



Subject card

Subject name and code	Industrial PID control systems, PG_00059858						
Field of study	Automation, Robotics and Control Systems						
Date of commencement of studies	October 2021		Academic year of realisation of subject		2023/2024		
Education level	first-cycle studies		Subject group				
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	3		Language of instruction		Polish		
Semester of study	6		ECTS credits		4.0		
Learning profile	general academic profile		Assessment form		assessment		
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				
			mgr inż. Tomasz Karla				
			dr inż. Bartosz Puchalski				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	15.0	0.0	0.0	45
	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	45		10.0		45.0	100
Subject objectives	The aim of the course will be to familiarise students with issues concerning PID control systems of selected objects/processes. The issues will be a development of the content presented in the subject Fundamentals of Control Engineering I.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U04] has the ability to self-educate, among other things, in order to improve professional qualifications		The student is able to search for information on applications of PID controllers in various structures.		[SU2] Assessment of ability to analyse information		
	[K6_W11] knows the hazards arising from devices, installations, systems and technical systems, basic principles of occupational health and safety, taking into account the role of control and security systems in controlling automation and robotics facilities		The student is able to list examples of risks associated with control systems.		[SW3] Assessment of knowledge contained in written work and projects		
	[K6_W06] knows the structure of computers and microprocessors and the tasks of operating systems, has basic knowledge of the basics of computer software, drivers, microprocessor technology, design of simple algorithms and the operation of information networks		The student is able to design a PID controller in various digital devices.		[SW3] Assessment of knowledge contained in written work and projects		
	[K6_W07] has basic knowledge related to control and automation systems		The student is able to design PID control systems in various structures.		[SW3] Assessment of knowledge contained in written work and projects		
	[K6_K05] can think and act in an entrepreneurial way		The student can identify examples of systems where PID controllers can be implemented.		[SK2] Assessment of progress of work		

Subject contents	1. Control systems - design, tasks, examples 2. Characteristics of PID controllers, limitations of PID controllers 3. Selection of PID controller settings 4. PID control systems - hardware aspects 5. Examples of PID control systems		
Prerequisites and co-requisites	Knowledge of the subject "Fundamentals of Control Engineering I"		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	written pass	50.0%	65.0%
	laboratory - oral credit for topics	0.0%	35.0%
Recommended reading	Basic literature	1. Åström K.J., Hägglund T. PID Controllers: Theory, Design and Tuning. 2nd edition. Instrument Society of America, 1997. 2. Brzózka J. Regulatory i układy automatyki. Wydawnictwo MIKOM, 2004. 3. Franklin G.F., Powell J.D., Emami-Naeini A. Feedback Control of Dynamic Systems. 7th edition, Prentice Hall, 2014. 4. Holejko D., Kościelny W.J. Automatyka procesów ciągłych. Oficyna Wydawnicza Politechniki Warszawskiej, 2012. 5. Visioli A. Practical PID Control. Springer, 2006.	
	Supplementary literature	1. Brzózka J. Regulatory cyfrowe w automatyce. Wydawnictwo MIKOM, 2002. 2. Byrski W. Obserwacja i sterowanie w systemach dynamicznych. Uczelniane Wydawnictwa Naukowo Dydaktyczne Akademii Górniczo Hutniczej w Krakowie, 2007. 3. Czemplik A. Modele dynamiki obiektów fizycznych. Wydawnictwa Naukowo Techniczne, 2008	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	1. List and characterise the input signals in a control system. 2. List and characterise the three settings of a PID controller.		
Work placement	Not applicable		