



Subject card

Subject name and code	, PG_00061738						
Field of study	Environmental Engineering						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2026/2027		
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	2		Language of instruction		Polish		
Semester of study	3		ECTS credits		3.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Control Engineering -> Faculty of Electrical and Control Engineering -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Jacek Zawalich				
	Teachers						
Lesson types	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		52.0	80
Subject objectives	The aim of the course is to acquisition theoretical and practical knowledge of: structure, properties, methods of description, analysis, synthesis, identification, design, diagnosis of simple and complex control systems and systems used in environmental engineering.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K7_U06		Solves tasks in the field of modeling, simulation, synthesis, and design of control systems and systems used in environmental engineering.		[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject		
	K7_W04		Definiuje i rozróżnia złożone układy oraz procesy automatyki. Formułuje podstawowe cele sterowania obiektami przemysłowymi. Zna metody badań i oceny funkcjonowania systemów sterowania w inżynierii środowiska.		[SW3] Assessment of knowledge contained in written work and projects		
	[K7_W11] has knowledge to analyze, evaluate and optimize processes, objects and systems of environmental engineering and knows the principles of rational energy management and resources		Analizuje ocenia i dobiera urządzenia automatyki celem optymalizacji pracy systemów sterowania.		[SW2] Assessment of knowledge contained in presentation		
Subject contents	Course content – lecture						
	Concepts related to the control of technical systems and processes. Creating block diagrams. Functions and structures of control systems. Mathematical description of systems. Typical dynamic elements and their properties. Methods for identifying objects and control processes.. Stability. Control quality indicators. Classical control systems. Controllers: dynamics, selection of controller type and settings. Two-position and three-position control systems. Control of actuators: pumps, valves, gate valves. Examples of control systems. Examples of industrial facility automation.						
	Course content – exercises						
	Formulating a mathematical description of automation systems. Creating and transforming block diagrams. Determining output signals from automation systems. Determining stability. Identifying objects, selecting PID controller settings, and determining control quality indicators.						

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
	colloquium from lectures	50.0%	60.0%
	exercises	50.0%	40.0%
Recommended reading	Basic literature	1. Kowal J.: Podstawy automatyki. t. I. Kraków: Wydawnictwo AGH 2004. 2. Nowakowski J.: Podstawy automatyki. t. I. Gdańsk: Wyd. PG 1992. 3. Urbaniak A.: Automatyzacja w inżynierii sanitarnej. Poznań: Wyd. Politechniki Poznańskiej 1985. 4. Próchnicki W., Dzida M.: Zbiór zadań z podstaw automatyki. Gdańsk: Wydawnictwo PG 1993.	
	Supplementary literature	Chmielnicki W., Kasperkiewicz K., Zawada B.: Laboratorium automatyzacji urządzeń sanitarnych. Warszawa: PWN 1987	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Transforming block diagrams. Calculating output signals for typical automation objects. Selecting PID controller settings.		
Practical activities within the subject	Not applicable		

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