GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Physics, PG_00049193		
Field of study	Chemistry		
Date of commencement of studies	October 2021	Academic year of realisation of subject	2021/2022
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	exam
Conducting unit	Department of Physics of Electronic Phenomena -> Faculty of Applied Physics and Mathematics		

Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Waldemar Stampor
	Teachers	dr inż. Damian Głowienka
		dr hab. inż. Waldemar Stampor

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 dla chemików (TChem, Chem) sem1 -2021/2022 - Moodle ID: 16730 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=16730						

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	50.0	100

Subject objectives	A student -correctly writes and reads the physical formulas, -knows principles of vector algebra, -understands the basic laws of physics, -predicts the course of physical phenomena on the basis of known laws, -solves physical problems encountered in mechanics and electromagnetism, -can carry out logical reasoning appropriate to the physical problem being solved, -can actively use the acquired knowledge to solve various technical problems.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U02] can work individually and in a team; he/she can assess the necessary task time and plan and organize individual work and in a small team in a way that ensures the execution of the task within a set deadline	Is able to prepare in advance individually and in a team to solve problems given during classes	[SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
	[K6_U08] is capable to design and carry out the experiment which is necessary to confirm a given hypothesis and sees wider context, often beyond-technical, of the analysed phenomena	Is able to correctly describe the course of experiments demonstrated during the lecture	[SU2] Assessment of ability to analyse information
	[K6_W01] has basic knowledge of selected areas of mathematics, including: algebra, differential calculus and integral calculus, functions of two variables, elements of analytical geometry, elements of vector analysis, differential equations and probability theory, and knowledge of physics: basic equations and concepts and physical laws, including the knowledge necessary to predict the course of physical phenomena and to solve various technical problems	A student -correctly writes and reads physical formulae, -distinguishes scalar and vector quantities, -understands fundamental physical laws, -predicts the following course of actions according to the physical laws, -sets up and solves physics problems in mechanics and electromagnetism.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
	[K6_U04] can use professional vocabulary, can prepare and communicate technical information in the form of text documents, spreadsheets, charts and technological schema	Knows terminology in the field of mechanics and electromagnetism and is able to make appropriate charts showing the relationship between physical quantities in physical formulas	[SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment

Subject contents	
	ABOUT PHYSICS. Physical quantities and their units . Elements of vector algebra . MECHANICS . Kinematics of a particle : rectilinear motion , curvilinear motion, Newton's laws of motion. Dynamics of rigid body : the moment of inertia, principal axes , Steiner's law, torque and angular momentum , equation of rotational motion, gyroscopes and precession. Consevation laws in mechanics . Oscillations and mechanical waves . Free, damped and forced vibrations. Mechanical resonance . Beats . Distribution of periodic oscillations in the harmonic components . Types of waves. Equation of harmonic plane wave motion . Wave velocity . Examples of diffraction and interference of waves. Standing waves . Doppler effect. Sound intensity level . ELECTROMAGNETISM. Electric field . Coulomb's law . The intensity of the electric field . The electrical potential . The relationship between the intensity of the electric field and potential. An electric dipole and its behavior in an external electric field. Capacitance of the electric capacitor . Magnetic field. Magnetic induction vector . The Lorentz force . Biot- Savart law . Electrodynamic force . The interaction of two straight linear wires carrying an electric current. Magnetic dipole and its behavior in an external magnetic field.

Prerequisites and co-requisites	

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Midterm tests	50.0%	40.0%
	Oral exam	50.0%	30.0%
	Written exam	50.0%	30.0%

Recommended reading	Basic literature	1. D.Halliday, R.Resnick, J.Walker. Podstawy fizyki. T.1 - T.5; PWN, Warszawa 2003. 2. Cz. Bobrowski. Fizyka. Krótki kurs. WNT, Warszawa (dowolne wydanie).
	Supplementary literature	1. J.Orear. Fizyka T1 i T2. WNT, Warszawa (dowolne wydanie). 2. J.Massalski. Fizyka dla inżynierów. T.1i T.2; WNT, Warszawa 2007.
	eResources addresses	Fizyka dla chemików (TChem, Chem) sem1 -2021/2022 - Moodle ID: 16730 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=16730

Example issues/ example questions/ tasks being completed	1 Moment of inertia . Determination of the moments of inertia of molecules
	2 The principle of conservation of angular momentum. Man in a spinning chair .
	3 Examples of harmonic oscillators : pendulum , the weight attached to a spring
	4 Damped motion. Over time t1 amplitude of vibrations decreased n1 times. How many times will decrease the amplitude of vibrations in the time t2 ?
	5 Doppler effect . Doppler ultrasound machine.
	6 Comparison of the basic features of the gravity and electrostatic fields
	7 Comparison of the basic features of the electrostatic and magnetostatic fields
	8 Electric dipole . Electric dipole moment . The behavior of the dipole in an external electric field. Determination of the dipole moments of molecules
	9 Magnetic Dipole . The magnetic dipole moment . The behavior of the dipole in an external magnetic field
	10 The interaction between two straight parallel conductors carrying electric current . The definition of the ampere
	11 Lorentz force . Definition of tesla . Motion of charge on a circular orbit in a uniform magnetic field. Mass spectrometer.
	12 Motion of charge in electric field ($mv^2 / 2 = eU$) . Definition of electronvolt
	13 Capacitor and coil. Capacitance and inductance . Definition of farad and henry.
Work placement	Not applicable

Document generated electronically. Does not require a seal or signature.