

Subject card

Subject name and code	Control Theory, PG_00038190								
Field of study	Automation, Robotics and Control Systems								
Date of commencement of studies	October 2022		Academic year of realisation of subject			2022/2023			
Education level	Education level second-cycle studies		Subject group			Obligatory subject group in the field of study			
						Subject group related to scientific research in the field of study			
Mode of study	Part-time studies		Mode of delivery			at the	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	Department of Contro	ineering -> Faculty of Electrical and Control Engineering							
Name and surname	Subject supervisor dr hab. inż. Robert Piotrowski								
of lecturer (lecturers)	Teachers		dr hab. inż. Kazimierz Duzinkiewicz						
			mor inż. Krzysztof Laddach						
			mgr inż. Mateusz Czyżniewski						
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	:t	Seminar	SUM	
of instruction	Number of study	30.0	10.0	10.0	0.0		0.0	50	
	E-learning hours included: 0.0								
Learning activity and number of study hours	Learning activity Participation ir classes include plan		a didactic Participation in ed in study consultation hours		Self-study SUM				
	Number of study 50 hours			5.0		70.0		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_U07		 The student selects the control algorithm to the control task. The student examines the control systems by simulation tests. 			[SU4] Assessment of ability to use methods and tools			
	K7_W06		 The student knows the classical and modern control methods. The student designs and analyzes the effect of the selected control systems. 			[SW3] Assessment of knowledge contained in written work and projects			
Subject contents	Recapitulation of the subjects: Control Engineering Foundations, Dynamic Systems, Continuous Processes Control. Control systems and and its basic features. Stability analyses od linear systems. Stability criteria Lyapunov"s methods of stability analysis of control systems - linear and nonlinear systems State space control design - poles placement methods State feedback control systems with observers Optimal control - Linear Quadratic Control (LQC), Dynamic Programming Noisy systems - robust control methods.								
Prerequisites and co-requisites	Not required								
Assessment methods and criteria	Subject passing criteria		Passing threshold			Percentage of the final grade			
	Laboratory		0.0%			30.0%			
	Exam		0.0%			70.0%			

Recommended reading	Basic literature	 Byrski, W. Obserwacja i sterowanie w systemach dynamicznych. Uczelniane Wydawnictwa Naukowo Dydaktyczne AGH, 2007. Bubnicki, A.: Teoria i algorytmy sterowania. PWN, 2005. Leigh J.R. Control theory. Wiley, 2004. Nise N.S. Control System Engineering. 3th edition. John Wiley & Control System Engineering. 3th edition. 			
	Supplementary literature	1. Ogata K. Modern Control Engineering. 4th edition. Prentice Hall, 2002.			
		2. Hendricks, E., Jannerup, O., Sorensen, P.H. (2008). Linear Systems Control, Deterministic and Stochastic Methods. Springer – Verlag.			
eResources address	eResources addresses	Adresy na platformie eNauczanie:			
Example issues/ example questions/ tasks being completed	 Check the observability and controllability of the system represented by A, B and C, using the Kalman test. Provide an overview of the linear, non-stationary continuous system using state space model and name its individual components. 				
Work placement	Not applicable				
Example issues/ example questions/ tasks being completed Work placement	eResources addresses 1. Check the observability and contro 2. Provide an overview of the linear, its individual components. Not applicable	2002. 2. Hendricks, E., Jannerup, O., Sorensen, P.H. (2008). Linear Syste Control, Deterministic and Stochastic Methods. Springer – Verlag. Adresy na platformie eNauczanie: ollability of the system represented by A, B and C, using the Kalman non-stationary continuous system using state space model and nam			