

Subject card

Subject name and code	Biotechnology in medicine - Therapies and medical technologies Methodology (M05_B3), PG_00197650						
Field of study	Biotechnology						
Date of commencement of studies	October 2025	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	3	Language of instruction			Polish		
Semester of study	5	ECTS credits			2.0		
Learning profile	academic	Assessment form			credit		
Conducting unit	UG Institute of Biotechnology -> Intercollegiate Faculty of Biotechnology UG-MUG -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Grzegorz Gołuński				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	20.0	0.0	0.0	20
	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	20	5.0	25.0	50		
Subject objectives	The aim of the course is familiarization of the student with the applications of selected methods of statistical analysis in biotechnology, especially in its medical aspect.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[BIOTECHL3_U03] The graduate applies mathematical and statistical methods to describe phenomena and analyze data and is able to use professional databases used in biotechnology.	The student(s) will understand the fundamental statistical techniques used in medical biotechnology, such as regression analysis, multivariate approaches, parametric (Student's t, ANOVA), and non-parametric (Mann-Whitney U, Wilcoxon) tests. The concepts of biological experiment design, such as sampling, randomization, and confounding variable control, are also understood by the student (s).			[SU1] oral statement/conversation/discussion [SU3] text preparation/written work [SU4] test/exam - oral or written		

Subject contents	Verification of statistical hypothesis and selected issues of statistical inference a) parametric and non-parametric tests, criteria for selecting tests of differences significance b) comparison of two samples: Student's t-test, Cochran-Cox test c) non-parametric equivalents of the Student's t-test (Mann-Whitney test, Wilcoxon test; Wald-Wolfowitz runs test, Kolmogorov-Smirnov test) d) one-way analysis of variance (ANOVA), post-hoc tests e) non-parametric equivalents of analysis of variance (Kruskal-Wallis test, Friedman test) f) analysis of qualitative data (chi-square test, Fisher's exact test, Yates correction) g) introduction to the analysis of interdependence of phenomena (correlation, regression, R coefficients, R square)		
Prerequisites and co-requisites	Knowledge of the Modules 01-04 contents		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	practical test	51.0%	70.0%
	oral exam	51.0%	15.0%
	report	51.0%	15.0%
Recommended reading	Basic literature	<ul style="list-style-type: none"> • Materials provided by the lecturer • Andrzej Stanisław, Przystępny kurs statystyki. Tom 1. Statystyki podstawowe, Wydawnictwo StatSoft, Kraków 2006 	
	Supplementary literature	<ul style="list-style-type: none"> • Andrzej Balicki, Wiesława Makać, Metody wnioskowania statystycznego, Wydawnictwo UG, Gdańsk 2010 • Włodzimierz Meissner, Metody statystyczne w Biologii, Wydawnictwo UG, Gdańsk 2011 • Wiesława Makać, Danuta Urbanek-Krzysztofiak; Metody opisu statystycznego, Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk 2020 • Tomasz Górecki; Podstawy statystyki z przykładami w R, Wydawnictwo BTC, Legionowo 2011 	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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