



Subject card

Subject name and code	, PG_00048738						
Field of study	Materials Engineering, Materials Engineering, Materials Engineering						
Date of commencement of studies	February 2022		Academic year of realisation of subject		2021/2022		
Education level	second-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	1		Language of instruction		Polish		
Semester of study	1		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Solid State Physics -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Michał Winiarski				
	Teachers		dr inż. Michał Winiarski				
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						
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		15.0	50
Subject objectives	The purpose of the subject is the extension of student's knowledge in the field of crystallography.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K7_W01		Student has an extended knowledge in the field of materials engineering.		[SW1] Assessment of factual knowledge		
	K7_U04		Student analyses the obtained data, which he presents and discusses in the report.		[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information		
	K7_U03		Student constructs a research hypothesis and conducts the experiment.		[SU2] Assessment of ability to analyse information		
	K7_W05		Student knows tools, methods and techniques necessary for solving problems in the field of materials engineering		[SW1] Assessment of factual knowledge		

Subject contents	<p>1. Introduction</p> <p>2. Symmetry</p> <p>symmetry operations, symmetry groups, projections</p> <p>3. Crystals morphology</p> <p>4. Experimental examination of the crystal structure</p> <p>5. Elements of modern crystallography</p> <p>quasicrystals, superstructures etc</p> <p>6. Crystal growth</p> <p>7. Properties of crystals</p> <p>8. Elements of mineralogy</p>														
Prerequisites and co-requisites	Required preceding subject: Crystallography														
Assessment methods and criteria	<table border="1" data-bbox="448 1099 1487 1283"> <thead> <tr> <th data-bbox="448 1099 798 1133">Subject passing criteria</th> <th data-bbox="798 1099 1141 1133">Passing threshold</th> <th data-bbox="1141 1099 1487 1133">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 1133 798 1193">individual work during the semester (homeworks etc.)</td> <td data-bbox="798 1133 1141 1193">51.0%</td> <td data-bbox="1141 1133 1487 1193">34.0%</td> </tr> <tr> <td data-bbox="448 1193 798 1249">passing laboratory activities (activities and reports)</td> <td data-bbox="798 1193 1141 1249">51.0%</td> <td data-bbox="1141 1193 1487 1249">33.0%</td> </tr> <tr> <td data-bbox="448 1249 798 1283">written test</td> <td data-bbox="798 1249 1141 1283">51.0%</td> <td data-bbox="1141 1249 1487 1283">33.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	individual work during the semester (homeworks etc.)	51.0%	34.0%	passing laboratory activities (activities and reports)	51.0%	33.0%	written test	51.0%	33.0%
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Example issues/ example questions/ tasks being completed	<p>1. Explain the crystal growing process with the chemical vapor transport (CVT) method.</p> <p>2. What is the optical indicatrix? Explain on the example of regular and orthorhombic systems.</p>														
Work placement	Not applicable														