

Subject card

Subject name and code	Statistics with elements of mathematics in biological sciences, PG_00129307						
Field of study	Biology						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2025/2026		
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		dr Agnieszka Baścik-Remisiewicz				
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_W11] The graduate knows 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_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
	[BIOLL3_U04] The graduate will be 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_K01] The graduate is prepared to evaluate their 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
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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