GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Methodology of Experimental Research, PG_00039045		
Field of study	Biotechnology		
Date of commencement of studies	February 2022	Academic year of realisation of subject	2022/2023
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	2	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 inż. Paweł Szczeblewski	
	Teachers	dr inż. Julia Borzyszkowska-Bukowska Justyna Górska	

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	6.0	14.0	50

Subject objectives

Acquiring knowledge and skills in planning experimental research works as well as developing and interpreting the obtained research results thanks to the use of statistical methods.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K7_W10	Has knowledge of planning experiments responding to the posed research or technical task. Analyzes the obtained results measurements with statistical tools.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
K7_W11	Has knowledge of the specificity of biotechnological processes and the resulting limitations in the planning of experiments.	[SW1] Assessment of factual knowledge
K7_U09	Planning an experience responding to those placed research or technical task. Analyzes the obtained results measurements with statistical tools	[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information
K7_K04	Describes the influence of sources of variation occurring in the population general study results experimental. Applies experimental statistics to formulate questions allowing for a solution the given research task	[SK2] Assessment of progress of work [SK5] Assessment of ability to solve problems that arise in practice

Subject contents	The scope of the lecture includes: basic concepts of mathematical and experimental statistics planning of experiments: selection of the sample size, distribution of measurement points in space independent variable testing statistical hypotheses graphical methods of presentation of measurement results correlation and regression of variables During the calculation exercises, students will learn how to use computer programs a spreadsheet type (eg Excel) to analyze the measurement results. As part of my own work they independently analyze the data sets prepared by the teacher and prepare reports containing a description of the course of the analysis and the correct presentation, including graphical representation, of the results of the analysis.
Prerequisites and co-requisites	Preceding subjects: mathematics with elements of probability calculus and mathematical statistics, analytical chemistry with elements of metrology

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
written own works	60.0%	50.0%
test pass	60.0%	50.0%

Recommended reading

Basic literature	1. J. Mazerski: Statystyczna analiza danych doświadczalnych.wydawnictwo MALAMUT, Warszawa 20092. A. Łomnicki: Wprowadzenie do statystyki dla przyrodników. PWNWarszawa 19993. J. Koronacki, J. Mielniczuk: Statystyka dla studentów kierunków technicznych i przyrodniczych. PWN Warszawa 2001
Supplementary literature	1. J. Greń: Statystyka matematyczna: modele i zadania. PWNWarszawa 19782. A. Stanisz: Przystępny kurs statystyki. StatSoft Polska, Kraków 1998
eResources addresses	

Example issues/ example questions/ tasks being completed	1. Plan a set of measurements to compare product yield under different fermentation conditions 2. present graphically the results of the measurements planned in point 1 3. select a statistical test allowing to decide whether the tested fermentation conditions have an impact on the yield of the product
Work placement	Not applicable