GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Automatic Control in Environmental Engineering, PG_00042498
Field of study	Environmental Engineering

Date of commencement of studies	October 2022	Academic year of realisation of subject	2022/2023
Education level	second-cycle studies	Subject group	Obligatory subject group 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	3.0
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	15.0	10.0	0.0	0.0	0.0	25
	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	25	3.0	50.0	78

Subject objectives	The aim of the lecture is to provide basic information on the analysis and design of single-circuit and complex automation systems. The aim of the blackboard exercises is to acquire skills in the identification, description and design of single-circuit and complex automation systems.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_U13] can integrate knowledge in the areas of sanitary engineering, automatics, electronics, computer science, chemistry, biology and other disciplines in the formulation and solving tasks related to the design or modeling of sanitary systems and their components, using a systematic approach including non-technical aspects (including economic and legal)	The student solves problems in the field of design, modeling and simulation of automation systems and systems used in environmental engineering. The student conducts the analysis and synthesis of complex automation systems.	[SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools
	[K7_W04] knows the basic automation methods, techniques, tools and systems used to solve complex engineering tasks in modeling, optimization and control of processes, objects and systems in environmental engineering	Student defines and distinguishes complex systems and automation processes. The student formulates the basic goals of industrial facilities control. The student knows the basic methods of research and evaluation of the operation of control systems.	[SW3] Assessment of knowledge contained in written work and projects

Subject contents	The terms from scope of systems and technical proceses control. Creating block diagrams. Functions and structures of automation systems. Mathematical description of systems. Linearization of mathematical models. Typical dynamic elements and their properties. Methods of identifying objects and control processes. Stability. Indicators of control quality. Classic control systems. Regulators: dynamics, selection of the type and settings of the regulator. Two-position and three-position control systems. Control of actuators: pumps, valves, gate valves, inverters. Examples of control systems. Industrial automation microprocessor systems: functions and structures. Examples of automation of industrial facilities.
Prerequisites and co-requisites	The student should be prepared in mathematics and physics at a higher level

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	exercise	50.0%	40.0%
	colloquium of lectures	50.0%	60.0%

Recommended reading	Basic literature	Ogata K.: Modern Control Engineering. 4th edition. Prentice Hall 2002.
	Supplementary literature	Raven F.H.: Automatic Control Engineering. McGraw-Hill 1988.
	eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	Converting block diagrams. Determination of output signals of typical automation objects. Tuning of PID regulators.
Work placement	Not applicable