GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Propedeutics of Mathematics, PG_00038381		
Field of study	Electrical Engineering		
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	at the university
Year of study	1	Language of instruction	Polish
Semester of study	1	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Mathematics Center -> Vice-Rector for Education		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Anna Niewulis	
	Teachers	dr Anna Niewulis mgr Katarzyna Kiepiela	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	20.0	20.0	0.0	0.0	0.0	40

E-learning hours included: 0.0

Adresy na platformie eNauczanie:
WEIA - Et. - PROPEDEUTYKA MATEMATYKI [Niestacjonarne][2021/22] (A.Niewulis) - Moodle ID: 13691
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=13691

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	40	4.0	56.0	100

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_U01	Student is able to process the acquired information, analyze and interpret it, draw conclusions and reason opinions. Student understands the need of lifelong learning and improving their engineering knowledge.	[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools
K6_K02	Student is able to work individually and in a group, knows how to estimate the time needed to carry out the task, and is able to implement the work schedule.	[SK3] Assessment of ability to organize work [SK1] Assessment of group work skills
K6_W01	Student knows basic properties of elementary functions. Student solves equations and inequalities with elementary functions. Student examines monotonicity and boundedness of sequences Student evaluates the limits of sequences. Student performs calculations on complex numbers. Student determines the real and complex roots of polynomial.	[SW1] Assessment of factual knowledge

Subject contents

Functions of one variable and their properties:

- 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 national 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
- Composite and inverse funktion

Infinite sequences:

- arithmetic and geometric sequences
- fundamental definitions and theorems of limit of sequence
- Euler's number

Complex numbers:

- agebraic, trigometric and exponential form
- powers and roots of complex numbers

Prerequisites and co-requisites

No requirements.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Midterm colloquium	50.0%	100.0%

Recommended reading

Basic literature	B. Wikieł, Matematyka. Podstawy z elementami matematyki wyższej. Wydawnictwo PG, Gdańsk 2009 T. Jurlewicz, Z. Skoczylas, Algebra liniowa 1. Definicje. Twierdzenia. Wzory. Oficyna Wydawnicza GIS, Wrocław 2006 T. Jurlewicz, Z. Skoczylas, Algebra liniowa 1. Przykłady i zadania. Oficyna Wydawnicza K. K. Jankowska, T. Jankowski, Zadania z matematyki wyższej, Wydawnictwo PG, Gdańsk 2008
Supplementary literature	W. Leksiński, I. Nabiałek, W. Żakowski, Matematyka. Definicje, twierdzenia, przykłady, zadania. WNT, Warszawa 2006
eResources addresses	WEIA - Et. - PROPEDEUTYKA MATEMATYKI [Niestacjonarne] [2021/22] (A.Niewulis) - Moodle ID: 13691 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=13691

Example issues/ example questions/ tasks being completed

1. Solve the inequality $3|x-3|-|2x+2| < 2x$.
2. Draw the graphs of $f(x) = ||x-2|-1|$ and solve $f(x)>1$.
3. Divide $(x^4-2x^3+4x^2+8):(x+1)$.
4. Find the inverse of $f(x)=2x-4$.
5. Solve the inequality $2^{-|x-1|} \geq 1/8$.
6. Solve the equation $(x+3)/(x+2) - (x-3)/(x-2)= (2x^2-4)/(x^2-4)$
7. Find the domain of $f(x)=\log_{3x-12}(x^2-9)$.
8. Solve the inequality $\log_{0.5}(x-3) - \log_{0.5}(3+x)<2$.
9. Find $\sqrt[3]{i}$ and indicate their placement in the complex plane.

Work placement

Not applicable