University of Gdańsk

Subject card

Subject name and code	Analysis of Experimental Data, PG_00182133						
Field of study	Medical Physics						
Date of commencement of studies	October 2026		Academic year of realisation of subject	2026/2027			
Education level	Bachelor's studies		Subject group	Obligatory subject group 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	1		ECTS credits	2.0			
Learning profile	academic		Assessment form	credit			
Conducting unit	Division of Atomic and Molecular Physics -> Institute of Experimental Physics -> Faculty of Mathematics, Physics and Informatics -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Marek Józefowicz					
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	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		0.0	20.0	50	
Subject objectives	The aim of the course is: a. to familiarize students with the principles of planning and conducting basic physical experiments in accordance with scientific methodology; b. to familiarize students with the basics of analyzing measurement uncertainty in experimental sciences; c. to acquire the skills to correctly compile and present the results of experimental measurements.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[FIZMEDL3_U02] He can perform measurements of physical quantities, prepare, describe, and present the results of physical experiments, including the estimation of measurement uncertainties, and perform quantitative analyses and formulate qualitative conclusions based on them.	a. properly plans and conducts a simple physical experiment; b. critically evaluates the results of the experiment, discusses them, and formulates conclusions based on the observations recorded; c. presents and compares the measurement results using computer programs dedicated to data analysis.	[SU3] text preparation/written work [SU8] observation of student's independent or team work
[FIZMEDL3_W04] Knows and understands the role of a physical experiment and the elements of the theory of measurement uncertainty.	a. knows the basic issues of statistical data analysis used in the processing of measurement results; b. uses statistical data analysis to describe and explain specific physical processes.	[SW3] text preparation/written work
[FIZMEDL3_W05] Knows and understands the most important computational and programming techniques used to solve physical and medical problems, present results, and analyse data.	a. applies the basic principles of measurement data analysis in accordance with scientific methodology; b. uses computer tools to present measurement results in the form of graphs; c. the student is able to critically and professionally present, analyze, and draw conclusions from the experimental results obtained.	[SW3] text preparation/written work

Subject contents

1. Basic concepts (the concept of measurement, direct and indirect measurements, classification of measurement uncertainties, and rounding of results and measurement uncertainties).
2. Assessment of maximum uncertainty in indirect measurements using the total differential method.
3. Assessment of maximum uncertainty in indirect measurements using the logarithmic derivative method.
4. Mean value and standard uncertainty (deviation) of a series of direct measurements.
5. Mean value of a series of independent and dependent indirect measurements.
6. Combined standard uncertainty of a series of independent and dependent indirect measurements.
7. Linear regression method (fitting a linear function to experimental results).
8. Assessment of uncertainty when random and systematic uncertainties are comparable.

Prerequisites and co-requisites

High school level knowledge of mathematics.
Basic knowledge of simple EXCEL spreadsheets.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
no aplicable	51.0%	60.0%
no aplicable	51.0%	30.0%
no aplicable	0.0%	10.0%

Recommended reading

Basic literature	no aplicable
Supplementary literature	no aplicable
eResources addresses	

Example issues/ example questions/ tasks being completed

no aplicable

Work placement

Not applicable

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