GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00052071		
Field of study	Nanotechnology		
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 Subject group related to scientific research 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	2	ECTS credits	8.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Zakład fizyki nanomateriałów -> Instytut Nanotechnologii i Inżynierii Materiałowej -> Faculty of Applied Physics and Mathematics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Leszek Wicikowski	
	Teachers	dr inż. Leszek Wicikowski dr hab. inż. Beata Bochentyn	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	45.0	45.0	0.0	0.0	0.0	90

E-learning hours included: 0.0

Adresy na platformie eNauczanie:
Physics II - Moodle ID: 13996
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=13996
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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	90	10.0	100.0	200

Subject objectives

Physics II's primary goal is to acquire basic knowledge in selected areas of classical physics and acquire the skills of qualitative understanding of principles and laws of classical physics and quantitative analysis of phenomena in this field. After completing the course, students possess knowledge about the basic techniques and methods of measuring selected physical quantities. Additional students develop social competencies (the ability to cooperate in a student group) to solve and task implementation effectively.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_W03	The student can think creatively and solve complex problems covering various branches of physics. It does not work schematically.	[SW1] Assessment of factual knowledge
K6_U01	The student uses the lecture's issues to prepare for solving physical problems in mechanics and electrodynamics independently. He can use textbooks for this purpose and find reliable sources of information on the Internet	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject
K6_U04	The student can analyze the described experiments. He can identify key physical experiments that allowed researchers to formulate the appropriate laws of physics. He sees a clear relationship between theoretical knowledge and experiment	[SU3] Assessment of ability to use knowledge gained from the subject
K6_W01	The student understands the importance of general physics for the effective acquisition of skills necessary in technical sciences. Can use computational methods of physics to solve problems.	[SW1] Assessment of factual knowledge

Subject contents

Coordinate systems, differential operators (in exercises), fundamental kinematic quantities, straight and curvilinear motion, integration of equations of motion Laws of dynamics, equations of particle motion in any force field, the motion of a body with variable mass Principles of behaviour in mechanics, conservative and non-conservative field, Stokes's law Rotational motion, torque, angular momentum, conservation of angular momentum, central force field, Kepler's laws Rigid body, a centre of mass, a moment of inertia, Steiner theorem, equilibrium conditions Harmonic vibrations, simple, damped and forced. Mechanical waves, plane wave equation, phase velocity and group velocity, diffraction, interference, standing wave, rumble, Doppler effect Electrostatics, Coulomb's law, superposition principle, electric field strength, electric dipole, continuous charge distributions, Gauss's law Work and energy in an electric field, the relationship between electric field intensity and potential, electrostatics of dielectrics, electric capacity, capacitors DC circuits, energy and power of direct current, classical theory of conductivity, Magnetic field generated by electric current, Biot-Savart law Electromagnetic induction Alternating current, electromagnetic vibrations Movement of a charge in an electric and magnetic field Maxwell's equations, electromagnetic waves

Prerequisites and co-requisites

To study the course, students must know fundamental physics in the advanced matura exam scope in physics. Completing the Physics I course is necessary.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Final exam	50.0%	50.0%
Midterm exam (2)	50.0%	50.0%

Recommended reading

Basic literature	Halliday, Resnick, Walker - Fundamentals of Physic D. Griffiths - Introduction to Electrodynamics W.Demtroeder - Experimental Physics
Supplementary literature	Hennel, Szuszkiewicz - Zadania i problemy z fizyki t.1 i t.2
eResources addresses	Physics II - Moodle ID: 13996 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=13996 Physics II - Moodle ID: 13996 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=13996

Example issues/ example questions/ tasks being completed

The moth moves along a curve whose length s is given by the formula s = s0exp (ct), where s0 and c - constants. Knowing that the acceleration vector a makes a constant angle with the path tangent at each point. Find the value of velocity, tangential acceleration, normal acceleration, the radius of curvature of the path as a function of the curve's arc length.

Work placement

Not applicable