GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Physics II, PG_00033414		
Field of study	Mechatronics, Mechatronics		
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	4.0
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 inż. Marcin Dampc	
	Teachers	dr inż. Marcin Dampc	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	0.0	0.0	0.0	30

E-learning hours included: 0.0

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	30	5.0	65.0	100

Subject objectives

Presentation and analysis of physical phenomena and quantities typical for: gravity, hydrostatics, hydrodynamics, thermodynamics, electromagnetic waves, wave optics, solid state physics, electrical and magnetical properties of matter, nuclear physics

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_U03	Ability of using complementary materials on e-learning platform On the basis of examples during lectures student analyses the mistakes of designers and engeneers	[SU1] Assessment of task fulfilment
K6_W02	Student analyzes the physical phenomena and solve simple problems in the art based on the laws of physics	[SW1] Assessment of factual knowledge
K6_U01	Ability of using fuctionalities of e-learning platform (forum, chat, wiki, choice, survey) Ability of using complementary materials on e-learning platform and individual studies of related problems	[SU4] Assessment of ability to use methods and tools

Subject contents

LECTURES: Gravity: law of universal gravitation, gravitational field strength and potential. Keplers laws, satelites, cosmicvelocities. Thermodynamics: I law of thermodynamics, ideal gas changes, graphical interpretation of work. II law of thermodynamics, Carnot cycle, Carnot engine, enthropy, III law of thermodynamics. Hydrostatics: properties of liquids, Pascals law, hydrostatic pressure, Archmedes principle, buoyancy. Hydrodymanics: fluid flow, Bernoullis theorem, viscosity, laminar flow and turbulent flow, Reynolds number. Electromagnetic waves: propagation, energy of electromagnetic field, Pointings vector, spectrum of electromagnetic waves. Wave optics: Huyghens principle, diffraction and interference of light, diffraction grating. Polarization of light: methods of polarization, Malus law, Brewsters law. Solid state physics: electric properties of materials, electric conductivity of metals, band structure of solids, Fermi-Dirac function, band structure of metals, semiconductors and insulators. Intrinsic and doped semiconductors, junctions and theirs applications: LED, laser, photovoltaic cell. Nuclear physics: structure of atom, Rutherford experiment, properties of atomic nucleus, bond energy of atomic nucleus, models of nucleus. Radioactivity: decay law, sample activity, types of radioactive decay, radiation-matter interaction. Absorption and detection of radiation.

Prerequisites and co-requisites

Course credit Physics I - E (07001W0) and Physics I (07021C0)

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Midterm colloquium	50.0%	100.0%
Recommended reading	Basic literature	1. Cz. Bobrowski, Fizyka - krótki kurs, WNT, Warszawa 1979, 1993 2. M. Skorko, Fizyka, PWN, Warszawa 3. J.Orear, Fizyka t. 1,2, WNT Warszawa 4. K.Kozłowski, R.Zieliński, I laboratorium z fizyki, cz.1, WPG 2003.	
	Supplementary literature	1. D.Halliday, R.Resnick, J. Walker, Podstawy fizyki t. 2,4, 5, PWN, Warszawa	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Calculate the number of nuclei of radioactive isotope in a function of time knowing the half life is T.		
Work placement	Not applicable		