



Subject card

Subject name and code	Physics I, PG_00043521						
Field of study	Environmental 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	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	Department of Physics of Electronic Phenomena -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Małgorzata Franz				
	Teachers		dr Małgorzata Franz				
			dr inż. Justyna Szostak				
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						
	Adresy na platformie eNauczanie: Fizyka I 2020/21 - Moodle ID: 5715 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=5715						
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		7.0		54.0	106
Subject objectives	The aim of the course is to acquaint students with the issues of classical mechanics.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W02] has knowledge of physics, including mechanics, thermodynamics, optics, electricity and magnetism, nuclear physics and solid state physics, including knowledge necessary to: 1) understand the basic physical phenomena related to material durability, fluid mechanics and hydraulics, building physics, geodetic measurements ; 2) understanding the principles of operation of basic electrical devices and systems; 3) solving project tasks of the sanitary industry;		Student describes and interprets the basic physical phenomena, predicts the course of physical phenomena based on the learned laws, performs logical reasoning adequate to the solved physical problem.		[SW1] Assessment of factual knowledge		
	[K6_U01] has the ability to self-education, can obtain information from literature, databases and other sources, uses information technology, Internet resources; can integrate the obtained information, make their interpretation, as well as draw conclusions and formulate and justify opinions		The acquired knowledge allows for independent analysis of selected issues regarding physics in the surrounding reality. Student carries out correct calculations and does transformations on units.		[SU4] Assessment of ability to use methods and tools		

Subject contents	LECTURES: Physical quantities and their units. MECHANICS. Kinematics of a point particle: motion along a straight line, motion in two or three dimensions. Newton's laws for translational motion. Dynamics of a rigid body: the rotational motion around a fixed axis, moment of inertia, Steiner (parallel axis) theorem, torque and angular momentum, Newton's equation of rotational motion. The conservation laws in mechanics. Gravitation. Newton's law of gravitation. Mechanical oscillations and waves. Free, damped and driven oscillations. Mechanical resonance. Beats. Decomposition of periodical oscillations into harmonic components. Kinds of waves. Kinematical equation of a plane harmonic wave. Wave velocity. Diffraction and interference examples. Standing waves. Doppler effect. TUTORIALS: 1. Units of physical quantities, vector calculus. 2. Kinematic quantities. Motion with a constant acceleration. 3. Newton's laws. Force and torque. 4. Moment of inertia. Dynamics of rotational motion. 5. Work, kinetic and potential energy, the conservation law of mechanical energy. 6. Conservation law of angular momentum. 7. Harmonic oscillators. 8. Characteristics of waves. Standing waves. Doppler effect.		
Prerequisites and co-requisites	Knowledge of elementary physics from secondary school.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Midterm colloquium	50.0%	100.0%
Recommended reading	Basic literature	D. Halliday, R. Resnick, J. Walker, Podstawy fizyki T.1, PWN, Warszawa 2003 Fizyka dla szkół wyższych t.1 (Mechanika; Fale i akustyka)	
	Supplementary literature	J. Massalski, Fizyka dla inżynierów T.I, WNT Warszawa (dowolne wydanie)	
	eResources addresses	Fizyka I 2020/21 - Moodle ID: 5715 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=5715	
Example issues/ example questions/ tasks being completed	Circular motion. Free fall. Newton's laws of dynamics. Draw a free-body diagram for the accelerated body and find its acceleration based on the Newton's second law. What is the moment of inertia?		
Work placement	Not applicable		