



## Subject card

Subject name and code	MATHEMATICS 1, PG_00061434						
Field of study	Engineering Management						
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 (on-line)	Mode of delivery			blended-learning		
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					
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: 24.0						
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		
	[K6_W02] demonstrates advanced preparation in the methods and techniques of formulating and solving problems	uses a mathematical apparatus to solve management problems, combining knowledge of mathematics with knowledge of social sciences			[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															
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="456 1196 794 1218">Subject passing criteria</th> <th data-bbox="799 1196 1137 1218">Passing threshold</th> <th data-bbox="1142 1196 1481 1218">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="456 1225 794 1247">Midterm colloquium</td> <td data-bbox="799 1225 1137 1247">50.0%</td> <td data-bbox="1142 1225 1481 1247">20.0%</td> </tr> <tr> <td data-bbox="456 1254 794 1276">Exam</td> <td data-bbox="799 1254 1137 1276">50.0%</td> <td data-bbox="1142 1254 1481 1276">60.0%</td> </tr> <tr> <td data-bbox="456 1283 794 1305">Class activity</td> <td data-bbox="799 1283 1137 1305">50.0%</td> <td data-bbox="1142 1283 1481 1305">20.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Midterm colloquium	50.0%	20.0%	Exam	50.0%	60.0%	Class activity	50.0%	20.0%
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Recommended reading	Basic literature	<p>Wikiel, B. (2009). <i>Matematyka, Podstawy z elementami matematyki wyższej</i>. Gdańsk: Wydawnictwo PG</p> <p>Jurlewicz, T., Gewert, M. <i>Algebra liniowa 1, Definicje, twierdzenia wzory</i>. Wrocław: Wydawnictwo GiS</p> <p>Jankowska, K., Jankowski, T. <i>Zbiór zadań z matematyki</i>, Gdańsk: Wydawnictwo PG</p>													
	Supplementary literature	<p>Gewert, M., Skoczylas, Z. <i>Wstęp do analizy i algebry</i>. Wrocław: Wydawnictwo GiS</p> <p>Batóg, B., i in. <i>Matematyka dla kierunków ekonomicznych</i>. Warszawa: Wydawnictwo Difin</p> <p>Banaś J., <i>Podstawy matematyki dla ekonomistów</i>. Warszawa: Wydawnictwa Naukowo-Techniczne</p> <p>Dymkowska J., Beger D., <i>Rachunek różniczkowy w zadaniach</i>. Gdańsk: Wydawnictwo PG</p>													
	eResources addresses	<p>Adresy na platformie eNauczanie:</p> <p>WZiE - AG, ZI - Matematyka I online 2023/24 (S.Domachowski) - Moodle ID: 32503</p> <p><a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32503">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32503</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														