GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	CORROSION PROTECTION OF METAL STRUCTURES, PG_00041294		
Field of study	Civil Engineering		
Date of commencement of studies	February 2023	Academic year of realisation of subject	2023/2024
Education level	second-cycle studies	Subject group	Optional subject group
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	2	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Metal Structures -> Faculty of Civil and Environmental Engineering		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Dariusz Kowalski	
	Teachers		

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	15.0	0.0	0.0	0.0	45

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	45	5.0	25.0	75

Subject objectives

The purpose of the course is acquaint students with the problem of corrosion of metal parts causing loss of capacity, stability or functionality of technical systems. Types of corrosion will be presented and the process of their course. Will discuss ways to protect the metal from corrosion by coatings and metallization. Students learn the process of selection of the corrosion protection system for the selected components.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_U15] has advanced skills in civil engineering within offered specialization/profile	The student knows how to assess corrosive exposure and choose the appropriate protection	[SU3] Assessment of ability to use knowledge gained from the subject
[K7_W14] knows and applies building codes and obeys the Construction Law; has knowledge on environmetal impact of investment realisation	The student got acquainted with the standard approach to theassessment of corrosive conditions and methods of material protection	[SW1] Assessment of factual knowledge
[K7_W10] knows modern building materials as well as technologies and methods of its manufacturing and production of construction elements	The student knows the types of materials and methods used to protect the structure from corrosion	[SW1] Assessment of factual knowledge
[K7_W15] has deep and adequate knowlege of civil engineering, within offered specialization and profile	The student knows the causes and conditions of corrosion development. He can choose a material protection system against negative corrosion phenomena	[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>Basis of design and shaping of metal structures.</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>Test</td><td>60.0%</td><td>80.0%</td></tr>
<tr><td>Design exercises</td><td>60.0%</td><td>20.0%</td></tr>
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<tr><td>Recommended reading</td><td>
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<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>Baszkiewicz J., Kaminski, J. Corrosion of materials, Publishing House of the Warsaw University of Technology, 2006</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>Selection of corrosion protection methods for steel structures
Assessment of the condition of anti-corrosion protection
Present the procedure for selecting protection devices for the structure</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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