

Subject card

Subject name and code	Statistics with elements of mathematics in biological sciences, PG_00146879						
Field of study	Genetics and Experimental Biology						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2024/2025		
Education level	undergraduate studies	Subject group					
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					
Conducting unit	Pracownia Fizjologii Roślin i Toksykologii -> Katedra Biologii Eksperymentalnej i Biotechnologii Roślin -> Faculty of Biology						
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	0.0	30.0	0.0	0.0	0.0	30
	E-learning hours included: 0.0						
	Additional information: solving tasks in groups or/and individual work						
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		10.0		10.0	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
	[GBEL3_K07] Lifelong learning and updating knowledge in the field of molecular genetics and other disciplines.	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_W05] the principles of research planning based on achievements in biological sciences and related fields, the potential application of their results in practice, the principles of 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 and practical activities, with consideration for sustainable use of biological diversity.	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 [SW5] implementation of a problem task
	[GBEL3_U02] Utilize computer programs for performing analyses and calculations, as well as utilize databases and bioinformatics tools to solve biological problems.	The graduate is able to choose an appropriate computer program used for statistical analysis of research results in the field of biological sciences.	[SU8] observation of student's independent or team work
	[GBEL3_U01] Independently perform practical tasks in the field of biological sciences and related disciplines, formulate research problems, analyze their results, and draw conclusions.	The graduate is able to independently perform practical tasks in the field of statistics and mathematics, formulate research problems, analyse their results and draw conclusions.	[SU4] test/exam - oral or written [SU5] implementation of a problem task [SU8] observation of student's independent or team work
[GBEL3_W02] Knowledge of mathematics, physics, and chemistry is necessary for understanding biological phenomena and processes, as well as 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 [SW5] implementation of a problem task	
Subject contents	<p>Examples of practical application of selected statistical and mathematical methods covered in the lecture topics.</p> <p>Statistics: Basic concepts of statistics (types of variables, rules for approximating number). Descriptive statistics: sample size, arithmetic mean, variance, standard deviation, standard error. Binomial and normal distributions. Statistical hypothesis testing. Homogeneity of variance (Snedecor's F test). Student's t-test. One-way analysis of variance.</p> <p>Mathematics: Introduction to the calculus of probability. Number sequences. 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.</p>		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	statistics exam	51.0%	60.0%
	mathematics exam	51.0%	40.0%
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	Adresy na platformie eNauczanie:	

Example issues/ example questions/ tasks being completed	
Work placement	Not applicable

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