GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Mathematics I, PG_00050292		
Field of study	Mechanical Engineering, Mechanical Engineering		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2020/2021
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	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 Anita Dąbrowicz-Tlałka	
	Teachers		

Lesson types and methods of instruction

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

Adresy na platformie eNauczanie:

WM - MiBM niestacjonarne - Matematyka 1, 2020/2021 (A.Tlałka) - Moodle ID: 8568
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=8568

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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	9.0	66.0	150

Subject objectives

The aim of this subject is to obtain the student's competence in the range of using the basic methods of mathematical analysis and linear algebra. Furthermore, the student is able to use this knowledge to solve simple theoretical and practical problems that can be found in the field of engineering.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W01] possesses mathematical knowledge within the range of linear algebra and mathematical analysis useful in characterising and interpreting mechanical systems, technological processes and operational properties of devices	Student recognizes the importance of skillful use of basic mathematical apparatus in terms of study in the future.	[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation
[K6_U01] is able to acquire information from specialized literary sources, databases and other resources, essential for solving engineering tasks; is able to compile the obtained information pieces and to interpret them, additionally is able to form conclusions and present justified opinion	Student is able to process the acquired information, analyze and interpret it, draw conclusions and reason opinions.	[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information

Subject contents	Fundamental definitions of a limit of a sequence, convergence and divergence, limit theorems. Fundamental definitions of a limit and continuity of a function, limit properties and useful theorems. Definition of a first derivative and differential. Roll's and Lagrange's theorems. 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 one variable functions. Basic vectors definitions and properties. Dot product, cross product, triple scalar product, their properties and their applications. Line and plane in three – dimensional space. Matrices, determinants and their properties. Systems of linear equations. Cramer's theorem. Rank of matrix. Kronecker – Capelly theorem.
Prerequisites and co-requisites	No requirements.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
midterm colloquiums	50.0%	50.0%
written exam	50.0%	50.0%

Recommended reading

Basic literature	1) Matematyka. Podstawy z elementami matematyki wyższej, red. Wikieł B., Gdańsk, 2009. 2) Jankowska K., Jankowski T., Zbiór zadań z matematyki, Gdańsk, 2009. 3) Gewert M., Skoczylas Z., Analiza matematyczna 1. Przykłady i zadania, Wrocław, 2003.
Supplementary literature	1) Krysicki W., Włodarski L., Analiza matematyczna w zadaniach. Część I, Warszawa, 1997. 2) Gewert M., Skoczylas Z., Analiza matematyczna 1. Definicje, twierdzenia, wzory, Wrocław, 2003. 3) Fichtenholz G. M.: Rachunek Różniczkowy i całkowy. PWN, Warszawa, 1995.

	eResources addresses	WM - MiBM niestacjonarne - Matematyka 1, 2020/2021 (A.Tlałka) - Moodle ID: 8568 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=8568 WM - MiBM niestacjonarne - Matematyka 1, 2020/2021 (A.Tlałka) - Moodle ID: 8568 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=8568
Example issues/ example questions/ tasks being completed	1) Find the limit of the sequence a_n = ... 2) Assign local extrema of function f (x) = ... 3) Find, if there are, solutions to the system of equations ... 4) Find the puncture point of the plane Π ... through the line l ... 5) Using the function differential, find the approximate value of the expression ...	
Work placement	Not applicable	