

Subject card

Subject name and code	Mathematics, PG_00188256						
Field of study	Matematyka (Wykład)						
Date of commencement of studies	October 2026		Academic year of realisation of subject			2026/2027	
Education level	Bachelor's studies		Subject group			Obligatory subject group 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	academic		Assessment form			exam	
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr Elżbieta Mrożek				
	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		5.0		15.0	50
Subject objectives	The aim of the course is to familiarize the student with the basic concepts of higher mathematics.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[AKRL3_W01] The graduate knows and understands, at an advanced level, the laws and theories in the field of chemistry, as well as the basics of biology, mathematics and law constituting general knowledge in the scientific disciplines forming the theoretical foundations relevant to the study program.		The student has knowledge of mathematics, including linear algebra with geometry, probability and statistics.			[SW4] test/egzamin - ustny lub pisemny	
	[AKRL3_U07] The graduate is able to communicate using specialist terminology in chemistry and forensic science while working in interdisciplinary teams.		The student is able to present the results of mathematical and statistical analyses in a form understandable to specialists in the fields of chemistry and forensics, using appropriate mathematical language and analytical terminology, and cooperate in a team in developing numerical data and interpreting results.			[SU4] test/egzamin - ustny lub pisemny	
	[AKRL3_K01] The graduate is ready to critically evaluate their own knowledge, understand its importance for solving cognitive and practical problems, and to seek expert opinions when necessary.		The student is able to critically evaluate the results of his/her own calculations and mathematical analyses, recognize the limitations of the methods used, seek additional sources of knowledge and, in justified cases, consult with experts in order to correctly interpret the results.			[SK4] test/egzamin - ustny lub pisemny	

Subject contents	1. Introduction to Mathematics in Data Analysis -The importance of mathematical methods in forensic analysis. -Basic data types and their numerical representation. 2. Basics of Linear Algebra -The concepts of vectors and vector spaces. -Matrices: types, structure, and representation of multidimensional data. -Basic matrix operations: addition, multiplication, determinant, and inverse matrix. -Applications of Linear Algebra in Forensic Analysis 3. Systems of Linear Equations - Methods for solving systems of equations: - substitution method, - Gaussian elimination method, - using matrices and matrix inverses. -Interpreting Systems of Equations in Phenomena Modeling 4. Probability Theory -Random Events and the Event Space -Principles of Calculating Probability Conditional -Probability and Independence of Events -Simple Probabilistic Models Applications in Forensic Science 5. Correlation and Regression -Correlation Coefficient: Interpretation, Range, and Limitations -Linear Relationships Between Variables -Linear Regression -Applications in Forensic Science
Prerequisites and co-requisites	

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	exam	51.0%	100.0%
Recommended reading	Basic literature	1. Teresa Jurlewicz, Zbigniew Skoczylas: "Linear Algebra 1 Examples and Problems," GiS Publishing House, Wrocław 2000. 2. M. Gewert, Z. Skoczylas: "Introduction to Analysis and Algebra," GiS Publishing House 2011. 3. N. Józefacka, M. Kołek, A. Arciszewska-Leszczuk, Methodology and Statistics. A Guide for the Scientific Tourist, PWN Scientific Publishing House, Warsaw 2023. 4. J. Jakubowski, R. Sztencel, Introduction to Probability, SCRIPT, 2010. 5. H. Jasiulewicz, W., Probability Calculus and Mathematical Statistics, GiS Publishing House.	
	Supplementary literature	not aviable	
	eResources addresses		
	Example issues/ example questions/ tasks being completed		
Work placement	Not applicable		

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