



Subject card

Subject name and code	Mathematics, PG_00037393						
Field of study	Biotechnology						
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			blended-learning		
Year of study	1	Language of instruction			Polish		
Semester of study	1	ECTS credits			11.0		
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 Anita Dąbrowicz-Tłałka				
	Teachers		dr Anita Dąbrowicz-Tłałka mgr Mirosław Bednarczyk				
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: 45.0						
	WCh - Bt, Ch, ChB, TCh - s1: 2020/21 (A.Tłałka) - Moodle ID: 5821 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=5821 WCh - Bt - s1, gr.1,2,3,4: 2020/21 (M. Bednarczyk) - Moodle ID: 6738 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=6738 WCh - Bt, Ch, ChB, TCh - Liczby zespolone: 2020/21 (A.Tłałka) - Moodle ID: 11109 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=11109						
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	6.0	179.0	275		
Subject objectives	Students obtain competence in the range of using methods of mathematical analysis and linear algebra and knowledge how to solve simple problems that can be found in the field of engineering.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K6_W01	Student mentions basic properties of elementary functions. Student solves equations and inequalities with elementary functions. Student gives the definition of basic notions of differential calculus. Student uses basic notions and formulas of differential calculus. Student determines intervals of monotonicity of a given functions and its extrema. Students calculates antiderivatives using the substitution method of integration and integration by parts. Student applies definite integrals to solving geometrical problems. Student uses the basic operations on complex numbers.			[SW1] Assessment of factual knowledge		
	K6_U01	Student recognizes the importance of skillful use of basic mathematical apparatus in terms of study in the future. Student is able to process the acquired information, analyze and interpret it, draw conclusions and reason opinions.			[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment		

Subject contents	<p>Functions of one variable and their properties: The absolute value function definition, solving equations and inequalities with absolute value, graphs of functions with absolute value. Power functions solving power and polynomial equations and inequalities. Rational functions solving rational equations and inequalities. Exponential function properties and graphs, solving exponential equations and inequalities. Logarithmic functions properties and graphs, solving logarithmic equations and inequalities. Trigonometric and cyclometric functions properties and graphs, solving trigonometric equations and inequalities. Limits and continuity: Infinite sequences. Fundamental definitions of limit of sequence, convergence and divergence, limit theorems. Applications to solving equations . Differential calculus of functions with one variable and applications of differential calculus of functions with one variable: Definition of first derivative and differential. Rols and Lagranges theorems. Higher derivatives and differentials. Monotonicity and local extrema. Convexity, concavity and inflexion points of a function. De l'Hospital's Thorem. Asymptotes. Applying differential calculus to studying the properties of functions with one variable. Integral calculus of functions with one variable antiderivatives: The process of finding antiderivatives and integration formulas the substitution method of integration and integration by parts. Integration of rational, trigonometric and irrational functions. Definite integrals in Riemann"s sense: Newtona-Leibniza Thorem. Integration formulas, the substitution method of integration and integration by parts for definite integrals. Applications of integral calculus in computing areas of plane figures, lengths of arcs, volumes of solids of revolution. Complex numbers.</p>																	
Prerequisites and co-requisites																		
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="448 757 794 801">Subject passing criteria</th> <th data-bbox="794 757 1141 801">Passing threshold</th> <th data-bbox="1141 757 1487 801">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 801 794 835">Midterm exams</td> <td data-bbox="794 801 1141 835">50.0%</td> <td data-bbox="1141 801 1487 835">32.0%</td> </tr> <tr> <td data-bbox="448 835 794 869">Activity during classes</td> <td data-bbox="794 835 1141 869">50.0%</td> <td data-bbox="1141 835 1487 869">7.0%</td> </tr> <tr> <td data-bbox="448 869 794 902">Quizzes</td> <td data-bbox="794 869 1141 902">50.0%</td> <td data-bbox="1141 869 1487 902">11.0%</td> </tr> <tr> <td data-bbox="448 902 794 936">Written exam</td> <td data-bbox="794 902 1141 936">40.0%</td> <td data-bbox="1141 902 1487 936">50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Midterm exams	50.0%	32.0%	Activity during classes	50.0%	7.0%	Quizzes	50.0%	11.0%	Written exam	40.0%	50.0%
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<p>Example issues/ example questions/ tasks being completed</p>	<ol style="list-style-type: none"> 1. Find the domain and the set of values of the function $f(x)=\dots$. Determine the inverse function of f. 2. Check the continuity of the following function $f(x)=$. 3. Find local extremes and intervals of monotonicity of the following function $f(x)=$. 4. Evaluate the indefinite integral of the given rational function . 5. Give three applications of the definite integral with appropriate rules. 6. Find the area of the region bounded by $y=$, $y=$, $x=$ and $x=$. 7. Find in the complex set solutions of the equation
<p>Work placement</p>	<p>Not applicable</p>