



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 2020	Academic year of realisation of subject				2022/2023	
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_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 implement a PID controller in a digital device, such as a computer.			[SW3] Assessment of knowledge contained in written work and projects		
	[K6_U04] has the ability to self-educate, among other things, in order to improve professional qualifications	The student knows the limitations of using PID controllers.			[SU4] Assessment of ability to use methods and tools		
	[K6_W07] has basic knowledge related to control and automation systems	Students will be able to design PID control systems in various control structures.			[SW3] Assessment of knowledge contained in written work and projects		
	[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 knows the regulations for working with live equipment.			[SW1] Assessment of factual knowledge		
	[K6_K05] can think and act in an entrepreneurial way	The student is able to design PID control systems.			[SK1] Assessment of group work skills [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
	laboratory - oral credit for topics	0.0%	35.0%
	written pass	50.0%	65.0%
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		
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		