



Subject card

Subject name and code	Physics II, PG_00040165						
Field of study	Mechanical Engineering, Mechanical Engineering						
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		
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	Department of Physics of Electronic Phenomena -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Grażyna Jarosz				
	Teachers		dr hab. inż. Grażyna Jarosz				
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						
	Adresy na platformie eNauczenie: Physics I for D&PI 2020/2021 - Moodle ID: 7294 https://enauczenie.pg.edu.pl/moodle/course/view.php?id=7294						
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, Poynting's vector, spectrum of electromagnetic waves. Wave optics: diffraction and interference of light, diffraction grating, thin films. Polarization of light: methods of polarization, Malus' law, Brewster's law, birefringence, rotation of plane of polarization of light. Elements of quantum physics: black-body radiation, Planck distribution, Stefan–Boltzmann's law, Wien's law. Photons: photoelectric effect, Compton's 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, Pauli's 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		
	2 tests		50.0%		100.0%		
Recommended reading	Basic literature		Holliday Resnick Walker "Fundamentals of Physics", Willey 2008				
	Supplementary literature		R. Shankar "Fundamentals of Physics", Yale University Press				
	eResources addresses		Physics I for D&PI 2020/2021 - Moodle ID: 7294 https://enauczenie.pg.edu.pl/moodle/course/view.php?id=7294				

Example issues/ example questions/ tasks being completed	<p>The function of the control rods in a nuclear reactor is to:</p> <p>A. increase fission by slowing down the neutrons</p> <p>B. decrease the energy of the neutrons without absorbing them</p> <p>C. increase the ability of the neutrons to cause fission</p> <p>D. decrease fission by absorbing neutrons</p> <p>E. provide the critical mass for the fission reaction</p>
Work placement	Not applicable