



Subject card

Subject name and code	PHYSICS, PG_00063512						
Field of study	Chemistry						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2024/2025		
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	Institute of Physics and Applied Computer Science -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Waldemar Stampor				
	Teachers		dr inż. Damian Glowienka 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							
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_U04] creates detailed documentation of the results obtained from the experiments carried out individually or as part of a team, analysing and interpreting the results in the form of text documents, spreadsheets, graphs, technological diagrams, multimedia presentations using correct chemical nomenclature	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			[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information		
	[K6_U02] determines the time required for the task, plans and organises the work of both the individual and the small team in such a way as to ensure that the task is completed within the set time limit	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_W01] applies his/her knowledge of selected branches of mathematics and physics to analyse, interpret and solve problems and to describe physical, chemical phenomena and technological processes	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			

Subject contents	<p>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. Conservation 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 . Electrodynamics force . The interaction of two straight linear wires carrying an electric current. Magnetic dipole and its behavior in an external magnetic field.</p>														
Prerequisites and co-requisites															
Assessment methods and criteria	<table border="1" data-bbox="451 461 1487 595"> <thead> <tr> <th data-bbox="451 461 794 495">Subject passing criteria</th> <th data-bbox="794 461 1137 495">Passing threshold</th> <th data-bbox="1137 461 1487 495">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="451 495 794 528">Written exam</td> <td data-bbox="794 495 1137 528">50.0%</td> <td data-bbox="1137 495 1487 528">30.0%</td> </tr> <tr> <td data-bbox="451 528 794 562">Oral exam</td> <td data-bbox="794 528 1137 562">50.0%</td> <td data-bbox="1137 528 1487 562">30.0%</td> </tr> <tr> <td data-bbox="451 562 794 595">Midterm tests</td> <td data-bbox="794 562 1137 595">50.0%</td> <td data-bbox="1137 562 1487 595">40.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Written exam	50.0%	30.0%	Oral exam	50.0%	30.0%	Midterm tests	50.0%	40.0%
Subject passing criteria	Passing threshold	Percentage of the final grade													
Written exam	50.0%	30.0%													
Oral exam	50.0%	30.0%													
Midterm tests	50.0%	40.0%													
Recommended reading	<table border="1" data-bbox="451 607 1487 1010"> <tbody> <tr> <td data-bbox="451 607 794 808">Basic literature</td> <td colspan="2" data-bbox="794 607 1487 808"> 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). </td> </tr> <tr> <td data-bbox="451 808 794 965">Supplementary literature</td> <td colspan="2" data-bbox="794 808 1487 965"> 1. J.Orear. Fizyka T1 i T2. WNT, Warszawa (dowolne wydanie). 2. J.Massalski. Fizyka dla inżynierów. T.1i T.2; WNT, Warszawa 2007. </td> </tr> <tr> <td data-bbox="451 965 794 1010">eResources addresses</td> <td colspan="2" data-bbox="794 965 1487 1010">Adresy na platformie eNauczanie:</td> </tr> </tbody> </table>			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	Adresy na platformie eNauczanie:				
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	Adresy na platformie eNauczanie:														
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> 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 t_1 amplitude of vibrations decreased n_1 times. How many times will decrease the amplitude of vibrations in the time t_2 ? 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.