



Subject card

Subject name and code	Digital Metrology I, PG_00039805						
Field of study	Materials Engineering, Materials Engineering, Materials Engineering, Materials Engineering						
Date of commencement of studies	October 2020		Academic year of realisation of subject		2022/2023		
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	3		Language of instruction		Polish		
Semester of study	5		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Electrochemistry, Corrosion and Materials Engineering -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Artur Zieliński				
	Teachers		dr hab. inż. Artur Zieliński				
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		1.0		19.0	50
Subject objectives	Knowledge of terminology related to metrology. The ability to measure the physical size, correct in terms of quality and quantity.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_W06		The student is able to interpret the results of digital measurements of various types of signals used in individual experiments.		[SW3] Assessment of knowledge contained in written work and projects		
	K6_K01		The student is able to evaluate the planned experiment in terms of economics, taking into account the costs of a possible purchase of measuring equipment.		[SK5] Assessment of ability to solve problems that arise in practice		
	K6_U01		The student is able to build a measuring stand adapted to the requirements of an appropriate experiment, using digital signal processing.		[SU4] Assessment of ability to use methods and tools		
	K6_U02		The student is able to plan the experiment correctly, taking into account the parameters typical for the digital measurement regime, such as the sampling rate or the bit resolution of the converter.		[SU3] Assessment of ability to use knowledge gained from the subject		
	K6_W04		The student is able to choose digital apparatus depending on the experimental requirements.		[SW1] Assessment of factual knowledge		
Subject contents	Digital signal definition. Differences between analog and digital measurement. Examples of digital techniques in everyday life and scientific investigations. Sampling and quantization of signals. Fourier transformation, frequency spectrum.						
Prerequisites and co-requisites	General mathematics.						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	lab		60.0%		50.0%		
	exam		60.0%		50.0%		

Recommended reading	Basic literature	R. G. Lyons, Wprowadzenie do cyfrowego przetwarzania sygnałów, WKiŁ, Warszawa, 2003
	Supplementary literature	T. P. Zieliński, Cyfrowe przetwarzanie sygnałów: od teorii do zastosowań, WKiŁ, Wyd. 2 popr, Warszawa, 2007
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	<p>Analysis of the signals used in impedance spectroscopy.</p> <p>Measurement of electrode potential by means of a digital system.</p> <p>Selection of the operating parameters of the measuring system according to the experimental requirements.</p>	
Work placement	Not applicable	