GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Introduction to Low Temperature and Pressure Techniques, PG_00020931		
Field of study	Nanotechnology		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2021/2022
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. Bogusław Kusz	
	Teachers	prof. dr hab. inż. Bogusław Kusz dr inż. Bartosz Trawiński	

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

Adresy na platformie eNauczanie:

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 kriotechnology

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_W10	The student has knowledge of planning and conducting a physical experiment.	[SW1] Assessment of factual knowledge
K6_K04	The student is able to interact and work in a group.	[SK1] Assessment of group work skills
K6_U04	The student is able to plan and carry out experiments, critically analyze their results, draw conclusions.	[SU4] Assessment of ability to use methods and tools
K6_W09	The student has a basic knowledge of the construction and operation of physical instruments.	[SW1] Assessment of factual knowledge
K6_U02	He can analyze and solve simple scientific and technical problems based on his knowledge.	[SU2] Assessment of ability to analyse information
K6_K05	The student will be able to present the effects of his work, make self-assessment and constructive assessment of the effects of other people's work.	[SK4] Assessment of communication skills, including language correctness

Subject contents

Basic knowledge about vacuum, vacuum pumps, vacuum valves, vacuum systems, low temperature, cryostats and physical properties of matter at low temperatures.

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="3">No requirements</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>Te3st</td><td>51.0%</td><td>49.0%</td></tr><tr><td>Laboratory-average mark</td><td>51.0%</td><td>51.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">Internet</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">No recomendations</td></tr>
<tr><td>eResources addresses</td><td colspan="2"></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">1. The idea of operation of a sorption pump.

2. Is the space empty?

3. What is the Casimir Effect?

4. How does the electrical conductivity of superconductors change at low temperatures?

5. How to achieve the temperature of 2.5K?</td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
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