



Subject card

Subject name and code	Experiment design and analysis, PG_00061894						
Field of study	Materials Engineering						
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		
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			5.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Zakład nowych materiałów funkcjonalnych do konwersji energii -> Instytut Nanotechnologii i Inżynierii Materiałowej -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Jakub Karczewski					
	Teachers	dr hab. inż. Jakub Karczewski dr inż. Marta Przeźniak-Welenc dr inż. Radosław Pomećko dr inż. Marcin Łapiński dr inż. Bartłomiej Cieślak					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	30.0	0.0	0.0	60
	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	60	5.0		60.0		125
Subject objectives	The aim of the course is to familiarize the student with basic information regarding the process of planning, performing and publishing experimental data.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W06] Knows selected methods, techniques, tools and materials used in solving simple engineering problems within the scope of materials engineering.	The student is able to analyze a series of measurement data, present the results in the form of clear graphs, and analyze measurement uncertainties			[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation		
	[K6_U01] Can properly use selected analytical, simulation and experimental methods, as well as devices for measuring the fundamental properties of materials and technological processes.	The student is able to plan an experiment and conduct simple measurement experiments. Is able to correctly analyze the received measurement data			[SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task		
	[K6_U11] Is able to notice non-technical aspects when forming and solving project tasks, including environmental, economic and legal aspects. Applies the rules of occupational health and safety.	The student knows and understands the hazards in laboratory work. Student basic principles of research ethics.			[SU3] Assessment of ability to use knowledge gained from the subject		
	[K6_U02] Can operate typical laboratory equipment and analyze material tests	The student is able to plan an experiment and conduct simple measurement experiments. Is able to correctly analyze the received measurement data			[SU1] Assessment of task fulfilment [SU5] Assessment of ability to present the results of task		

Subject contents	<p>lectures/classes</p> <ul style="list-style-type: none"> • measurement errors and uncertainties; • measurements of complex quantities • statistical distribution of measurements • graphical presentation of results - linear regression • scientific method • formulating scientific hypotheses • research ethics • preparation of a scientific publication <p>lab:</p> <ul style="list-style-type: none"> • designing and conducting a simple experiment enabling statistical analysis of the collected measurement data • designing and conducting a simple experiment enabling the analysis of complex quantities • designing and conducting an experiment demonstrating the ability to formulate scientific hypotheses, analyze the results of complex values, graphically present results and report experimental data 											
Prerequisites and co-requisites	the student should have basic knowledge of mathematics at secondary school level											
Assessment methods and criteria	<table border="1" data-bbox="448 1088 1493 1267"> <thead> <tr> <th data-bbox="448 1088 794 1126">Subject passing criteria</th> <th data-bbox="794 1088 1141 1126">Passing threshold</th> <th data-bbox="1141 1088 1493 1126">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 1126 794 1182">exercises and a lecture in the form of a written test</td> <td data-bbox="794 1126 1141 1182">50.0%</td> <td data-bbox="1141 1126 1493 1182">50.0%</td> </tr> <tr> <td data-bbox="448 1182 794 1267">presentation of laboratory results in the form of a "scientific publication"</td> <td data-bbox="794 1182 1141 1267">50.0%</td> <td data-bbox="1141 1182 1493 1267">50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	exercises and a lecture in the form of a written test	50.0%	50.0%	presentation of laboratory results in the form of a "scientific publication"	50.0%	50.0%
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Example issues/ example questions/ tasks being completed	<ul style="list-style-type: none"> • calculate the standard deviation for the given series of experimental data • provide the sources of measurement uncertainties • draw a line graph from the given data, calculate the slope of the line and the fit coefficient 											
Work placement	Not applicable											