



Subject card

Subject name and code	Physics II, PG_00059246						
Field of study	Civil 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	2	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Instytut Nanotechnologii i Inżynierii Materiałowej -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Bogumiła Strzelecka				
	Teachers		dr inż. Bogumiła Strzelecka dr inż. Bartosz Trawiński dr inż. Marta Prześniak-Welenc				
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						
Fizyka II 2022/23 - Moodle ID: 29041 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=29041							
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	3.0	42.0	75		
Subject objectives	Familiarizing the student with the basic phenomena and laws of physics. Acquisition of skills by the student explaining phenomena, drawing conclusions and solving problems.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W01] Demonstrate knowledge and understanding of mathematics as well as sciences and engineering disciplines underlying civil engineering at a level necessary to achieve the other programme outcomes.	The student solves the tasks accounting in physics and interprets obtained results			[SW1] Assessment of factual knowledge		
	[K6_U01] Apply knowledge and understanding of mathematics as well as sciences and engineering disciplines underlying civil engineering to solve engineering problems and issues.	The student defines the basic the law of physics. The student applies the acquired knowledge to describe physical reality and environmental. The student applies the laws of physics to identifying, formulating and solving problems			[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools		
Subject contents	Electrostatics - point charges, field lines, field strength vector, principle of superposition of fields, potential energy of electrostatic interactions, field potential, motion of a particle in an electrostatic field, Gauss's law, conductors and dielectrics, capacitors, Cargo transport in conductors, Ohm's law, Kirchoff's laws, Magnetism: magnetic field - sources of magnetic field, Lorentz force, magnetic field induction vector, Ampere's law. Biot-Savart law, The phenomenon of electromagnetic induction - Faraday's law, alternating current, electromagnetic vibrations, Maxwell's laws, electromagnetic waves. Wave and geometric optics.						
Prerequisites and co-requisites	Knowledge of mathematical analysis (differentiation and integration) Knowledge of vector algebra						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Physics exam pass	51.0%	50.0%
	passing both colloquia	51.0%	50.0%
Recommended reading	Basic literature	Physics for universities -openstax Polska Fundamentals of physics - D.Halliday. R. Resnick, J. Walker	
	Supplementary literature	Collection of tasks in physics Jędrzejewski, Kruczek Collection of tasks in physics Irodov	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Based on Gauss's law, derive Coulomb's law Derive the formula for the magnetic field induction in the center of a circular conductor carrying current Prove the law of light reflection based on Fermat's principle		
Work placement	Not applicable		