



## Subject card

Subject name and code	Measurement techniques, PG_00057265						
Field of study	Power Engineering, Power Engineering, Power Engineering						
Date of commencement of studies	February 2022	Academic year of realisation of subject				2022/2023	
Education level	second-cycle studies	Subject group				Optional subject group 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	1	Language of instruction				Polish	
Semester of study	2	ECTS credits				2.0	
Learning profile	general academic profile	Assessment form				assessment	
Conducting unit	Zakład Maszyn Przepływowych -> Institute of Energy -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Wojciech Włodarski				
	Teachers		dr inż. Wojciech Włodarski				
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	7.0		13.0	50	
Subject objectives	Providing general knowledge about the methodology of the experiment, broadening the knowledge of selected measurement techniques.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[K7_U04] is able to plan and perform experiments using measurements and computer simulations, together with interpretation of results, is able to present and evaluate the course and results of work in a team realizing an advanced engineering project, is able to use technical documentation and to create it independently		The student uses analytical, simulation and experimental methods to formulate and solve engineering tasks.			[SU1] Assessment of task fulfilment	
	[K7_W03] knows advanced aspects of automation and automatic control of power systems or transmission networks and internal installations		The student is able to plan and carry out experiments, including measurements and computer simulations, critically interpret the obtained results and draw conclusions.			[SW1] Assessment of factual knowledge	
	[K7_W02] has extended and deepened knowledge of physics, chemistry, thermodynamics, fluid mechanics, material science, necessary to understand and describe basic thermal and flow phenomena occurring in and around power equipment and systems, transmission networks and internal installations		The student is able to plan and carry out experiments, including measurements and computer simulations, critically interpret the obtained results and draw conclusions.			[SW1] Assessment of factual knowledge	

Subject contents	<p>1. Historical development of the experimental method</p> <p>2. Elements of the experimental method</p> <p>3. Planning the experiment</p> <p>4. Approximation of the function of the research object</p> <p>5. Assessment of measurement errors</p> <p>6. Selected measurement techniques</p>		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
Recommended reading	Basic literature	<p>Leon Kukielka Podstawy badań inżynierskich Politechnika Koszalińska 2000</p> <p>Zbigniew Polański Metodyka badań doświadczalnych Politechnika Krakowska 1978</p> <p>Kazimierz Mańczak Technika planowania eksperymentu Wydawnictwo Naukowo Techniczne 1976</p> <p>Roma Górecka Teoria i technika eksperymentu Politechnika Krakowska 1998</p> <p>Mieczysław Korzyński Metodyka eksperymentu Wydawnictwo Naukowo Techniczne 2013</p> <p>Zbigniew Polański Planowanie doświadczeń w technice Państwowe Wydawnictwo Naukowe 1984</p> <p>Jerzy Godziszewski Zasady planowania doświadczeń i opracowywania wyników pomiaru Akademia Górniczo-Hutnicza w Krakowie 1982</p>	
Example issues/ example questions/ tasks being completed	Supplementary literature	A. Strzałkowski, A. Śliżyński, "Matematyczne metody opracowywania wyników pomiarów", PWN, 197	
Work placement	eResources addresses		
	Describe the types of measurement errors		
	Not applicable		