GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Crystallography, PG_00020925		
Field of study	Nanotechnology		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2024/2025
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	2	Language of instruction	Polish
Semester of study	3	ECTS credits	5.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Solid State Physics -> Faculty of Applied Physics and Mathematics		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Maria Gazda	
	Teachers	prof. dr hab. inż. Maria Gazda	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	15.0	0.0	0.0	45

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	45	18.0	62.0	125

Subject objectives

Gaining knowledge on the fundamentals of crystallography and relations between the crystal structure and properties of materials.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_U04	Is able to perform some experiments, e.g. XRD, density determination etc	[SU1] Assessment of task fulfilment
K6_U01	Is able to learn	[SU1] Assessment of task fulfilment
K6_W06	Has basic knowledge on crystalline materials	[SW1] Assessment of factual knowledge
K6_W05	Has basic knowledge on inorganic materials	[SW1] Assessment of factual knowledge

Subject contents

Basic definitions, crystallographic equations; Symmetry of crystals, symmetry groups. •Examples of crystals, their characteristic features and structural properties . Reciprocal lattice: definitione and interpretation . •Methods of structural studies. •Structural defects - their influence on the selected properties.

•Chemical bonds. • Crystal growth , Morphology of crystals.

Physical properties of crystals. Anisotropy.

Prerequisites and co-requisites

No requirements

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
test	51.0%	65.0%
Homework	30.0%	5.0%
Laboratory - average mark	51.0%	30.0%

Recommended reading	Basic literature	Krystalografia, Bojarski i inni Any textbook on crystallography
	Supplementary literature	No requirements
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	1. How many atoms belong to the cel shown in the figure 1? What is the coordination numer of larger atom? 2. Define Miller indices. Draw the planes (411), (002) and (100) in an orthorhombic crystal of cel parameters **a = 4 Å, b = 2 Å** i **c = 8 Å.** Give indices of the planes equivalent to (100). 3. Crystal has two mirror planes: one perpendicular to y and other to z. Determine points equivalent to ¼ ¾ ½.. What multiplicity has this point? 4. Calculate packing density for bcc structure. 5. What information may be obtained on the basis of X-ray diffraction investigation of a monocrystal?	
Work placement	Not applicable	