



## Subject card

Subject name and code	Metrology II, PG_00056027						
Field of study	Electrical Engineering						
Date of commencement of studies	October 2021		Academic year of realisation of subject		2022/2023		
Education level	first-cycle studies		Subject group				
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 Metrology and Information Systems -> Faculty of Electrical and Control Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Marek Wołoszyk				
	Teachers		dr inż. Marek Wołoszyk				
			dr inż. Michał Ziółko				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	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		2.0		18.0	50
Subject objectives	Introduce students with the methods and tools for measuring electrical quantities						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_W05		The student prepares multiple measurement results (measurement series). The student takes measurements of basic electrical parameters and prepares their results. The student performs measurements of RLC parameters using bridge methods and specialized instruments. The student uses an electronic oscilloscope. The student analyzes the operation of basic electronic analog measuring systems. The student analyses the recorded waveforms with the use of computer technique.		[SW3] Assessment of knowledge contained in written work and projects		
	K6_U02		The student takes measurements individually or as part of a team. The student prepares and documents the results using various techniques. The student controls the completion of the task within the prescribed time.		[SU1] Assessment of task fulfilment		
	K6_K02		The student directs the work of the team or within the team takes measurements, documents them or prepares the results.		[SK5] Assessment of ability to solve problems that arise in practice		
Subject contents	LABORATORY Analysis of measurement data. Calibration. Measurement of RLC parameters. Oscilloscope measurement. Power measurement of three phase circuits. Measurement of sinusoidal and distorted waveforms. Analog signal processing for measurement. Computer processing of measurement signals. Measurement of ground earth resistance and the fault loop impedance. Magnetic measurement.						
Prerequisites and co-requisites	Basic knowledge of electrical engineering and electrical circuit analysis. Knowledge of the Metrology I course.						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Practical exercise	60.0%	100.0%
Recommended reading	Basic literature	1. Praca zbiorowa (red. Roskosz R.): Miernictwo elektryczne. Laboratorium. Wydawnictwo Politechniki Gdańskiej, 2007.	
	Supplementary literature	1. Chwaleba A., Poniński M., Siedlecki A.: Metrologia elektryczna. WNT, 2010. 2. Tumański S.: Technika pomiarowa. WNT, 2016. 3. Lisowski M.: Podstawy metrologii. Oficyna Wydawnicza Politechniki Wrocławskiej, 2011.	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	1. Explain the concepts of median and modal values.  2. Measurement error of insensitivity in a Wheatstone bridge.  3. The methods used for the LPS measurements.		
Work placement	Not applicable		