GDAŃSK UNIVERSITY OF TECHNOLOGY

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 2022	Academic year of realisation of subject	2024/2025
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	Department of Intelligent and Decision Support Systems -> 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	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 is for students to master the issues of PID control systems for selected objects/ processes. The topics 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_K05] can think and act in an entrepreneurial way	Finds a research article in the subject area.	[SK2] Assessment of progress of work
[K6_W07] has basic knowledge related to control and automation systems	Draws a diagram of a control system with feedback.	[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	Designs a PID controller for various digital devices.	[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	Gives examples of the risks associated with control systems.	[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	Seeks information on applications of PID controllers in various structures.	[SU2] Assessment of ability to analyse information

Subject contents	**Lecture:** 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 **Laboratory:** 1. Analysis of the operation of the PID control system 2 Selection of PID controller settings Synthesis of PID control operation - Part 1. Synthesis of PID control operation - Part 2. 5. PID control systems in the hardware structure
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	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

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