GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Corrosion measurements, PG_00060320		
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	Optional subject group 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	5	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	exam
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 dr hab. inż. Michał Szociński dr inż. Łukasz Gaweł dr hab. inż. Andrzej Miszczyk	

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

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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	50.0	100

Subject objectives

To familiarize students with basic corrosion processes and methods of their study.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[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 plan the time and subsequent steps necessary to assess the causes, mechanism, and rate of corrosion of structural metals and alloys.	[SU4] Assessment of ability to use methods and tools
[K6_U02] Can operate typical laboratory equipment and analyze material tests	Able to prepare and perform corrosion measurements using modern measurement equipment for corrosion and analytical testing,	[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools
[K6_W07] Has detailed knowledge of selected problems of materials science.	The student is able to determine the resistance of a material under given operating conditions and propose a material solution for defined corrosion hazards.	[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 is aware of the need to supplement his/her information in the field of development of measurement methods in corrosion.	[SK5] Assessment of ability to solve problems that arise in practice

Subject contents

Course content – lecture
Lecture: -Chemical thermodynamics: corrosion cells, E/pH diagrams, thermodynamic stability of water and its solutions. -Corrosion processes kinetics: E=f(I) diagrams, corrosion processes control. -Types of corrosion: general, pitting, selective, intergranular, crevice, stress corrosion and stress corrosion cracking, corrosion-erosion, cavitation. -Corrosion occuring conditions (practical examples). -Atlas of corrosion fatigue: description and visualization of fatigues. Laboratory: 1.Introduction and safety. 2.Temperature cell. 3.Oxygen concentration cell. 4.Galvanic cell. 5.Crevice corrosion. 6.Intergranular corrosion. 7.Selective corrosion of brass. 8.Pitting corrosion of steel. 9.Water 10.Reserved.

Prerequisites and co-requisites

Chemical thermodynamics

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Passing the lectures	60.0%	50.0%
Passing the labs	100.0%	50.0%

Recommended reading

Basic literature	Philip. A. Schweitzer, Corrosion-of-Linings-Coatings-Cathodic-and-Inhibitor-Protection-and-Corrosion-Monitoring, CRC Press F P Ijsseling-General Guidelines for Corrosion Testing of Materials for Marine Applications (European Federation of Corrosion Series)-Maney Publishing (1989) Yurii I. Kuznetsov, A. D. Mercer, J. G. N. Thomas (auth.)-Organic Inhibitors of Corrosion of Metals-Springer US (1996)
Supplementary literature	No requirements
eResources addresses	Basic https://enauczanie.pg.edu.pl/moodle/course/view.php?id=46173 - The platform provides materials necessary for students to prepare for laboratory exercises and lectures.

Example issues/ example questions/ tasks being completed

Corrosion cells. Types of corrosion. Potential / pH diagrams

Practical activites within the subject

Not applicable

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