University of Gdańsk

Subject card

Subject name and code	Physical Laboratory - Mechanics, PG_00168485		
Field of study	Pracownia fizyczna - mechanika (Ćw. laboratoryjne)		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2025/2026
Education level	Bachelor's studies	Subject group	Obligatory subject group in the field of study Optional subject group
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish not applicable
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

Broadening knowledge and understanding of the kinematics and dynamics of a material point and a rigid body by independently conducting selected physical experiments in this field of physics, compiling and interpreting their results.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[BJORL3_U02] Has the ability to perform measurements of basic quantities used in physics and chemistry; can develop, describe and present the results of simple experiments and computer simulations; can perform quantitative analyses and formulate qualitative conclusions on this basis; can estimate measurement uncertainties	The student is able to: – present and use knowledge of mechanics in experimental work, – plan and conduct physical experiments in mechanics, – collect measurement data, – perform quantitative analysis of the obtained measurement data, – apply mathematical apparatus to describe and analyze physical phenomena in mechanics, – use computer software to analyze and present measurement data, – determine the uncertainty of the obtained measurement data, – draw qualitative conclusions about the studied phenomenon from the obtained experimental results.	[SU1] wypowiedź ustna/rozmowa/ dyskusja [SU2] prezentacja/projekt/referat/ raport
	[BJORL3_W03] knows how to plan and perform a simple physical or chemical experiment and analyze the results obtained; knows the elements of the theory of measurement uncertainty as applied to experiments; knows the basic units of the SI system and its most important derived units; knows other systems of measurement units	The student knows and understands: – basic models, quantities, and physical laws in mechanics; – principles of planning and conducting physical experiments with an emphasis on the study of mechanical phenomena; – principles of collecting and analyzing measurement data; – methods of calculating measurement uncertainty; – units of physical quantities in mechanics from various systems of measurement; – the basics of numerical analysis and basic application software packages for presenting results and analyzing measurement data.	[SW1] wypowiedź ustna/rozmowa/ dyskusja [SW2] prezentacja/projekt/referat/ raport
	[BJORL3_K07] has a sense of responsibility for jointly implemented tasks; is able to interact and work in a group, taking on different roles in it	The student is aware of: – the need to cooperate with members of the research group in order to correctly conduct a physical experiment; – the need to constructively evaluate their own work and that of other members of the research group; – the need to perform the tasks assigned to them reliably and on time; – the need to comply with the rules on intellectual property protection and the legal and ethical conditions related to research activities.	[SK1] wypowiedź ustna/rozmowa/ dyskusja [SK2] prezentacja/projekt/referat/ raport
	[BJORL3_U09] Can independently plan and implement his own learning	The student is able to: – search for reliable sources of knowledge and information; – complete assigned tasks on time.	[SU1] wypowiedź ustna/rozmowa/ dyskusja [SU2] prezentacja/projekt/referat/ raport
	[BJORL3_W02] Understands the role of physical and chemical experimentation, mathematical theoretical models approximating reality, and computer simulations in scientific research methodology; is aware of technological, apparatus, and methodological limitations in scientific research	The student knows and understands: – basic concepts, physical quantities, and regularities of mechanical phenomena, – the role of physical experiments in understanding the regularities of mechanical phenomena, – experimental limitations in the study of mechanical phenomena, – the concept of measurement accuracy; – the construction and operating principles of basic measuring instruments used in mechanics experiments.	[SW1] wypowiedź ustna/rozmowa/ dyskusja [SW2] prezentacja/projekt/referat/ raport
	[BJORL3_K08] can think and act in an entrepreneurial way	Student: – is able to precisely formulate problems and doubts related to the task at hand and present their own proposals for solving them.	[SK1] wypowiedź ustna/rozmowa/ dyskusja [SK2] prezentacja/projekt/referat/ raport

Subject contents	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 phenomena and the properties of mechanical: 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
Prerequisites and co-requisites	
Assessment methods and criteria	

Subject passing criteria	Passing threshold	Percentage of the final grade
oral responses	51.0%	40.0%
reports	51.0%	60.0%

Recommended reading	Basic literature: not applicable
	Supplementary literature: not applicable
	eResources addresses:
Example issues/ example questions/ tasks being completed	not applicable
Work placement	Not applicable

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