



Subject card

Subject name and code		Elementary Mathematics, PG_00047357						
Field of study		Informatics						
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		dr Magdalena Musielak mgr inż. Dorota Żarek mgr Anetta Brękiewicz-Sieg mgr inż. Wojciech Dąbrowski				
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_W01] knows and understands, to an advanced extent, mathematics necessary to formulate and solve simple issues related to the field of study	Student names the basic properties of elementary functions and plots their graphs. Student solves equations and inequalities with elementary functions. Student constructs inverse functions of exponential, logarithmic, trigonometric and cyclometric functions. Student solves exercises involving infinite sequences. Student understands the notion of a continuous function and uses limits of functions to determine continuity.			[SW1] Assessment of factual knowledge		
		[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 uses the methods of elementary mathematics to formulate and solve simple problems in other areas of mathematics and informatics			[SU4] Assessment of ability to use methods and tools		

Subject contents	<p>Course content – lecture The set of real numbers and its subsets. Bounded sets. The limit of a bounded set. The axiom of continuity of the set of real numbers. Newton's binomial formula. Functions and their properties. Monotonic, even, odd and periodic functions. Injection, surjection, bijection. Countable and uncountable sets. Superposition of functions. Inverse function. Rational, power, exponential, hyperbolic, logarithmic, trigonometric, cyclometric functions. Circle, ellipse, parabola, hyperbola. Numerical sequences. Arithmetic and geometric sequences. Sequences defined by a recursive formula. Limit of a sequence. Properties of convergent sequences. Limit of a function. Continuous functions and their properties.</p> <p>Course content – exercises Absolute value of a real number. Functions and their properties. Domain, range, graph of a function. Transforming the graph of a function. Equations and inequalities with polynomial, power, exponential, logarithmic, trigonometric and cyclometric functions. Numerical sequences. Arithmetic and geometric sequences. Sum of n terms of an arithmetic and geometric sequence. Sum of an infinite geometric sequence. Determining the monotonicity and boundedness of sequences. Calculating limits of sequences and limits of functions. Determining the continuity of functions.</p>											
Prerequisites and co-requisites												
Assessment methods and criteria	<table border="1" data-bbox="451 510 1487 577"> <thead> <tr> <th data-bbox="451 510 794 544">Subject passing criteria</th> <th data-bbox="794 510 1137 544">Passing threshold</th> <th data-bbox="1137 510 1487 544">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="451 544 794 577">Final exam</td> <td data-bbox="794 544 1137 577">50.0%</td> <td data-bbox="1137 544 1487 577">100.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Final exam	50.0%	100.0%			
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Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> 1. Solve the inequality $(x^4+x^2-10x) / (1-\sin 2x) < 0$. 2. Solve the equation $9\log_3 \sin x - 4\sqrt{2} + \log_2 \cos x - \log_2 0,5 = 0$. 3. Find the domain, the set of values and sketch the graf of the function $f(x) = +1/2 \arcsin(1-2x)$. Determine the inverse function of f. 4. Evaluate $\tan(\arccos(2/3)) + \cos(\arctan(2/3))$. 5. For the sequence $a_n = (3n)! / n^{3n}$ evaluate the limit $\lim_{n \rightarrow \infty} (a_n + 1/a_n)$. 6. Using the three-series theorem find the limit of the sequence $x_n = 2/(n+2) + 4/(n+4) + 6/(n+6) + \dots + 2n/(n+2n)$. 											
Practical activites within the subject	Not applicable											

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