GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Physics laboratory I (electricity and magnetism), PG_00020721		
Field of study	Technical Physics		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2027/2028
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
Semester of study	3	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Institute of Physics and Applied Computer Science -> Faculty of Applied Physics and Mathematics -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Łukasz Haryński	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	0.0	45.0	0.0	0.0	45

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	45	5.0	25.0	75

Subject objectives

To get knowledge about performing of basic experiments and estimation of various quantities withiin witin electricity and magnetism

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U04] is able, individually or in a team, to plan and conduct experiments in physics and related fields, including applied computer science or energy engineering, and to analyse and interpret results and formulate conclusions.	Student is able to independently or in a group plan and perform experiments and research tasks in the field of physics and related sciences, critically analyze and interpret the obtained results, and draw conclusions using methods specific to applied computer science or power engineering.	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment
[K6_W04] has advanced knowledge of the principles of experimental design, experimental methods, measurement techniques and scientific equipment used in physics and related sciences, including their life cycle.	Has knowledge regarding the planning and conducting of physical experiments, methods for critical analysis and interpretation of obtained results, and the apparatus used in physics and related sciences, including its life cycle.	[SW3] Assessment of knowledge contained in written work and projects
[K6_U08] communicates effectively using specialist terminology in physics and related disciplines, enabling the preparation of reports, publications or presentations, as well as participation in discussion and expression of opinions.	Student is able to communicate using specialized terminology in the field of physics and related sciences (including applied computer science or power engineering) to a degree that allows for the preparation of text studies, publications, or presentations, as well as actively participate in discussions and formulate reasoned opinions.	[SU5] Assessment of ability to present the results of task

<table>
<tr><td>Subject contents</td><td>Course content – laboratory
1. Investigation of electric field distribution. 2. Determination of dielectric constant of various materials. 3. Measuring resistance with the use of the Wheatstone's bridge. 4. Measuring a capacitance of a capacitor with the use of the Wheatstone's bridge. 5. Measuring a force acting on a current-carrying conductor in a magnetic field. 6. Determination of a magnetic moment of a loop carrying a current. 7. Determination of a magnetic field of circular conductors carrying a current. 8. Magnetic field around current-carrying conductors: a long straight wire or a loop. 9. Determination of magnetic permeability and hysteresis. 10. Performance of a transformer. 11. Determination of an RC charging circuit curve. 12. Investigation of a series RLC circuit. 13. Determination of the horizontal component of the Earth's magnetic field. 14. Measurement of the electrochemical equivalent of cooper and the Faraday constant. 15. Curie temperature determination.</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>credit theory on each of the exercises</td><td>50.0%</td><td>30.0%</td></tr>
<tr><td>Acceptance of reports of 10 exercises</td><td>100.0%</td><td>70.0%</td></tr>
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</td></tr>
<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>1. K. Kozłowski, R. Zieliński I Laboratorium z fizyki cz.1 Wyd.PG

2. Materials for students available at the website of the Faculty https://ftims.pg.edu.pl/laboratorium-z-fizyki-i-pracownia

3. D. Halliday, R. Resnick Fizyka t.2</td></tr>
<tr><td>Supplementary literature</td><td>No requirements</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>1. Give the definition of the electric field and electric potential

2. Definition of the magnetic induction

3 .Structure, the principle of operation and the use of a transformer</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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