



Subject card

Subject name and code	Digital measurements, PG_00049430						
Field of study	Corrosion						
Date of commencement of studies	February 2023	Academic year of realisation of subject				2022/2023	
Education level	second-cycle studies	Subject group				Obligatory subject group in the field of study 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	1	ECTS credits				4.0	
Learning profile	general academic profile	Assessment form				exam	
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	30.0	0.0	0.0	45
	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	45		10.0		45.0	100
Subject objectives	Presentation of the possibilities of using digital signal processing techniques in corrosion research.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	K7_W04		The student is able to apply theoretical knowledge on electrochemical measurement techniques for conducting digital measurements.			[SW1] Assessment of factual knowledge	
	K7_U03		The student is able to control the parameters of the measuring device he creates in order to obtain the appropriate measurement results.			[SU4] Assessment of ability to use methods and tools	
	K7_K01		The student gains extended knowledge about modern measurement methods used in electrochemical studies.			[SK5] Assessment of ability to solve problems that arise in practice	
	K7_K02		The student is able to work on a joint project implemented in a programming environment.			[SK1] Assessment of group work skills [SK2] Assessment of progress of work	
Subject contents	Design of a virtual instrument for impedance measurements. Development takes place in the LabVIEW environment based on digital measurement. The lectures include explanation of issues related to the above measurement (eg, sampling theorem, discrete Fourier transform) and discussion of the construction details of the created application.						
Prerequisites and co-requisites	General knowledge of electrochemistry and corrosion.						
Assessment methods and criteria	Subject passing criteria		Passing threshold			Percentage of the final grade	
	Lecture		60.0%			50.0%	
	Laboratory		100.0%			50.0%	
Recommended reading	Basic literature		Richard G. Lyons, Understanding Digital Signal Processing (3rd Edition), Prentice Hall PTR, 2011.				
	Supplementary literature		Tomasz P. Zieliński, Cyfrowe przetwarzanie sygnałów, WKŁ, 2005.				
	eResources addresses						

Example issues/ example questions/ tasks being completed	What is the purpose of electrochemical impedance spectroscopy? What is the sampling theorem? How is the spectrum of voltage waveform obtained?
Work placement	Not applicable