GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Corrosion of industrial buildings, PG_00069272		
Field of study	Chemical Technology, Chemistry, Materials Engineering, Biotechnology, Corrosion		
Date of commencement of studies	February 2025	Academic year of realisation of subject	2025/2026
Education level	second-cycle studies	Subject group	
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	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=3089

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

The aim of this course is to introduce students to the main causes and characteristics of corrosion processes occurring in various industrial installations. The characteristics of corrosion and the main causes of its occurrence will be presented for selected industrial installations.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_K02] understands the non-technical aspects and implications of graduate activity, including the impact on the environment	The student is aware of the negative impact of corrosion processes on the surrounding environment and understands the need for effective measures to combat corrosion and degradation of materials.	[SK2] Assessment of progress of work [SK5] Assessment of ability to solve problems that arise in practice
[K7_W02] has the knowledge of materials necessary to describe and understand the relationship between chemical composition and physical properties	The student has mastered knowledge related to the development of corrosion science and The student has knowledge of basic construction materials and their degradation in environments of various aggressiveness.	[SW1] Assessment of factual knowledge
[K7_W05] recognises key developments in research, apparatus and technology in corrosion and material degradation and related fields	The student has acquired knowledge related to the development of corrosion science and new trends in corrosion measurements.	[SW1] Assessment of factual knowledge
[K7_U02] conducts experiments using properly selected techniques and apparatus, taking advantage of new developments in corrosion and related fields	The student is able to correctly select the research method for the corrosion problem being solved.	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools

<table>
<tr><td>Subject contents</td><td>Course content – lecture
1. Electrochemical corrosion and high-temperature (chemical) corrosion.
2. Corrosion protection technologies.
3. Corrosion of underground and subsea structures.
4. Corrosion of offshore installations.
5. Corrosion of water treatment systems.
6. Corrosion in wastewater treatment systems.
7. Stainless steels as an alternative to carbon steels.
Course content – laboratory
1. Concrete corrosion;
2. Corrosion of structural materials in acidic condensates;
3. Corrosion under CIP (Clean in Place) conditions;
4. Effect of temperature on corrosion of stainless steel (heat exchanger corrosion);
5. Interaction of coating protection with cathodic protection in immersed structures;
6. Corrosion and erosion in flue gas desulfurization plants;
7. Corrosion problems when joining structural materials.
8. Corrosion problems resulting from submarine pipeline failures.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Basic information on physical chemistry and the chemistry of polymeric materials.</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>Passing the lectures</td><td>60.0%</td><td>50.0%</td></tr>
<tr><td>Passing the labs</td><td>100.0%</td><td>50.0%</td></tr>
</table></td></tr>
<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>Alec Groysman, Corrosion in Systems for Storage and Transportation of Petroleum Products and Biofuels Identification, Monitoring and Solutions, Springer, 2014

H.M. Shalaby, A. Al-Hashem, M. Lowther, J. Al-Besharah, INDUSTRIAL CORROSION AND CORROSION CONTROL TECHNOLOGY, Published By Kuwait Institute for Scientific Research, 1996

Ramesh Singh-Corrosion control for offshore structures _ cathodic protection and high-efficiency coating-Elsevier, Gulf Professional Publishing (2015)</td></tr>
<tr><td>Supplementary literature</td><td>In line with the recommendations of the instructors</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>Principles of industrial design.
How oxide films grow during high-temperature corrosion.
Main corrosion hazard zones in FGD plants.
Critical factors in stainless steel corrosion.</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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