GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	BIOSTATISTICS, PG_00063480		
Field of study	Biotechnology		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2025/2026
Education level	second-cycle studies	Subject group	Optional subject group Specialty subject group 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	2	Language of instruction	Polish
Semester of study	3	ECTS credits	1.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Faculty of Chemistry -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Anna Stanisławska-Sachadyn	
	Teachers	dr hab. inż. Anna Stanisławska-Sachadyn	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	15.0	0.0	0.0	0.0	15

E-learning hours included: 0.0

eNauczanie source addresses:

Moodle ID: 42609 BIOSTATYSTYKA
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=42609

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	15	2.0	8.0	25

Subject objectives

The aim of the biostatistics course is to present practical tools in the field of analysis of biological and biomedical variables using Excel and SAS (North Carolina, USA). The student acquires the skills necessary for designing and conducting scientific experiments and conducting research in the field of biotechnology, which is one of the objectives of education in the second cycle of the Biotechnology field. The subject deepens the student's bioinformatics knowledge. The student gains the ability to apply knowledge in the field of biostatistics.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_U08] prepares documentation of experiments and technological processes using professional terminology in biotechnology and related fields	The student is aware of the limitations, but also of the constant expansion of knowledge and technology; understands the need for lifelong learning and training. The student independently searches available databases for information necessary to conduct analyses.	[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
[K7_W01] defines the phenomena, processes and laws of living nature applied to the production of useful goods and the carrying out of services	Students can design experiments and analyze experimental results. Students can select appropriate statistical tests to interpret variables obtained from an experiment.	[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge

Subject contents

Course content – exercises
Descriptive statistics. Comparison of variable frequencies between groups. Comparison of the level of variables between groups - parametric and non-parametric methods. Correlation in biomedical analyses. Linear Regression. The importance of the regression coefficient in the description of biomedical data. Odds ratio. Logistic regression in case-control population analyses. Kaplan-Meier analysis. Construction of the research population. Explanation of terms: endpoints, truncated data. The problem of multiple comparisons in biomedical research.

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="3">Knowledge of mathematics, molecular biology, human genetics</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td></td><td>60.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">Presentations presented during classes and sent to the Teacher</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">Jerrold H. Zar, Biostatistical analysis, 5th ed., Pearson International Edition, 2010

Literature available at the Nanotechnology Library of the Gdańsk University of Technology</td></tr>
<tr><td>eResources addresses</td><td colspan="2"></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">Students perform statistical calculations using specialized software, present the results and discuss the results during subsequent classes:

1. Comparison of variable frequencies between groups.
2. Comparison of the level of variables between groups - parametric and non-parametric methods, paired and unpaired tests. Example: comparison of drug response between a study group and a control group.
3. Sample size in analyses, power of statistical test.
4. Assessment of normality of distribution.
5. Correlation. Linear Regression. The importance of the regression coefficient in the description of biomedical data.
6. Odds ratio. Logistic regression in case-control population analyses.
7. Kaplan-Meier analysis. Construction of the research population. Explanation of terms: endpoints, truncated data.</td></tr>
<tr><td>Practical activites within the subject</td><td colspan="3">Not applicable</td></tr>
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