



## Subject card

Subject name and code	Basics of Industrial Measurements and Automatics, PG_00035154						
Field of study	Engineering and Technologies of Energy Carriers						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2022/2023		
Education level	second-cycle studies	Subject group			Optional subject group Subject group related to practical vocational preparation		
Mode of study	Full-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	practical profile	Assessment form			assessment		
Conducting unit	Department of Process Engineering and Chemical Technology -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Jacek Gębicki					
	Teachers	dr hab. inż. Jacek Gębicki dr inż. Bartosz Szulczyński					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	30.0	0.0	15.0	60
	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	60	4.0		36.0		100
Subject objectives	To acquaint students with the basic concepts of control, control and automatic regulation of chemical industry processes. Discussion of the principle of operation of measuring instruments for the control of basic process parameters in the chemical industry.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K7_W03	The student is able to design methods of control and control of technological processes and is able to control the quality of production			[SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects		
	K7_K02	The student understands the principles of cooperation with the economic and social environment			[SK5] Assessment of ability to solve problems that arise in practice [SK1] Assessment of group work skills		
	K7_U09	The student is able to independently perform a design and research task. He can work in a team and coordinate work in a team			[SU5] Assessment of ability to present the results of task [SU1] Assessment of task fulfilment		
Subject contents	Feedback, regulation and control systems. Block diagrams, basic mathematical description of the dynamic properties of control elements. Steady and transient states of processes. Selection of regulators. Criteria for assessing the quality of regulation. Types of regulation. Measurements of basic process parameters such as: temperature, pressure, flow rate, liquid level in the tank, density, viscosity.						
Prerequisites and co-requisites	Basic concepts of hydrostatics and hydrodynamics, heat movement, basic concepts of differential calculus						
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
	seminar	60.0%			30.0%		
	laboratory	60.0%			20.0%		
	lecture	60.0%			50.0%		

Recommended reading	Basic literature	1. R. Kaula, Podstawy Automatyki, Wydawnictwo Politechniki Śląskiej, Gliwice 2005.  2. J. Piotrowski i in., Pomiary, czujniki i metody pomiarowe wybranych wielkości fizycznych i składu chemicznego, Warszawa, WNT 2012
	Supplementary literature	There are no requirements
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	<p>The pressure of the fluid in the constriction of the nozzle in relation to the pressure of the fluid before constriction is:</p> <p>a) higher b) the same c) lower d) it is difficult to determine</p> <p>In August's psychrometer, the following applies:</p> <p>a) dry, wet and fan thermometer b) dry, wet thermometer c) thermometer d) 2 wet thermometers</p> <p>What adjustable parameters are the P controller:</p> <p>a) reinforcement, integration time b) reinforcement, c) reinforcement, time of advance d) reinforcement, sometimes doubling</p> <p>If the excitation is abrupt and the control element is characterized by integral transmittance then the element response will be:</p> <p>a) step b) linear c) none of them d) exponential</p>	
Work placement	Not applicable	