



## Subject card

Subject name and code	BIOSTATISTICS, PG_00069902						
Field of study	InfoBioChem						
Date of commencement of studies	February 2026		Academic year of realisation of subject			2025/2026	
Education level	second-cycle 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 Polish	
Semester of study	1		ECTS credits			2.0	
Learning profile	general academic profile		Assessment form			assessment	
Conducting unit	Department of Biotechnology and Microbiology -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Anna Stanisławska-Sachadyn				
	Teachers		dr hab. inż. Anna Stanisławska-Sachadyn				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	0.0	0.0	30
	E-learning hours included: 0.0						
	eNauczenie source address: <a href="https://enauczanie.pg.edu.pl/2025/course/section.php?id=47110">https://enauczanie.pg.edu.pl/2025/course/section.php?id=47110</a> Moodle ID: 5396 Biostatystyka <a href="https://enauczanie.pg.edu.pl/2025/course/view.php?id=5396">https://enauczanie.pg.edu.pl/2025/course/view.php?id=5396</a>						
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	The aim of the biostatistics course is to present practical tools in the field of analysis of biological and biomedical variables using Excel and SAS (North Carolina, USA). SAS is the most widely used statistical analysis tool in industry and research. The student acquires the skills necessary for designing and conducting scientific experiments and conducting research in the field of biotechnology, which is one of the objectives of education in the second cycle of the Biotechnology field. The subject deepens the student's bioinformatics knowledge. The student gains the ability to apply knowledge in the field of biostatistics.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_U01] is able to use databases in the field of exact and natural sciences - appropriate to the educational program InfoBioChem	The student is able to search for and retrieve scientific information from specialized databases in the fields of biotechnology, bioinformatics, and natural sciences. The student is able to use selected biological and biochemical databases to obtain and interpret scientific data. The student is able to critically evaluate the quality and relevance of information obtained from scientific databases. The student is able to organize, analyze, and interpret data retrieved from databases for research or technological purposes.	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task
	[K7_U06] is able to obtain information from literature, databases, and other appropriately selected sources, also in English; is able to integrate the obtained information, interpret it, and draw conclusions	The student is able to apply statistical methods to the design of experiments and technologies, the analysis of experimental results and technological processes, and the solving of problems in the field of biotechnology. The student is also able to use biotechnological databases. The student has the following skills: comparing the frequency of variables between groups, comparing the levels of variables between groups, assessing changes over time, determining sample size in analyses, determining the power of a statistical test, assessing the normality of distribution, evaluating the correlation of continuous variables, performing linear regression using biomedical data, conducting odds ratio analyses, performing logistic regression in case-control population analyses, and carrying out Kaplan-Meier analysis in groups where an endpoint occurred in some cases.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools
[K7_W04] has knowledge of mathematical statistics to the extent necessary to understand, describe, and model chemical processes with a deeper level of complexity	The student knows and is able to select and apply appropriate statistical methods for processing experimental data in biochemistry and biotechnology. The student can evaluate and interpret statistical results to support decision-making in biochemical research and technological processes. The student is able to design experiments and simulations considering statistical principles to ensure reliable and reproducible outcomes. The student is able to critically assess the applicability and limitations of statistical models in data analysis	[SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects	
Subject contents	Course content – laboratory Descriptive statistics. Comparison of variable frequencies between groups. Comparison of variable levels between groups - parametric and nonparametric methods. Correlation in biomedical analyses. Linear regression. The importance of the regression coefficient in describing biomedical data. Odds ratio. Logistic regression in case-control population analyses. Kaplan-Meier analysis. Construction of the research population. Explanation of terms: endpoints, censored data. The problem of multiple comparisons in biomedical research.		
Prerequisites and co-requisites	Basic knowledge of mathematics, advanced knowledge in biochemistry, molecular biology, human genetics		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		60.0%	100.0%
Recommended reading	Basic literature	Presentations given during classes	

	Supplementary literature	<p>Jerrold H. Zar, Biostatistical analysis, 5th ed., Pearson International Edition, 2010</p> <p>Literature available at the Nanotechnology Library of the Gdańsk University of Technology</p>
	eResources addresses	
Example issues/ example questions/ tasks being completed	<p>Students perform statistical calculations using specialized software, present the results in subsequent classes, and discuss the results:</p> <ul style="list-style-type: none"> <li>• Comparison of variable frequencies between groups.</li> <li>• Comparison of variable levels between groups - parametric and nonparametric methods, paired and unpaired tests. Example: comparison of drug response between the study and control groups.</li> <li>• Sample size in analyses, power of statistical tests.</li> <li>• Assessment of normality of distribution.</li> <li>• Correlation. Linear regression. The importance of the regression coefficient in describing biomedical data.</li> <li>• Odds ratio. Logistic regression in case-control population analyses.</li> <li>• Kaplan-Meier analysis. Construction of the study population. Explanation of terms: endpoints, censored data.</li> </ul>	
Practical activities within the subject	Not applicable	

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