GDAŃSK UNIVERSITY OF TECHNOLOGY

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 Electrochemistry, Corrosion and Materials Engineering -> 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: Helmoltz, Stern and Guy-Chapman models. -Adsorption at electrodes: surface excess,adsorption isoterms, 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 insiede a sphere and outside a sphere. -Electron tunneling. -Activation and diffusion control of electrodic 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. Kisza, 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 eNauczanie:	
Example issues/ example questions/ tasks being completed	Chemical and electrochemical processes determination of thermodynamic parameters activation and diffusion control		
Work placement	Not applicable		