



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 and Quality						
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Kazimierz Darowicki					
	Teachers						
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	<ol style="list-style-type: none"> 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	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Subject passing criteria</th> <th style="width: 33%;">Passing threshold</th> <th style="width: 33%;">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>laboratory</td> <td>60.0%</td> <td>50.0%</td> </tr> <tr> <td>lectures</td> <td>60.0%</td> <td>50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	laboratory	60.0%	50.0%	lectures	60.0%	50.0%
	Subject passing criteria	Passing threshold	Percentage of the final grade									
	laboratory	60.0%	50.0%									
lectures	60.0%	50.0%										
Recommended reading	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Basic literature</td> <td colspan="2" data-bbox="802 669 1487 875"> -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. </td> </tr> <tr> <td>Supplementary literature</td> <td colspan="2" data-bbox="802 882 1487 1167"> - 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 </td> </tr> <tr> <td>eResources addresses</td> <td colspan="2" data-bbox="802 1173 1487 1205">Adresy na platformie eNauczanie:</td> </tr> </table>			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:	
	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	<ol style="list-style-type: none"> 1. Methods of implementation of passivation and etching of stainless steels 2. Ways of implementing anodic protection 3. Diagram of the installation for anodic protection of the tank 											
Work placement	Not applicable											