



## Subject card

Subject name and code	MATHEMATICS 1, PG_00058542						
Field of study	Economic Analytics						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2022/2023		
Education level	first-cycle studies	Subject group			Obligatory subject group in the field of study		
Mode of study	Part-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			Polish		
Semester of study	1	ECTS credits			5.0		
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 Lech Kujawski				
	Teachers		dr Lech Kujawski				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	16.0	16.0	0.0	0.0	0.0	32
	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	32		10.0		83.0	125
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_U04] formulates logical solutions to complex or unstructured problems		integrates the information obtained from solving complex problems, interpreting them, drawing conclusions and formulating and justifying opinions		[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information		
[K6_W02] demonstrates comprehensive preparation in the field of methods, techniques for formulating and solving problems		uses a mathematical apparatus to solve economic problems, combining knowledge of mathematics with knowledge of social sciences		[SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge			
Subject contents	Functions of one variable and their properties. Elementary functions: absolute value, polynomials, rational functions, power functions, exponential and logarithmic functions, trigonometric and inverse trigonometric functions - properties, graphs, solving equations and inequalities. Infinite sequences - properties, limits. The limit and continuity of a function. Derivatives and differentials of first and higher orders. Rolle, Lagrange, de l'Hospital, Taylor-Maclaurin theorems. Monotonicity and local extrema. Convexity, concavity and inflexion points of a function. Asymptotes. Matrices, their properties and operations on matrices. Determinants. Systems of linear equations.						
Prerequisites and co-requisites	Knowledge of high school level mathematics.						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Tests		50.0%		20.0%		
	Activity		50.0%		20.0%		
	Exam		50.0%		60.0%		

Recommended reading	Basic literature	<p>Wikieł, B. (2009). Matematyka, Podstawy z elementami matematyki wyższej. Gdańsk: Wydawnictwo PG</p> <p>Jurlewicz, T, Gewert, M. Algebra liniowa 1, Definicje, twierdzenia wzory. Wrocław: Wydawnictwo GiS</p> <p>Jankowska, K., Jankowski, T. Zbiór zadań z matematyki, Gdańsk: Wydawnictwo PG</p>
	Supplementary literature	<p>Gewert, M., Skoczylas, Z. Wstęp do analizy i algebry. Wrocław: Wydawnictwo GiS</p> <p>Batóg, B., i in. Matematyka dla kierunków ekonomicznych. Warszawa: Wydawnictwo Difin</p> <p>Banaś J., Podstawy matematyki dla ekonomistów. Warszawa: Wydawnictwa Naukowo-Techniczne</p> <p>Dymkowska J., Beger D., Rachunek różniczkowy w zadaniach. Gdańsk: Wydawnictwo PG</p> <p>Zasoby dydaktyczne na platformie moodle.</p>
	eResources addresses	<p>Podstawowe</p> <p><a href="https://enauczanie.pg.edu.pl/moodle/enrol/index.php?id=26326">https://enauczanie.pg.edu.pl/moodle/enrol/index.php?id=26326</a> - ecourse</p>
Example issues/ example questions/ tasks being completed	<p>Find the derivatives of the following functions.</p> <p>Find local extremes and intervals of monotonicity of the following function <math>f(x)=</math>.</p> <p>Sketch the graph of the function <math>f(x)</math>.</p> <p>Identify any local extrema and points of inflection.</p> <p>Find the rank of the matrix <math>A</math>.</p> <p>Solve the systems of linear equations using the back substitution method.</p> <p>Solve the systems of linear equations by Cramer rule.</p> <p>Formulate the Kronecker-Capelli theorem.</p>	
Work placement	Not applicable	