



Subject card

Subject name and code	Laboratory of the basics of modern physics, PG_00049440						
Field of study	Technical Physics						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2024/2025		
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						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Ireneusz Linert					
	Teachers	dr inż. Ireneusz Linert					
Lesson types and methods of instruction	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						
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.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	K6_U04	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.	[SU1] Assessment of task fulfilment
	K6_W07	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.	[SW1] Assessment of factual knowledge
	K6_W08	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.	[SW3] Assessment of knowledge contained in written work and projects
	K6_W02	The student applies the knowledge of solid state, atomic and nuclear physics, uses different methods of analysis of the measured results and error estimation	[SW1] Assessment of factual knowledge
	K6_W12	The student is introduced to Health and safety rules and complies with them.	[SW3] Assessment of knowledge contained in written work and projects
Subject contents	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.		
Prerequisites and co-requisites	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)		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	preparation for exercises	50.0%	60.0%
	execution of the report	90.0%	40.0%
Recommended reading	Basic literature	1. D. Haliday, R. Resnick, J. Walker „Podstawy fizyki”, t. 5, Wydawnictwo Naukowe PWN, Warszawa 2005. 3. J. Massalski, M. Massalska „Fizyka dla inżynierów” cz. II	
	Supplementary literature	T. Mayer-Kukuck, Fizyka jądrowa, PWN 1987	
	eResources addresses	Adresy na platformie eNauczanie: Laboratorium podstaw fizyki współczesnej 2024/2025 - Sem. zimowy - Moodle ID: 26683 https://enauzanie.pg.edu.pl/moodle/course/view.php?id=26683	
Example issues/ example questions/ tasks being completed	Radioactive decay, the law of radiation absorption, the law of radioactive decay, counter scintillation,		
Work placement	Not applicable		

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