GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Elementary Mathematics, PG_00047357
Field of study	Electronics and Telecommunications

Date of commencement of studies	October 2024	Academic year of realisation of subject	2024/2025
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study Subject group related to scientific research 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	6.0
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 Robert Fidytek
	Teachers	mgr Dorota Grott dr Robert Fidytek mgr Anetta Brękiewicz-Sieg

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						

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	6.0	84.0	150

Subject objectives	Students obtain competences in the range of using methods of elementary mathematics.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U01] can apply mathematical knowledge to formulate and solve complex and non-typical problems related to the field of study and perform tasks, in an innovative way, in not entirely predictable conditions, by:n- appropriate selection of sources and information obtained from them, assessment, critical analysis and synthesis of this information,n- selection and application of appropriate methods and toolsn	Student solves equations and inequalities with elementary functions. Student solves exercises involving arithmetic and geometric sequences. Student applies the concepts of limit, continuity, and derivatives of functions to solve curve sketching problems.	[SU4] Assessment of ability to use methods and tools
	[K6_W01] knows and understands, to an advanced extent, mathematics necessary to formulate and solve simple issues related to the field of study	Student names basic properties of elementary functions. Student defines the basic concepts of differential calculus of one variable function. Student uses the first and second derivatives of a function to analyze its properties.	[SW1] Assessment of factual knowledge

Subject contents	Number sets. Absolute value of a real number. Exponentiation. Rational powers. Factorial. Binomial. Functions and their properties. Polynomials. Calculus with polynomials. Rational functions. Rational equations and inequalities. Power functions. Roots equations and inequalities. Exponential functions. Exponential equations and inequalities. Hyperbolic functions. Logarithms of numbers and their properties. Logarithmic functions. Logarithmic equations and inequalities. Trygonometric functions. Trigonometric formulas and identities. Trygonometric equations and inequalities. Cyclometric functions. Number sequences and their properties. The arithmetic and the geometric sequence. Limit of a sequence. Euler"s number. Proper and improper limit of a function. Continuity. Derivatives. Differentiation rules. Derivatives and differentials of higher order. Applications of Taylor and Maclaurin formula. Increasing and decreasing functions. Maximum and minimum values. Concavity and points of inflection. Indeterminate forms and De lHospital rule. Asymptotes of function. Applications of differential calculus to studying properties of one variable functions.
Prerequisites and co-requisites	

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Final exam	50.0%	60.0%
	Test	50.0%	30.0%
	Activity	0.0%	10.0%

Recommended reading	Basic literature	Wikieł B. (red), Matematyka. Podstawy z elementami matematyki wyższej, Wydawnictwo Politechniki Gdańskiej
	Supplementary literature	M.Bryński, N.Dróbka, K.Szymański, ,,Matematyka dla zerowego roku studiów wyższych. Elementy analizy matematycznej", Wydawnictwa Naukowo-Techniczne
	eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	1. Solve the equation $|x-3|^2 -4|x-3|-12=0$. 2. Finf the domain and the set of values of the function $f(x) = - 2 \arcsin(3-x)$. Determine the inverse function of f. 3. Find the derivative of $f(x)==(\ln x)^x$. 4. Evaluate the limit of a given sequence $a_n = n (\ln(2n-1) - \ln(2n+1))$. 5. Find local extremes and intervals of monotonicity of the function $f(x) = x - \text{arctg } 2x$.
Work placement	Not applicable