements of observer theory (lecture, project). Optimal control (lecture). Adaptive control (lecture).						
Prerequisites and co-requisites	No requirements.						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Exam		50.0%		70.0%		
	Project		50.0%		30.0%		

Recommended reading	Basic literature	<p>1. Byrski W. Obserwacja i sterowanie w systemach dynamicznych. Uczelniane Wydawnictwa Naukowo Dydaktyczne Akademii Górniczo Hutniczej w Krakowie, 2007.</p> <p>2. Hendricks, E., Jannerup, O., Sorensen, P.H. (2008). Linear Systems Control, Deterministic and Stochastic Methods. Springer Verlag.</p>
	Supplementary literature	<p>1. Ostertag, E. (2011). Mono- and Multivariable Control and Estimation. Springer Verlag.</p> <p>2. Fen, L. (2007). Robust Control Design - An Optimal Control Approach. John Wiley &amp; Sons.</p>
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	1. For a given pair of matrices (A, C) use Ackermann formula and calculate the matrix G, providing the specified allocation of the eigenvalues of the observer error dynamics.	
Work placement	Not applicable	