GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Structural Research of Materials, PG_00039768		
Field of study	Materials Engineering, Materials Engineering, Materials Engineering, Materials Engineering		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2021/2022
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	2	Language of instruction	Polish
Semester of study	4	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Marek Szkodo	
	Teachers	dr inż. Alicja Stanisławska dr hab. inż. Marek Szkodo	

Lesson types and methods of instruction

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

Adresy na platformie eNauczanie:
Badania strukturalne materiałów - Moodle ID: 22915
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=22915

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	5.0	40.0	75

Subject objectives

The aim of the course is to familiarize students with the methods of examining the microstructure of engineering construction materials, mainly with microscopic methods.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_U02	The student is able to use an optical microscope to choose the appropriate method of examining the microstructure of engineering materials	[SU5] Assessment of ability to present the results of task
K6_U01	The student is able to choose the appropriate method of preparing a material sample to determine its microstructure.	[SU4] Assessment of ability to use methods and tools
K6_K01	The student understands the relationship between the microstructure of engineering materials and their properties, and is aware of what methods can be used to determine the microstructure of materials.	[SK5] Assessment of ability to solve problems that arise in practice
K6_W06	The student knows the structure of optical and electron microscopes and knows how to prepare material samples to determine their microstructure using various microscopes.	[SW1] Assessment of factual knowledge
K6_W04	The student knows the structure of optical and electron microscopes and knows how to use these tools to determine the microstructure of engineering materials.	[SW1] Assessment of factual knowledge

<table>
<tr><td>Subject contents</td><td>Construction and operation of an optical microscope and various electron microscopes. Resolving power, total and useful magnification of the microscope, the aperture of the objective and the method of selecting the eyepiece for the selected objectives. Methods of obtaining contrast in the light and electron microscopy. Preparation of samples for research on the light and electron microscope.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></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>colloquium which includes the lectures</td><td>50.0%</td><td>50.0%</td></tr>
<tr><td>passing all laboratory exercises</td><td>100.0%</td><td>50.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>Transmission Electron Microscopy: A Textbook for Materials Science: by C. Barry Carter David B. Williams

Scanning Electron Microscopy and X-Ray Microanalysis. A Text for Biologists, Materials Scientists, and Geologists: Goldstein, J., Newbury, D.E., Echlin, P., Joy, D.C., Romig Jr., A.D., Lyman, C.E., Fiori, C., Lifshin, E.

Imaging Optics. Joseph Braat, Peter Török</td></tr>
<tr><td>Supplementary literature</td><td>Introduction to Optical Microscopy. Jerome Mertz</td></tr>
<tr><td>eResources addresses</td><td>Badania strukturalne materiałów - Moodle ID: 22915
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=22915</td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>Draw a diagram of the optical microscope
List the methods of obtaining contrast on the optical microscope
List the stages of making extraction films</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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