GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Electrodynamics, PG_00038395		
Field of study	Electrical Engineering		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2021/2022
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study Subject group related to scientific research in the field of study
Mode of study	Part-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish
Semester of study	3	ECTS credits	5.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Katedra Elektrotechniki i Inżynierii Wysokich Napięć -> Faculty of Electrical and Control Engineering		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Adam Młyński	
	Teachers	dr inż. Adam Młyński	

Lesson types and methods of instruction

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

E-learning hours included: 0.0

Address on the e-learning platform: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=16951
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	8.0	87.0	125

Subject objectives

Understanding the fundamental rights of the electromagnetic field. Description of the different types of fields. Ability to apply the calculation of the electromagnetic field with technical problems.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_K05	The student is able to assess the influence of the electromagnetic field on living organisms and technical devices. The student knows the dangers associated with strong electromagnetic fields.	[SK5] Assessment of ability to solve problems that arise in practice
K6_W03	The student is able to perform engineering calculations of the electromagnetic field and use peripheral models.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
K6_U04	The student is able to apply the known methods to calculate the electromagnetic field and use peripheral models.	[SU4] Assessment of ability to use methods and tools
K6_W02	The student knows how to describe electric and magnetic fields, the student can describe the phenomena occurring in the electric and magnetic fields.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge

Subject contents

Electrostatics: Gauss law,Coulomb's law, electric field and potential, conductor in an electric field, capacitance of various systems covers and pipe , dielectrics, polarization, multilayer dielectrics, electric strength of isolation, Stationary current density field, resistance. Magnetostatics: Ampères law, magnetic flux density, Biot-Savarts law, coefficient of self and mutual inductance, dia-, para- and ferromagnetic, magnetization curve, magnetic circuits, forces. Faradays law, induced and rotational electromotive force.

Prerequisites and co-requisites

Knowledge of vector algebra. Learn how to calculate derivatives of functions of several variables. Understand the concept of integral linear, surface and volume.

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Reports on laboratory exercises	60.0%	40.0%
	Written exam	60.0%	60.0%
Recommended reading	Basic literature	Krakowski M: Elektrotechnika teoretyczna. Pole elektromagnetyczne, tom 2. PWN, Warszawa 1992 D.J. Griffiths: Podstawy elektrodynamiki. PWN Warszawa 2001r. P.Czarnywojtek i in. Zbiór zadań z elektromagnetyzmu. WU PWSZ Kalisz 2009 r., Zahn M.: Pole elektromagnetyczne. PWN Warszawa 1989, Sikora R.: Teoria Pola Elektromagnetycznego. WNT, Warszawa 1997	
	Supplementary literature	R.P. Feynman, R.B. Leighton, M. Sands: Feynmana wykłady z fizyki (tom II część 1 i 2). PWN Warszawa 2001r.; Sadiku M. : Elements of Electromagnetics. Oxford University Press, 2006	
	eResources addresses		
Example issues/ example questions/ tasks being completed	1. Calculate the electric field intensity distribution of a given system point charges placed at specified points in the cartesian coordinate system. 2. Calculate the magnetic field distribution for a cable of a given diameter as a function of distance from the center of the duct. 3. Calculate the capacity of single core cables, coaxial cables having a length L = 10 km, the wire diameter is d = 30 mm, the inner diameter of the screen, D = 30 mm and the relative permittivity of the dielectric is $_w$ = 3.5. 4. Calculate the leakage coaxial cable of length L = 1.5 km, the diameter of the vein is d = 30 mm, the inner diameter of the screen, D = 40 mm, and is the conductivity isolation = 20 S / m. 5. Calculate the unit inductance own two-wire line, the wires of diameter d spaced apart at a distance h. 6. Calculate the force of attraction armature CI		
Work placement	Not applicable		