GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Physics II, PG_00040036		
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	2	ECTS credits	3.0
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 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	15.0	0.0	15.0	0.0	0.0	30

E-learning hours included: 0.0

Fizyka 2 - Kurs dla IMM oraz MiBM niestacjonarne - 2020/21 sem. letni - Moodle ID: 9359
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=9359

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

The aim of the course is to acquaint students with the issues of modern physics.

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 student has the ability to self-study and can find the necessary information in the field of physics	[SU2] Assessment of ability to analyse information
[K6_W02] possesses an organized knowledge on physics, including classic mechanics, acoustics, optics, electricity and magnetism, shows knowledge of the elements of quantum physics	Lecture contents (together with the I term course) covers the range of suggested topics	[SW1] Assessment of factual knowledge

Subject contents	LECTURE: Elastic properties of bodies: elastic deformations, Hooke's law, Young's modulus. Hydrostatics: properties of liquids, Pascal's law, hydrostatic pressure, Archimedes law. Hydrodynamics: Bernoulli's law, viscosity, laminar and turbulent flow, Reynolds number. Heat transport and masses: conductivity, convection and diffusion. Wave optics: Huyghens principle, diffraction and interference of light, diffraction grating, polarization of light, Malus and Brewster's laws. Structure of matter: atom structure, hydrogen atom according to Bohr, energy levels. Spectroscopy: absorption spectrum and emission spectrum, prismatic and mesh spectroscope. Orbital and spin momentum of the electron in the atom, types of orbitals, quantum numbers. Elemental classification: multi-electron atom, Pauli ban, system Periodic table of elements and properties of elements. Chemical bonds: potential energy of the diatomic molecule, types of bonds and properties of crystals. Fundamentals of physical chemistry: thermodynamics classical, internal energy, first law of thermodynamics, enthalpy, entropy, second law of thermodynamics. Laser physics. EXPERIMENTS (examples) Determination of the acceleration due to gravity using a simple pendulum, determination of the coefficient of linear expansion of solids, an investigation of the pressure dependence of the boiling-point of water, determination of the ratio of specific heats κ=cp/cv of air, determination of the coefficient of rigidity of a wire using dynamic Gauss' method. Examination of longitudinal sound waves in the rods, measurement of sound velocity in air, measurement of the focal length of lenses using Bessel's method. Studies of gas spectra, Measuring of Brewster angle, Studies of polarization of light
Prerequisites and co-requisites	Knowledge of the basic laws of physics, the ability to use calculus, basic knowledge of handling simple measuring instruments (ammeter, voltmeter)
Assessment methods and criteria	

Subject passing criteria	Passing threshold	Percentage of the final grade
Laboratory final grade	100.0%	50.0%
Lecture credit	50.0%	50.0%

Recommended reading	Basic literature	D. Halliday, R. Resnick, J. Walker, "Podstawy fizyki tomy 1-5", PWN, Warszawa 2003. Laboratorium z Fizyki I - I Pracownia sale 7-11 GG - materiały dostępne na stronie http://ftims.pg.edu.pl/laboratorium-z-fizyki-i-pracownia
	Supplementary literature	1. Cz. Bobrowski, Fizyka- krótki kurs, WNT Warszawa 1979, 1993 2.. J. Massalski, M. Massalska, Fizyka dla inżynierów, tom 1, 2, WNT Warszawa 1979
	eResources addresses	Uzupełniające https://ftims.pg.edu.pl/materialy-dydaktyczne - free book in pdf - University Physics (Openstax)
Example issues/ example questions/ tasks being completed	Give Bernoulli's law. What is the polarization of light? What is photoelectric effect?	
Work placement	Not applicable	