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 2025	Academic year of realisation of subject	2024/2025
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		

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_W02	Has solid, expanded knowledge necessary to solve technical and scientific problems.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
K7_U03	Is able to predict the amount of work necessary to design a series of experiments and compile the results obtained.	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools
K7_K02	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_W03	Has knowledge of methods for developing analytical measurement results necessary to solve specific problems, also in the production plant.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects

<table>
<tr><td>Subject contents</td><td>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.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Practical exercises</td><td>60.0%</td><td>80.0%</td></tr>
<tr><td>Project</td><td>60.0%</td><td>20.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><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>Adresy na platformie eNauczanie:</td></tr>
</table>
</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>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>Work placement</td><td>Not applicable</td></tr>
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