



## Subject card

Subject name and code	Metrology II, PG_00038094						
Field of study	Automation, Robotics and Control Systems						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2021/2022		
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			3.0		
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					
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		43.0	75	
Subject objectives	Introduce students with the methods and tools for measuring electrical quantities						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	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_W03	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_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	<b>LABORATORY</b> 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. Electrical temperature measurements. Examination of selected displacement sensors.						
Prerequisites and co-requisites	Basic knowledge of electrical engineering and electrical circuit analysis. Knowledge of the Metrology 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	<ol style="list-style-type: none"> <li>1. Chwaleba A., Poniński M., Siedlecki A.: Metrologia elektryczna. WNT, 2003.</li> <li>2. Turmański S.: Technika pomiarowa. WNT, 2007 (2013, 2020).</li> <li>3. Lisowski M.: Podstawy metrologii. Oficyna Wydawnicza Politechniki Wrocławskiej, 2011.</li> </ol>
	eResources addresses	
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> <li>1. Explain the concepts of median and modal values.</li> <li>2. Measurement error of insensitivity in a Wheatstone bridge.</li> <li>3. The methods used for the LPS measurements.</li> </ol>	
Work placement	Not applicable	