GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Electrodynamics, PG_00037300		
Field of study	Technical Physics		
Date of commencement of studies	October 2021	Academic year of realisation of subject	2022/2023
Education level	first-cycle studies	Subject group	Optional subject group Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish Explanations in English will be provided if required.
Semester of study	4	ECTS credits	5.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Instytut Fizyki i Informatyki Stosowanej -> Faculty of Applied Physics and Mathematics		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. Józef Sienkiewicz	
	Teachers	prof. dr hab. Józef Sienkiewicz dr Piotr Weber	

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

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

Convince the student of the importance of electrodynamics for understanding the foundations of science and technology. Give a basis for understanding the basic issues of electrodynamics. Raise classical issues and applications in atomic and molecular physics.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_W02	Well-organized knowledge of electrodynamics basics.	[SW1] Assessment of factual knowledge
K6_U02	Student is able to use appropriate tools to solve basic problems in the field of electrodynamics.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information

Subject contents

Electrostatics in vacuum. Scalar potential. Boundary conditions. Gauss law. Poisson, Laplace equations. Multipole expansion. Electric field in medium. Boundary conditions. Anisotropic dielectrics. Stationary magnetic field in vacuum. Ampere's law. Vector potential, Poisson equation. Biot-Savart law. Continuity equation. Magnetic moment. Magnetostatics in medium. Boundary conditions. Anisotropic magnetics. Law of e-m induction. Maxwell's equations. Potentials of e-m field. Gauging. D'Alambert equation. Energy density and flux. Poynting vector. E-m field momentum. Maxwell stress tensor. E-m waves in homogenous and isotropic media. Monochromatic plane wave. Polarisation. Plane e-m wave in a conducting medium. Reflaction and refraction.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Written exam	50.0%	50.0%
Practical exercise	50.0%	50.0%

Recommended reading

Basic literature	David J. Griffiths, Introduction to Electrodynamics

	Supplementary literature	John D. Jackson. Classical Electrodynamics
	eResources addresses	Adresy na platformie eNauczanie: Elektrodynamika - Moodle ID: 27717 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=27717
Example issues/ example questions/ tasks being completed	Mulitpole expansion	
Work placement	Not applicable	