



## Subject card

Subject name and code	Corrosion of structural materials, PG_00058344						
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	Hydrogen Technologies Center -> Vice-Rector for Development						
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	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	Understand the theory of mixed electrochemical processes, including the corrosive (mixed) potential. Methods of determining the rate of corrosion and corrosion control.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W04] knows the properties of materials used in solving simple engineering tasks related to the field of study, in particular has knowledge in the field of materials science and is able to relate the properties of materials with their structure and composition, knows the theoretical description of phenomena occurring in materials subjected to external factors		The student has knowledge in the field of materials science and the relationship between the properties of materials and their structure and composition.		[SW1] Assessment of factual knowledge		
	[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		The student implements the program content.		[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information		
	[K6_U13] can use properly selected methods and devices enabling the measurement of basic quantities characterizing materials and technological processes		The student is able to measure the rate of corrosion occurring in materials and technological processes.		[SU1] Assessment of task fulfilment		

Subject contents	1. Water durability, 2. electrochemical thermodynamics of metals, 3. corrosion diagrams, 4. kinetics of simple electrode reactions, 5. oxidation reaction, 6. hydrogen reduction reaction, 7. reduction oxidation reduction, 8. mixed electrode processes, 9. control determination mixed electrode processes, 10. corrosion cells, 11. types of corrosion processes		
Prerequisites and co-requisites	Fundamentals of general chemistry and mathematics.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	laboratory	60.0%	50.0%
	lectures	60.0%	50.0%
Recommended reading	Basic literature	-W.v.Baeckmann, W.Schwenk, W.Prinz, Handbook of cathodic corrosion protection, Elsevier Science USA, 1997.  - N.Perez, Elektrochemistry and corrosion science, Kluwer Academic Publishers, Boston, 2004.	
	Supplementary literature	- Wiliam D. Corbett, Using Coatings Inspections Instruments, A KTA-Tator, In Publication,  - Electrochemical protection against corrosion (collective work edited by J. Ostaszewicz), WNT, W-wa, 1991	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	1. Methods of implementation of passivation and etching of stainless steels  2. Ways of implementing anodic protection3. Diagram of the installation for anodic protection of the tank		
Work placement	Not applicable		

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