GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Precalculus, PG_00045351		
Field of study	Data Engineering		
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	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 Magdalena Musielak	
	Teachers	dr Magdalena Musielak	

Lesson types and methods of instruction

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

WETI (Data Engineering) - Mathematics 2020/21 (M.Musielak) - Moodle ID: 7358
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=7358

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_K01] is aware of quickly changing trends and the resulting need for further education and self-improvement in the area of the performed profession of an engineer with IT and economic-financial skills.	Student recognizes the importance of skillful use of basic mathematical apparatus in the context of engineering studies.	[SK2] Assessment of progress of work
[K6_W01] has basic knowledge in the field of mathematics, including mathematical analysis, algebra, geometry, probability calculus, statistics and numerical methods, necessary to formulate and solve simple tasks in the field of IT	Student uses methods of precalculus to formulate and solve simple problems from other areas of mathematics.	[SW1] Assessment of factual knowledge
[K6_U05] Uses matrix calculus in the theory of systems of linear equations, uses differential, integer and vector calculus, performs operations on complex numbers and determines polynomial elements.	Student names the properties of elementary functions and plots their graphs. Solves equations and inequalities with elementary functions. Finds the inverse functions of exponential, logarithmic, and trigonometric functions. Solves problems connected to sequences.	[SU4] Assessment of ability to use methods and tools

Subject contents

- 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.

Prerequisites and co-requisites

No requirements

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Tests	50.0%	23.0%
Final comprehensive test	40.0%	70.0%
eTest	50.0%	7.0%

Recommended reading

Basic literature	• 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*
Supplementary literature	• *Matematyka. Podstawy z elementami matematyki wyższej*, pod red. B.Wikieł, Wydawnictwo Politechniki Gdańskiej • K.Jankowska, T.Jankowski, *Zbiór zadań z matematyki*, Wydawnictwo PG, 2010 • W.Żakowski, *Algebra i analiza matematyczna dla licealistów i kandydatów na wyższe uczelnie,* WNT, Warszawa 1999 • M.Gewert, Z.Skoczylas, *Analiza matematyczna 1*, Oficyna wydawnicza GiS.
eResources addresses	

Example issues/ example questions/ tasks being completed

1. Solve the inequality (x4+x2-10x) / (1-sin 2 πx)<0.
2. Solve the equations 9log3√sin x - 41/2+\log2cos x - log2 0,5=0.
3. Find the domain and range of the function and sketch its graph f(x)=π+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)

Work placement

Not applicable