GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Laboratory of the basics of modern physics, PG_00049440		
Field of study	Laboratorium podstaw fizyki współczesnej		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2025/2026
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	3	Language of instruction	Polish
Semester of study	5	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Institute of Physics and Applied Computer Science -> Faculty of Applied Physics and Mathematics -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Ireneusz Linert	
	Teachers	dr inż. Ireneusz Linert	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	0.0	30.0	0.0	0.0	30

E-learning hours included: 0.0

eNauczanie source addresses:

Moodle ID: 26683 Laboratorium podstaw fizyki współczesnej 2025/2026 - Sem. zimowy
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=26683

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	30	2.0	18.0	50

Subject objectives

To familiarize students with typical issues in the field of modern physics (solid state physics, atomic and nuclear physics), basic experimental techniques and methods of results analysis.

<table>
<tr><td>Learning outcomes</td><td>
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<tr><th>Course outcome</th><th>Subject outcome</th><th>Method of verification</th></tr>
<tr><td>[K6_W08] Has knowledge of planning and conducting physical experiments, and critical analysis of its results.</td><td>Student:
- operates measuring instruments: power supplies, frequency meters, counters,
universal meters,
- uses computer programs for processing measurement data,
- uses various methods developing the results of measurement and error analysis, - confronts the measurement results with theoretical predictions and / or literature data.</td><td>[SW3] Ocena wiedzy zawartej w opracowaniu tekstowym i projektowym</td></tr>
<tr><td>[K6_W07] Has knowledge of the construction and operation of physical instruments, measurement and research equipment.</td><td>Student:
- operates measuring instruments: power supplies, frequency meters, counters,
universal meters,
- uses computer programs for processing measurement data,
- uses various methods developing the results of measurement and error analysis, - confronts the measurement results with theoretical predictions and / or literature data.</td><td>[SW1] Ocena wiedzy faktograficznej</td></tr>
<tr><td>[K6_U04] Can plan and conduct experiments, critically analyze their results, draw conclusions and form opinions. Has laboratory work experience.</td><td>Student:
- operates measuring instruments: power supplies, frequency meters, counters,
universal meters,
- uses computer programs for processing measurement data,
- uses various methods developing the results of measurement and error analysis, - confronts the measurement results with theoretical predictions and / or literature data</td><td>[SU1] Ocena realizacji zadania</td></tr>
<tr><td>[K6_W12] Knows basic health and safety rules.</td><td>The student is introduced to Health and safety rules and complies with them.</td><td>[SW3] Ocena wiedzy zawartej w opracowaniu tekstowym i projektowym</td></tr>
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<tr><td>Subject contents</td><td>Set of experiments: 1. Investigation of stochastic processes. 2. Determination of the half-life of radioactive isotope 3. Study of the absorption of beta radiation in materials. 4.Study of the absorption of gamma radiation in materials 5. Measurement of optical spectra of gases 6. Measurement of the range of alpha particles in air and checking the inverse square law of the distance 7. Investigation of the temperature dependence of semiconductors.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>1. Basic knowledge of solid state, atomic and nuclear physics. 2. Ability to use differential and integral calculus. 3. Ability to use basic measuring devices (multimeter, caliper, micrometer screw)</td></tr>
<tr><td>Assessment methods and criteria</td><td>
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<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>execution of the report</td><td>90.0%</td><td>40.0%</td></tr>
<tr><td>preparation for exercises</td><td>50.0%</td><td>60.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>1. D. Haliday, R. Resnick, J.Walker ,,Podstawy fizyki"", t. 5, Wydawnictwo Naukowe PWN, Warszawa 2005. 3. J. Massalski, M. Massalska ,,Fizyka dla inzynierów"" cz. II</td></tr>
<tr><td>Supplementary literature</td><td>T. Mayer-Kukuck, Fizyka jądrowa, PWN 1987</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>Radioactive decay, the law of radiation absorption, the law of radioactive decay, counter scintillation,</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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