GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00048761		
Field of study	Green Technologies		
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	5.0
Learning profile	general academic profile	Assessment form	exam
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. Jędrzej Szmytkowski	
	Teachers	dr Małgorzata Franz dr hab. inż. Jędrzej Szmytkowski	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	30.0	0.0	0.0	0.0	60

E-learning hours included: 0.0

Adresy na platformie eNauczanie:
Physics II - Moodle ID: 13506
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=13506

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	60	5.0	60.0	125

Subject objectives

The aim is to demonstrate laws of physics

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_K02] is aware of the social role of a technical college graduate, take the reflections on the ethical, scientific and social aspects of the work performed, understands the need to promote, formulating and providing the public with information and opinions concerning the activities of the profession of engineer.	Student knows how to interpret results of his research	[SK5] Assessment of ability to solve problems that arise in practice
[K6_U05] can formulate and solve engineering tasks analytical methods, simulation as well as experimental, able to apply knowledge of basic physics and mathematics to analyze the results of experiments, is able to analyze and assess existing technical solutions	Student has knowledge about physics and mathematics to apply it in analytical sciences and environmental technologies	[SU3] Assessment of ability to use knowledge gained from the subject
[K6_W01] has a basic knowledge from some branches of mathematics and physics useful for formulating and solving simple problems in the field of environmental technologies and modern analytical methods	Student is prepared to learn physics during his life	[SW1] Assessment of factual knowledge

<table>
<tr><td>Subject contents</td><td>The lecture is a continuation of lecture in Physics from last semester. Therefore, it is possible to describe some selected problems from recent semester.

Electromagnetic induction. Faraday's law. Self-induction and mutual induction. Maxwell's equations. Geometrical optics. Mirrors. Lenses. Reflection and refraction of light. Electromagnetic waves. Interference of light. Dispersion. Diffraction. Gratings. Polarization of light. Elements of relativistic physics. Introduction to quantum physics - radiation of black body, photoelectric effect, Compton effect. The Bohr atom. Spectral series. Heisenberg's uncertainty principle. The matter (de Broglie) waves. Schrodinger equation. Particle in quantum well. Quantum tunneling. Quantum numbers. Atomic terms. Zeeman effect. Lasers. Electronic band structure of solid state. Semiconductors. Diode. Superconductors. Elements of nuclear physics - alpha, beta and gamma particles. Models of atomic nucleus. Nuclear reactions. Elementary particles.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Students must pass an exam in Physics from last semester.</td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Lecture: Written exam</td><td>50.0%</td><td>60.0%</td></tr>
<tr><td>Tutorials: Writen tests</td><td>50.0%</td><td>40.0%</td></tr>
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</td></tr>
<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>1. H. Sodolski, Selected problems in physics with examples and exercises, Wydawnictwo Politechniki Gdańskiej 2007

2. D. Halliday, R. Resnick, J. Walker, Fundametals of physics, Wiley 2008</td></tr>
<tr><td>Supplementary literature</td><td>1. J. Orear, Physics, Macmillan Publishing Co, 1979

2. S.P. Myasnikov, T.N Osanova, Selected Problems in Physics, Mir Publishers 1990</td></tr>
<tr><td>eResources addresses</td><td>Physics II - Moodle ID: 13506
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=13506</td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>1. Electromagnetic induction

2. Laws of geometrical optics

3. The Bohr atom.

4. Schrodinger equation.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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