



Subject card

Subject name and code	Introduction to Intermetallic Materials, PG_00066685						
Field of study	Materials Engineering, Materials Engineering						
Date of commencement of studies	February 2024		Academic year of realisation of subject		2024/2025		
Education level	second-cycle studies		Subject group		Optional subject group Specialty 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	3		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Institute of Nanotechnology and Materials Engineering -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. inż. Tomasz Klimczuk				
	Teachers		prof. dr hab. inż. Tomasz Klimczuk				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	10.0	0.0	5.0	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	10.0	10.0	50		
Subject objectives	The aim of the course is to introduce students to the broad field of intermetallic materials. In particular, to explain the most important methods of synthesis of both polycrystalline materials and crystals, as well as methods of measuring physical properties.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K7_U02	The student is aware of the lack of complete knowledge in the context of the continuous development of the field he studies, i.e. development trends and the most significant new developments in the field of intermetallic materials.			[SU3] Assessment of ability to use knowledge gained from the subject		
	K7_U01	The student consciously, consistently and patiently searches for sources where information on intermetallic materials is available. He is able to verify them, analyze and draw accurate conclusions, formulate and justify opinions; he is not afraid to pose questions.			[SU5] Assessment of ability to present the results of task		
	K7_W05	The student knows and can apply the basic methods and tools used in the synthesis and study of physical properties of intermetallic materials.			[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects		
	K7_K01	The student understands and is aware of the need to educate himself, as he knows his own limitations. With the classes he consciously decides to take, he is able to determine his own priorities and define and shape his competencies resulting from his choice of subject.			[SK2] Assessment of progress of work		

Subject contents	Lectures:1. Thermal properties and phase diagrams.2. Synthesis of polycrystalline materials: arc melting method, solid phase reaction method.3. Crystal growth: growth from liquid phase, PVT and CVT methods.4. Magnetism in intermetallic materials: type of magnetic ordering, Curie-Weiss law, determination of Neel and Curie temperature.5. Electrical properties of intermetallic materials: charge density waves, superconductivity, others.Laboratory: Students conduct synthesis, study of crystal structure and study of physical properties of selected intermetallic compound.Seminar: Students present a scientific publication selected together with the instructor, the topic of which is consistent with the content of the subject.		
Prerequisites and co-requisites	The student should have basic knowledge of crystallography and solid state physics.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		55.0%	60.0%
		55.0%	20.0%
		55.0%	20.0%
Recommended reading	Basic literature	1. Mary Anne White Properties of Materials, Oxford University Press 1999; 2. William D. Callister, Jr. Materials Science and Engineering an Introduction, 6th edition, John Wiley & Sons, Inc. 2003;	
	Supplementary literature	Selected scientific papers	
	eResources addresses	Adresy na platformie eNauczanie: Wprowadzenie do materiałów międzymetalicznych - Moodle ID: 45658 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=45658	
Example issues/ example questions/ tasks being completed	Describe proposed methods for growing dichalcogenides containing 3d transition metals		
Work placement	Not applicable		

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