



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	<p>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.</p>		
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
Recommended reading	Basic literature	<p>D. Halliday, R. Resnick, J. Walker, Podstawy fizyki T.1, PWN, Warszawa 2003</p> <p>Fizyka dla szkół wyższych t.1 (Mechanika; Fale i akustyka)</p>	
	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	<p>Circular motion.</p> <p>Free fall.</p> <p>Newton's laws of dynamics.</p> <p>Draw a free-body diagram for the accelerated body and find its acceleration based on the Newton's second law.</p> <p>What is the moment of inertia?</p>		
Work placement	Not applicable		