



Subject card

Subject name and code	Physics I, PG_00040028						
Field of study	Mechanical Engineering, Mechanical Engineering						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2020/2021		
Education level	first-cycle studies	Subject group			Obligatory subject group in the field of study		
Mode of study	Part-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			Polish		
Semester of study	1	ECTS credits			5.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Department of Physics of Electronic Phenomena -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Ireneusz Linert				
	Teachers		dr inż. Ireneusz Linert				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	0.0	0.0	0.0	45
	E-learning hours included: 0.0						
Fizyka 1 - kurs dla specjalności IMM oraz MiBM niestacjonarne - Moodle ID: 7126 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=7126							
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		5.0		75.0	125
Subject objectives	To know physical quantities and phenomena, to describe, analyse and understand more complex physical problems.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U01] is able to acquire information from specialized literary sources, databases and other resources, essential for solving engineering tasks; is able to compile the obtained information pieces and to interpret them, additionally is able to form conclusions and present justified opinion		The knowledge obtained from the course allows independent analysis of selected issues related to physics in the surrounding reality.		[SU4] Assessment of ability to use methods and tools		
	[K6_W02] possesses an organized knowledge on physics, including classic mechanics, acoustics, optics, electricity and magnetism, shows knowledge of the elements of quantum physics		The student can describe and interpret basic physical phenomena, predicts the course of physical phenomena based on known laws, performs logical reasoning adequate to the physical problem being solved.		[SW1] Assessment of factual knowledge		
Subject contents	LECTURES: International system of units. Scalar and vector quantities in physics. Kinematics: simple and resultant motions Dynamics of the particle: Newton's laws. Work, power and energy. Conservation of energy, conservation of linear momentum Dynamics of a rigid body: torque, moment of inertia. Steiner's law. Newton's laws for rotational motion. Conservation of angular momentum. Rotational kinetic energy Harmonic motions and waves: Simple harmonic motion. Damped harmonic motion. Forced vibration. Mechanical waves. Interference of waves. Standing wave. Doppler's effect. Electric field: Gauss's law, capacitor, energy of electric field EXERCISES: Vector operations Solving kinematics problems. Free fall and projectile motion. Solving problems illustrating Newton's laws. Conservation of energy and momentum in translational motion. Determination of oscillation period for simple and damped harmonic motion. Problems illustrating wave motion. Determination of electric field and potential for the set of point charges.						
Prerequisites and co-requisites	Ability to use simple mathematical apparatus (vector algebra), high school level physics knowledge, basic physics problem solving skills						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	midterm tests		50.0%		40.0%		
	written exam		50.0%		60.0%		

Recommended reading	Basic literature	D. Halliday, R. Resnick, J. Walker, Podstawy fizyki tomy 1, PWN, Warszawa 2003. Fizyka dla szkół wyższych t.1 (Mechanika; Fale i akustyka)
	Supplementary literature	J. Massalski, M. Massalska, Fizyka dla inżynierów, tom 1, WNT Warszawa 1979
	eResources addresses	
Example issues/ example questions/ tasks being completed	Give a definition of average velocity and instantaneous velocity. Write and explain Newton's laws of motion.	
Work placement	Not applicable	