



Subject card

Subject name and code	Mechanics and heat laboratory, PG_00061899						
Field of study	Materials Engineering						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2023/2024		
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	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Instytut Nanotechnologii i Inżynierii Materiałowej -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Jakub Karczewski				
	Teachers		dr hab. inż. Jakub Karczewski				
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	5.0		15.0	50	
Subject objectives	Getting to know the basic methods of collecting and analyzing measurement data on the example of exercises in the first physical laboratory						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_U05] can learn independently	The student is able to independently prepare for the task.			[SU5] Assessment of ability to present the results of task [SU1] Assessment of task fulfilment		
	[K6_W02] has knowledge of physics and chemistry, useful for formulating and solving simple problems within the scope of materials science	the student, based on basic knowledge of classical physics, understands the operation of simple scientific experiments, is able to use appropriate measurement tools and draw conclusions from the obtained results			[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge		
	[K6_U10] Can work in a group in order to solve problems typical of materials engineering.	The student is able to measure basic physical quantities and analyze the collected data while working in a research group			[SU5] Assessment of ability to present the results of task [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment		
	[K6_U01] Can properly use selected analytical, simulation and experimental methods, as well as devices for measuring the fundamental properties of materials and technological processes.	The student is able to apply appropriate data analysis methods, determine measurement uncertainties, and uses appropriate measurement data analysis tools			[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information		

Subject contents	<p>M3 - Ruch prostoliniowy jednostajnie przyspieszony</p> <p>M4 Swobodny spadek ciał analiza ruchu i wyznaczenie przyspieszenia ziemskiego</p> <p>M9 Wyznaczanie momentu bezwładności</p> <p>M12 Wyznaczanie modułu Younga metodą strzałki ugięcia</p> <p>M14 Badanie siły odśrodkowej</p> <p>C1a Wyznaczanie współczynnika rozszerzalności liniowej ciał stałych</p> <p>C2 Badanie zależności temperatury wrzenia wody od ciśnienia</p> <p>O3 Pomiar zależności współczynnika załamania światła od długości fali</p> <p>O5 Wyznaczanie rozmiarów szczelin i przeszkód za pomocą światła laserowego</p> <p>O6 Wyznaczanie promienia krzywizny soczewki za pomocą pierścieni Newtona</p>											
Prerequisites and co-requisites	knowledge of basic physics in high school											
Assessment methods and criteria	<table border="1" data-bbox="451 940 1477 1059"> <thead> <tr> <th data-bbox="451 940 798 974">Subject passing criteria</th> <th data-bbox="798 940 1141 974">Passing threshold</th> <th data-bbox="1141 940 1477 974">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="451 974 798 1059">36 / 5 000 Wyniki tłumaczenia Tłumaczenie report on the implementation of the exercise</td> <td data-bbox="798 974 1141 1059">50.0%</td> <td data-bbox="1141 974 1477 1059">100.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	36 / 5 000 Wyniki tłumaczenia Tłumaczenie report on the implementation of the exercise	50.0%	100.0%			
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Recommended reading	<table border="1" data-bbox="451 1064 1477 1261"> <tbody> <tr> <td data-bbox="451 1064 798 1097">Basic literature</td> <td colspan="2" data-bbox="798 1064 1477 1097">instructions for tasks of the 1st physics laboratory</td> </tr> <tr> <td data-bbox="451 1097 798 1131">Supplementary literature</td> <td colspan="2" data-bbox="798 1097 1477 1131">-</td> </tr> <tr> <td data-bbox="451 1131 798 1261">eResources addresses</td> <td colspan="2" data-bbox="798 1131 1477 1261"> Podstawowe https://ftims.pg.edu.pl/strona-glowna/wydzial/laboratoria-wydzialowe/i-pracownia-fizyczna - - Adresy na platformie eNauczanie: </td> </tr> </tbody> </table>			Basic literature	instructions for tasks of the 1st physics laboratory		Supplementary literature	-		eResources addresses	Podstawowe https://ftims.pg.edu.pl/strona-glowna/wydzial/laboratoria-wydzialowe/i-pracownia-fizyczna - - Adresy na platformie eNauczanie:	
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Example issues/ example questions/ tasks being completed	<ul data-bbox="451 1265 1477 1355" style="list-style-type: none"> • determine Young's modulus using the deflection arrow method • determine the acceleration due to gravity using the free fall time measurement 											
Work placement	Not applicable											