

。 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Mathematics, PG_00060834								
Field of study	Chemical Technology								
Date of commencement of studies	October 2023		Academic year of realisation of subject		2023/2024				
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	1		ECTS credits		9.0				
Learning profile	general academic profile		Assessment form		exam				
Conducting unit	Mathematics Center -	or Education							
Name and surname	Subject supervisor		dr Anita Dąbrowicz-Tlałka						
of lecturer (lecturers)	Teachers		dr Hanna Guze						
			dr Anita Dąbrowicz-Tlałka						
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
of instruction	Number of study hours	45.0	60.0	0.0	0.0		0.0	105	
	E-learning hours included: 0.0								
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	105		15.0		150.0 2		270	
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] has knowledge in mathematics, including the solution of equations and inequalities involving elementary functions, differential and integral calculus, elements of vector analysis, statistics, optimisation and numerical methods, has basic knowledge in selected branches of physics, useful for the description and analysis of technological processes		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] is able to acquire information from literature, databases and other appropriately selected sources, also in English; is able to integrate information obtained, interpret it and make conclusions, formulate and justify opinions		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.		[SU5] Assessment of ability to present the results of task [SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information				

Subject contents	The sets of numbers and set notation. Basic mathematics symbols.							
	Functions of one variable:							
	 definitions, graphs, properties, continuity, limits absolute value, equations and inequalities polynomials, rational functions, power functions, trigonometric and inverse trigonometric functions, exponential and logarithmic functions equations and inequalities involving these functions applications to mathematical modeling 							
	Infinite number sequences, limits and continuity of functions							
	 boundedness and monotonicity imits 							
	continuity of functions, types of discontinuities and their interpretation							
	Single variable calculus:							
	 definition of the derivative Rolle's and Lagrange's theorems and their applications L'Hospital's Rule monotonicity and local/global extrema (optimization problems) higher order derivatives concavity, inflection points applications of single variable differential calculus to curve sketching, applications of differential calculus to other fields (e.g. chemistry, physics, biology) Definite and indefinite integral, Fundamental Theorem of Calculus 							
	 basic integration formulas integration by substitution, by parts, by partial fractions applications of integral calculus to other fields 							
Prerequisites								
and co-requisites	Г	1	1					
Assessment methods	Subject passing criteria	Passing threshold	Percentage of the final grade					
and chiena	Activity during lectures and classes	0.0%	10.0%					
	Midterm exams	50.0%	45.0%					
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; 						
		zyk : Matematyka - podręcznik dla , PWN 1975.						
		- W. Żakowski, G. Decewicz : Matematyka I I II, Wydawnictwo Naukowo-Techniczne, Warszawa 1991.						

	eResources addresses	Podstawowe			
		https://enauczanie.pg.edu.pl/moodle/course/view.php?id=31298 - E- course on the eNauczanie platform with course materials and exercises for students. The e-course also has an organizational character related to the subject.			
		Adresy na platformie eNauczanie:			
		WCh - Bt, Ch, TCh, ZT s1: 2023/24 (A.Tlałka) - Moodle ID: 31298 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=31298			
		WCh - Bt gr.2,3, TCh s.1: ćw. 2023/24 (H.Guze) Matematyka - Moodle ID: 31392 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=31392			
		WCh - Bt, Ch, TCh, ZT s.1 - Liczby zespolone 2023/24 (A.Tlałka) - Moodle ID: 32788 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32788			
Example issues/ example questions/ tasks being completed	1. Find the domian and the set of values of the function $f(x) = \dots$				
	2. Find the derivative of f(x)=3. Sketch the graph of the function f(x)= . Identify any local extrema and points of inflection.				
	4. Find solutions of the equation in the set of complex numbers.				
	5. Use the definite integral to determine the volume of the solid formed by the rotation of the curve arou the axis oX.				
Work placement	Not applicable				

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