GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Corrosion diagnostics, PG_00060321		
Field of study	Materials Engineering, Materials Engineering		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2026/2027
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	prof. dr hab. inż. Juliusz Orlikowski	
	Teachers	prof. dr hab. inż. Juliusz Orlikowski	

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

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

Mastering knowledge of nondestructive testing

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U02] Can operate typical laboratory equipment and analyze material tests	Ability to perform ultrasonic and penetrant testing, as well as visual documentation of corrosion damage	[SU1] Assessment of task fulfilment
[K6_U01] Can properly use selected analytical, simulation and experimental methods, as well as devices for measuring the fundamental properties of materials and technological processes.	Ability to assess the location of defects in structural materials using the ultrasonic method	[SU1] Assessment of task fulfilment
[K6_K01] Understands the need to improve professional and personal competencies; is conscious of own limitations and knows when to turn to experts, properly establishes priorities helping to accomplish tasks defined by oneself or others.	Ability to search for data on research performed in the literature and on the Internet	[SK2] Assessment of progress of work

Subject contents

Course content – lecture
Materials science for unalloyed steels, stainless steels, and copper alloys. Discussion of applicable standards. Methodology for visual assessment of structural materials. Measurement principles and applicability of the following NDT methods: ultrasonic flaw detection, penetrant method, eddy current, radiographic method, acoustic emission method, and thermal imaging.

Course content – laboratory
1. Visual assessment of corrosion damage
2. Photographic documentation of corrosion and degradation damage
3. Ultrasonic flaw detection
4. Ultrasonic thickness measurement
5. Penetrant testing
6. Thermal imaging

Prerequisites and co-requisites

Knowledge of electrochemistry and measurements of resistance

<table>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>Practical exercises</td><td>60.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">Guseppe Lacidonga, Nondestructive Testing (NDT), MDPI AG, 2021</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">Not required</td></tr>
<tr><td>eResources addresses</td><td colspan="2"></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">Selecting NDT testing methods for specific applications
Determine the measurement limitations of selected NDT methods
Determine the steel nomenclature based on the PN-EN 10020 standard</td></tr>
<tr><td>Practical activites within the subject</td><td colspan="3">Not applicable</td></tr>
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