



Subject card

Subject name and code	Technical electrochemistry, PG_00058345						
Field of study	Hydrogen Technologies and Electromobility						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2024/2025		
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	2		Language of instruction		Polish		
Semester of study	3		ECTS credits		4.0		
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		dr hab. inż. Paweł Ślepski				
	Teachers		dr hab. inż. Paweł Ślepski dr hab. inż. Stefan Krakowiak dr hab. inż. Michał Szociński dr hab. inż. Krzysztof Żakowski				
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		7.0		48.0	100
Subject objectives	The aim of the course is for the student to master the knowledge of applications of electrochemical methods in industry. In addition, the student will master the ability to independently carry out electrochemical processes and analyses with industrial applications on a laboratory scale.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U02] can work individually and in a team, can communicate using various techniques in a professional environment, as well as document and analyze the results of their work, can estimate the time needed to perform the entrusted task		Prepares and presents results from an electrochemical process.		[SU5] Assessment of ability to present the results of task [SU1] Assessment of task fulfilment		
	[K6_U13] can use properly selected methods and devices enabling the measurement of basic quantities characterizing materials and technological processes		Controls selected technical electrochemical processes.		[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information		
	[K6_W19] has knowledge of the properties of electrolyte solutions, electrode processes and some electrochemical processes relevant to industrial practice and the application of electrochemistry in practice		Selects the appropriate electrochemical technology to solve a technological problem.		[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects		

Subject contents	Lecture:Application of electrochemistry in corrosion monitoring and protection: electrochemical monitoring of corrosion rates, cathodic and anodic protection of metallic industrial structures. Electrochemical application of metallic coatings. Electrochemical wastewater treatment: electrocoagulation, electro-oxidation of organic compounds. Laboratory:Monitoring of corrosion rate by polarisation resistance method. Analysis of potentiodynamic curves to determine corrosion rate and type of control. Anodic and cathodic protection of metallic materials. Application of anodic and cathodic metallic coatings. Study of the effectiveness of the electrocoagulation process.		
Prerequisites and co-requisites	The student has a basic knowledge of the mathematics of physics and the fundamentals of electrochemistry. The student has the ability to perform laboratory experiments in electrochemistry.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	written exam	60.0%	60.0%
	report	100.0%	40.0%
Recommended reading	Basic literature	K. Jackowska, P. Kryszinski; Applied Electrochemistry, De Gruyter, 2020 R. Dylewski, W. Gnot, M. Gonet; Elektrochemia przemysłowa, WPŚ, Gliwice 1999. H. Bala; Korozja materiałów - teoria i praktyka, WIPMiFS, Częstochowa 2000.	
	Supplementary literature	journal: "Journal of Applied Electrochemistry", Springer	
	eResources addresses	Adresy na platformie eNauczanie:	
	Example issues/ example questions/ tasks being completed	<ul style="list-style-type: none">• electrochemical protection of steel in a sulphuric acid environment• metallization - acid baths• electro-oxidation of paracetamol	
Work placement	Not applicable		

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