



Subject card

Subject name and code	Metal coatings, PG_00060322						
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	6	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. Andrzej Miszczyk					
	Teachers	dr hab. inż. Andrzej Miszczyk					
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						
	eNauczanie source address: https://enauczanie.pg.edu.pl/2025/course/view.php?id=4823						
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 familiarize students with metal coatings used to protect surfaces (primarily steel structures) from corrosion and to achieve aesthetic appeal. The course covers the methods used to obtain such coatings (electrolytic, immersion, and spray methods), the mechanisms of their protective action, their properties and scope of application, and quality control methods.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_U02] Can operate typical laboratory equipment and analyze material tests	The student has the competence to operate instruments and equipment enabling the performance of analyses and measurements of metal coatings on other metal substrates.			[SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools		
	[K6_U06] Can integrate obtained information, interpret it and draw conclusions, as well as formulate and justify opinions.	The student combines various pieces of information, selects them and critically interprets them, thus being able to draw conclusions and formulate reasoned opinions.			[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject		
	[K6_W07] Has detailed knowledge of selected problems of materials science.	The student freely uses knowledge of material phenomena and is able to use it in practical situations.			[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation		

Subject contents	<p>Course content – lecture Classification and types of metal coatings used in engineering practice in terms of materials and mechanism of action. Methods for obtaining metal coatings on other metals. Electrochemical methods (galvanic coatings). Immersion (hot-dip) methods. Spray methods. Advantages and disadvantages of various methods. Material characteristics of coating structures obtained by various methods. Performance properties of metal coatings in various environments. Test methods for metal coatings. Additional protection of metal coatings: conversion layers and organic coatings (duplex system). Development trends in the field of metal coatings.</p> <p>Course content – laboratory Recognizing different types of metal coatings. Identifying the coating metal and the substrate metal. Obtaining electrolytic coatings. Faraday's law. Visual assessment of surface quality. Destructive and non-destructive methods for measuring the thickness of metal coatings. Coating adhesion testing. Coating tightness testing. Measuring physical parameters of coatings (roughness, hardness, gloss). Corrosion testing of metal coatings: exposure in immersion and in natural atmospheric conditions. Estimating the durability of metal coatings under varying atmospheric corrosivity.</p>											
Prerequisites and co-requisites	<p>Knowledge of the basic mechanisms of corrosion and destruction of metals in atmospheric and industrial environments. Knowledge of the basic properties of metals used in engineering practice.</p>											
Assessment methods and criteria	<table border="1" data-bbox="451 678 1487 779"> <thead> <tr> <th data-bbox="451 678 794 712">Subject passing criteria</th> <th data-bbox="794 678 1137 712">Passing threshold</th> <th data-bbox="1137 678 1487 712">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="451 712 794 745">test</td> <td data-bbox="794 712 1137 745">60.0%</td> <td data-bbox="1137 712 1487 745">50.0%</td> </tr> <tr> <td data-bbox="451 745 794 779">laboratory</td> <td data-bbox="794 745 1137 779">100.0%</td> <td data-bbox="1137 745 1487 779">50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	test	60.0%	50.0%	laboratory	100.0%	50.0%
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Example issues/ example questions/ tasks being completed	Types of coatings based on their anticorrosive mechanism. Structure of hot-dip zinc coatings. Structure of duplex systems. Types of conversion coatings.											
Practical activities within the subject	Not applicable											

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