



## Subject card

Subject name and code	Physics II, PG_00059246						
Field of study	Civil Engineering						
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	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. Tadeusz Miruszewski				
	Teachers						
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						
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, Kirchhoff'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 PolskaFundamentals of physics - D.Halliday. R. Resnick, J. Walker				

	Supplementary literature	Collection of tasks in physics Jędrzejewski, KruczekCollection of tasks in physics Irodov
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	Based on Gauss's law, derive Coulomb's lawDerive the formula for the magnetic field induction in the center of a circular conductor carrying currentProve the law of light reflection based on Fermat's principle	
Work placement	Not applicable	