



Subject card

Subject name and code	, PG_00058872						
Field of study	Nanotechnology						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2023/2024		
Education level	first-cycle studies	Subject group			Obligatory subject group in the field of study 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			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Instytut Nanotechnologii i Inżynierii Materiałowej -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Beata Bochentyn					
	Teachers	dr hab. inż. Beata Bochentyn dr hab. inż. Aleksandra Mielewczyk-Gryń					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	0.0	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	Acquiring the ability to describe the problem, plan and conduct an experiment leading to solving the problem, analyze, present and discuss the experimental results.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K6_U04	The student is able to plan an experiment, select appropriate measuring instruments, conduct an experiment, critically analyze the obtained results, assess measurement uncertainty and conduct a discussion.			[SU2] Assessment of ability to analyse information		
	K6_K04	The student knows how to work in a team.			[SK1] Assessment of group work skills		
	K6_U10	On the example of nanotechnology, the student is able to critically assess the risks associated with new technologies			[SU2] Assessment of ability to analyse information		
K6_W10	The student has knowledge in the field of planning and conducting a physical experiment.			[SW1] Assessment of factual knowledge			
Subject contents	Sources of scientific and non-scientific knowledge. The ability to plan a simple experiment. Ability to calculate the standard deviation of the average value of the results of many measurements. Ability to calculate the uncertainty of a complex quantity. Ability to create a chart (by hand and using computer software) based on tabular data and determine from the chart the basic parameter of the process described by the chart. Description with as much information as possible. Ability to select an appropriate measuring instrument for the planned measurement and to assess the uncertainty of the measurement made using this instrument. Rules for preparing reports from laboratory classes. Rules for preparing a scientific publication.						
Prerequisites and co-requisites	none						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	classes - scientific project		50.0%		50.0%		
	lecture - written exam		50.0%		50.0%		

Recommended reading	Basic literature	<p>B. Kusz, Metody wykonywania pomiarów oraz szacowanie niepewności pomiaru (https://pg.edu.pl/files/ftims/2021-03/wstep.pdf)</p> <p>K. Kozłowski, R. Zieliński I Laboratorium z Fizyki część I Wydawnictwo PG, 2003</p> <p>Zubek M, Experiments in physics. First laboratory for students, GUT Publishing House, 2009</p> <p>Dudkiewicz J, Kusz B, Laboratorium z Fizyki, część 2, Wydawnictwo Politechniki Gdańskiej, 2002</p> <p>Wstęp do analizy błędu pomiarowego, Wydawnictwo PWN</p> <p>Guide to the Expression of Uncertainty in Measurement, ISO, Switzerland 1995. Tłumaczenie: Wyrażanie niepewności pomiaru: Przewodnik, Główny Urząd Miar, Warszawa 1999.</p>
	Supplementary literature	none
	eResources addresses	<p>Adresy na platformie eNauczanie:</p> <p>Wprowadzenie do eksperymentu - Moodle ID: 38044 https://enauzanie.pg.edu.pl/moodle/course/view.php?id=38044</p>
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	