



Subject card

Subject name and code	Propedeutics of Mathematics, PG_00038084						
Field of study	Electrical Engineering						
Date of commencement of studies	October 2026	Academic year of realisation of subject			2026/2027		
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			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	mgr Katarzyna Kiepiela dr Anna Niewulis mgr Justyna Woron					
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	30.0	0.0	0.0	0.0	60
	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	60	6.0		34.0	100	
Subject objectives	The aim of the 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	<p>Course content – lecture</p> <p>Course content lecture</p> <p>Functions of one variable, graphs and their properties:</p> <ul style="list-style-type: none"> • absolute value function definition • power functions • rational functions • exponential function • logarithmic functions • trigonometric and cyclometric functions • hyperbolic funtions • Composite and inverse funktion <p>Infinite sequences:</p> <ul style="list-style-type: none"> • arithmetic and geometric sequences • fundamental definitions and theorems of limit of sequence • Eulers number <p>Complex numbers:</p> <ul style="list-style-type: none"> • agebraic, trigometric and exponential form • powers and roots of complex numbers <p>Basic concepts of analitic geometry:</p> <ul style="list-style-type: none"> • line, circle, ellipse, parabola, hiperbola <p>Course content exercises</p> <p>Functions of one variable:</p> <ul style="list-style-type: none"> • solving equations and inequalities with absolute value, graphs of functions with absolute value • solving power and polynomial equations and inequalities • solving national equations and inequalities • solving exponential equations and inequalities • solving logarithmic equations and inequalities • solving trigonometric equations and inequalities <p>Infinite sequences:</p> <ul style="list-style-type: none"> • evaluation of sequence limits • Eulers number <p>Complex numbers:</p> <ul style="list-style-type: none"> • agebraic, trigometric and exponential form • powers and roots of complex numbers 											
Prerequisites and co-requisites												
Assessment methods and criteria	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Subject passing criteria</th> <th style="width: 33%;">Passing threshold</th> <th style="width: 33%;">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>Final colloquium</td> <td>50.0%</td> <td>50.0%</td> </tr> <tr> <td>Midterm colloquium</td> <td>50.0%</td> <td>50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Final colloquium	50.0%	50.0%	Midterm colloquium	50.0%	50.0%
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Recommended reading	Basic literature	<p>B. Wikieł, Matematyka. Podstawy z elementami matematyki wyższej. Wydawnictwo PG, Gdańsk 2009</p> <p>T. Jurliewicz, Z. Skoczylas, Algebra liniowa 1. Definicje. Twierdzenia. Wzory. Oficyna Wydawnicza GIS, Wrocław 2006</p> <p>T. Jurliewicz, Z. Skoczylas, Algebra liniowa 1. Przykłady i zadania. Oficyna Wydawnicza</p> <p>K. K. Jankowska, T. Jankowski, Zadania z matematyki wyższej, Wydawnictwo PG, Gdańsk 2008</p>										
	Supplementary literature	<p>W. Leksiński, I. Nabiałek, W. Żakowski, Matematyka. Definicje, twierdzenia, przykłady, zadania. WNT, Warszawa 2006</p>										
	eResources addresses											

Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> 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 $2^{- x-1 } > 1/8$. 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.
Practical activities within the subject	Not applicable

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