



## 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 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 Can be run in English (e.g. for the Erasmus+ students).		
Semester of study	3	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Instytut Fizyki i Informatyki Stosowanej -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Damian Głowienka					
	Teachers	dr inż. Damian Głowienka dr inż. Marcin Dampc					
Lesson types and methods of instruction	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	Learn how to perform basic experiments and determine physical quantities related to electricity and magnetism						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K6_W08	Knows how to plan and conduct physical experiments. Knows how to assess experimental results properly.			[SW3] Assessment of knowledge contained in written work and projects		
	K6_W07	Knows the structure and operating principles of physical instruments, and measuring apparatus.			[SW3] Assessment of knowledge contained in written work and projects		
	K6_U04	Is able to set and perform experiments, critically analyze their results, and come to reliable conclusions.			[SU2] Assessment of ability to analyse information [SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools		
	K6_W02	Has extended, detailed knowledge regarding electricity and magnetism.			[SW1] Assessment of factual knowledge		
K6_W12	Knows principles of occupational safety and hygiene			[SW1] Assessment of factual knowledge			
Subject contents	1. Investigation of electric field distribution. 2. Determination of dielectric constant of various materials. 3. Measuring a resistance with the use of Wheatstones bridge. 4. Measuring a capacitance of a capacitor with the use of Wheatstones bridge. 5. Measuring a force acting on a conductor with a current in magnetic field. 6. Determination of a magnetic moment of a loop with current. 7. Determination of magnetic field formed by circular conductors with currents. 8. Magnetic field of conductors with current: investigation of magnetic field distribution of a straight conductor. 9. Determination of magnetic permeability and hysteresis. 10. Checking the performance of a transformer. 11. Determination of a RC charging circuit curve. 12. Investigation of a series RLC circuit. 13. Determination of the horizontal component of the Earths magnetic field. 14. Measurement of the electrochemical equivalent of cooper and the Faraday constant. 15. Determination of a specific charge of electron due to deviation of electron stream in magnetic and electric fields.						

Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	credit theory on each of the exercises	60.0%	50.0%
	Acceptance of reports of 10 exercises	100.0%	50.0%
Recommended reading	Basic literature	1. K. Kozłowski, R. Zieliński I Laboratorium z fizyki cz.1 Wyd.PG  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>  3. D. Halliday, R. Resnick Fizyka t.2	
	Supplementary literature	No requirements	
	eResources addresses	Adresy na platformie eNauczanie: Elektryczność i Magnetyzm Laboratorium - Moodle ID: 27025 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=27025">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=27025</a>	
Example issues/ example questions/ tasks being completed	1. Define the electric E- field vector and electric potential  2. Magnetic B-field vector.  3. Structure, principles of operation, and applications of a transformer.		
Work placement	Not applicable		