GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00058867		
Field of study	Nanotechnology		
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	8.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Differential Equations and Mathematical Applications -> Faculty of Applied Physics and Mathematics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Anna Niewulis	
	Teachers	dr Leszek Ziemczonek dr Anna Niewulis	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	45.0	0.0	0.0	0.0	75

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	75	15.0	110.0	200

Subject objectives

Students obtain competence in the range of using methods of mathematical analysis 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_U01	Student recognizes the importance of self-expanding knowledge and take the challenge of working with a group to solve a problem.	[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information
K6_W02	Student mentions basic properties of elementary functions. Student solves equations and inequalities with elementary functions. Student calculates limits of the sequences and functions Student determines intervals of monotonicity of a given functions and its extrema. Student calculates antiderivatives using the substitution method of integration and integration by parts. Student applies definite integrals to solving geometrical problems.	[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation

<table>
<tr><td>Subject contents</td><td>Functions of one variable and their properties:
The absolute value function definition, solving equations and inequalities with absolute value, graphs of functions with absolute value.
Power functions solving power and polynomial equations and inequalities.
Rational functions solving rational equations and inequalities.
Exponential function properties and graphs, solving exponential equations and inequalities.
Logarithmic functions properties and graphs, solving logarithmic equations and inequalities.
Trigonometric and cyclometric functions properties and graphs, solving trigonometric equations and inequalities.
Limits and continuity:
Infinite sequences.
Fundamental definitions of a limit of a sequence, convergence and divergence, limit theorems.
Applications to solving equation.
Differential calculus of one variable functions and its applications:
Definition of a first derivative and differential.
Rolls and Lagranges theorems.
Higher derivatives and differentials.
Monotonicity and local extrema.
Convexity, concavity and inflexion points of a function.
De lHospitals Thorem.
Asymptotes.
Applying differential calculus to studying the properties of one variable functions.
Inegral calculus of one variable functions antiderivatives:
The process of finding antiderivatives and integration formulas the substitution method of integration and integration by parts.
Definite integrals in Riemanns sense:
Newton-Leibniz Thorem.
Integration formulas, the substitution method of integration and integration by parts for definite integrals.</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>Exam</td><td>50.0%</td><td>50.0%</td></tr>
<tr><td>Colloquium</td><td>50.0%</td><td>50.0%</td></tr>
</table>
</td></tr>
<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>Basic literature

K. Kuratowski, Introduction to calculus, Pergamon press, 1961</td></tr>
<tr><td>Supplementary literature</td><td>Supplementary literature</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:
WFTiMS - NT - Analiza Matematyczna 2023/2024 (A.Niewulis) - Moodle ID: 32499
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32499</td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>Find the domain and the set of values of the function f(x)=... . Determine the inverse function of f.

Evaluate the limit of the function f(x)=

Sketch the graph of the function f(x)= . Identify any local extrema and points of inflection.

Find the area between the two curves y= and y= from x= to x= .

Evaluate the indefnite integral of the function f(x)=</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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