GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	NANOSCOPY OF SURFACES, PG_00064361		
Field of study	Corrosion		
Date of commencement of studies	February 2025	Academic year of realisation of subject	2025/2026
Education level	second-cycle studies	Subject group	Obligatory subject group in the field of study Specialty 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	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 Corrosion and Electrochemistry -> Faculty of Chemistry -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Paweł Ślepski	
	Teachers	dr hab. inż. Paweł Ślepski	

Lesson types and methods of instruction

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

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 the course is to familiarise students with the modification and analysis of construction material surfaces, mainly using metal coatings.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W01] defines the phenomena and processes used to produce consumer goods and run services	The student is able to define and characterise surface phenomena relevant to the production and use of materials and to the design of technologies and services related to corrosion protection.	[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 plan and conduct an experiment using appropriately selected research techniques, correctly operate the equipment and apply modern solutions in the analysis of material surfaces in the context of corrosion and related problems	[SU4] Assessment of ability to use methods and tools
[K7_K03] can interact and work in a group, undertaking various roles within it	The student is able to work in a team during laboratory and project tasks, taking on various roles, which enables effective examination and interpretation of the surface structure of metal coatings.	[SK1] Assessment of group work skills

<table>
<tr><td>Subject contents</td><td>hot dip galvanizing
electroplating
metal spray galvanizing
conversion coatings
nanoscopic examination of metal coatings
preparation of elements for surface metallisation</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Optical microscopy, electron microscopy, corrosion processes</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>report</td><td>100.0%</td><td>40.0%</td></tr>
<tr><td>final test</td><td>60.0%</td><td>60.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>Dror Sarid, Scanning Force Microscopy. With Applications to Electric, Magnetic, and Atomic Forces ISBN13: 978-0-19-509204-2

Robert Kelsall, Ian Hamley, Mark Geoghegan, Nanotechnologie, ISBN: 9788301155377

Sergei V. Kalinin, Alexei Gruverman, Scanning Probe Microscopy. Electrical and Electromechanical Phenomena at the Nanoscale, ISBN: 978-0-387-28667-9</td></tr>
<tr><td>Supplementary literature</td><td>Rebecca Howland, Lisa Benatar, STM / AFM. Mikroskopy ze skanującą sondą. Elementy teorii i praktyki. Warszawa 2002.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
</table>
</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>• surface preparation before metallization
• composition of the galvanising bath in relation to coating properties
• location of technological holes
• coating capacity of the bath
• surface properties of metal coatings</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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