GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00061742		
Field of study	Environmental Engineering		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2024/2025
Education level	second-cycle studies	Subject group	Obligatory subject group in the field of study
Mode of study	Part-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish
Semester of study	4	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department Of Engineering Structures -> Faculty Of Civil And Environmental Engineering -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Dariusz Kowalski	
	Teachers	dr inż. Dariusz Kowalski	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	10.0	10.0	0.0	0.0	0.0	20

E-learning hours included: 0.0

Additional information:
The course will be conducted in a traditional manner, with lectures held in the classroom and practical exercises in the laboratory. As part of the practical exercises, manual and measurement laboratory work related to anti-corrosion protection will be carried out. Framework materials for the course will be posted on the eLearning platform.

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	20	3.0	29.0	52

Subject objectives

The aim of the course is to familiarize students with the issue of corrosion of metal elements, which leads to the loss of load-bearing capacity, stability, or technical functionality of structural systems, as well as sanitary networks and installations. The types of corrosion and their processes will be presented. Methods of protecting metal against corrosion using paint and metallization coatings will be discussed. Students will learn the process of selecting an anti-corrosion protection system for selected elements.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	K7_W05	The student has expanded and organized knowledge of the applicable regulations in construction law, water law, environmental protection, and spatial planning and development. Thanks to the completion of the course, the student will be able to: • Understand and interpret the regulations of construction law, water law, and environmental protection in the context of anti-corrosion protection. • Apply knowledge of spatial planning and development in practical situations related to the design and implementation of anti-corrosion protection systems for networks, installations, and technical devices related to environmental engineering.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
	[K7_U08] is able to assess risks in the implementation of engineering projects and implement appropriate safety rules	The student is able to: • Identify and analyze problems related to the corrosion of metal elements, which can lead to the loss of load-bearing capacity, stability, or technical functionality of structural systems, as well as sanitary networks and installations. • Propose solutions in the field of environmental protection and water management by ensuring effective anti-corrosion protection of technological infrastructure elements. • Perform manual and measurement laboratory work related to anti-corrosion protection, in accordance with applicable standards and regulations.	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
	[K7_W02] has broadened and well-ordered knowledge of the current law on construction, water, environmental protection and planning and spatial planning.	The student has knowledge in the field of construction; technology and organization of industry-specific works or the impact of construction investments on the environment. Thanks to the completion of the course "Anti-Corrosion Protection", the student will be able to: • Understand the basic principles of construction and the technologies used in anti-corrosion protection. • Organize and supervise works related to anti-corrosion protection in various construction sectors. • Analyze the impact of construction investments on the environment, with particular emphasis on aspects related to corrosion. • Apply appropriate methods and technologies for protecting metal structural elements against corrosion. • Conduct measurements and assessments of the technical condition of metal elements and plan repair and preventive actions. • Utilize knowledge of applicable construction, water, and environmental protection laws in the context of anti-corrosion protection.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge

<table>
<tr><td>Subject contents</td><td>Program content of the lecture:

Methods of corrosion protection - protection coating, modification corrosive environment, electrochemical protection, selection of a metallic material, shape the structure and corrosion. Preparation of steel surfaces for the application of protective coatings. Surface contamination, surface preparation to clean. Methods for cleaning surfaces - abrasive used in blasting - abrasive. Evaluation of the quality of surface preparation for painting, surface roughness. Division and characteristics of painting. Techniques for applying paint products. Metallized coating. Evaluation and testing of coatings. Disadvantages of paints and coatings and metallization. Designing corrosion protection according to PN- EN ISO 12944. Designing corrosion protection according to PN- EN ISO 12944. Electrochemical corrosion protection. Examples of corrosion protection of selected structures . Health and safety in the work of anticorrosive.

Exercise Program content:

Discussion on the scope and principles of the object. Corrosion around us - to discuss homework. Traps corrosion - work with the album Steel Structures. Corrosion around us - the students own work. Traps corrosion - work with the album Steel Structures. Corrosion around us - the students own work. Corrosion around us - the students own work . Presentation of students chosen from the range to discover corrosion. Description of the environment for their own cases. Classification corrosive environment for the cases of their own. Prepare design for galvanizing - work with the album Steel Structures. Selection of corrosion protection system for cases of their own. Selection of corrosion protection system for cases of their own. Selection of commercial protective coating.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Fundamentals of designing and shaping metal structures and sanitary systems in the context of anti-corrosion protection.</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>exercise reports</td><td>60.0%</td><td>20.0%</td></tr>
<tr><td>test of lecture content</td><td>60.0%</td><td>80.0%</td></tr>
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<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>1. PN EN ISO 12944 - Paints and varnishes - Corrosion protection of steel structures by protective paint systems - Part. 1-7
2. PN EN ISO 1461 Zinc coatings applied to steel by immersion (galvanizing unit) - Requirements and testing
3. BS EN ISO 8501 - Preparation of steel substrates before application of paints and related products. Visual assessment of surface cleanliness. Part 1. Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings. Part 2 preparation of previosly coates steel substrates after localized removal of previous coatings.</td></tr>
<tr><td>Supplementary literature</td><td>1. Baszkiewicz J., Kaminski, J. Corrosion of materials, Publishing House of the Warsaw University of Technology, 2006
2. Tomaszow N. D.:Teoria korozji i ochrony metali, PWN 1962
3. Zabezpieczenia abtykorozyjne w budownictwie przemysłowym - Poradnik Projektanta, Arkady
4. Wranglen G.: Podstawy korozji i ochrony metali, WNT 1975</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:
2024/25 Ochrona antykorozyjna IS mgr ns - Moodle ID: 45686
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=45686</td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>corrosion identification, identification of hazards corrosion, corrosion protection systems, paint coatings, metallized coating</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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