GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00065847		
Field of study	Materials Engineering		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2026/2027
Education level	second-cycle studies	Subject group	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	2	Language of instruction	Polish
Semester of study	3	ECTS credits	1.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Division of Magnetic Properties of Materials -> Institute of Nanotechnology and Materials Engineering -> Faculty of Applied Physics and Mathematics -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Leszek Piotrowski	
	Teachers	dr hab. inż. Leszek Piotrowski	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	0.0	15.0	0.0	0.0	15

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	15	1.0	9.0	25

Subject objectives

The aim of the course is to prepare the student for experimental work in the field of materials testing with the use of modern non-destructive diagnostic techniques. These techniques are widely used in industry to study the physical properties of matter, the state of structure and to detect defects.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_U04] Can undertake a detailed analysis of the obtained results and develop a technical report or presentation, also in English.	The student is able to analyze the results obtained and processs them using appropriate software tools (Origin, LabView)	[SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task [SU1] Assessment of task fulfilment
[K7_U03] Can formulate a research hypothesis, design an experiment needed to prove it and use properly selected measuring and laboratory methods.	The student is able to assess the situation and select the required measuring equipment on the basis of the data provided by the potential client. It is able to carry out measurements on its own using diagnostic devices.	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment
[K7_W05] Knows methods, techniques, tools and materials for solving complex engineering tasks relevant to materials engineering.	The student has knowledge of modern methods of non-destructive testing Can choose a measurement method for the examined issue.	[SW3] Assessment of knowledge contained in written work and projects

Subject contents

Course content – laboratory

Visual Testing Magnetic testing Distributed field method The Barkhausen effect Guided waves Magnetostrictive pulses Eddy current techniques Stress measurements

Prerequisites and co-requisites

<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>100</td><td>50.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">Handbook of Nondestructive Evaluation, Charles Hellier, McGraw-Hill, 2020</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">Introduction To Nondestructive Testing A Training Guide Second Edition Paul E. Mix; John Wiley & Sons 2005</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">D efect d etection i n rods . G uided waves i n p ipes. M easurements o f t he s peed o f s ound. M easurements o f t he s tress s tate i n w elds. E ddy c urrent t ests o f t he t hickness of paint l ayers.</td></tr>
<tr><td>Practical activites within the subject</td><td colspan="3">Not applicable</td></tr>
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