

Subject card

Subject name and code	Physics I, PG_00053382						
Field of study	Chemical Business						
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		40.0	75
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		
	[BCHINŻ_W03] Describes the techniques of higher mathematics and IT tools necessary to describe and model chemical phenomena and technological processes.		The student formulates basic physical theorems and laws, using mathematical formalism to describe them. He/she uses vector, differential, and integral calculus to solve various physical problems. He/she is able to perform quantitative analyses and formulate qualitative conclusions on this basis.		[SW4] test/exam - oral or written		
	[BCHINŻ_W02] Enumerates basic laws and theories in chemistry, physics and mathematics necessary to formulate and solve simple engineering tasks.		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		
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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