University of Gdańsk

Subject card

Subject name and code	Statistics in biotechnology 2, PG_00153632		
Field of study	Biotechnology		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
Education level	Master's 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	academic	Assessment form	credit
Conducting unit	Intercollegiate Faculty of Biotechnology UG-MUG -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Adam Iwanicki	
	Teachers		

Lesson types

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

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	15	5.0	30.0	50

Subject objectives

The aim of the course is to teach students how to analyze experimental data using statistical methods with help of such programs as MS Excel or Past.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[BIOTECHMU2_U03] The graduate is able to work independently and in a team, including acting as a leader, demonstrating social maturity, empathy and responsibility for the team and the decisions made.	Student is capable of working independently and as a member of a team accordingly to a assigned role.	[SU8] observation of student's independent or team work
[BIOTECHMU2_U02] The graduate is able to collect and interpret empirical data; use statistical methods and IT tools in data analysis; formulate conclusions based on empirical data.	Student is capable of performing a statistical analysis of experimental data. Student is capable of making inference based on results of statistical tests.	[SU5] implementation of a problem task
[BIOTECHMU2_W05] The graduate possesses in-depth knowledge of methods used in the field of exact and natural sciences, necessary to understand biological phenomena and processes at the molecular level, and the connection of this knowledge with medical sciences.	Student knows statistical methods of analysis of experimental data that can help in solving asked research questions.	[SW5] implementation of a problem task

<table>
<tr><td>Subject contents</td><td>1. Proper planning of an experiment.
2. Preparation of experimental data to statistical analysis.
3. Selection of appropriate method of graphical presentation of experimental data.
4. Verification of statistical hypotheses. Calculation of statistical power.
5. Introduction to linear models.
6. Parametric and non-parametric analysis of variance.
7. Linear regression analysis with selection of contributing explanatory variables</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Statistics or equivalent</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>Content of the course</td><td>51.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>1. Robert R. Sokal F. "Introduction to biostatistics", Dover Publications
2. A course prepared in Portal Edukacyjny UG</td></tr>
<tr><td>Supplementary literature</td><td>N/A</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>1. What kind of variables can be identified in the experiment in which we analyzed expression of dnaA gene in E. coli cells in different growth phases.

2. Plan an experiment in which we would like to analyze efficiency of apoptosis induction in HeLa cells treated with doxorubicin. Ask a biological question, make biological and statistical hypotheses, propose methods of statistical analysis of obtained results.

3. Use appropriate statistical test to analyze data coming form experiment in which we tested influence of UV of S. aureus cells, according to provided results. Remember about making statistical hypotheses and interpreting results of performed statistical test.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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