

## 表 GDAŃSK UNIVERSITY OF TECHNOLOGY

## Subject card

Subject name and code	Automatics Equipment, PG_00038096							
Field of study	Automation, Robotics and Control Systems							
Date of commencement of studies	October 2023		Academic year of realisation of subject			2024/2025		
Education level	first-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	Full-time studies		Mode of delivery			at the university		
Year of study	2		Language of instruction			Polish		
Semester of study	4		ECTS credits			4.0		
Learning profile	general academic profile		Assessment form			exam		
Conducting unit	Department of Mechatronics and High Voltage Engineering -> Faculty of Electrical and Control Engineer					Engineering		
Name and surname	Subject supervisor prof. dr hab. inż. Grzegorz Redlarski							
of lecturer (lecturers)	Teachers							
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM
of instruction	Number of study	30.0	0.0	15.0	0.0		0.0	45
	E-learning hours inclu	uded: 0.0						
Learning activity and number of study hours	Learning activity	Participation ir classes includ plan	n didactic ed in study	Participation in consultation hours		Self-study		SUM
	Number of study hours	45		4.0		51.0		100
Subject objectives	Gaining the basic knowledge, skills and competencies related to the performance and operation of automation devices							
Learning outcomes	Course outcome		Subject outcome			Method of verification		
	[K6_K04] can react in abnormal and emergency situations, threats to health and life when using automation and robotics components and systems		The student has the knowledge and skills of safe operation of automation devices, as well as the knowledge of how to react in disturbances and emergencies			[SK5] Assessment of ability to solve problems that arise in practice [SK2] Assessment of progress of work		
	[K6_U07] can build and analyze models of systems and systems in the field related to control systems and automation		The student is able to create mathematical models and design of automation devices tailored to specific needs			[SU1] Assessment of task fulfilment		
	[K6_W07] has basic knowledge related to control and automation systems		The student knows the principles of analysis and design, as well as the selection and configuration of industrial automation devices			[SW1] Assessment of factual knowledge		
Subject contents	Introduction, definitions, groups. Requirements for automatics devices. Description methods, static and dynamics characteristics of automatics devices. Systematics of automatics devices. General characteristics of the automatics devices. Types of power for automatics devices. Elements of performing time functions (relays and controllers). Switching elements: electromagnetic relays, reed relay, bimetal elements. Regulators: types and comparing devices constructions, directly and indirectly regulators. The main characteristics and types of regulators. Electrical regulators of the continuous operation. Multipositions regulators with and without correction. Pulse and stepper regulators. Operating characteristics of the regulators. Actuators: general characteristics, types and selection of actuators. Methods for evaluation of dynamic properties (examples). Electric actuators: construction, principle of operation, materials, static and dynamic characteristics, control. AC servo motors: types, construction, static and dynamic characteristics, control. AC servo motors: types, construction, static and dynamic devices: general characteristics, the preparation of air supply and support equipment, methods of describing the dynamic properties (examples), the elements of power and displacement. The basic measuring mechanical elements of automatics devices. Pneumatic cauctors. Pneumatic regulators. Pneumatic power amplifiers, setpoints, pneumatic actuators, valves. Hydraulic automatics devices: advantages, types of working medium, power stations, distributor devices, actuators. Formulating technical requirements, certificate, acceptance tests. Sample analysis of automatics device.							
Prerequisites and co-requisites	Basics of electrical engineering and metrology.							

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade			
	Laboratory	60.0%	40.0%			
	Lectures	60.0%	60.0%			
Recommended reading	Basic literature	<ol> <li>Skrypt do laboratorium pod red. A. Grono: Mechatronika. Gdańsk 2008. Wydawnictwo Politechniki Gdańskiej.</li> <li>Parr, Andrew E.: Hydraulics and Pneumatics: a technicians and engineers guide. Oxford: Butterworth-Heinemann, 2000.</li> </ol>				
	Supplementary literature	1. Kostro J.: <i>Elementy, urządzenia i układy automatyki,</i> WSiP, Warszawa 1998.				
	eResources addresses	Adresy na platformie eNauczanie:				
Example issues/ example questions/ tasks being completed	1. Structures and types of automatiio	on devices.				
	2. The automation devices in electric power systems.					
	3. Hydraulic and pneumatic devices and systems.					
	4. Communications between automation devices and systems.					
	5. Design methodology of selected automation systems.					
Work placement	Not applicable					