GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Physics I, PG_00058732		
Field of study	Environmental Engineering		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2022/2023
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	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Zakład Metod Obliczeniowych Fizyki Chemicznej -> Instytut Fizyki i Informatyki Stosowanej -> Faculty of Applied Physics and Mathematics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Małgorzata Franz	
	Teachers	dr Małgorzata Franz dr inż. Ireneusz Linert	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	15.0	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	8.0	37.0	75

Subject objectives

The aim of the course is to familiarize 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;	The student knows, knows how to describe and interpret basic physical phenomena on the basis of learned laws, conducts logical reasoning adequate to the physical problem being solved.	[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 Student to independently analyze selected issues concerning physics in the surrounding reality. Student carries out correct calculations and makes transformations on units.	[SU4] Assessment of ability to use methods and tools

Subject contents	**LECTURES:** 1. Introduction to the course: What is physics? Physical quantities and their units. Scalar and vector quantities. Operations on vectors. 2. Motion along a straight line: What is a motion? Quantities needed to describe the motion. Average and instantaneous velocity as well as average and instantaneous acceleration. Special kinds of motion 3. Newton's laws of motion: What does dynamics do? Newton's laws of motion. Several important forces 4. Dynamics of rotational motion: Rotational motion of a rigid body. Moment of inertia, angular momentum and kinetic energy in the rotational motion of a rigid body. Special cases of rotational motion of a rigid body. 5. Energy, work, power: What are energy, work, and power? The principle of conservation of energy. The principle of conservation of momentum and angular momentum. 6. Static equilibrium and elasticity: Conditions of static equilibrium and its examples. Stress, strain and modulus of elasticity. Elasticity and plasticity. 7. Temperature and quantity of heat: Temperature, temperature measurement, thermal expansion of solids and liquids, quantity of heat, specific heat, heat of fusion and heat of vaporization. EXERCISES: 1. Physical quantities and their units, vector algebra. 2. Kinematic quantities. Motion with constant acceleration. 3. Newton's laws of motion. Force and torque. 4. Moment of inertia. Dynamics of rotational motion. 5. Work, kinetic and potential energy, the principle of conservation of mechanical energy. 6. The principle of conservation of angular momentum. 7. Static balance and elasticity.
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
2 tests per semester	50.0%	100.0%

Recommended reading

Basic literature	D. Halliday, R. Resnick, J. Walker, Podstawy fizyki T.1, PWN, Warszawa 2003 University Physics t.1 (Mechanics; Waves and acoustics) University Physics t.2 (Thermodynamics; Electricity and magnetism)
Supplementary literature	J. Massalski, Fizyka dla inżynierów T.I, WNT Warszawa (dowolne wydanie)
eResources addresses	Podstawowe https://ftims.pg.edu.pl/spolecznosc-lokalna/materialy-dydaktyczne - The address of the website where you can find a physics textbook in Polish and English. Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	**Examples of theoretical questions for the test:** Represent the basic units of the SI system with the names of the physical quantities which they correspond to. Explain the concept: complex traffic. Give examples of such a movement. Present Newton's laws of motion. **An example of a task carried out during the exercises:** A freely released steel ball bounces (without energy loss) from a horizontal, perfectly elastic surface, hitting it every second. How high does the ball jump? Take the value of g = 10 m/s ^{2}.
Work placement	Not applicable