



Subject card

Subject name and code	MATHEMATICS 1, PG_00070666						
Field of study							
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		
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		English		
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 inż. Renata Zakrzewska				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	45.0	0.0	0.0	0.0	75
	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	75		3.0		72.0	150
Subject objectives	Uses the apparatus of linear algebra and mathematical analysis to solve theoretical and practical problems occurring in social sciences						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W02] possesses advanced knowledge of methods and techniques that enable precise formulation and effective problem solving.		uses a mathematical apparatus to solve economic problems, combining knowledge of mathematics with knowledge of social sciences		[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation		
	[K6_U04] develops logical solutions to complex or unstructured problems, even under conditions of uncertainty.		integrates the information obtained from solving complex problems, interpreting them, drawing conclusions and formulating and justifying opinions		[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools		

Subject contents	Course content – lecture		
	1. Functions of one variable and their properties. 2. Elementary functions: absolute value, polynomials, rational functions, power functions, exponential and logarithmic functions, trigonometric and inverse trigonometric functions - properties, graphs, solving equations and inequalities. 3. Infinite sequences - properties, limits. 4. The limit and continuity of a function. 5. Derivatives and differentials of first and higher orders. 6. Rolle, Lagrange, de l'Hospital, Taylor-Maclaurin theorems. 7. Monotonicity and local extrema. 8. Convexity, concavity and inflexion points of a function. 9. Asymptotes. 10. Matrices, their properties and operations on matrices. 11. Determinants. 12. Systems of linear equations.		
	Course content – exercises		
	1. Functions of one variable and their properties. 2. Elementary functions: absolute value, polynomials, rational functions, power functions, exponential and logarithmic functions, trigonometric and inverse trigonometric functions - properties, graphs, solving equations and inequalities. 3. Infinite sequences - properties, limits. 4. The limit and continuity of a function. 5. Derivatives and differentials of first and higher orders. 6. Rolle, Lagrange, de l'Hospital, Taylor-Maclaurin theorems. 7. Monotonicity and local extrema. 8. Convexity, concavity and inflexion points of a function. 9. Asymptotes. 10. Matrices, their properties and operations on matrices. 11. Determinants. 12. Systems of linear equations.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Class tests	50.0%	33.0%
	Midterm colloquium	50.0%	63.0%
	Class activity	50.0%	4.0%
Recommended reading	Basic literature	1. Praca zbiorowa pod redakcją B. Wiekła, "Matematyka - Podstawy z elementami matematyki wyższej", Wydawnictwo PG, Gdańsk 2009 2. J. Dymkowska, D. Beger, "Rachunek różniczkowy w zadaniach", Wydawnictwo PG, Gdańsk 2016 3. T. Jurliewicz, Z. Skoczylas, "Algebra liniowa 1 - Definicje, twierdzenia, wzory ", Oficyna Wydawnicza GiS, Wrocław 2002 4. T. Jurliewicz, Z. Skoczylas, "Algebra liniowa 1 - Przykłady i zadania", Oficyna Wydawnicza GiS, Wrocław 2002 5. K. Jankowska, T. Jankowski, "Zbiór zadań"	
	Supplementary literature	1. M. Gewert, Z. Skoczylas, "Analiza Matematyczna I - Definicje, twierdzenia, wzory", Oficyna Wydawnicza GiS, Wrocław 2001 2. M. Gewert, Z. Skoczylas, "Analiza Matematyczna I - Przykłady i zadania", Oficyna Wydawnicza GiS, Wrocław 2001 3. Teaching materials available on the Moodle platform.	
	eResources addresses		
Example issues/ example questions/ tasks being completed	• Find the derivatives of the following functions. • Find local extremes and intervals of monotonicity of the following function $f(x)=$. • Sketch the graph of the function $f(x)$. • Identify any local extrema and points of inflection. • Find the rank of the matrix A. • Solve the systems of linear equations using the back substitution method. • Solve the systems of linear equations by Cramer rule. • Formulate the Kronecker-Capelli theorem.		
Practical activities within the subject	Not applicable		

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