



Subject card

Subject name and code	Physics II, PG_00039865						
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			Polish		
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						
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		4.0		6.0	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] possesses an organized knowledge on physics, including classic mechanics, acoustics, optics, electricity and magnetism, shows knowledge of the elements of quantum physics		A student has knowledge of fundamentals of modern physics.		[SW1] Assessment of factual knowledge		
	[K6_U01] is able to acquire information from specialized literary sources, databases and other resources, essential for solving engineering tasks; is able to compile the obtained information pieces and to interpret them, additionally is able to form conclusions and present justified opinion						
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 (07001W0)						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	2 tests		50.0%		100.0%		
Recommended reading	Basic literature		D.Halliday, R.Resnick, J. Walker, Fundamentals of Physics, 8th Edition, Wiley 2008.				
	Supplementary literature		D.Halliday, R.Resnick, J. Walker, Fundamentals of Physics, 8th Edition, Wiley 2008.				
	eResources addresses						

Example issues/ example questions/ tasks being completed	The rainbow seen after a rain shower is caused by: a) polarization, b) interference, c) refraction, d) diffraction.
Work placement	Not applicable