University of Gdańsk

Subject card

Subject name and code	Statistics with elements of mathematics in biological sciences, PG_00198107		
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	3.0
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	0.0	30.0	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	8.0	37.0	75

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
[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 [SW5] implementation of a problem task
[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 [SW5] implementation of a problem task
[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
[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 [SU5] implementation of a problem task [SU8] observation of student's independent or team work

<table>
<tr><td>Subject contents</td><td>Examples of practical application of selected statistical and mathematical methods covered in the lecture topics.

Statistics: Basic concepts of statistics (types of variables, principles of number approximation). 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.

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.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>mathematics exam</td><td>51.0%</td><td>40.0%</td></tr>
<tr><td>statistics exam</td><td>51.0%</td><td>60.0%</td></tr>
</table></td></tr>
<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>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.</td></tr>
<tr><td>Supplementary literature</td><td>Wrzosek D. 2010. (lub wydania wcześniejsze). Matematyka dla biologów. Wydawnictwo Uniwersytetu Warszawskiego.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
</table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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