University of Gdańsk

Subject card

Subject name and code	Statistics with elements of mathematics in biological sciences, PG_00198281						
Field of study	Genetics and Experimental Biology						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2026/2027		
Education level	Bachelor'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	1		ECTS credits		2.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Laboratory of Plant Physiology and Toxicology -> Department of Experimental Biology and Plant Biotechnology -> Faculty of Biology -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Agnieszka Baścik-Remisiewicz				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	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	1. To prepare students to use basic methods of statistical analysis and to apply them in the interpretation of biological phenomena and processes. 2. To acquaint students with the tools of mathematics necessary to understand the laws of nature and to describe life processes.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[GBEL3_K07] The graduate is prepared to: lifelong learning and updating of knowledge in molecular genetics and other fields.	The graduate understands the need for lifelong learning and updating their knowledge of molecular genetics, statistics and mathematics and related disciplines.	[SK8] observation of student's independent or team work
[GBEL3_U01] The graduate is able to: independently perform practical tasks in the biological and related sciences, formulate research problems, analyse their results and draw conclusions.	The graduate is able to independently perform practical tasks in the field of statistics and mathematics, formulate research problems, analyze their results and draw conclusions.	[SU4] test/exam - oral or written
[GBEL3_W02] A graduate has an advanced knowledge and understanding of:: knowledge of mathematics, physics and chemistry to the extent necessary for understanding biological phenomena and processes and their application in research methodology.	The graduate has the knowledge of mathematics to the extent necessary to understand biological phenomena and processes and their application in research methodology.	[SW4] test/exam - oral or written
[GBEL3_W05] A graduate has an advanced knowledge and understanding of: principles for planning research based on the achievements of biological sciences and related disciplines and the possibility of putting their results into practice, principles for the operation of equipment and apparatus used in molecular genetics research, and the principle of interpreting biological phenomena and processes based on empirical data in research work and practical action, taking into account the sustainable use of biodiversity.	The graduate has knowledge of the principles of planning research based on the achievements of biological sciences and related fields and the possibility of using the results in practice, the graduate knows the principle of interpreting biological phenomena and processes based on empirical data in research work and practical activities.	[SW4] test/exam - oral or written

Subject contents

Statistics: Basic concepts of statistics (types of variables, types of scales, rules for approximating numbers, histograms). Descriptive statistics: samples size, arithmetic, geometric and harmonic mean, variance, standard deviation, coefficient of variation, standard error, median and modal value, skewness, confidence interval. Binomial and normal distributions. Statistical hypothesis testing. Homogeneity of variance (Snedecor's F test). Student's t-test. One-way analysis of variance and Kruskal-Wallis test. The chi-square test. Selected non-parametric tests. Correlation and simple regression.

Mathematics: Introduction to the calculus of probability. Number sequences and series. Derivative of a function and its application. Integral calculus of functions of one variable: the indeterminate and determinate integral, methods of calculating integrals and their application. Real and imaginary numbers. Actions on matrices.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
written test	51.0%	100.0%

Recommended reading

Basic literature	Baścik-Remisiewicz A., Chincinska I., Miklaszewska M. 2020. Wybrane zagadnienia ze statystyki i matematyki. Przewodnik do ćwiczeń dla studentów biologii. Wydawnictwo Uniwersytetu Gdańskiego Łomnicki A. 2014. (lub wydania wcześniejsze). Wprowadzenie do statystyki dla przyrodników. PWN, Warszawa. Krysicki W., Włodarski L. 2015. (lub wydania wcześniejsze). Analiza matematyczna w zadaniach. Część I i II. PWN, Warszawa
Supplementary literature	Wrzosek D. 2010. (lub wydania wcześniejsze). Matematyka dla biologów. Wydawnictwo Uniwersytetu Warszawskiego.
eResources addresses	

Example issues/ example questions/ tasks being completed

Work placement	Not applicable

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