



Subject card

Subject name and code	Elementary Mathematics, PG_00047357						
Field of study	Electronics and Telecommunications						
Date of commencement of studies	October 2026	Academic year of realisation of subject			2026/2027		
Education level	first-cycle studies	Subject group			Obligatory subject group in the field of study Subject group related to scientific research 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	general academic profile	Assessment form			exam		
Conducting unit	Mathematics Center -> Vice-Rector For Education						
Name and surname of lecturer (lecturers)	Subject supervisor	dr Magdalena Musielak					
	Teachers	mgr Małgorzata Suchecka mgr Jolanta Fidytek dr Magdalena Musielak mgr Anetta Brękiewicz-Sieg					
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	30.0	0.0	0.0	0.0	60
	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	60	6.0		84.0		150
Subject objectives	Students obtain competences in the range of using methods of elementary mathematics.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_U01] can apply mathematical knowledge to formulate and solve complex and non-typical problems related to the field of study and perform tasks, in an innovative way, in not entirely predictable conditions, by:n- appropriate selection of sources and information obtained from them, assessment, critical analysis and synthesis of this information,n- selection and application of appropriate methods and toolsn	Student solves equations and inequalities with elementary functions. Student solves exercises involving arithmetic and geometric sequences. Student applies the concepts of limit, continuity, and derivatives of functions to solve curve sketching problems.			[SU4] Assessment of ability to use methods and tools		
	[K6_W01] knows and understands, to an advanced extent, mathematics necessary to formulate and solve simple issues related to the field of study	Student names basic properties of elementary functions. Student defines the basic concepts of differential calculus of one variable function. Student uses the first and second derivatives of a function to analyze its properties.			[SW1] Assessment of factual knowledge		

Subject contents	<p>Course content – lecture Functions and their properties: polynomials, rational functions, power functions, exponential functions, logarithmic functions, trigonometric functions, cyclometric functions. Number sequences and their properties. Limit of a sequence. Euler's number. Proper and improper limits of functions. Continuity of functions. Derivatives of functions. Rules for differentiating functions. Higher-order derivatives and differentials. Taylor and Maclaurin's theorem. Monotonicity and extrema of functions of one variable. Concavity/convexity and inflection points of functions of one variable. De l'Hospital's rule. Asymptotes of functions. Application of differential calculus to the study of properties of functions of one variable.</p> <p>Course content – exercises Numerical sets. Absolute value of a real number. Powers and roots of numbers. Factorial. Newton's binomial symbol and formula. Equations and inequalities with polynomials, rational, power, exponential, logarithmic, trigonometric and cyclometric functions. Number sequences and their properties. Arithmetic and geometric sequences. Calculating limits of numerical sequences and functions. Examining the continuity of functions. Calculating and applying the derivative of a function.</p>		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Final exam	50.0%	70.0%
	Midterm	0.0%	30.0%
Recommended reading	Basic literature	<p>Wikieł B. (red), Matematyka. Podstawy z elementami matematyki wyższej, Wydawnictwo Politechniki Gdańskiej</p> <p>Marian Gewert, Zbigniew Skoczylas, Analiza matematyczna 1, GiS</p>	
	Supplementary literature	<p>J. Dymkowska, D. Beger - Rachunek różniczkowy w zadaniach, Wydawnictwo PG</p> <p>M. Bryński, N. Dróbka, K. Szymański, „Matematyka dla zerowego roku studiów wyższych. Elementy analizy matematycznej”, Wydawnictwa Naukowo-Techniczne</p>	
	eResources addresses		
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> 1. Solve the equation $4^x + 5 \cdot 2^x + 6 = 0$. 2. Find the domain and the set of values of the function $f(x) = -2 \arcsin(3-x)$. Determine the inverse function of f. 3. Find the derivative of $f(x) = (\ln x)^x$. 4. Evaluate the limit of a given sequence $a_n = n (\ln(2n-1) - \ln(2n+1))$. 5. Find local extremes and intervals of monotonicity of the function $f(x) = x - \operatorname{arctg} 2x$. 		
Practical activities within the subject	Not applicable		

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