GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Fundamentals of electrochemistry, PG_00058339		
Field of study	Hydrogen Technologies and Electromobility		
Date of commencement of studies	October 2024	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	1	Language of instruction	Polish
Semester of study	2	ECTS credits	3.0
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 dr hab. inż. Paweł Ślepski	

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	6.0	24.0	75

Subject objectives

Understanding the phenomenon of electrolytic dissociation. Distinguish between strong and weak electrolytes. What is the scale of electrochemical potentials and electrochemical kinetics.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U13] can use properly selected methods and devices enabling the measurement of basic quantities characterizing materials and technological processes	Performs electrotechnical measurements.	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject
[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	Understands electrochemical phenomena relevant to industrial practice..	[SW3] Assessment of knowledge contained in written work and projects
[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	Have knowledge of the basics of electrochemistry, can work in a team.	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject

<table>
<tr><td>Subject contents</td><td>1. Electrolyte solutions,
2. Conductivity of electrolyte solutions,
3. Conductometry,
4. Transport in electrolyte solutions,
5. Electric potential,
6. Internal potential,
7. External potential
8. Surface potential,
9. Hydrogen electrode,
10. SEM of the cell electrochemical,
11. Electrode potential scale,
12. pH measurement of potentiometry,
13. Kinetics of the electrochemical reaction</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Fundamentals of general chemistry and mathematics.</td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>labolatory</td><td>60.0%</td><td>50.0%</td></tr>
<tr><td>lecture</td><td>60.0%</td><td>50.0%</td></tr>
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</td></tr>
<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>1- Adolf Kisza Electrochemistry I Jonika WNT, 2000,

2- Adolf Kisza Electrochemistry II Elektrodyka WNT, 2001,

3- Rudolf Holze, Experimental Electrochemistry, Wiley-vch, 2019</td></tr>
<tr><td>Supplementary literature</td><td>not applicable</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
</table>
</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>1 -Charge transport in the electrolyte, types, examples.

2- Influence of compound structure on the conductivity of the solution.

3- Construction and operation of an electrochemical cell.

4- Speed of electrode reactions.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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