GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Precalculus, PG_00045351		
Field of study	Data Engineering, Data 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
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	English
Semester of study	1	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Mathematics Center -> Vice-Rector For Education		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Ewa Kozłowska-Walania	
	Teachers	dr Ewa Kozłowska-Walania	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	15.0	0.0	0.0	0.0	30

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	30	5.0	40.0	75

Subject objectives

Student obtains knowledge in elementary mathematics necessary to understand calculus

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W02] demonstrates advanced preparation in methods and techniques for formulating and solving problems	Student knows the main theorems, methods and tools presented during the lecture and knows how top use them.	[SW1] Assessment of factual knowledge
[K6_U04] formulates logical solutions to complex or unstructured problems	Student is able to analyze a problem and choose, from the methods presented during the class, the tools necessary for its correcxt solution.	[SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment [SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject

<table>
<tr><td>Subject contents</td><td>Course content – lecture
• Review of polynomials, rational and power functions.
• Exponential functions. Exponential equation and inequalities. Logarithmic function. Logarithms and their properties. Logarithmic equations and inequalities.
• Trigonometric functions of any angle. Graphs of trig functions. Trig identities. Trigonometric equations and inequalities. Inverse trig functions.
• Number sequences. Monotonicity, boundedness, limits. Properties of convergent sequences. Squeeze theorem.

Course content – exercises
• Review of polynomials, rational and power functions.
• Exponential functions. Exponential equation and inequalities. Logarithmic function. Logarithms and their properties. Logarithmic equations and inequalities.
• Trigonometric functions of any angle. Graphs of trig functions. Trig identities. Trigonometric equations and inequalities. Inverse trig functions.
• Number sequences. Monotonicity, boundedness, limits. Properties of convergent sequences. Squeeze theorem.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>No requirements</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 comprehensive test</td><td>50.0%</td><td>90.0%</td></tr>
<tr><td>Class participation</td><td>0.0%</td><td>10.0%</td></tr>
</table></td></tr>
<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>• B.Sikora, E.Łobos, A first course in calculus, Wydawnictwo Politechniki Śląskiej, 2010
• K.Binmore, J.Davies, Clculus, Cambridge University Press, 2007
• Portal Mathematics, https://cnm.pg.edu.pl/mathematics/precalculus</td></tr>
<tr><td>Supplementary literature</td><td>• Precalculus: Mathematics for Calculus (7th edition), James Stewart, Lothar Redlin, and Saleem Watson. Cengage Learning 2016
• Precalculus, Michael Sullivan, Pearson (10th edition), 2015
• Precalculus, Julie Miller and Donna Gerken, McGraw Hill</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
</table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>1. Solve the inequality (x4+x2-10x) / (1-sin 2 x)<0.
2. Solve the equations 9log3sin x - 41/2+\log2cos x - log2 0,5=0.
3. Find the domain and range of the function and sketch its graph f(x)=+1/2 arcsin(1-2x). Find the inverse function of f.
4. Evaluate tg(\arccos(2/3)+cos(arctg(2/3).
5. Let an=(3n)!/n3n . Find limn(an+1/an).
6. Use the squeeze theorem to find the limit of the sequence
xn= 2/(n4+2)+4/(n4+4)+6/(n4+6)+... +2n/(n4+2n)</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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