



## Subject card

Subject name and code	MATHEMATICS 1, PG_00058542						
Field of study	Economic Analytics						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2023/2024		
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 Stanisław Domachowski					
	Teachers	dr Stanisław Domachowski 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	<p>Functions of one variable and their properties: The absolute value function definition, solving equations and inequalities with absolute value, graphs of functions with absolute value. Power functions solving power and polynomial equations and inequalities. Rational functions solving rational equations and inequalities.</p> <p>Exponential function properties and graphs, solving exponential equations and inequalities. Logarithmic functions properties and graphs, solving logarithmic equations and inequalities. Trigonometric and cyclometric functions properties and graphs, solving trigonometric equations and inequalities. Limits and continuity: Infinite sequences. Fundamental definitions of limit of sequence, convergence and divergence, limit theorems. Applications to solving equations . Differential calculus of functions with one variable and applications of differential calculus of functions with one variable. Higher derivatives and differentials.</p> <p>Monotonicity and local extrema. Convexity, concavity and inflexion points of a function. De l'Hospital's Theorem. Asymptotes. Applying differential calculus to studying the properties of functions with one variable.</p> <p>Integral calculus of functions with one variable antiderivatives: The process of finding antiderivatives and integration formulas the substitution method of integration and integration by parts.</p>														
Prerequisites and co-requisites	Knowledge of high school level mathematics.														
Assessment methods and criteria	<table border="1" data-bbox="448 1180 1490 1319"> <thead> <tr> <th data-bbox="448 1180 794 1216">Subject passing criteria</th> <th data-bbox="794 1180 1141 1216">Passing threshold</th> <th data-bbox="1141 1180 1490 1216">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 1216 794 1252">Exam</td> <td data-bbox="794 1216 1141 1252">50.0%</td> <td data-bbox="1141 1216 1490 1252">60.0%</td> </tr> <tr> <td data-bbox="448 1252 794 1288">Activity</td> <td data-bbox="794 1252 1141 1288">50.0%</td> <td data-bbox="1141 1252 1490 1288">20.0%</td> </tr> <tr> <td data-bbox="448 1288 794 1319">Tests</td> <td data-bbox="794 1288 1141 1319">50.0%</td> <td data-bbox="1141 1288 1490 1319">20.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Exam	50.0%	60.0%	Activity	50.0%	20.0%	Tests	50.0%	20.0%
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Recommended reading	Basic literature	<p>Wikiel, 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>Adresy na platformie eNauczenie:</p> <p>WZiE - AG, ZI niestacjonarne - Matematyka I 2023/24 (S.Domachowski) - Moodle ID: 32504  <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32504">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32504</a></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>Determine indefinite integrals of the following functions using methods of integration by parts or by substitution .</p>														
Work placement	Not applicable														