



## Subject card

Subject name and code	Laboratory of modern physics, PG_00031944						
Field of study	Technical Physics						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2023/2024		
Education level	second-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	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Theoretical Physics and Quantum Information -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Ireneusz Linert					
	Teachers	dr inż. Ireneusz Linert dr Mykola Shopa dr hab. inż. Beata Bochentyn					
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		8.0		22.0	75
Subject objectives	Student is able to plan complex physical experiments under a variety of methods of measurement; student can handle complex measurement systems using electronic tools and information, student can carry out precision measurements and analyze data.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K7_U03] Has enhanced laboratory work experience.	Student has skill set necessary to perform laboratory experiments.			[SU1] Assessment of task fulfilment		
	[K7_W07] Has extended knowledge of the methodology of physics laboratory work, based on experience in laboratory work. Knows the health and safety rules, sufficient for independent work at the research or measuring position.	Student has knowledge of the methods used to work in the laboratory. Knows the BHP safety requirements necessary to safely perform experiments independently in the laboratory.			[SW1] Assessment of factual knowledge		
	[K7_W06] Has enhanced knowledge of the experimental methods and techniques applied in physics.	Student knows some selected methods and techniques used in physics.			[SW3] Assessment of knowledge contained in written work and projects		
	[K7_W05] Knows the theoretical basis of the functioning of physical scientific equipment.	Student knows theoretical explanation for how the measurement apparatus works.			[SW3] Assessment of knowledge contained in written work and projects		
Subject contents	Structures and sets of measuring apparatuses in the field of classical and modern physics. Computer-aided methods of the experiment. Advanced methods of data analysis.						
Prerequisites and co-requisites	No requirements						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Practical exercise		50.0%		100.0%		
Recommended reading	Basic literature		Zawadzki A., Hofmokl H., Laboratorium fizyczne. PWN, Warszawa, 1964				

	Supplementary literature	H. Szydłowski, Pracownia fizyczna, PWN, Warszawa, 1999  John H.Moore, Christopher C.Davis and Michael A.Coplan, Building scientific apparatus, 4th edition, Cambridge University Press 2013
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	Structures and sets of measuring apparatuses in the field of classical and modern physics. Computer-aided methods of the experiment. Advanced methods of data analysis.	
Work placement	Not applicable	