GDAŃSK UNIVERSITY OF TECHNOLOGY

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-Tlałka	
	Teachers	dr Anita Dąbrowicz-Tlałka 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

Adresy na platformie eNauczanie:

WCh - Bt, Ch, ChB, TCh - s1: 2020/21 (A.Tlałka) - Moodle ID: 5821
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=5821

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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	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. Rolls and Lagranges theorems. Higher derivatives and differentials. Monotonicity and local extrema. Convexity, concavity and inflexion points of a function. De lHospitals Thorem. Asymptotes. Applying differential calculus to studying the properties of functions with one variable. Inegral 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.
Prerequisites and co-requisites	
Assessment methods and criteria	

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%

Recommended reading	Basic literature	- Praca zbiorowa pod redakcją Wikieł B.: Matematyka - Podstawy z elementami matematyki wyższej. PG, Gdańsk 2007; - M. Gewert, Z. Skoczylas : Analiza matematyczna 1, Oficyna Wydawnicza GiS 2008; - K. Jankowska, T. Jankowski : Zbiór zadań z matematyki, Wydawnictwo PG, 2010.
	Supplementary literature	- G.M. Fichtenholz : Rachunek różniczkowy i całkowy I, PWN 1985; - R. Leitner : Zarys matematyki wyższej I i II, Wydawnictwo Naukowo-Techniczne Warszawa 1999; - L. Maurin, M. Maczyński, T. Traczyk : Matematyka - podręcznik dla studentów wydziałów chemicznych, PWN 1975. - W. Żakowski, G. Decewicz : Matematyka I I II, Wydawnictwo Naukowo-Techniczne, Warszawa 1991.
	eResources addresses	WCh - Bt, Ch, ChB, TCh - s1: 2020/21 (A.Tlałka) - Moodle ID: 5821 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=5821 WCh - Bt, Ch, ChB, TCh - s1: 2020/21 (A.Tlałka) - Moodle ID: 5821 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=5821 WCh - Bt, Ch, ChB, TCh - s1: 2020/21 (A.Tlałka) - Moodle ID: 5821 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=5821

Example issues/ example questions/ tasks being completed	1. Find the domain and the set of values of the function f(x)=... . 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
Work placement	Not applicable