



## 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 2025		Academic year of realisation of subject		2026/2027		
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 with electricity and magnetism						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W08] has knowledge of planning and conducting physical experiments, and critical analysis of its results		Knows how to plan and conduct physical experiments and how to assess experimental results properly.		[SW3] Assessment of knowledge contained in written work and projects		
	[K6_W07] has knowledge of the construction and operation of physical instruments, measurement and research equipment		Has basic knowledge of the structure and the operating principles of physical instruments, and measuring devices.		[SW3] Assessment of knowledge contained in written work and projects		
	[K6_U04] plans and conduct experiments, critically analyzes their results, draw conclusions and forms opinions, has laboratory work experience		Is able to set and perform experiments, critically analyze their results, and draw conclusions.		[SU4] Assessment of ability to use methods and tools		
Subject contents	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 <i>straight wire</i> or a <i>loop</i> . 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.						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Acceptance of reports of 10 exercises		100.0%		70.0%		
	credit theory on each of the exercises		50.0%		30.0%		

Recommended reading	Basic literature	<p>1. K. Kozłowski, R. Zieliński I Laboratorium z fizyki cz.1 Wyd.PG</p> <p>2. Materials for students available at the website of the Faculty <a href="https://ftims.pg.edu.pl/laboratorium-z-fizyki-i-pracownia">https://ftims.pg.edu.pl/laboratorium-z-fizyki-i-pracownia</a></p> <p>3. D. Halliday, R. Resnick Fizyka t.2</p>
	Supplementary literature	No requirements
	eResources addresses	
Example issues/ example questions/ tasks being completed	<p>1. Give the definition of the electric field and electric potential</p> <p>2. Definition of the magnetic induction</p> <p>3 .Structure, the principle of operation and the use of a transformer</p>	
Practical activities within the subject	Not applicable	

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