GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Corrosion measurement, PG_00060767		
Field of study	Chemical Technology		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2027/2028
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	4	Language of instruction	Polish
Semester of study	7	ECTS credits	2.0
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. Paweł Ślepski	
	Teachers		

Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	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	30	2.0	18.0	50

Subject objectives	The aim of this course is to introduce students to the topic of corrosion and familiarize them with the principles and methods of measuring corrosion processes in various environments, as well as with techniques for assessing the technical condition of materials and structures exposed to corrosion. Students will acquire the ability to select appropriate testing methods (electrochemical, gravimetric, potentiometric, etc.), interpret measurement results, and formulate conclusions necessary for designing anticorrosion protection and assessing the operational durability of equipment.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_K01] understands the need for continuing education, and is aware of the opportunities to improve professional, personal and social competences	The student recognizes the need for continuous improvement of qualifications through active and responsible engagement in the process of regularly updating knowledge, developing skills, and self-development. The student is aware of their own limitations and can identify areas requiring further improvement.	[SK1] Assessment of group work skills [SK3] Assessment of ability to organize work [SK2] Assessment of progress of work
[K6_W07] has knowledge of structural materials used in the chemical industry and their corrosion, corrosion monitoring and protection, and corrosion metrology	The student possesses a basic knowledge of construction materials used in industrial installations, understands their corrosion mechanisms, and factors affecting durability. Understands the general principles of corrosion monitoring and protection, including the basics of corrosion measurement. Recognizes corrosion hazards, selects simple methods for their assessment, and identifies appropriate methods for monitoring the condition of materials and assessing the effectiveness of protection. Demonstrates the ability to use basic measurement equipment and techniques to assess corrosion processes. Recognizes the importance of proper material selection and corrosion protection for the safety and economics of installation operation, and is ready to work collaboratively in a team to assess corrosion risk and propose protective solutions.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
[K6_U08] is able to classify and apply knowledge of the driving forces of corrosion processes in different construction materials to the design of process installations and the selection of corrosion protection methods for installations	Students will understand the basic mechanisms and types of corrosion in structural materials, be able to identify factors influencing corrosion processes, and be able to propose methods for monitoring and mitigating them. Additionally, students will be able to analyze and interpret the results of corrosion measurements and understand the importance of corrosion protection for the safety and operational durability of machinery and equipment.	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools

Subject contents

Course content – lecture
Basic concepts of corrosion and corrosion protection.
Chemical and electrochemical corrosion.
Environmental factors affecting corrosion intensity.
Examples of corrosion in industrial installations.
Principles of anticorrosion protection.
Types of corrosion protective coatings.
Methods for testing coating quality.

Course content – laboratory
Determining Corrosion Rate and Corrosion Potential
Gravimetric Techniques
Electrochemical Methods
Measuring Protective Coating Thickness
Basic LabView Programming

Prerequisites and co-requisites

Students should have basic knowledge of general and physical chemistry, particularly electrochemical processes, as well as the fundamentals of materials science and materials mechanics. Knowledge of basic concepts in thermodynamics and chemical kinetics, as well as the ability to perform simple physicochemical calculations, is recommended. Students should be familiar with basic laboratory equipment and be familiar with laboratory safety regulations.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Laboratory	51.0%	30.0%
Lecture	51.0%	70.0%

Recommended reading

Basic literature	Technika przeciwkorozyjna, praca zbiorowa pod redakcją Romulada Juchniewicza, PWSZ 1973 Techniki przeciwkorozyjne, Józef Mikuła, Politechnika Rzeszowska 1992 Podstawy teoretyczne i aspekty praktyczne zjawiska korozji, T. Hryniewicz, K. Rokosz, Politechnika Koszalińska 2010

	Supplementary literature	Eksperymentalna chemia fizyczna, praca zbiorowa, PWN 1982
	eResources addresses	
Example issues/ example questions/ tasks being completed	Types and mechanisms of corrosion: chemical, electrochemical, galvanic, crevice, and stress corrosion. Thermodynamic and kinetic determinants of corrosion processes. Electrochemical potential, corrosion current, and polarization resistance: their significance and interpretation.	
Practical activites within the subject	Not applicable	

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