



Subject card

Subject name and code	CRYSTALLOGRAPHY, PG_00039781						
Field of study	Materials Engineering, Materials Engineering, Materials Engineering, Materials Engineering						
Date of commencement of studies	October 2020		Academic year of realisation of subject		2020/2021		
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 the laboratory may also be in English		
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 dr inż. Marta Roman				
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						
	Address on the e-learning platform: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=8857 Adresy na platformie eNauczanie: krystalografia 1 -2020/2021 - Moodle ID: 8857 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=8857						
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		15.0		55.0	100
Subject objectives	Learning the basics of crystallography						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	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_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_U05	the student is able to independently learn the basics of crystallography	[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
	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
Subject contents	<p>Intruduction</p> <p>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</p>		
Prerequisites and co-requisites	no		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	lab.> raports	51.0%	30.0%
	lecture: quiz	51.0%	70.0%
Recommended reading	Basic literature	an textbook on crystallography	
	Supplementary literature	any textbook in crystallography or solid state physics	
	eResources addresses	Podstawowe https://enauczenie.pg.edu.pl/moodle/course/view.php?id=8857 - Krystalografia 1 2020/21 krystalografia 1 -2020/2021 - Moodle ID: 8857 https://enauczenie.pg.edu.pl/moodle/course/view.php?id=8857	
Example issues/ example questions/ tasks being completed	<p>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.</p>		
Work placement	Not applicable		