

Subject card

Subject name and code	CRYSTALLOGRAPHY, PG_00039781								
Field of study	Materials Engineering, Materials Engineering, Materials Engineering								
Date of commencement of studies	October 2021		Academic year of realisation of subject			2021/2022			
Education level	first-cycle studies		Subject group			Obligatory subject group in the field of study 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 no			
Semester of study	2		ECTS credits			4.0			
Learning profile	general academic profile		Assessment form			assessment			
Conducting unit	Instytut Nanotechnologii i Inżynierii Materiałowej -> Faculty of Applied Physics and Mathematics								
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Maria Gazda							
	Teachers		dr inż. Kacper Dzierzgowski prof. dr hab. inż. Maria Gazda						
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
of instruction	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: krystalografia 1 -2021/22 - Moodle ID: 19936 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=19936								
Learning activity and number of study hours	Learning activity Participation in classes including plan				Self-st	tudy	SUM		
	Number of study hours	30		15.0		55.0		100	
Subject objectives	Learning the basics of crystallography								
Learning outcomes	Course out	Subject outcome			Method of verification				
	K6_W02		the student has knowledge of physics and chemistry useful for formulating and solving simple tasks in the field of crystallography			[SW1] Assessment of factual knowledge			
	K6_K01		the student understands the need to improve professional and personal competences; is aware of its own limitations and knows when to turn to experts, is able to properly define priorities for the implementation of tasks set by himself or other			[SK2] Assessment of progress of work			
	K6_U05		the student is able to independently learn the basics of crystallography			[SU1] Assessment of task fulfilment			
	K6_U01		the student is able to use properly selected analytical and experimental methods and devices that enable the measurement of the basic quantities characterizing crystalline materials			[SU1] Assessment of task fulfilment			
	K6_W04		the student knows the basic aspects of the construction and operation of an X-ray diffractometer			[SW1] Assessment of factual knowledge			

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Cubic at a sustaint	Intruduction					
Subject contents	Basic quantities used to describe lattice networks, crystallographic patterns. Crystal symmetry. Examples of real crystal structures. Their characteristics and some properties. Inverse network: definition, physical interpretation. Methods of studying the structure of crystals. Structure defects. Types and their influence on the properties of crystalline matter. Chemical bonds. How crystals are formed: crystallization, crystal morphology. Physical properties of crystals					
Prerequisites and co-requisites	no					
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade			
	lecture: quiz	51.0%	70.0%			
	lab.> raports	51.0%	30.0%			
Recommended reading	Basic literature	any textbook on crystallography				
	Supplementary literature	any textbook in crystallography or solid state physics				
	eResources addresses	krystalografia 1 -2021/22 - Moodle ID: 19936 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=19936				
Example issues/ example questions/ tasks being completed	1 How many atoms A and B (A - smaller, B - larger) are there in the unit cell (cube) shown in Figure 2? What is the structure? What is the coordination number of the B atom? What is the summary formula for this relationship?2 Draw and mark according to the plane definition (411), (002) and (100) in the orthorhombic crystal with lattice constants a = 4 Å, b = 2 Å and c = 8 Å Write the indicators of the planes equivalent to the plane (100).3. Write Laue's condition and explain its quantities.					
Work placement	Not applicable					

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