

Subject card

Subject name and code	Physics Lab, PG_00154244						
Field of study	Physics						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2024/2025		
Education level	Master's studies		Subject group		Obligatory subject group in the field of study Optional subject group		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish not applicable		
Semester of study	2		ECTS credits		5.0		
Learning profile	academic		Assessment form				
Conducting unit	Zakład Spektroskopii Fazy Skondensowanej -> Instytut Fizyki Doświadczalnej -> Faculty of Mathematics, Physics and Informatics -> Rektor						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Tadeusz Leśniewski				
	Teachers		dr Łukasz Sobolewski dr inż. Tadeusz Leśniewski mgr Mikołaj Kamiński				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	75.0	0.0	0.0	75
	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	75		0.0		50.0	125
Subject objectives	Experimental verification of physical phenomena discussed in lectures on basic physics, quantum mechanics and electrodynamics, solid state physics, atomic and particle physics, laser physics, quantum information. Deepening the understanding of basic physical phenomena occurring in nature and the nature of quantum phenomena. Learning to perform computer-aided experiments, using the latest software including Lab View. Learning to perform physical experiments, analyse the results obtained and the measurement uncertainties and interpretation of the results obtained.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[FIZMU2_U02] has the ability to plan and perform basic and advanced experiments or observations in specific areas of physics or its applications	not applicable	[SU1] oral statement/conversation/discussion [SU2] presentation/project/paper/report
	[FIZMU2_U03] is able to make a critical analysis of the results of measurements, observations or theoretical calculations, together with an assessment of the accuracy of the results	not applicable	[SU1] oral statement/conversation/discussion [SU2] presentation/project/paper/report
	[FIZMU2_U04] is able to find the necessary information in the literature, both in databases and other sources; is able to reproduce the reasoning or course of an experiment described in the literature, taking into account the assumptions and approximations made	not applicable	[SU1] oral statement/conversation/discussion [SU2] presentation/project/paper/report
	[FIZMU2_U06] is able to adapt knowledge and methodology of physics as well as applied experimental and theoretical methods to related scientific disciplines	not applicable	[SU1] oral statement/conversation/discussion [SU2] presentation/project/paper/report
	[FIZMU2_U07] is able to present the results of research (experimental, theoretical or numerical) in written, oral, multimedia presentation or poster form	not applicable	[SU1] oral statement/conversation/discussion [SU2] presentation/project/paper/report
	[FIZMU2_K01] knows the limits of his own knowledge and skills; can formulate questions precisely; understands the need for further education of himself and others	not applicable	[SK1] oral statement/conversation/discussion [SK2] presentation/project/paper/report
	[FIZMU2_W03] knows advanced experimental, observational and numerical techniques to plan and execute a complex physical experiment or computer simulation	not applicable	[SW1] oral statement/conversation/discussion [SW2] presentation/project/paper/report
	[FIZMU2_W07] knows the principles of occupational health and safety to a degree that allows independent work in the area corresponding to the chosen specialization	not applicable	[SW1] oral statement/conversation/discussion [SW2] presentation/project/paper/report
	[FIZMU2_K02] is aware of the conclusive role of experiment in the verification of physical theories; is aware of the scientific method in the accumulation of knowledge	not applicable	[SK1] oral statement/conversation/discussion [SK2] presentation/project/paper/report
	[FIZMU2_K03] is able to work individually and in a team; is aware of the responsibility for jointly implemented tasks	not applicable	[SK1] oral statement/conversation/discussion [SK2] presentation/project/paper/report
	[FIZMU2_K07] is aware of the responsibility for jointly (team) carrying out research tasks	not applicable	[SK1] oral statement/conversation/discussion [SK2] presentation/project/paper/report
	[FIZMU2_K06] is aware of the risks in obtaining information from unverified sources, including the Internet	not applicable	[SK1] oral statement/conversation/discussion [SK2] presentation/project/paper/report
	[FIZMU2_K04] understands and appreciates the importance of intellectual honesty in one's own and others' actions; is aware of ethical issues in the context of research integrity	not applicable	[SK1] oral statement/conversation/discussion [SK2] presentation/project/paper/report

	Course outcome	Subject outcome	Method of verification
	[FIZMU2_W09] knows and understands the basic concepts and principles of industrial property protection and copyright law and the need to manage intellectual property resources; knows the principles of using patent information resources	not applicable	[SW1] oral statement/ conversation/discussion [SW2] presentation/project/paper/ report
	[FIZMU2_W08] has a basic knowledge of the legal and ethical considerations involved in scientific and teaching activities	not applicable	[SW1] oral statement/ conversation/discussion [SW2] presentation/project/paper/ report
	[FIZMU2_W01] has an extended knowledge of general physics and an advanced knowledge of a selected area of physics; knows the history of the development of physics and its importance for the progress of science and natural sciences, world cognition and social development	not applicable	[SW1] oral statement/ conversation/discussion [SW2] presentation/project/paper/ report
	[FIZMU2_K08] is able to formulate competent opinions on professional issues and opinions on some issues that occupy public opinion, such as the greenhouse effect, renewable energy or nuclear energy	not applicable	[SK1] oral statement/conversation/ discussion [SK2] presentation/project/paper/ report
	[FIZMU2_U09] can work independently and in a team	not applicable	[SU1] oral statement/conversation/ discussion [SU2] presentation/project/paper/ report
	[FIZMU2_W04] knows the principle of operation of measuring systems and research apparatus specific to the area of physics related to the chosen specialization or knows advanced methods of theoretical and mathematical physics	not applicable	[SW1] oral statement/ conversation/discussion [SW2] presentation/project/paper/ report
Subject contents	• Experimental verification of physical phenomena from those discussed in quantum mechanics, electrodynamics, solid state, atomic and particle physics, laser physics, quantum information. • Deepening the understanding of classical physical phenomena and the nature of quantum phenomena. • Learning to apply the learned models of phenomena, physical processes, mathematical formalisms, research methodology to specific experimental tasks performed in the physics laboratory. • To learn about modern equipment, apparatus, measuring devices: construction, principle of operation, handling. • Learning to perform computer-aided/computer-controlled experiments, learning the latest computer software including Lab View. • Learning to analyse and interpret the results obtained in experiments and their measurement uncertainties.		
Prerequisites and co-requisites	• A. Formal Requirements: none • B. Prerequisites: knowledge of basic physics, mathematics, programming, electrodynamics, solid state physics, quantum mechanics at undergraduate level, ability to analyse and process measurement results at the level of Physical Laboratory II.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		51.0%	60.0%
		51.0%	40.0%
Recommended reading	Basic literature	not applicable	
	Supplementary literature	not applicable	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	not applicable		
Work placement	Not applicable		

Document generated electronically. Does not require a seal or signature.