

GDAŃSK UNIVERSITY

Subject card

Subject name and code	Mathematics 1, PG_00041990								
Field of study	Power Engineering, Power Engineering, Power Engineering, Power Engineering, Power 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	Full-time studies		Mode of delivery			at the university			
Year of study	1		Language of instruction		English				
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 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								
	Adresy na platformie eNauczanie: Energy Technologies - sem 1 - Mathematics 1 2020/21 (M.Łapińska) - Moodle ID: 5834 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=5834								
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-st	udy	SUM	
	Number of study hours	90		15.0		45.0		150	
Subject objectives	Students obtain competence in using methods of mathematical analysis (single variable calculus) and linear algebra, and knowledge how to solve simple problems that are found in the field of engineering.								
Learning outcomes	Course outcome		Subject outcome			Method of verification			
	K6_U02		Student uses various methods to solve systems of linear equations. Student analyzes and solves problems from the area of analytic geometry. 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. Student solves the ordinary differential equations of the first and second order.			[SU3] Assessment of ability to use knowledge gained from the subject			
	NO_VV01		knowledge gained in the different modules.			knowledge			

Subject contents	Elements of linear algebra.						
	 Matrices and matrix operations. Determinants and their properties. Inverse matrix. Rank of a matrix. Systems of linear equations. 						
	Analytic geometry in 3-space.						
	 The vectors, dot product, cross Equations of lines and planes 	product and triple scalar product and	t and triple scalar product and their applications.				
	Elementary functions.						
	 Linear function Quadratic function Polynomials Power function Exponential function Logarithmic function Cyclometric and trigonometric functions 						
	Sequences.						
	 Definition. Monotone sequences. Limit of a sequence. <u>Differential calculus of one variable functions.</u>						
	Applications differential calculus	Applications differential calculus of one variable functions.					
	<u>Anti-derivate.</u>						
	The substitution method of integration and integration by parts. Integration of rational, trigonometric and irrational functions.						
	Definite integrals						
	Application						
Improper integrals.							
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade				
	Tests	50.0%	50.0%				
			50.0%				
Recommended reading	Basic literature W.W.Sawyer, What is Calculus About?, MAA Volume 2 (1962)						
		Rhonda Huettenmueller, College Algebra DeMYSTiFieD, McGraw-Hill Education; 2 edition (December 27, 2013)					
		George B. Thomas, Jr., Ross L. Finney., Calculus and analytic geometry, Addison-Wesley Publishing Company; 7th edition (January 1988) T.Jankowski, Linear algebra, Wydawnictwo Politechniki Gdańskiej, Gdańsk, 2001.					

Supplementary literature		Praca zbiorowa pod redakcja B.Wikieł, Matematyka. Podstaw z elementami matematyki wyższej. Wydawnictwo Politechnik Gdanśkiej, Gdanśk, 2007.		
		M.Gewert, Z.Skoczylas, Analiza matematyczna I - Definicje, twierdzenia, wzory, Oficyna Wydawnicza GiS M.Gewert, Z.Skoczylas, Analiza matematyczna I - Przykłady i zadania, Oficyna Wydawnicza GiS		
eResources addresses		K. Jankowska, T. Jankowski, Zbioŕ zadan z matematyki. Wydawnictwo Politechniki Gdanśkiej , Gdansk, 2007.		
	Energy Technologies - sem 1 - Mathematics 1 2020/21 (M.Łapińska) - Moodle ID: 5834 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=5834			
Example issues/ example questions/ tasks being completed	 Solve the system of linear equations Find the sine of the angle between two vectors Find the equation of a line perpendicular to a plane Determine the monotonicity of a function and find it's extreme values Evaluate a definite integral 			
Work placement	Not applicable			