GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Mathematics 2, PG_00042017		
Field of study	Power Engineering, Power 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	Full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	English
Semester of study	2	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 Marcin Szyszkowski	
	Teachers	dr Marcin Szyszkowski	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	45.0	45.0	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	15.0	45.0	150

Subject objectives

Students obtain competence in using methods of mathematical analysis and differential equations, 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_W01] has basic knowledge of mathematics necessary to describe the phenomena related to the processes of energy conversion and transfer; uses information technology to solve mathematical problems	Student combines knowledge of mathematics with knowledge from other fields.	[SW1] Assessment of factual knowledge
[K6_K01] is aware of the need for training and self-improvement in the profession of energy and the possibility of further education; can think and act in a creative and entrepreneurial manner; can define priorities for the implementation of an individual or group task	Student understands that in many areas to use i practise math tool, he needs to reach for additional knowlege in given subject.	[SK2] Assessment of progress of work
[K6_U02] is able to apply the learned mathematical methods to the analysis and design of elements, systems and energy systems	The student uses mathematical methods to analyze and design energy elements. Student is able to process the acquired information, analyze and interpret it, draw conclusions and reason opinions.	[SU3] Assessment of ability to use knowledge gained from the subject

Subject contents	Definite integrals Complex numbers Double variable functions • continuity, directional derivatives, • extremum • double integral • polar coordinates Multivariable Calculus • triple variable functions • triple integral • cylindrical and sferical coordinates Series • monotonicity, boundedness, convergence • convergence tests Function series: • power series, radius of convergence • examples of Taylor's and MacLaurent series Ordinary differential equations: • separarable equations, linear equations • second degree equations • Equations of constant coefficents • line integral over scalar and vector fields • information about surface integral
Prerequisites and co-requisites	Working knowledge of the concepts of the first semester of mathematics.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Tests	50.0%	65.0%
Final Exam	50.0%	35.0%

Recommended reading

Basic literature	George B. Thomas, Jr., Ross L. Finney., Calculus and analytic geometry, Addison-Wesley Publishing Company; 7th edition (January 1988) Z.Michna, Mathematics, 2nd edition, Publishing House of Wrocław University of Economics, Wrocław, 2012.
Supplementary literature	M.Gewert, Z.Skoczylas, Analiza matematyczna II, wzory, Oficyna Wydawnicza GiS E.Łobos, B.Sikora, Calculus and differential equations in exercises, The Publishing House of the Silesian University of Technology, Gliwice, 2006. J.Polking, A.Boggess, D.Arnold, Differential Equations, Pearson
eResources addresses	Podstawowe https://tutorial.math.lamar.edu/Classes/CalcIII/3DSpace.aspx - calculis course at Lamar University by Paul Dawkins

Example issues/ example questions/ tasks being completed	1. Solve the given differetial equation of the first order 2. Solve the given differetial equation of the second order. 3. Find the extremum of the given function of the two variables. 4. Find the volumes of the given solids by means of double integral (or by means of triple integral). 5. Find roots of third degree of the number -2+2i 6. Find center of mass od a given lamina/solid (quarter of a circle, paraboloid)
Work placement	Not applicable