GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Mathematics I, PG_00055040		
Field of study	Management and Production Engineering		
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	Full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	1	ECTS credits	8.0
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 inż. Magdalena Łapińska	
	Teachers	dr inż. Magdalena Łapińska	

Lesson types and methods of instruction							
	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	60.0	0.0	0.0	0.0	90
	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	90	11.0	99.0	200

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. 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_K03] is aware of the social role of a graduate of a technical university, understands the importance of non-technical aspects and effects of engineering activities including their impact on the environment and responsibility for decisions, sees the need to formulate and provide the public with information and opinions on the achievements of technology, correctly identifies and resolves dilemmas associated with thejob of an engineer	Student recognizes the importance of self-expanding knowledge and takes the challenge of working with a group to solve a problem.	[SK3] Assessment of ability to organize work
	[K6_U05] is able to prepare and present a presentation on the results of analysis of the tasks in the area of production engineering, is able to plan and carry out experiments, measurements, computer simulations and analyses and interpret the results and draw conclusions is able to use analytical methods, simulation and experiments for formulating and solving problems associated with production engineering	The student is able to apply the learned mathematical methods for analysis to solve problems in the field of production management.	[SU3] Assessment of ability to use knowledge gained from the subject
	[K6_W01] has knowledge of linear algebra, differential equations, analysis and mathematical statistics useful for modelling and interpreting mechanical systems, manufacturing processes and operating properties of devices, has structured knowledge of physics including classical mechanics, optics, electricity and magnetism, demonstrates knowledge of elements of quantum physics	Student applies the basic properties of derivatives. Student analyzes the properties of functions with the use of its first and second derivatives. Student applies basic formulas and techniques of integration to calculate indefinite integrals. Student uses basic operations on complex numbers.	[SW1] Assessment of factual knowledge

Subject contents

- Functions of one variable and their properties: absolute value - definition, solving equations and inequalities, graphs. Power functions, rational, exponential, logarithmic, trigonometric - equations and inequalities, graphs.
- Sequences of numbers and continuity of functions: definitions, properties, theorems.
- Complex numbers.
- Elements of linear algebra: matrices, determinants, systems of linear equations.
- Vector calculus in three-dimensional space: definitions and properties of vectors, scalar, vector, mixed product and their applications.
- A line and a plane in space: definitions, the distance of a point from a plane, the angle between planes and lines.

Prerequisites and co-requisites

No recomendations

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
exam , 90 minutes	50.0%	100.0%

Recommended reading

Basic literature	G.M. Fichtenholz, Rachunek różniczkowy i całkowy,Tom 1, Wydawnictwo Naukowe PWN, Warszawa 2002 , B.Wikieł, Matematyka, Podstawy z elementami matematyki wyższej, Wydawnictwo Politechniki Gdańskiej Gdańsk 2009, K.Jankowska, J.Jankowski, Zbiór zadań z matematyki, Wydawnictwo Politechniki Gdańskiej Gdańsk 2003, W. Krysicki, L. Włodarski Analiza matematyczna w zadaniach część I, PWN, Warszawa 1986.
Supplementary literature	M.Gewert, Z.Skoczylas, Analiza matematyczna 1, Przykłady i zadania, GiS, Wrocław 2000, R.Leitner, W.Matuszewski, Z.Rojek, Zadania z matematyki wyższej, cz. 1, WNT,Warszawa 1992, W.Żakowski, Ćwiczenia problemowe dla politechnik, WNT, Warszawa, 1991.

	eResources addresses	Adresy na platformie eNauczanie: WIMiO - ZiIP - Matematyka 2022/2023 (M.Łapińska) - Moodle ID: 24368 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=24368 WIMiO - ZiIP - Elementy Algebry Liniowej 2022/23 (M.Łapińska) - Moodle ID: 26830 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=26830
Example issues/ example questions/ tasks being completed	1. Prove that this sequence is monotonic a_n=(n^2+1)/n!. 2. Evaluate the limit of a given sequence $a_n=(3n^2+6n)^{1/2}-3^{1/2}n$. 3. Find the limit of the function f(x)= x sin(1/x) in the zero point.	
Work placement	Not applicable	

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