



Subject card

Subject name and code	Mechanics and heat laboratory, PG_00061899						
Field of study	Materials Engineering						
Date of commencement of studies	October 2026	Academic year of realisation of subject			2026/2027		
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	Institute of Nanotechnology and Materials Engineering -> Faculty of Applied Physics and Mathematics -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Jakub Karczewski					
	Teachers						
Lesson types	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_W02] has advanced knowledge of physics and chemistry, including facts, concepts, methods, and theories that enable the description and explanation of complex mechanical and physical phenomena as well as chemical processes; understands their key role in the advancement of civilization	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			[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects		
	[K6_U01] is able to analyse and solve complex and non-standard scientific and technical problems in materials engineering based on his knowledge, using appropriate analytical, computational, numerical, simulation, or experimental methods	The student is able to apply appropriate data analysis methods, determine measurement uncertainties, and uses appropriate measurement data analysis tools			[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools		
	[K6_U10] is able to collaborate as part of a team to solve complex, non-standard problems in materials engineering	The student is able to measure basic physical quantities and analyze the collected data while working in a research group			[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU5] Assessment of ability to present the results of task		

Subject contents	Course content – laboratory <ul style="list-style-type: none"> • M3 - Uniformly accelerated rectilinear motion • M4 Free fall of bodies - analysis of motion and determination of gravitational acceleration • M9 Determination of the moment of inertia M12 Determination of Young's modulus using the deflection arrow method • M14 Investigation of centrifugal force • C1a Determination of the coefficient of linear expansion of solids • C2 Investigation of the dependence of the boiling point of water on pressure • O3 Measurement of the dependence of the refractive index on wavelength • O5 Determination of the sizes of gaps and obstacles using laser light • O6 Determination of the radius of curvature of a lens using Newton's rings 		
Prerequisites and co-requisites	knowledge of basic physics in high school		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	report on the implementation of the exercise	50.0%	100.0%
Recommended reading	Basic literature	instructions for tasks of the PG physical laboratory I	
	Supplementary literature	-	
	eResources addresses		
Example issues/ example questions/ tasks being completed	<ul style="list-style-type: none"> • determine Young's modulus using the deflection arrow method • determine the gravitational acceleration using the free fall time measurement 		
Practical activities within the subject	Not applicable		

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