GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Automatics of industrial process, PG_00059838						
Field of study	Automation, Robotics and Control Systems						
Date of commencement of studies	February 2023		Academic year of realisation of subject	2023/2024			
Education level	second-cycle studies		Subject group				
Mode of study	Full-time studies		Mode of delivery	at the university			
Year of study	2		Language of instruction	Polish			
Semester of study	3		ECTS credits	2.0			
Learning profile	general academic profile		Assessment form	assessment			
Conducting unit	Department of Control Engineering -> Faculty of Electrical and Control Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Jacek Zawalich					
	Teachers	dr inż. Jacek Zawalich					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	15.0	0.0	30
	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	30		0.0	0.0	30	
Subject objectives	The aim of the course is to provide theoretical and practical knowledge in the field of designing automated technological processes in industrial conditions with the use of professional computer hardware and engineering software.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_W08	The student knows the principles of selection and configuration of devices and systems used to control electric machines and servomechanisms.	[SW1] Assessment of factual knowledge
K7_W07	Student identifies threats in complex control systems, defines methods of information protection in computer systems.	[SW3] Assessment of knowledge contained in written work and projects
K7_W10	The student formulates the assumptions, goals and requirements of drive systems operating in systems and systems for controlling objects and industrial processes.	[SW3] Assessment of knowledge contained in written work and projects
K7_U08	The student recognizes and describes the occurring threats from devices and control systems. The student designs technical systems containing appropriate security systems.	[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject
K7_K04	The student is able to check the operation of automatic industrial process control systems and react properly in abnormal and emergency conditions, taking into account the life and health hazards.	[SK3] Assessment of ability to organize work [SK5] Assessment of ability to solve problems that arise in practice
K7_K05	The student is aware of the role of man in the economy and industrial production. He makes responsible decisions taking into account market requirements and the needs of the company.	[SK5] Assessment of ability to solve problems that arise in practice
K7_U09	The student is able to make a critical analysis of the functioning of control and regulation systems. Can make a preliminary economic analysis of undertaken engineering activities.	[SU1] Assessment of task fulfilment [SU5] Assessment of ability to present the results of task

Subject contents

Examples of industrial processes, formulating aimes and tasks for industrial process control systems and technical problems in their implementation. Types and ways of describing selected objects and technical processes, their specific properties as well as static and dynamic characteristics. Control structures: open and closed systems, systems with feedback from output values and from the process status, with a reference model, with a status estimator. Types of industrial control devices: continuous PID controllers, two-position and three-position controllers with correction, stepper, fuzzy and predictive controllers. Selection of control, measuring and executive devices. Designing industrial process control systems using PLC controllers.

Prerequisites and co-requisites

Knowledge of the subject Basics of Automation

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Lecture	50.0%	60.0%
Project	100.0%	40.0%

Recommended reading

Basic literature

1. Kaczorek T., Dzieliński A., Dąbrowski W., Łopatka R.: Podstawy teorii sterowania. PWN, Warszawa 2016.
2. Tatiewski P.: Sterowanie zaawansowane obiektów przemysłowych. Struktury i algorytmy. EXIT, Warszawa 2016.
3. Mikulczyński T., Samsonowicz Z., Więcławek R.: Automatyzacja procesów produkcyjnych. WNT, Warszawa 2015.
4. Kwiecień R.: Komputerowe systemy automatyki przemysłowej. Helion, Gliwice 2013.
5. Bubnicki Z.: Teoria i algorytmy sterowania, Wydawnictwo Naukowe PWN, Warszawa 2002.
6. Kasprzyk J.: Programowanie sterowników przemysłowych. PWN, Warszawa 2017.
7. Fudali M.: Przewodnik po technologiach przemysłu 4.0. Wyd.: Elamed Media Group, Katowice 2021.
8. Kacprzyk J.: Wieloetapowe sterowanie rozmyte, Wydawnictwo Naukowo - Techniczne, Warszawa 2001.

	Supplementary literature	1. Ogata K.: Modern Control Engineering. 4th edition. Prentice Hall, New Jersey 2002. 2. Goodwin GC., Graebe S.F., Salgado M.E.: Control Systems Design, Prentice Hall. 2001. 3. Czemplik A.: Modele dynamiki układów fizycznych dla inżynierów. WNT, Warszawa 2008. 4. Piegat A.: Modelowanie i sterowanie rozmyte. EXIT, Warszawa 1999. 5. Findeisen W.: Technika regulacji automatycznej. PWN, Warszawa 1976.
	eResources addresses	Adresy na platformie eNauczanie: AUTOMATYKA PROCESÓW PRZEMYSŁOWYCH [2023/24] - Moodle ID: 36047 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=36047
Example issues/ example questions/ tasks being completed	Types and ways of describing selected industrial processes. Types of industrial measuring, control and executive devices. Methods of selection of control devices	
Work placement	Not applicable	