University of Gdańsk

Subject card

Subject name and code	Mathematics, PG_00205382						
Field of study	Medical Physics						
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			
Semester of study	1		ECTS credits	6.0			
Learning profile	academic		Assessment form	credit			
Conducting unit	Faculty of Mathematics, Physics and Informatics -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Tomasz Człapiński					
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	75.0	0.0	0.0	0.0	75
	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	75		0.0		75.0	150
Subject objectives	Equipping the student with the mathematical tools necessary to describe physical phenomena.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[FIZMEDL3_U01] He can formulate, analyse, and solve complex problems in physics and medicine, using mathematical formalism, based on the physical phenomena, principles, and theories he has learned.	Is able to: compute derivatives of functions given by formulas, apply differential calculus to study the behavior of functions, calculate indefinite integrals using integration by parts and substitution, solve simple first-order ordinary differential equations and second-order linear equations, use vector calculus, perform algebraic operations on matrices, determine eigenvalues and eigenvectors of square matrices.	[SU3] text preparation/written work
[FIZMEDL3_W03] Knows and understands at an advanced level the most important topics of higher mathematics, including statistics, to the extent necessary for the quantitative description, understanding and modelling of physical and medical processes.	Knows: The basic rules of differentiation for a single-variable function. The fundamental applications of differential calculus. The rules for the integration of a single-variable function. The basic types of first- and second-order differential equations and methods for their solution. The principles of vector calculus and matrix calculus. Methods for determining eigenvalues and eigenvectors.	[SW3] text preparation/written work
[FIZMEDL3_K01] He is ready for a critical evaluation of his own knowledge and the information he receives, and understands the need for further education and for improving professional and personal competencies.	Understands the need to verify the principles and solutions applied. Can use literature to expand and verify their knowledge. Can critically use internet resources to expand and verify their knowledge.	[SK5] implementation of a problem task

Subject contents

Block 1 (10 hours)

The concept of a function, one-to-one functions, onto functions, bijections, inverting functions, elementary functions, solving equations, solving inequalities, systems of equations.

Block 2 (30 hours)

The intuitive definition of a function's derivative at a point, the intuitive definition of the derivative as a function, the differential of a function, monotonicity and local extrema of a function, derivatives of elementary functions, rules for differentiating sums, products, quotients, and composite functions, calculation of partial derivatives of multivariable functions, indefinite and definite integrals, formulas for integrals derived from knowledge of differentiation, rules of integration (by parts, by substitution), simple ordinary differential equations.

Block 3 (20 hours)

Vector and matrix calculus, determining eigenvalues and eigenvectors.

Prerequisites and co-requisites

High school-level knowledge of mathematics.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
implementation of a problem task	51.0%	50.0%
written work	51.0%	50.0%

Recommended reading

Basic literature	not applicable
Supplementary literature	not applicable
eResources addresses	

Example issues/ example questions/ tasks being completed

not applicable

Work placement

Not applicable

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