



## Subject card

Subject name and code	Introduction to Low Temperature and Pressure Techniques, PG_00020931						
Field of study	Materials Engineering, Materials Engineering, Materials Engineering						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2022/2023		
Education level	second-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		
Semester of study	1	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. Bogusław Kusz				
	Teachers		prof. dr hab. inż. Bogusław Kusz				
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 vacuum technology and kriotechnologjy						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K7_W06						
	K7_U05						
Subject contents	Basic knowledge about vacuum, vacuum pumps, vacuum valves, vacuum systems, low temperature, cryostats and physical properties of matter at low temperatures.						
Prerequisites and co-requisites	No requirements						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Laboratory-average mark		51.0%		51.0%		
	Te3st		51.0%		49.0%		
Recommended reading	Basic literature		Internet				
	Supplementary literature		No recommendations				
	eResources addresses						

Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"><li>1. The idea of operation of a sorption pump.</li><li>2. Is the space empty?</li><li>3. What is the Casimir Effect?</li><li>4. How does the electrical conductivity of superconductors change at low temperatures?</li><li>5. How to achieve the temperature of 2.5K?</li></ol>
Work placement	Not applicable