GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Mechanics, electricity, and magnetism, PG_00071278		
Field of study	Technologies for Industry 5.0		
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 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	1	Language of instruction	Polish None
Semester of study	1	ECTS credits	6.0
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 inż. Tadeusz Miruszewski	
	Teachers	dr inż. Tadeusz Miruszewski dr inż. Leszek Litzbarski	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	45.0	0.0	0.0	0.0	75

E-learning hours included: 0.0

eNauczanie source address: https://enauczanie.pg.edu.pl/2025/course/view.php?id=1555

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	75	5.0	70.0	150

Subject objectives

The objective of this course is to familiarize students with practical investigations in mechanics and electricity, with a particular emphasis on applying theoretical concepts to real-world scenarios.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W01] demonstrates knowledge and understanding of mathematics, physics, chemistry and IT tools at the level necessary to formulate and solve typical engineering and technological problems	The student has knowledge of issues related to mechanics and electricity with a view to using them in his future professional work	[SW1] Assessment of factual knowledge
[K6_K01] is aware of the need to constantly update and enrich knowledge and practical skills, and improve professional, personal and social competences	The student has extended and deepened knowledge of mechanics, electrostatics, DC and AC.	[SK2] Assessment of progress of work
[K6_U01] applies knowledge of mathematics, physics, chemistry, IT tools and other engineering disciplines to solve theoretical, engineering and technological problems	Understands the need to update knowledge regarding mechanics and electrical phenomena.	[SU4] Assessment of ability to use methods and tools

<table>
<tr><td>Subject contents</td><td>Course content – lecture

Mechanics
Kinematics of a point mass
Dynamics of a point mass
Dynamics of a rigid body
Conservation laws (energy and momentum)
Electrostatics
Electric charge
Electric field
Concepts of electric potential and electric field intensity
Capacitors
Direct current (DC)
Definitions of physical quantities
Microscopic description of electric current
Ohm’s law
Kirchhoff’s laws
Joule-Lenz law
Electrical circuit components
Elements of electrical engineering
Alternating current (AC)
Alternating current: definitions of physical quantities
RLC circuits

Course content – exercises

As above.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></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</td><td>50.0%</td><td>50.0%</td></tr>
<tr><td>Excercises</td><td>50.0%</td><td>50.0%</td></tr>
</table>
</td></tr>
<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>[1] M.Herman, A.Kalestyński, L.Widomski, Podstawy Fizyki dla kandydatów na wyższe uczelnie i studentów, WN PWN, Warszawa

[2] J. Massalski, M. Massalska Fizyka dla Inżynierów, WNT Warszawa

[3] D.Halliday, R.Resnick, J.Walker, Podstawy Fizyki, PWN, Warszawa

[4] Fizyka dla szkół wyższych, Tom 2, wyd. OpenStax Polska</td></tr>
<tr><td>Supplementary literature</td><td>As above.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>Describe Coulomb's law for point charges.Give the definition of electric field intensity, list the types of electric fields with drawings of the fields.Give Gauss's law for the electrostatic field and its application in one selected case.Direct electric current (DC) provide the definition and conditions of flow of electric current.State and explain Ohm's law and Kirchhoff's law in direct current circuits.</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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