



Subject card

Subject name and code	Physics II, PG_00040165						
Field of study	Mechanical Engineering						
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		English		
Semester of study	2		ECTS credits		1.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Zakład Energetyki i Automatyki Morskiej -> Institute of Ocean Engineering and Ship Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Klaudia Wrzask				
	Teachers		dr inż. Klaudia Wrzask				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	0.0	15
	E-learning hours included: 0.0						
	Address on the e-learning platform: http:// Adresy na platformie eNauczanie:						
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	15		3.0		7.0	25
Subject objectives	Student is familiar with electromagnetic waves, quantum nature of e-m radiations, Bohr's model of atom and nuclear physics.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_W02		The student has knowledge of modern physics.		[SW1] Assessment of factual knowledge		
	K6_U01		The student can solve a physical problem on the basis of data taken from sources.		[SU1] Assessment of task fulfilment		
Subject contents	Geometric optics. Electromagnetic waves: propagation of waves, Poyntings vector, spectrum of electromagnetic waves. Wave optics: diffraction and interference of light, diffraction grating, thin films. Polarization of light: methods of polarization, Malus law, Brewsters law, birefringence, rotation of plane of polarization of light. Elements of quantum physics: black-body radiation, Planck distribution, StefanBoltzmanns law, Wiens law. Photons: photoelectric effect, Comptons effect, X-rays. Quantum mechanics: de Broglie waves, Heisenberg's uncertainty principle, Schrodinger wave equation. Constitution of matter: atom structure, Bohr model of hydrogen atom, energy levels. Angular momentum and spin of electron at atomic orbitals, quantum numbers. Elements: multielectron atom, Paulis exclusion principle, periodic table of the elements. Nuclear physics: law of radioactive decay, radioactivity, nuclear energy, fundamentals of nuclear power plant.						
Prerequisites and co-requisites	Course credit Physics I						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	15 homework		50.0%		70.0%		
	final test		50.0%		30.0%		
Recommended reading	Basic literature		University Physics Volume3 https://openstax.org/details/books/university-physics-volume-3				
	Supplementary literature		R. Shankar "Fundamentals of Physics", Yale University Press				

	eResources addresses	Podstawowe https://openstax.org/details/books/university-physics-volume-3 - University Physics Volume3
Example issues/ example questions/ tasks being completed	<p>Discuss any similarities and differences between the photoelectric and the Compton effects.</p> <p>If an electron and a proton are traveling at the same speed, which one has the shorter de Broglie wavelength?</p> <p>Define and make clear distinctions between the terms neutron, nucleon, nucleus, and nuclide.</p>	
Work placement	Not applicable	