University of Gdańsk

Subject card

Subject name and code	Statistics with elements of mathematics in biological sciences, PG_00196808		
Field of study	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 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	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	2.0	18.0	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
[BIOLL3_U04] The graduate is able to apply statistical methods and computer algorithms and techniques to the description of phenomena and the analysis of biological data	The graduate is able to apply basic statistical and mathematical methods to description of phenomena and analysis of biological data.	[SU4] test/exam - oral or written
[BIOLL3_W11] The graduate knows and understands at an advanced level the methods of statistical analysis and their importance in the interpretation of phenomena and processes	The graduate knows and understands the basic methods of statistical analysis and their importance in the interpretation of biological phenomena and processes.	[SW4] test/exam - oral or written
[BIOLL3_K01] The graduate is prepared to evaluate his/her own knowledge, understand the need for continuous learning and development, and is open to new ideas	The graduate knows the limitations of his/her own knowledge and understands the need for continuous learning and development and is open to new ideas.	[SK8] observation of student's independent or team work
[BIOLL3_W08] The graduate knows the tools of mathematics necessary to understand the laws of nature and to describe life processes	The graduate knows and understands the tools of mathematics necessary to understand the laws of nature and to describe life processes.	[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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