GDAŃSK UNIVERSITY OF TECHNOLOGY

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 2025	Academic year of realisation of subject	2026/2027
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		

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_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

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="3">Fundamentals of general chemistry and mathematics.</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<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>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">-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">- 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"></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">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</td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
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