



Subject card

Subject name and code	Low Temperature and Pressure Techniques, PG_00059058						
Field of study	Materials Engineering, Materials Engineering, Materials Engineering						
Date of commencement of studies	October 2022		Academic year of realisation of subject			2024/2025	
Education level	first-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	3		Language of instruction			Polish	
Semester of study	5		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. Bogusław Kusz				
	Teachers						
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		2.0		18.0	50
Subject objectives	Gaining knowledge on the fundamentals of vacuum technology and kriotechnology						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K6_K01	The student is able to appropriately determine priorities for the implementation of tasks specified by himself or others			[SK5] Assessment of ability to solve problems that arise in practice		
	K6_U02	The student is able to perform analyzes related to material research			[SU4] Assessment of ability to use methods and tools		
	K6_W04	The student knows the basic aspects of the construction and operation of scientific equipment in the field of materials engineering			[SW1] Assessment of factual knowledge		
	K6_U05	The student is able to learn independently.			[SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment		
Subject contents	Laboratory(Lb): 0.Initial classes 1h 1.Low and high-pressure techniques. 2.Heat conductivity phenomena - conductivity, convection and radiation. 1h 3.Low temperature techniques: 1h 4. Seebeck phenomenathermocouple (2h) 5.Vacuum system and helium criostat: low pressure and low temperature. 3h 6.Measurement of specific resistivity and Meissner effect in Y-Ba-Cu-O superconductors (3h) 7. Properties of low temperatures mixtures (2h) 8. Measurement of specific resistivity of Cu in low temperatures (2h)						
Prerequisites and co-requisites							

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	lab	60.0%	100.0%
Recommended reading	Basic literature	F.Pobell Matter at Low Temperatures Springer 1992 - J.Groszkowski Technika Wysokiej Próźni PWN 1978	
	Supplementary literature	zasoby internetu	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	1.How sorption pump works ?2.Resistivity of metals in low temperature.3.What is Peltiera effect ?4.Seebeck effect.		
Work placement	Not applicable		

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