University of Gdańsk

Subject card

Subject name and code	Physical Laboratory I - Mechanics, PG_00207540						
Field of study	Medical Physics						
Date of commencement of studies	October 2026		Academic year of realisation of subject	2026/2027			
Education level	Bachelor's studies		Subject group	Obligatory subject group 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	4.0			
Learning profile	academic		Assessment form	credit			
Conducting unit	Faculty of Mathematics, Physics and Informatics -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Joanna Gondek				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	45.0	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		0.0		55.0	100
Subject objectives	Deepening knowledge and understanding of mechanical phenomena by conducting laboratory experiments independently and analyzing and interpreting the results of these experiments.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[FIZMEDL3_W04] Knows and understands, at an advanced level, the role of the physical experiment and the elements of measurement uncertainty theory.	The student knows and understands: – basic models, quantities, and physical laws in mechanics; – the role of physical experimentation in understanding the regularities of physical phenomena; – principles of planning, performing, and analyzing physical experiments; – principles of processing measurement data; – units of physical quantities in mechanics; – the structure and operation of basic measuring instruments used in physical experiments in mechanics; – basic numerical analysis and basic application software packages for presenting results and analyzing measurement data.	[SW1] oral statement/ conversation/discussion [SW2] presentation/project/paper/ report
	[FIZMEDL3_U09] Can communicate effectively with colleagues and other employees, works in a team, including interdisciplinary teams, and manages his/her own and his/her colleagues' time appropriately.	The student is able to: – plan, coordinate, and conduct research requiring the cooperation of a group of people, – formulate doubts and problems related to the research being conducted, – publicly analyze the results of measurements, observations, and theoretical calculations, – adopt a critical analysis of your measurement results, observations, and theoretical calculations, – apply the knowledge and methodology of physics and its experimental methods to related scientific disciplines, – follow the rules of professional ethics by diligently and timely completing assigned tasks.	[SU1] oral statement/conversation/ discussion [SU2] presentation/project/paper/ report
	[FIZMEDL3_U08] Can prepare a written paper or presentation in Polish or English using specialised terminology in the field of physics and medical physics.	The student is able to: – use basic computer software packages to theoretically represent the phenomenon being experimentally studied, present the obtained measurement data, and analyze it.	[SU1] oral statement/conversation/ discussion [SU2] presentation/project/paper/ report
	[FIZMEDL3_U02] He can perform measurements of physical quantities, prepare, describe, and present the results of physical experiments, including the estimation of measurement uncertainties, and perform quantitative analyses and formulate qualitative conclusions based on them.	The student is able to: – use theoretical knowledge of mechanics to conduct mechanical experiments; – apply mathematical tools to describe and analyze independently obtained experimental data and their uncertainty; – perform a quantitative analysis of the phenomenon being studied and, based on this analysis, formulate qualitative conclusions.	[SU1] oral statement/conversation/ discussion [SU2] presentation/project/paper/ report

<table>
<tr><td>Subject contents</td><td>Measurement methods in classical physics using electronic techniques. Planning measurements, constructing measurement systems, performing measurements, evaluating measurement uncertainty. Experimental study of the basic principles of mechanical phenomena:

determining the moment of inertia of a rigid body (Oberbeck pendulum)

determining the relative viscosity coefficient of a liquid using an Oswald viscometer

determining the viscosity coefficient of a liquid (Stokes experiment)

determining Young's modulus

study of air flow velocity

determining the value of Earth's gravitational acceleration using a reversible pendulum

determining the value of the acceleration of a normal flat pendulum

determining the stiffness modulus of a wire using the dynamic method

determining the moment of inertia of a Maxwell pendulum

study of Archimedes' principle

study of accelerated rectilinear motion on an inclined plane

study of projectile motion

study of curvilinear motion

study of the of the mechanical energy conservation principle

study of the dependence of the viscosity coefficient on temperature

acoustic resonance

determining the hearing threshold and isophonic curves</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>oral responses</td><td>51.0%</td><td>40.0%</td></tr>
<tr><td>reports</td><td>51.0%</td><td>60.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>not applicable</td></tr>
<tr><td>Supplementary literature</td><td>not applicable</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>not applicable</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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