

Subject card

Subject name and code	Basic Mathematics, PG_00182286						
Field of study	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			9.0		
Learning profile	academic	Assessment form			credit		
Conducting unit	Faculty of Mathematics, Physics and Informatics -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Joanna Gondek				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	120.0	0.0	0.0	0.0	120
	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	120		0.0		105.0	225
Subject objectives	Equipping students with the mathematical tools necessary to describe physical phenomena.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[FIZL3_W04] knows the methods of higher mathematics, including differential and integral calculus of functions of one and many variables, and the basics of algebra to the extent necessary to describe physical phenomena and solve physical problems	The student knows and understands: <ul style="list-style-type: none"> – the basics of vector calculus, – the concept of a mathematical function as a basic tool for describing quantitative quantities, – elementary mathematical functions, – the intuitive definition of the derivative of a function at a point and its geometric interpretation, – applications of the derivative of a function at a point, – the intuitive definition of indefinite and definite integrals, – the significance of differential equations. 	[SW3] text preparation/written work
	[FIZL3_U01] can use advanced mathematical formalism to define, describe, and solve problems in physics	The student is able to: <ul style="list-style-type: none"> – use vector calculus, – use the concept of a mathematical function to describe the relationship between quantitative quantities, – calculate the derivative of a function at a point, – determine the monotonicity of a function, – find a derivative as a function, – calculate derivatives of functions, – calculate partial derivatives of functions of several variables, – calculate simple integrals using formulas for integration by parts and substitution. – solve simple integral equations. 	[SU3] text preparation/written work

Subject contents	<p>Block 1. (60 hours):</p> <p>the concept of a function,</p> <p>multivalued functions, bijections,</p> <p>inverse functions</p> <p>elementary functions</p> <p>solving equations</p> <p>solving inequalities</p> <p>systems of equations</p> <p>integration rules (by parts, by substitution)</p> <p>simple ordinary differential equations</p> <p>Block 2. (60 hours):</p> <p>vector calculus</p> <p>intuitive definition of the derivative of a function at a point</p> <p>intuitive definition of the derivative as a function</p> <p>monotonicity and local extrema of functions</p> <p>derivatives of elementary functions</p> <p>rules for differentiating sums, products, quotients of functions, composite functions</p> <p>calculating partial derivatives of functions of several variables</p> <p>differential of a function</p> <p>indefinite and definite integrals</p> <p>formulas for integrals resulting from knowledge of differentiation</p>		
Prerequisites and co-requisites	Knowledge of mathematics at the basic secondary school level		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	colloquium	51.0%	100.0%
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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