



Subject card

Subject name and code	Electrochemistry I, PG_00039804						
Field of study	Materials Engineering, Materials Engineering, Materials Engineering						
Date of commencement of studies	October 2021	Academic year of realisation of subject				2023/2024	
Education level	first-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	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 Corrosion and Electrochemistry -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. inż. Kazimierz Darowicki				
	Teachers		prof. dr hab. inż. Kazimierz Darowicki				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	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	familiarizing students with the phenomena occurring at the interface between a metallic electrode and an electrolyte						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_K01		familiarizing students with the phenomena occurring at the interface between a metallic electrode and an electrolyte		[SK2] Assessment of progress of work		
	K6_W02		familiarizing students with the phenomena occurring at the interface between a metallic electrode and an electrolyte		[SW3] Assessment of knowledge contained in written work and projects		
	K6_U01		familiarizing students with the phenomena occurring at the interface between a metallic electrode and an electrolyte		[SU1] Assessment of task fulfilment		
Subject contents	-Inner, outer and surface potential. -Double electric layer and its structure: Helmholtz, Stern and Guy-Chapman models. -Adsorption at electrodes: surface excess, adsorption isotherms, zero charge potential. -Chemical and electrochemical processes. -Determination of thermodynamic parameters and equilibrium conditions. -Electrode reaction current dependence of potential: Butler theory and Marcus theory. -Charge transfer coefficient: phenomena occurring inside a sphere and outside a sphere. -Electron tunneling. -Activation and diffusion control of electrochemical processes. -Multi-electrode processes. -Hydrogen evolution reaction on solid electrodes - kinetic analysis. -Chloride evolution reactions - kinetic analysis. -Electrochemical dissolution of iron.						
Prerequisites and co-requisites	Basics of thermodynamics and chemical kinetics.						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
Recommended reading	Basic literature	A. Kiswa, Elektrochemia t.I i II , WNT, Warszawa 2000 Z. Galus, Elektroanalityczne metody wyznaczania stałych fizykochemicznych, PWN Warszawa 1979 Z. Galus, Teoretyczne podstawy elektroanalizy chemicznej. PWN Warszawa 1977	
	Supplementary literature	No requirements	
	eResources addresses	Adresy na platformie eNauczenie:	
Example issues/ example questions/ tasks being completed	<p>Chemical and electrochemical processes</p> <p>determination of thermodynamic parameters</p> <p>activation and diffusion control</p>		
Work placement	Not applicable		

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