

**Subject card**

<b>Subject name and code</b>	Mathematics, PG_00205382						
<b>Field of study</b>	Medical Physics						
<b>Date of commencement of studies</b>	October 2026	<b>Academic year of realisation of subject</b>				2026/2027	
<b>Education level</b>	Bachelor's studies	<b>Subject group</b>			Obligatory subject group in the field of study		
<b>Mode of study</b>	full-time studies	<b>Mode of delivery</b>			at the university		
<b>Year of study</b>	1	<b>Language of instruction</b>			Polish		
<b>Semester of study</b>	1	<b>ECTS credits</b>			6.0		
<b>Learning profile</b>	academic	<b>Assessment form</b>			credit		
<b>Conducting unit</b>	Faculty of Mathematics, Physics and Informatics -> Rector						
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		dr hab. Tomasz Człapiński				
	<b>Teachers</b>						
<b>Lesson types</b>	<b>Lesson type</b>	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	<b>Number of study hours</b>	0.0	75.0	0.0	0.0	0.0	75
	E-learning hours included: 0.0						
<b>Learning activity and number of study hours</b>	<b>Learning activity</b>	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	<b>Number of study hours</b>	75		0.0		75.0	150
<b>Subject objectives</b>	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	<p>Block 1 (10 hours)</p> <p>The concept of a function, one-to-one functions, onto functions, bijections, inverting functions, elementary functions, solving equations, solving inequalities, systems of equations.</p> <p>Block 2 (30 hours)</p> <p>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.</p> <p>Block 3 (20 hours)</p> <p>Vector and matrix calculus, determining eigenvalues and eigenvectors.</p>		
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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