

Subject card

Subject name and code	Physics, PG_00053407						
Field of study	Chemistry						
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	
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			3.0	
Learning profile	academic		Assessment form			exam	
Conducting unit	Division of Atomic and Molecular Physics -> Institute of Experimental Physics -> Faculty of Mathematics, Physics and Informatics -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Marek Józefowicz				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	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	To familiarize students with basic physical phenomena occurring in nature and their mathematical description. Learning about selected areas of physics at an academic level, such as mechanics, hydrostatics and hydrodynamics, thermodynamics, and electricity and magnetism, will allow for a deeper understanding of the internal unity of the natural sciences.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[CHEML3_W01] Enumerates basic laws and theories in chemistry, physics, mathematics and biology.	The student has knowledge: a. of selected areas of physics enabling understanding of physical phenomena and processes occurring in nature; b. of basic concepts and laws in the fields of mechanics, hydrostatics, hydrodynamics, thermodynamics, electricity, and magnetism.	[SW4] test/exam - oral or written
	[CHEML3_U09] Is able to learn independently.	Can independently solve a given physics problem using mathematical apparatus. Can design an experiment to demonstrate the laws of physics.	[SU4] test/exam - oral or written [SU8] observation of student's independent or team work
	[CHEML3_K01] Identifies the level of her/his own knowledge and skills and the need for continuous learning and personal development.	The student searches for information from subject literature and other sources, interprets it, and applies it to the problem under consideration. They are able to verify this data using inductive and deductive methods in the analysis of phenomena occurring in nature.	[SK5] implementation of a problem task [SK8] observation of student's independent or team work
	[CHEML3_W06] Chooses higher mathematics techniques to the extent necessary to understand and describe the physical processes important for understanding chemistry.	The student uses vector, differential, and integral calculus to solve various physical problems. They are able to perform quantitative analyses and formulate qualitative conclusions based on them.	[SW4] test/exam - oral or written
	[CHEML3_W08] Demonstrates knowledge of basic computational methods to solve problems in chemistry, physics, mathematics.	The student formulates basic physical theorems and laws, using mathematical formalism to describe them.	[SW4] test/exam - oral or written
Subject contents	Kinematics of a material point: description of motion in different coordinate systems, relativity of motion. Dynamics of a material point: Newton's laws of motion, principle of conservation of mechanical energy (work, power, kinetic energy, potential energy), law of universal gravitation. Rigid body mechanics: torque, angular momentum, conservation principles Basic laws of hydrostatics and hydrodynamics. Thermodynamics and statistical physics: description of an ideal gas, thermodynamic transformations of gas, states of matter, first and second laws of thermodynamics - internal energy and enthalpy, real gases. Electricity and magnetism: electric field, laws of electric current flow in liquids and solids, magnetic field, electric and magnetic properties of matter, electromagnetic waves and their properties.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		51.0%	100.0%
Recommended reading	Basic literature	D. Halliday, R. Resnick, J. Walker, Podstawy Fizyki, PWN, Warszawa 2015; - Samuel J. Ling, Truman State University JeX Sanny, Loyola Marymount University William Moebs; Fizyka dla szkół wyższych: https://assets.openstax.org/oscms-prodcms/media/documents/Fizyka_dla_szko%C5%82_wyzszych_Tom_1_6Ok9XZL.pdf - Czesław Bobrowski, Fizyka krótki kurs, WNT 1998	
	Supplementary literature	M. Skorko, Fizyka, PWN Warszawa 1979	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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