GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Basic Math, PG_00047522		
Field of study	Biomedical Engineering, Biomedical Engineering, Biomedical Engineering		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
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	3.0
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 Barbara Wikieł	
	Teachers	dr Barbara Wikieł mgr inż. Wojciech Dąbrowski	

Lesson types

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	3.0	12.0	75

Subject objectives

Students obtain competence in the range of using methods of basic 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 arythmetic and geometric sequences. Student geometrically interprets the results of an examination of a graph of a function using the concept of limit, continuity and derivatives of functions.	[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 mentions basic properties of elementary functions. Student defines the basic concepts of differential calculus of one variable. Student analyses the properties of functions on the basis of an examination of its first and second derivatives.	[SW1] Assessment of factual knowledge

<table>
<tr><td>Subject contents</td><td>Course content – lecture
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 l’Hospital rule. Asymptotes of function. Applications of differential calculus to studying properties of one variable functions.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Final exam</td><td>50.0%</td><td>80.0%</td></tr>
<tr><td>Activity</td><td>0.0%</td><td>20.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>Wikieł B. (red), „Matematyka. Podstawy z elementami matematyki wyższej”, Wydawnictwo Politechniki Gdańskiej</td></tr>
<tr><td>Supplementary literature</td><td>M.Bryński, N.Dróbka, K.Szymański, ,,Matematyka dla zerowego roku studiów wyższych. Elementy analizy matematycznej", Wydawnictwa Naukowo-Techniczne</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>1. Solve the equation $|x-3|^2 -4|x-3|-12=0$.

2. Finf the domain and the set of values of the function $f(x) = \pi - 2 \arcsin(3-x)$. 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 $f(x) = x - \operatorname{arctg} 2x$.</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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