GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Mathematics I, PG_00050183		
Field of study	Engineering Management		
Date of commencement of studies	October 2021	Academic year of realisation of subject	2021/2022
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study
Mode of study	Part-time studies	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: 16.0

Adresy na platformie eNauczanie:
WZiE - Z inż - Matematyka I 2021/22 (S.Domachowski) - Moodle ID: 17765
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=17765

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	7.0	86.0	125

Subject objectives

Students obtain competence in the range of using methods of mathematical analysis and linear algebra and knowledge how to solve simple problems that can be found in the field of engineering.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U01] interprets and analyses the phenomena and processes taking place in the economy and organisation using basic theoretical knowledge of economics, management and science	Student analyses the properties of functions on the basis of an examination of its first and second derivatives. Student geometrically interprets the results of an examination of a graph of a function using the concept of limit, continuity and derivatives of functions.	[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
[K6_W11] has the basic knowledge of mathematics, physics and chemistry necessary to solve technical problems	Student mentions basic properties of elementary functions. Student solves equations and inequalities with elementary functions. Student determines intervals of monotonicity of a given functions and its extrema. Students calculates antiderivatives using the substitution method of integration and integration by parts.	[SW1] Assessment of factual knowledge

Subject contents	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. 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. Monotonicity and local extrema. Convexity, concavity and inflexion points of a function. De l'Hospital's Thorem. Asymptotes. Applying differential calculus to studying the properties of functions with one variable. Inegral calculus of functions with one variable – antiderivatives: The process of finding antiderivatives and integration formulas – the substitution method of integration and integration by parts.
Prerequisites and co-requisites	

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Midterm colloquium	50.0%	40.0%
Active participation during classes	0.0%	10.0%
Written exam	50.0%	50.0%

Recommended reading

Basic literature	- Praca zbiorowa pod redakcją Wikeł B.: Matematyka - Podstawy z elementami matematyki wyższej. PG, Gdańsk 2007; - M. Gewert, Z. Skoczylas : Analiza matematyczna 1, Oficyna Wydawnicza GiS 2008; - K. Jankowska, T. Jankowski : Zbiór zadań z matematyki, Wydawnictwo PG, 2010;
Supplementary literature	- R. Leitner : Zarys matematyki wyższej I i II, WNT; - W. Żakowski, G. Decewicz : Matematyka I I II, WNT; - A. Ostoja-Ostaszewski. Matematyka w ekonomii Modele i metody, PWN.
eResources addresses	WZiE - Z inż - Matematyka I 2021/22 (S.Domachowski) - Moodle ID: 17765 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=17765

Example issues/ example questions/ tasks being completed

1. Solve the equation … .

2. Check the continuity of the following function f(x)=… .

3.Find the absolute extrema of f(x)=… on the interval … .

4. Find the derivatives of the following functions … .

5. Determine indefinite integrals of the following functions using methods of integration by parts or by substitution… .

Work placement	Not applicable