GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Methodology of Experimental Research, PG_00038892		
Field of study	Chemistry		
Date of commencement of studies	February 2026	Academic year of realisation of subject	2025/2026
Education level	second-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	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Pharmaceutical Technology and Biochemistry -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Julia Borzyszkowska-Bukowska	
	Teachers		

Lesson types

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_K02] is able to cooperate and work in a group, taking on different roles	Is aware of the responsibility for the correctness of the conclusions drawn from the results obtained.	[SK4] Assessment of communication skills, including language correctness [SK5] Assessment of ability to solve problems that arise in practice [SK2] Assessment of progress of work
[K7_W04] indicates methods for the synthesis of chemical compounds with defined properties	has knowledge of computational methods and computer programs used to analyze experimental data	[SW3] Assessment of knowledge contained in written work and projects
[K7_U01] integrates and interprets information from literature, databases and other sources	is able to analyze data using computer programs; is able to select the appropriate program to perform the analysis and correctly interpret the obtained results.	[SU4] Assessment of ability to use methods and tools

Subject contents

Course content – exercises

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

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.

Prerequisites and co-requisites

<table>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Practical exercises - tests</td><td>60.0%</td><td>80.0%</td></tr>
<tr><td>Project - assesment of project</td><td>60.0%</td><td>20.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>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</td></tr>
<tr><td>Supplementary literature</td><td>E.Steiner: "Matematyka dla chemików", Wydawnictwo Naukowe PWN, Warszawa 2001S.Brandt: Analiza danych, Wydawnictwo Naukowe PWN, Warszawa 1998</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">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</td></tr>
<tr><td>Practical activites within the subject</td><td colspan="2">Not applicable</td></tr>
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