



Subject card

Subject name and code	Physics in experiment I, PG_00072323						
Field of study	Nanotechnology						
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	1		ECTS credits		4.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Division of New Functional Materials For Energy Conversion -> 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. Beata Bochentyn				
	Teachers		dr inż. Piotr Okoczuk dr hab. inż. Marcin Łapiński dr hab. inż. Beata Bochentyn				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	30.0	0.0	0.0	0.0	60
	E-learning hours included: 0.0						
	eNauczanie source addresses: Moodle ID: 8281 Fizyka w eksperymencie I NT 2026-2027 https://enauczanie.pg.edu.pl/2025/course/view.php?id=8281						
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	60		5.0		35.0	100
Subject objectives	Familiarization with the basic laws of classical physics, with particular emphasis on broadly understood mechanics. Acquisition of skills in analyzing physical phenomena and solving technical problems based on the laws of physics.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U02] is able to analyze and solve complex and non-routine scientific and technical problems in the field of nanotechnology and related disciplines, including physics, chemistry, and materials engineering, based on acquired knowledge and using appropriate analytical, computational, numerical, simulation, or experimental methods.	Prepares to solve physical problems using the recommended textbooks. Recognizes and understands basic physical laws. Acquires the ability to analyze experimental data. Can analyze physical phenomena by making the necessary drawings. He obtains the final results by deriving them from the laws of physics. Applies unit conversion and performs numerical calculations.	[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information
	[K6_W03] possesses structured knowledge of physics and chemistry, including facts, concepts, methods, and theories enabling the description and explanation of complex phenomena and processes in the field of nanotechnology.	Knows the basic issues of classical mechanics, kinematics and dynamics of translational and rotational motion. He can describe vibrational and wave motion.	[SW1] Assessment of factual knowledge
	[K6_U01] is able to engage in lifelong self-directed learning and to acquire and synthesize information from literature, databases, and other appropriately selected sources.	Is able to independently acquire and systematize knowledge in the field of physics from Polish or English academic textbooks and other sources of scientific knowledge. Is able to assess the reliability of the analyzed sources.	[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information
Subject contents	Course content – lecture Physics in Experiment I introduces students to concepts related to various branches of physics, which will be explained through experimental demonstrations. LECTURE - lecture, discussion, and experimental demonstrations on the following topics: - Mathematical framework, analysis, and presentation of physical measurement results: units (conversions, SI system), vector algebra - Uniform and uniformly varying rectilinear motion - Projections: vertical, horizontal, and oblique - Newton's dynamics of the translational motion of a material point (including pulleys, plane) - Conservation of energy and momentum in translational motion - Kinematics of rotational motion (circular, angular parameters, centripetal acceleration). Centripetal and centrifugal forces. Conservative forces. Inertial forces. Inertial and non-inertial frames. - Rigid body mechanics. Simple and Damped Oscillatory Motion - Mechanical Waves		
	Course content – exercises COMPUTATIONAL CLASSES - solving computational problems on the following topics: - Mathematical framework, analysis, and presentation of physical measurement results: units (conversion, SI system), vector algebra - Uniform and uniformly varying rectilinear motion - Projections: vertical, horizontal, and oblique - Newton's dynamics of the translational motion of a material point (including pulleys, planes) - Laws of conservation of energy and momentum in translational motion - Kinematics of rotational motion (circular, angular parameters, centripetal acceleration). Centripetal and centrifugal forces. Conservative forces. Inertial forces. Inertial and non-inertial frames. - Rigid body mechanics. - Simple and damped oscillatory motion - Mechanical Waves		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Final exam from the lecture part	50.0%	50.0%
	Final mark from tutorial	50.0%	50.0%

Recommended reading	Basic literature	[1] K. Jezierski, K. Sierański, I. Szlufarska, <i>Fizyka -- Repetytorium, zadania z rozwiązaniami, kurs powtórkowy dla studentów I roku i uczniów szkół średnich</i>, Oficyna Wydawnicza Scripta, Wrocław 2005 [2] M. Herman, A. Kalestyński, L. Widomski, <i>Podstawy Fizyki dla kandydatów na wyższe uczelnie i studentów</i>, WN PWN, Warszawa 2004 [3] J. Jędrzejewski, W. Kruczek, A. Kujawski, <i>Zbór zadań z fizyki dla uczniów szkół średnich i kandydatów na studia</i>, WNT, Warszawa, 2000 [4] D. Halliday, R. Resnick, J. Walker, <i>Podstawy Fizyki</i>, PWN, Warszawa
	Supplementary literature	[1] D. Halliday, R. Resnick, J. Walker, <i>Podstawy Fizyki, Zbiór zadań</i>, PWN, Warszawa [2] Zbiór zadań z fizyki, skrypt Politechniki Gdańskiej, http://www.mif.pg.gda.pl/zz/ [3] W. Moebis, S. J. Ling, J. Sanny, <i>Fizyka dla szkół wyższych</i>, Tom 1, OpenStax Polska https://openstax.org/details/books/fizyka-dla-szk%C3%B3%C5%82-wy%C5%BCszych-tom-1
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Practical activities within the subject	Not applicable	

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