GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Automatics of Industrial Process, PG_00038276
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	4.0
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	

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	20.0	0.0	10.0	10.0	0.0	40
	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	40	4.0	56.0	100

Subject objectives	The aim of the course is to develop the students' ability to design industrial automation systems.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	K7_W07	Student identifies hazards that may exist in computer control systems. Student characterizes methods of protection of information in computer systems.	[SW2] Assessment of knowledge contained in presentation
	K7_U09	Student is able to make a critical analysis of the operating of control systems and robotics systems; he has the skill to choose automation systems using programmable controllers; he is able to make an initial economic analysis of engineering activities.	[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject
	K7_U08	The student recognizes and describes threats coming from devices and control systems. The student designs technical systems containing appropriate security systems.	[SU3] Assessment of ability to use knowledge gained from the subject
	K7_W10	Student formulates assumptions, aims and requirements of drive systems working in systems and control systems of industrial objects and processes.	[SW3] Assessment of knowledge contained in written work and projects
	K7_K04	The student is able to inspect the work of the automatic control systems of the industrial processes and react properly in abnormal and emergency conditions, taking into account the hazards of life and health.	[SK3] Assessment of ability to organize work [SK5] Assessment of ability to solve problems that arise in practice
	K7_K05	Is aware of the role of man in the economy as an entrepreneur, employee or consumer.	[SK5] Assessment of ability to solve problems that arise in practice

Subject contents	Examples of industrial control systems, technical problems of their implementation, the formulation of goals and objectives for the process control system. Control models of real objects: analytic and behavioral. Types and ways of describing selected objects and their specific properties, static and dynamic characteristics. Analysis of delay objects. Methods for identifying industrial facilities. Control structure: open and closed systems, systems with feedback on the size of the output and the state of the process, the reference model, the estimator of the state. Types of industrial control devices: continuous PID controllers, controls two-and three-position correction, stepper controllers, fuzzy predictors. The implementation of software controllers. The technical implementation, selection of controls, their structures and technical parameters. Test and regulations. Communication and data transfer in the system automation, synchronization devices. Analysis of automation selected industrial processes (heating, drying, rewinding, packaging, mixing, transport, power flow control).
Prerequisites and co-requisites	

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
project	60.0%	40.0%
colloquium	60.0%	60.0%

Recommended reading

Basic literature	1. Kaczorek T., : Linear Control Systems, vol.1 and 2, Research Studies Press and J. Wiley, New York 1993. 2. Phillips CL., Harbor RD.: Feedback Control Systems, Prentice Hall. 1996. 3. Rabbath C.A., Lechvin N.: Discrete-Time Control System Design with Application. Academic Press 1995
Supplementary literature	1. Goodwin GC., Graebe S.F., Salgado M.E.: Control Systems Design, Prentice Hall. 2001.
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	Types and methods of description selected objects and their specific properties. Methods for identifying industrial facilities. Types of industrial control devices: continuous PID controllers, controls two-and three-position correction
Work placement	Not applicable