

**Subject card**

<b>Subject name and code</b>	Mathematics in Physics, PG_00193386						
<b>Field of study</b>	Medical Physics						
<b>Date of commencement of studies</b>	October 2025	<b>Academic year of realisation of subject</b>				2025/2026	
<b>Education level</b>	Bachelor's studies	<b>Subject group</b>				Obligatory subject group in the field of study Optional subject group	
<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>	2	<b>ECTS credits</b>				3.0	
<b>Learning profile</b>	academic	<b>Assessment form</b>				credit	
<b>Conducting unit</b>							
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		dr Joanna Gondek				
	<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	45.0	0.0	0.0	0.0	45
	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>	45		0.0		30.0	75
<b>Subject objectives</b>	The aim of the course Mathematics in Physics is to consolidate and deepen students' understanding of the mathematical concepts they learned in the course Mathematics (1st semester) and to introduce elements of higher algebra (complex numbers, matrix calculus, tensor calculus). Mathematical concepts will be discussed from the point of view of their applications in physics, and physical equations will be discussed as examples of mathematical concepts.						

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.	The student is able to adequately apply the mathematical concepts learned in the course to describe physical phenomena (mechanical, electromagnetic, nuclear). They are able to solve practical problems related to the topics discussed in class and interpret the results obtained.	[SU1] oral statement/conversation/discussion [SU3] text preparation/written work
	[FIZMEDL3_W01] Knows and understands at an advanced level the phenomena, principles, laws and theories specific to physics and biophysics.	The student knows and understands the regularities of physical phenomena classified as mechanics, electromagnetism, nuclear physics, and the theories and models used to describe them.	[SW1] oral statement/conversation/discussion [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.	The student is aware of the limitations of: – their own knowledge and abilities, – physics as a science. The student is aware of the importance of: – their own work in studying, – critical thinking skills, – discussion skills, – rigorous reasoning and precise formulation of issues.	[SK1] oral statement/conversation/discussion [SK3] 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.	The student knows and understands the concepts of differential, integral, tensor, and matrix calculus in the context of their applications to the description of mechanical, electromagnetic, and nuclear phenomena. They understand the role and importance of mathematics in the development of physics and science in general.	[SW1] oral statement/conversation/discussion [SW3] text preparation/written work	
Subject contents	Differential calculus, integral calculus, matrix calculus, complex number calculus, tensor calculus in mechanics, electromagnetism, and nuclear physics		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		51.0%	95.0%
		0.0%	5.0%
Recommended reading	Basic literature	-	
	Supplementary literature	-	
	eResources addresses		
Example issues/ example questions/ tasks being completed	-		
Work placement	Not applicable		

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