

## 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	Subject supervisor	dr Anna Niewulis								
of lecturer (lecturers)	Teachers		dr Anna Niewulis mgr Katarzyna Kiepiela							
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	:t	Seminar	SUM		
of instruction	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 classes include 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				

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Functions of one variable and their properties:	Subject contents	I						
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 posprimmic equations and inequalities logarithmic functions — properties and graphs, solving logarithmic equations and inequalities trigonometric and cytometric 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  complex numbers:  agebraic, trigometric and exponential form powers and roots of complex numbers  No requirements.  Assessment methods and criteria  Subject passing criteria  Midtern colloquium  Basic literature  Basic literature  Basic literature  Basic literature  Basic literature  Basic literature  Bukkiek, Matematyka. Podstawy z elementami matematyki wyższej. Wydawnictwo PG, Gdańsk 2009 T. Juriewicz, Z. Skoczyjas, Algebra liniowa 1. Definicje. Twierdzenia. Wzory. Oficyna Wydawnicza GIS, Wrocław 2006 T. Juriewicz, Z. Skoczyjas, Algebra liniowa 1. Przykłady i zadania. Oficyna Wydawnicza Oficyna Wydawnicza Skoczyjas, Algebra liniowa 1. Przykłady i zadania. Oficyna Wydawnicza Skoczyjas, Algebra liniowa 1. Przykłady i zadania. Oficyna Wydawnicza Wydawniczy PG, Gdańsk 2008  Supplementary literature  W. Leksiński, I. Nabiałek, W. Zakowski, Matematyki wyższej. Wydawniczy PG, Gdańsk 2008  Example issues/ example questions/ tasks being completed  I. Solve the inequality Six-3i-12x-12 < 2x. Draw the graphs of f(x) =   x-2 -11 and solve f(x)>-1. Divide (x²-2x-4x-4x-8)  x+1 . Find the inverse of f(x)=2x-4x-2x-4x-8. Solve the inequality six-3i-12x-12 < 2x. Solve the inequality	Subject contents	Functions of one variable and their properties:						
* 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    No requirements.  **  **  **  **  **  **  **  **  **		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						
Prerequisites and co-requisites  Assessment methods and criteria  Recommended reading  Basic literature  W. Leksiński, I. Nabialek, N. Żakowski, Matematyki vyższej, Wydawnictwo PG, Gdańsk 2008  W. Leksiński, I. Nabialek, W. Żakowski, Matematyki wyższej, Wydawnictwo PG, Gdańsk 2008  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 (23-21-1) and solve f(x)>1.  3. Divide (x <sup>4</sup> -2/x <sup>3</sup> +4/x <sup>4</sup> +8):(x+1).  4. Find the inverse of f(x)=2-2x-4  5. Solve the inequality (28-1) x-21 > 18.  6. Solve the inequality (28-3) and (38-3) - logo, s(3+x)-2.  9. Find the domain of f(x)=logosa-12(x <sup>2</sup> -9).  8. Solve the inequality logo s(x-3) - logo, s(3+x)-2.  9.								
