GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Control Theory, PG_00038190
Field of study	Automation, Robotics and Control Systems

Date of commencement of studies	October 2023	Academic year of realisation of subject	2023/2024
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 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 Control Systems Engineering -> Faculty of Electrical and Control Engineering

Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Robert Piotrowski
	Teachers	

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	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 in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
	Number of study hours	50	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_W06	1. The student knows the classical and modern control methods. 2. The student designs and analyzes the effect of the selected control systems.	[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 by simulation tests.	[SU4] Assessment of ability to use methods and tools

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
	Exam	0.0%	70.0%
	Laboratory	0.0%	30.0%

Recommended reading	Basic literature	1. Byrski, W. Obserwacja i sterowanie w systemach dynamicznych. Uczelniane Wydawnictwa Naukowo Dydaktyczne AGH, 2007.
		2. Bubnicki, A.: Teoria i algorytmy sterowania. PWN, 2005.
		3. Leigh J.R. Control theory. Wiley, 2004.
		4. Nise N.S. Control System Engineering. 3th edition. John Wiley & Sons, 2000.
	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 addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	1. Check the observability and controllability of the system represented by A, B and C, using the Kalman test. 2. Provide an overview of the linear, non-stationary continuous system using state space model and name its individual components.	
Work placement	Not applicable	