GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Physics in experiment II, PG_00063336		
Field of study	Nanotechnology		
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
Semester of study	2	ECTS credits	5.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Division of New Functional Materials For Energy Conversion -> 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 hab. inż. Beata Bochentyn	
	Teachers	dr hab. inż. Beata Bochentyn	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	30.0	0.0	0.0	0.0	60
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	60	5.0	60.0	125

Subject objectives

Physics in Experiment II is a consequence of the subject Physics in Experiment I. The aim of the subject is to familiarize students with issues in the field of electrostatics, electricity, magnetism, electromagnetic waves, wave and geometric optics, and to acquire the skills of analyzing physical phenomena and solving technical problems based on the appropriate laws of physics.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W01] understands the civilizational significance of materials science and is familiar with the processes occurring throughout the material life cycle (design, manufacturing, use, and disposal).	Understands the importance of general physics for effective acquisition of skills necessary in technical sciences. Is able to apply computational methods of physics to solve tasks related to material problems.	[SW1] Assessment of factual knowledge
[K6_W03] possesses structured knowledge of physics and chemistry, including facts, concepts, methods, and theories enabling the description and explanation of complex phenomena and processes in the field of nanotechnology.	Has knowledge of the physical laws of optics, electricity and magnetism and can describe phenomena related to them occurring in everyday life. Can creatively solve complex problems from various branches of physics.	[SW1] Assessment of factual knowledge
[K6_U01] is able to engage in lifelong self-directed learning and to acquire and synthesize information from literature, databases, and other appropriately selected sources.	Uses the lecture's issues to prepare for solving physical problems in optics, electricity and magnetism-related issues independently. He can use textbooks for this purpose and find reliable sources of information in the Internet	[SU3] Assessment of ability to use knowledge gained from the subject
[K6_U04] is able to independently or in a team plan and conduct experiments in nanotechnology and related disciplines, including physics, materials engineering, and chemistry, as well as analyze and interpret the obtained results and formulate conclusions.	Can analyze the described experiments. He can identify key physical experiments that allowed researchers to formulate the appropriate laws of physics. Sees a clear relationship between theoretical knowledge and experiment	[SU3] Assessment of ability to use knowledge gained from the subject

Subject contents

Course content – lecture

Lecture/exercises:vector operators, electrostatics, electric field from a point and extended charge, electric current, magnetic field, electromagnetic induction, electromagnetic waves, wave and geometric optics.

Prerequisites and co-requisites

Knowledge of vector, differential and integral calculus used in basic calculations of instantaneous values of physical quantities.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Final exam	50.0%	50.0%
Passing the computational classes	50.0%	50.0%

Recommended reading

Basic literature

D.Halliday, R.Resnick, J.Walker, Podstawy Fizyki, PWN, Warszawa W.Moebs, S.J.Ling, J.Sanny, Fizyka dla szkół wyższych, Tom 2, https://openstax.org/details/books/fizyka-dla-szkół-wyższych-polska.J. Massalski "Fizyka dla inżynierów" NTM.Herman, A.Kalestyński, L.Widomski, Podstawy Fizyki dla kandydatów na wyższe uczelnie i studentów, WN PWN, Warszawa 2004Cz. Bobrowski. Fizyka. Krótki kurs. WNT, Warszawa 2004 lub wydania późniejsze.I.W. Sawieliew, Kurs fizyki tom 2, PWN 1989 lub wydania późniejsze.

	Supplementary literature	K. Jezierski, K. Sierański, I.Szlufarska, Fizyka - Repetytorium, zadania z rozwiązaniami, kurs powtórkowy dla studentów I roku i uczniów szkół średnich, Oficyna Wydawnicza Scripta, Wrocław 2005J.Jędrzejewski, W.Kruczek, A.Kujawski, Zbór zadań z fizyki dla uczniów szkół średnich i kandydatów na studia, WNT, Warszawa, 2000D.Halliday, R.Resnick, J.Walker, Podstawy Fizyki, Zbiór zadań, PWN, WarszawaZbiór zadań z fizyki, skrypt Politechniki Gdańskiej, https://ftims.pg.edu.pl/spolecznosc-lokalna/materialy-dydaktyczne/zbior-zadan-z-fizyki/zbior-zadan
	eResources addresses	
Example issues/ example questions/ tasks being completed	Using Gauss's law, determine the electric field intensity generated by a plane uniformly charged with a surface charge density .	
Practical activites within the subject	Not applicable	

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