



Subject card

Subject name and code	, PG_00059467						
Field of study	Nanotechnology						
Date of commencement of studies	February 2023		Academic year of realisation of subject		2023/2024		
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	2		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Zakład ceramiki -> Instytut Nanotechnologii i Inżynierii Materiałowej -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Sebastian Wachowski				
	Teachers		dr inż. Sebastian Wachowski				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	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		0.0		0.0	30
Subject objectives	Gaining knowledge of the fundamentals of physics of materials in an experimental point of view.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K7_K04	A student is able to plan and realize a scientific project related to nanotechnology.			[SK2] Assessment of progress of work		
	K7_K03	Students are able to divide and manage work in the group.			[SK1] Assessment of group work skills [SK3] Assessment of ability to organize work		
	K7_U07	Students can perform scientific work including synthesis, material characterization, data analysis etc.			[SU1] Assessment of task fulfilment		
	K7_W01	Students know a set of novel characterization methods in the field of nanotechnology and are able to use them in practice.			[SW1] Assessment of factual knowledge		
K7_W06	Students gain expertise in laboratory methods. They know the safety rules in the lab and are able to work without supervision.			[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects			
Subject contents	In the laboratory, students will prepare the interesting materials and they will measure a properties of materials. The measured properties will include the structural, microstructural and charge transport properties. Students will analyze the obtained results and make a short seminar about the results they obtained.						
Prerequisites and co-requisites	math knowledge as well as solid state physics principles.						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		obecność, sprawozdania	51.0%
Recommended reading	Basic literature	Introduction to solid state physics by Charles Kittel	
	Supplementary literature	<p>The Basics of Crystallography and Diffraction, Ch. Hammond, Oxford University Press</p> <p>Materials Science J.W. Morris, Jr, www.mse.berkeley.edu/groups/morris/MSE205/.../defects.pdf</p> <p>Fundamentals of Solid State Engineering, link.springer.com/content/pdf/10.1007/0-306-47567-7_7.pdf</p> <p>N.W. Ashcroft and N.D. Mermin, Solid State Physics,</p> <p>Principles of the Theory of Solids, J.M. Ziman,</p> <p>The Physics of Semiconductors</p> <p>An Introduction Including Nanophysics and Applications, Marius Grundmann, Springer link</p> <p>Introduction to Superconductivity</p> <p>Edited by:A.C. Rose-Innes</p>	
	eResources addresses	Uzupełniające Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		