



## Subject card

Subject name and code	Automatics and Measurements of Physico-Chemical Values , PG_00025250						
Field of study	Chemistry in Construction Engineering						
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		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	2	Language of instruction			Polish		
Semester of study	3	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Physical Chemistry -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Adam Kloskowski				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	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	30		4.0		16.0	50
Subject objectives	To familiarize students with the theoretical model description of industrial processes. Showing the students the opportunity to use the theoretical model of the processes in the description of industrial processes. Shaping students' computing habits in terms of industrial processes.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
			assess the social and environmental problems resulting from technological processes in industry and nature		[SU2] Assessment of ability to analyse information [SW1] Assessment of factual knowledge [SK2] Assessment of progress of work		
	K6_K02		Student identifies elements of the control systems, understands methods of their operation and interaction, also he knows the methods of measurements of physico-chemical properties.		[SK5] Assessment of ability to solve problems that arise in practice		
			1. perform basic calculations necessary for proper selection of the parameters in industrial processes 2. make simple measurements on basic physical and chemical parameters		[SW1] Assessment of factual knowledge		
			The student knows the rules of operation and conduct of non-electrical properties measurements using electric meters		[SU1] Assessment of task fulfilment		
	K6_U08						
Subject contents	Basic parameters and their dimensions. Feed-back, systems of regulation and process control. Block diagrams. Mathematical description of dynamic properties of the control system elements. Steady and unsteady states of processes. Setting, control and regulation of processes - regulators and executive facilities. Methods of testing and analysis of unsteady states processes. Selection of regulators. Stability and quality of steering. Criteria for assessing the quality of regulation. Types of regulation. Measurements of basic parameters of processes. Measurement and regulation of temperature, temperature sensors, construction, operation principle. Dynamics of the temperature sensors. Pressure measurement, construction and principles operation of manometers. Measuring of the quantity and volume of fluid flow, liquid level, density, viscosity, humidity.						

Prerequisites and co-requisites	Physical parameters and their units. Basic differential calculus.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	tests during lectures	50.0%	60.0%
	performance of of exercises and preparation of reports	100.0%	40.0%
Recommended reading	Basic literature	1. W. Greblicki: Podstawy automatyki, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2006, 2. Automatyka i robotyka – podstawy, Wydawnictwo PG, Gdańsk 2003, 3. D. Taler, J. Sokołowski: Pomiary cieplne w przemyśle, Agenda Wydawnicza PAK, Warszawa 2006 4. M.W. Kułakow: Pomiary technologiczne i aparatura kontrolno – pomiarowa w przemyśle chemicznym, WNT, Warszawa 1972, 5. E. Romer: Miernictwo przemysłowe, WNT, Warszawa	
	Supplementary literature	No requirements	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		