GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Mathematics, PG_00048778					
Field of study	Green Technologies					
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		Polish	
Semester of study	2		ECTS credits		5.0	
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 Anna Niewulis			
	Teachers					

Lesson types and methods of instruction	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						
	Adresy na platformie eNauczanie:						

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	10.0	55.0	125

Subject objectives	Students obtain competence in using methods of mathematical analysis and linear algebra, and knowledge how to solve simple problems that are found in the field of engineering, in particular connected to green technologies and environment protection.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_W01] has a basic knowledge from some branches of mathematics and physics useful for formulating and solving simple problems in the field of environmental technologies and modern analytical methods	Student has basic knowledge of single variable calculus, linear algebra and differential equations, useful for formulating and solving simple problems in the field of environmental protection with the help of modern analytical methods.	[SW1] Assessment of factual knowledge
	[K6_K01] understands the need for learning throughout life, can inspire and organize the learning process of others. Is aware of his/her own limitations and knows when to ask the experts, can properly identify priorities for implementation, critically evaluate his knowledge	Student understands the need of lifelong learning. Student is able to inspire others and organize their learning process. Is aware of his/her own limitations and knows when to ask the experts. Can properly identify priorities for implementation and critically evaluate his knowledge.	[SK5] Assessment of ability to solve problems that arise in practice
	[K6_U03] is able to use information and communication technologies relevant to the common tasks of engineering, is able to use known methods and mathematical-physical models to describe and explain phenomena and chemical processes	Student recognizes the importance of skillful use of basic mathematical apparatus in terms of study in the future. Student uses methods of mathematical description of phenomena in the physical and chemical processes.	[SU4] Assessment of ability to use methods and tools

Subject contents	Definite Integral of a function of one variable definition geometrical applications applications to other disciplines Improper Integrals Complex Numbers: algebraic, trigonometric, and exponential forms complex conjugate, modulus arithmetic operations roots of complex numbers solving equations Elements of Linear Algebra: matrices: definition, types of matrices, operations, inverse matrix determinants: definition, properties systems of linear equations: Cramer's rule, Kroneckera - Capelli theorem, Gaussian elimination eigenvalues and eigenvectors Conic sections Multivariable Functions: domian, graphs partial derivatives with applications
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
	Final Exam	50.0%	50.0%
	Tests	50.0%	50.0%

Recommended reading	Basic literature	M. Gewert, Z. Skoczylas,"Analiza matematyczna II - Definicje, twierdzenia, wzory", Oficyna Wydawnicza GiS. M. Gewert, Z. Skoczylas,"Analiza matematyczna II - Przykłady i zadania", Oficyna Wydawnicza GiS. K. Jankowska, T. Jankowski, "Zbiór zadań z matematyki", cz. 2 i 3, PG Gdańsk. M. Gewert, Z. Skoczylas, "Równania różniczkowe zwyczajne" Wrocław: GiS. T. Jurewicz, Z. Skoczylas, "Algebra liniowa 1." Wrocław: GiS.
	Supplementary literature	M. Lassak, "Matematyka dla studiów technicznych." Warszawa: Supremum. W. Leksiński, I. Nabiałek, W. Żakowski, "Matematyka. Definicje, twierdzenia, przykłady, zadania." warszawa: WNT.
	eResources addresses	

Example issues/ example questions/ tasks being completed	1. Evaluate an improper integral. 2. Find the length of the curve on the given interval. 3. Find the inverse matrix. 4. Use Gaussian elimination to solve the given system. 5. Find the solution of the differential equation. 6. Find the roots of the given complex number. 7. Find the probability distribution of the given random variable.
Work placement	Not applicable