GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Mathematics, PG_00060628		
Field of study	Transport and Logistics		
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	Polish
Semester of study	1	ECTS credits	10.0
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 Lech Kujawski	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	45.0	60.0	0.0	0.0	0.0	105

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	105	10.0	135.0	250

Subject objectives

The student's acquisition of competence in using the tools of mathematical analysis, linear algebra, and mathematical statistics, as well as the ability to solve simple problems occurring in engineering domains.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U02] can work individually and in a team, communicate using various techniques in a professional environment, as well as document, analyze and present the results of his work; can estimate the time needed to complete a given task	The student integrates knowledge in the field of mathematics with knowledge from other disciplines.	[SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment
[K6_W01] has well structured knowledge of mathematics, including algebra, elements of logic, geometry, mathematical analysis and probabilistics necessary to describe and analyze the operation of means and transport systems	The student lists the basic properties of elementary functions. The student solves equations and inequalities containing elementary functions. The student interprets the geometric results of analyzing the graph of a function using the concept of limit and function continuity. The student defines the basic concepts of differential calculus of a single-variable function. The student analyzes the properties of a function based on the examination of its first and second derivative. The student applies basic formulas and integration techniques to calculate indefinite integrals. The student lists the geometric applications of definite integration. The student distinguishes between types of improper integrals. The student solves equations using complex numbers.	[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects

<table>
<tr><td>Subject contents</td><td>Course content – lecture
Functions of one variable and their properties: Absolute value, definition, solving equations and inequalities with absolute value, graphs of functions with absolute value. Power, exponential, logarithmic, trigonometric, and cyclometric functions, properties, and graphs, solving equations and inequalities. Limit and continuity of functions: Number sequences. Basic definitions and theorems concerning limits and continuity of functions. Applications for determining solutions of equations. Differential calculus of functions of one variable and applications of differential calculus of functions of one variable: Definition of the derivative of a function and differentials of functions. Monotonicity and local extremes of functions. Concavity, convexity of the function graph, inflection points. L'Hôpital's theorem. Taylor's theorem. Asymptotes of the function graph. Use in the analysis of stages of function variability. Integral calculus of functions of one variable - indefinite integral: Basic methods and ways of integration, integration by parts and substitution. Integration of rational, trigonometric, and irrational functions. Definite integral in the sense of Riemann: Newton-Leibniz theorem. Basic calculation methods, integration by substitution and by parts for the definite integral. Applications of the definite integral to determine the areas of flat areas, the length of a curve, the volume of solid figures. Improper integral. Definition. Types of integrals. Analytic geometry in space: Basic definitions and properties of vectors. Eigenvalues and eigenvectors. Scalar, vector, mixed product - their properties and applications.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Absence of prerequisites and additional 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></td><td>50.0%</td><td>50.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>Red. B. Wikieł, Matematyka. Podstawy z elementami matematyki wyższej. Wydawnictwo PG, Gdańsk 2009W. Krysicki, L. Włodarski, Analiza matematyczna w zadaniach 1,Wydawnictwo Naukowe PWN, Warszawa 2008M. Gewert, Z. Skoczylas, Analiza matematyczna 1. Definicje.Twierdzenia. Wzory. Oficyna Wydawnicza GIS, Wrocław 2008M. Gewert, Z. Skoczylas, Analiza matematyczna 1. Przykłady izadania. Oficyna Wydawnicza GIS, Wrocław 2008T. Jurlewicz, Z. Skoczylas, Algebra liniowa 1. Definicje. Twierdzenia.Wzory. Oficyna Wydawnicza GIS, Wrocław 2006T. Jurlewicz, Z. Skoczylas, Algebra liniowa 1. Przykłady i zadania.Oficyna Wydawnicza GIS, Wrocław 2006K. Jankowska, T. Jankowski, Zbiór zadań z matematyki, WydawnictwoPG, Gdańsk 2008K. Jankowska, T. Jankowski, Zadania z matematyki wyższej, Wydawnictwo PG, Gdańsk 2008</td></tr>
<tr><td>Supplementary literature</td><td>W. Leksiński, I. Nabiałek, W. Żakowski, Matematyka. Definicje,twierdzenia, przykłady, zadania. WNT, Warszawa 2006</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></td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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