



Subject card

Subject name and code	Mathematics, PG_00048778						
Field of study	Green Technologies						
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			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		dr Anna Niewulis				
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						
	WCh - ZT II - Matematyka 2020/21 (A.Niewulis) - Moodle ID: 6218 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=6218 WCh - ZT sem.2 - Liczby zespolone 2020/21 (A.Niewulis) - Moodle ID: 13681 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=13681 WCh - ZT sem.2 - Macierze 2020/21 (A.Niewulis) - Moodle ID: 14671 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=14671						
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_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		
	[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_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		

Subject contents	<p>Definite Integral of a function of one variable definition geometrical applications applications to other disciplines</p> <p>Improper Integrals</p> <p>Complex Numbers: algebraic, trigonometric, and exponential forms complex conjugate, modulus arithmetic operations roots of complex numbers solving equations</p> <p>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</p> <p>Conic sections</p> <p>Multivariable Functions: domian, graphs partial derivatives with applications</p>											
Prerequisites and co-requisites	Working knowledge of the concepts of the first semester of mathematics.											
Assessment methods and criteria	<table border="1" data-bbox="451 954 1477 987"> <thead> <tr> <th data-bbox="451 954 794 987">Subject passing criteria</th> <th data-bbox="794 954 1137 987">Passing threshold</th> <th data-bbox="1137 954 1477 987">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="451 987 794 1021">Tests</td> <td data-bbox="794 987 1137 1021">50.0%</td> <td data-bbox="1137 987 1477 1021">50.0%</td> </tr> <tr> <td data-bbox="451 1021 794 1055">Final Exam</td> <td data-bbox="794 1021 1137 1055">50.0%</td> <td data-bbox="1137 1021 1477 1055">50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Tests	50.0%	50.0%	Final Exam	50.0%	50.0%
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Recommended reading	Basic literature	<p>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.</p>										
	Supplementary literature	<p>M. Lassak, "Matematyka dla studiów technicznych." Warszawa: Supremum. W. Leksiński, I. Nabiałek, W. Żakowski, "Matematyka. Definicje, twierdzenia, przykłady, zadania." warszawa: WNT.</p>										
	eResources addresses											
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> 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											