Prerequisites and co-requisites  Assessment methods and criteria  Recommended reading  Basic literature  Washinkia, I. Nabialea, W. Zakowski, Matematyka Definicje, twierdzenia, przykłady, zadania z matematyki wyższej, Wydawnictwo PG, Gdańsk 2008  Basic literature  Washinkia, I. Nabialek, W. Zakowski, Matematyka Definicje, twierdzenia, przykłady, zadania. WNT, Warszawa 2006  Basic literature  Washinkia, I. Nabialek, W. Zakowski, Matematyka Definicje, twierdzenia, przykłady, zadania. WNT, Warszawa 2006  Basic literature  Washinkia, I. Nabialek, W. Zakowski, Matematyka Definicje, twierdzenia, przykłady, zadania. WNT, Warszawa 2006  Basic literature  Washinkia, I. Nabialek, W. Zakowski, Matematyka Definicje, twierdzenia, przykłady, zadania z matematyki wyższej, Wydawnictwo PG, Gdańsk 2008  Basic literature  Washinkia, I. Nabialek, W. Zakowski, Matematyka Definicje, twierdzenia, przykłady, zadania z matematyki wyższej, Wydawnicza Gls, Wishinkia, I. Nabialek, W. Zakowski, Matematyka Definicje, twierdzenia, przykłady, zadania z matematyki wyższej, Wydawnicza Gls, Wishinkia, I. Nabialek, W. Zakowski, Matematyka Definicje, twierdzenia, przykłady, zadania, Norwania, przykłady, zakowski, Matematyka Definicje, twierdzenia, przykłady, zakowski, Matematyka Definicje, twierdzenia, przykłady, zakowski, Matematyka Definicje, wydawnicze Gls, Wydawnicze Gls, Wydawnicze Gls, Wydawnicze Gls, Wyd								
Subject passing criteria   Passing threshold   Percentage of the final grade   Midterm colloquium   50.0%   100.0%		powers and roots of complex numbers						
Midterm colloquium   50.0%   100.0%		No requirements.						
Recommended reading  Basic literature  Wasic lit	Assessment methods	Subject passing criteria	Passing threshold	Percentage of the final grade				
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	and criteria	Midterm colloquium	50.0%	100.0%				
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 <sup>4</sup> -2x³+4x²+8):(x+1). 4. Find the inverse of f(x)=2x-4. 5. Solve the inequality 2 <sup>- x-1 </sup> ≥ 1/8. 6. Solve the equation (x+3)/(x+2) - (x-3)/(x-2)= (2x²-4)/(x²-4) 7. Find the domain of f(x)=log₃x-12(x²-9). 8. Solve the inequality log₀.5(x-3) - log₀.5(3+x)<2. 9. Find ³√i and indicate their placement in the complex plane.	Recommended reading	Basic literature	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,					
WEIA - Et PROPEDEUTYKA MATEMATYKI [Niestacjonarne]   [2021/22] (A.Niewulis) - Moodle ID: 13691   https://enauczanie.pg.edu.pl/moodle/course/view.php?id=13691		Supplementary literature	W. Leksiński, I. Nabiałek, W. Żakowski, Matematyka. Definicje,					
example questions/ tasks being completed  2. Draw the graphs of f(x) =   x-2 -1  and solve f(x)>1. 3. Divide (x <sup>4</sup> -2x <sup>3</sup> +4x <sup>2</sup> +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 <sup>2</sup> -4)/(x <sup>2</sup> -4) 7. Find the domain of f(x)=log <sub>3x-12</sub> (x <sup>2</sup> -9). 8. Solve the inequality log <sub>0.5</sub> (x-3) - log <sub>0.5</sub> (3+x)<2. 9. Find <sup>3</sup> √i and indicate their placement in the complex plane.		eResources addresses	[2021/22] (A.Niewulis) - Moodle ID: 13691					
Work placement Not applicable	example questions/	<ol> <li>Draw the graphs of f(x) =   x-2 -1  and solve f(x)&gt;1.</li> <li>Divide (x<sup>4</sup>-2x<sup>3</sup>+4x<sup>2</sup>+8):(x+1).</li> <li>Find the inverse of f(x)=2x-4.</li> <li>Solve the inequality 2- x-1  ≥ 1/8.</li> <li>Solve the equation (x+3)/(x+2) - (x-3)/(x-2)= (2x<sup>2</sup>-4)/(x<sup>2</sup>-4)</li> <li>Find the domain of f(x)=log<sub>3x-12</sub>(x<sup>2</sup>-9).</li> <li>Solve the inequality log<sub>0.5</sub>(x-3) - log<sub>0.5</sub>(3+x)&lt;2.</li> </ol>						
	Work placement	Not applicable						

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