



Subject card

Subject name and code	Mathematics, PG_00048757						
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			English		
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 Hanna Guze					
	Teachers	dr Hanna Guze					
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 eNauczenie: WCh - GT - Mathematics2 2020/21 (H.Guze) - Moodle ID: 8826 https://enauczenie.pg.edu.pl/moodle/course/view.php?id=8826 WCh - GT - Mathematics2 2020/21 (H.Guze) - Moodle ID: 8826 https://enauczenie.pg.edu.pl/moodle/course/view.php?id=8826						
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. Student gives the graphic interpretation of definite integral. Student uses the basic operations on complex numbers. Student analyses properties of a given function of two variables using differential calculus of multivariable functions. Student defines the basic concepts of linear algebra.			[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 recognizes the importance of self-expanding knowledge and takes the challenge of working with a group to solve a problem. Student is able to process the acquired information, analyze and interpret it, draw conclusions and reason opinions.			[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	<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 and trigonometric form, 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, Kronecker's - Capelli theorem, Gaussian elimination).</p> <p>Conic sections and graphs of selected surfaces.</p> <p>Multivariable Functions: limits and continuity, 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="448 719 1477 819"> <thead> <tr> <th data-bbox="448 719 794 752">Subject passing criteria</th> <th data-bbox="794 719 1141 752">Passing threshold</th> <th data-bbox="1141 719 1477 752">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 752 794 786">Final Exam</td> <td data-bbox="794 752 1141 786">50.0%</td> <td data-bbox="1141 752 1477 786">50.0%</td> </tr> <tr> <td data-bbox="448 786 794 819">Tests</td> <td data-bbox="794 786 1141 819">50.0%</td> <td data-bbox="1141 786 1477 819">50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Final Exam	50.0%	50.0%	Tests	50.0%	50.0%
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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. Solve the given system of linear equations. 5. Sketch the graph of the following surface. 6. Find the roots of the given complex number. 7. Find local extreme values of the function $f(x,y)=...$ 											
Work placement	Not applicable											