



Subject card

Subject name and code	Methodology of Experimental Research, PG_00038892						
Field of study	Chemistry						
Date of commencement of studies	February 2024	Academic year of realisation of subject			2023/2024		
Education level	second-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	1	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Pharmaceutical Technology and Biochemistry -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Tomasz Laskowski					
	Teachers	dr inż. Julia Borzyszkowska-Bukowska dr hab. inż. Tomasz Laskowski dr inż. Paweł Szczepblewski					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	30.0	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	5.0		15.0		50
Subject objectives	Understanding the basics of rational planning of experiments and the methods of analysis of the results of experimental studies						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K7_W03	Has knowledge of methods for developing analytical measurement results necessary to solve specific problems, also in the production plant.			[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge		
	K7_K02	Is aware of the responsibility for the correctness of the conclusions drawn from the results obtained.			[SK2] Assessment of progress of work [SK5] Assessment of ability to solve problems that arise in practice [SK4] Assessment of communication skills, including language correctness		
	K7_U03	Is able to predict the amount of work necessary to design a series of experiments and compile the results obtained.			[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment		
	K7_W02	Has solid, expanded knowledge necessary to solve technical and scientific problems.			[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge		

Subject contents	<p>The scope of the subject includes: 1. basic concepts of experimental statistics and (sample and population , measures of central tendency and dispersion, distribution of a random variable) 2. experimental design: the choice of sample size, distribution of sampling points in the independent variable space 3. statistical hypothesis testing: confidence intervals of the sample, comparing measurements from two or more series, tests of independence 4. methods of graphical presentation of the results 5. correlation and regression of variables</p> <p>Student: - performs its own statistical analysis of data using a spreadsheet computer program such as Excel, - prepare a reports describing the course of the data analysis and correct presentation, including graphical, of the results obtained.</p>		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Project	60.0%	20.0%
	Practical exercises	60.0%	80.0%
Recommended reading	Basic literature	J.Mazerski: "Statystyczna analiza wyników doświadczalnych", Wydawnictwo Malamut, Warszawa 2009J.Koronacki, J.Mielniczuk: Statystyka dla studentów kierunków technicznych i przyrodniczych. WN-T, W-wa 2001	
	Supplementary literature	E.Steiner: "Matematyka dla chemików", Wydawnictwo Naukowe PWN, Warszawa 2001S.Brandt: Analiza danych, Wydawnictwo Naukowe PWN, Warszawa 1998	
	eResources addresses	Adresy na platformie eNauczanie: Metodologia Pracy Doświadczalnej - letni 23/24 - Moodle ID: 38471 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=38471	
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> 1. design a set of measurements that allows you to compare yield of product under different reaction conditions 2. present graphically the results of measurements designed in p. 1 3. choose a statistical test to determine whether the studied synthesis conditions affect yield of the product 		
Work placement	Not applicable		