GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Processes Measurements, PG_00061924		
Field of study	Materials Engineering		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2025/2026
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	3	Language of instruction	Polish
Semester of study	6	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Corrosion and Electrochemistry -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Stefan Krakowiak	
	Teachers	dr hab. inż. Stefan Krakowiak	

Lesson types

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

eNauczanie source address: https://enauczanie.pg.edu.pl/2025/course/view.php?id=3058

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	5.0	25.0	75

Subject objectives

Teaching students basic information about corrosion and presenting selected measurement methods used in the science of corrosion.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W04] Knows selected aspects of construction and operation of scientific equipment in materials engineering.	Can select a research method to solve the problem related to corrosion.	[SW1] Assessment of factual knowledge
[K6_K01] Understands the need to improve professional and personal competencies; is conscious of own limitations and knows when to turn to experts, properly establishes priorities helping to accomplish tasks defined by oneself or others.	The student knows what are the ways of improving professional competences in the field of corrosion and metal protection.	[SK5] Assessment of ability to solve problems that arise in practice [SK3] Assessment of ability to organize work [SK2] Assessment of progress of work
[K6_U01] Can properly use selected analytical, simulation and experimental methods, as well as devices for measuring the fundamental properties of materials and technological processes.	The student is able to determine the corrosion rate and indicate the type of corrosion attack.	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information
[K6_U02] Can operate typical laboratory equipment and analyze material tests	The student knows the methods of determining the corrosion rate and is able to assess the composition and type of construction material.	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools

<table>
<tr><td>Subject contents</td><td>Course content – lecture
Corrosion thermodynamics: corrosion cells, potential/pH diagrams, thermodynamic stability of water and its solutions. - Corrosion kinetics: potential/current diagrams, control of corrosion processes. - Types of corrosion: general, pitting, selective, intergranular, crevice, stress corrosion cracking, corrosion-erosion, cavitation. - Conditions for the occurrence of individual corrosion types (practical examples). - Atlas of corrosion damage: description and visualization of damage.
Course content – laboratory
Laboratory exercises: Introduction and laboratory safety rules. 1 - Galvanic cells 2.- Temperature cell. 3. Differential oxygenation cell. 4. Galvanic cells. 5. Crevice corrosion. 6. Intergranular corrosion. 7. Selective corrosion of brass. 8. Pitting corrosion of steel. 9. Cavitation 10. Reserve.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Basic knowledge of engineering measurements: pH, conductivity, density. Knowledge of operating a voltmeter and zero-ampere meter. Basic knowledge of electrochemistry.</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>doing lecture</td><td>60.0%</td><td>50.0%</td></tr>
<tr><td>doing laboratory</td><td>60.0%</td><td>50.0%</td></tr>
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<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>Textbooks available on https://enauczanie.pg.edu.pl/2025/course/view.php?id=3058</td></tr>
<tr><td>Supplementary literature</td><td>no recommendation</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>Investigation of current and potential in galvanic cells.

Comparison of pitting corrosion resistance using the cyclic polarization method.

Cavitation of selected construction materials.

Selective corrosion of brasses.</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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