GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Physics II, PG_00069011		
Field of study	Cosmetic technologies		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
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	3.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Division of Ceramics -> Institute of Nanotechnology and Materials Engineering -> Faculty of Applied Physics and Mathematics -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Sebastian Wachowski	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	20.0	10.0	0.0	0.0	0.0	30

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	30	5.0	40.0	75

Subject objectives

The aim of the course is to familiarize students with the basic principles of physics necessary to understand the chemical and electrochemical processes used in cosmetic technologies.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W01] defines the phenomena, processes and physicochemical laws used to produce utility goods and provide services	knows and understands the basics of electricity, magnetism, thermodynamics and modern physics and understands their role in modern production technology.	[SW1] Assessment of factual knowledge
[K6_W02] explains the structure and functions of cosmetic raw materials and methods and instruments for determining their quantity, quality and activity	through knowledge of physical principles, is able to explain the principles underlying the operation of measuring instruments and the internal structure of cosmetic raw materials.	[SW1] Assessment of factual knowledge

Subject contents

Course content – lecture
The lecture covers theoretical topics in the following areas:
1. Electrostatics, direct current
2. Magnetism, alternating current
3. Thermodynamics, gas and liquid physics, transport phenomena
4. Modern physics: quantum mechanics, fundamentals of matter structure and crystallography

Course content – exercises
The content of the tutorials is thematically similar to the lectures, but includes accounting issues.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Theory test	50.0%	50.0%
Tutorials test	50.0%	50.0%

Recommended reading

Basic literature

Hernan, Kalestyński, Widomski, Podstawy fizyki dla kandydatów na uczelnie wyższe i studentów, PWN, 2009

Massalski, Massalska, Fizyka dla inżynierów PWN 2018

	Supplementary literature	Fizyka dla uczelni wyższych, OpenStax, podręcznik online: https://openstax.pl/szczegoly-ksiazki?book=Fizyka_dla_szk%C3%B3%C5%82_wy%C5%BCszych_tom_1
	eResources addresses	
Example issues/ example questions/ tasks being completed	1. State the second law of thermodynamics. 2. Explain the microscopic model of electrical conduction. 3. Calculate the resonance frequency of an RLC system. 4. Calculate the energy of a particle in a potential well.	
Practical activites within the subject	Not applicable	

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