

Subject card

Subject name and code	Statistics in biotechnology 2, PG_00153632						
Field of study	Biotechnology						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2025/2026		
Education level	Master's 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	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_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.		Student knows statistical methods of analysis of experimental data that can help in solving asked research questions.		[SW5] implementation of a problem task		
	[BIOTECHMU2_U03] The graduate is able to work independently and in a team; be flexible when working in a team and accept various roles and tasks, including the role of a group leader.		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		
Subject contents	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						

Prerequisites and co-requisites	Statistics or equivalent		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Content of the course	51.0%	100.0%
Recommended reading	Basic literature	1. Robert R. Sokal F. "Introduction to biostatistics", Dover Publications 2. A course prepared in Portal Edukacyjny UG	
	Supplementary literature	N/A	
	eResources addresses		
Example issues/ example questions/ tasks being completed	1. What kind of variables can be identified in the experiment in which we analyzed expression of <i>dnaA</i> gene in <i>E. coli</i> 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 <i>S. aureus</i> cells, according to provided results. Remember about making statistical hypotheses and interpreting results of performed statistical test.		
Work placement	Not applicable		

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