

Subject card

Subject name and code	Statistics with elements of mathematics in biological sciences, PG_00198108						
Field of study	Natural Resources Conservation						
Date of commencement of studies	October 2026	Academic year of realisation of subject			2027/2028		
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	2	Language of instruction			Polish		
Semester of study	3	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		4.0		16.0	50
Subject objectives	<p>1. To prepare students to use basic methods of statistical analysis and to apply them in the interpretation of biological phenomena and processes.</p> <p>2. To acquaint students with the tools of mathematics necessary to understand the laws of nature and to describe life processes.</p>						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[OZPL3_W12] The graduate possesses knowledge of statistical methods and IT tools relevant to the field of study.		The graduate has knowledge of the use of statistical methods in the field related to the field of study.			[SW4] test/exam - oral or written	
	[OZPL3_W08] The graduate possesses advanced knowledge and understanding of data analysis tools required to comprehend natural laws and describe biological processes		The graduate know and understand the tools of mathematics and statistics necessary to understand the laws of nature and to describe biological processes.			[SW4] test/exam - oral or written	
	[OZPL3_U05] The graduate is able to apply basic statistical methods and computer techniques and tools to describe phenomena and analyse biological data		The graduate is able to apply basic statistical and mathematical methods to describe phenomena and analysis of biological data.			[SU4] test/exam - oral or written	
	[OZPL3_K01] The graduate is ready to recognise the limitations in his/her own knowledge and understands the need for continuous learning and development		The graduate is ready to recognise the imitations in his/her own knowledge and understand the need for continuous learning and development.			[SK8] observation of student's independent or team work	

Subject contents	<p>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.</p> <p>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.</p>		
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	<p>Baścik-Remisiewicz A., Chincinska I., Miklaszewska M. 2020. Wybrane zagadnienia ze statystyki i matematyki. Przewodnik do ćwiczeń dla studentów biologii. Wydawnictwo Uniwersytetu Gdańskiego</p> <p>Łomnicki A. 2014. (lub wydania wcześniejsze). Wprowadzenie do statystyki dla przyrodników. PWN, Warszawa.</p> <p>Krysicki W., Włodarski L. 2015. (lub wydania wcześniejsze). Analiza matematyczna w zadaniach. Część I i II. PWN, Warszawa.</p>	
	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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