



Subject card

Subject name and code	Mathematics, PG_00064167						
Field of study	Transport						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2025/2026		
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		7.0		
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 Krzysztof Radziszewski				
	Teachers						
Lesson types and methods of instruction	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		10.0		105.0	175
Subject objectives	Students obtain competence in the range of using methods of mathematical analysis and linear algebra 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_W01] has knowledge of mathematical analysis, algebra, calculus of probability and operational research required for describing and solving transport problems		Student: defines the basic concepts of linear algebra, solves equations and inequalities, containing elementary functions geometrically interprets the results of an examination of a graph of a function using the concept of limit, continuity and derivatives of functions, recognizes the importance of selfexpanding knowledge and take the challenge of working with a group to solve a problem.		[SW1] Assessment of factual knowledge		
	[K6_U08] able to carry out simple engineering tasks related to the construction and operation of a selected element of the transport system, select the right methods and tools		Student: defines the basic concepts of linear algebra, solves equations and inequalities, containing elementary functions, geometrically interprets the results of an examination of a graph of a function using the concept of limit, continuity and derivatives of functions, recognizes the importance of selfexpanding knowledge and take the challenge of working with a group to solve a problem.		[SU1] Assessment of task fulfilment		

Subject contents	Matrices. Determinants. Inverse matrix. Rank of the matrix. Systems of linear equations: Cramers theorem, Kronecker-Capelly theorem, Gauss-Jordan elimination. Absolute value of a real number. Functions and their properties. Elementary functions: polynomials, rational functions, exponential functions, logarithmic functions, trigonometric and inverse trigonometric functions. Sequences of numbers. Limit of a sequence. Limit and continuity of a function. Differential calculus: derivative and differential of a function, Taylors formula, asymptotes of functions, maxima and minima, concavity and points of inflection. Antiderivative and the indefinite integral.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Written exam	50.0%	60.0%
	Midterm colloquium	50.0%	40.0%
Recommended reading	Basic literature	1. Praca zbiorowa pod redakcją B. Wikiel, Matematyka - Podstawy z elementami matematyki wyższej, PG, Gdańsk 2007. 2. K. Jankowska, T. Jankowski, Zbiór zadań z matematyki, PG, Gdańsk 1997. 3. Praca zbiorowa pod red. E. Mieloszyka, Matematyka Materiały pomocnicze do ćwiczeń, PG, Gdańsk 2004. 4. R. Leitner, Zarys matematyki wyższej I i II, Wydawnictwo Naukowo-Techniczne, Warszawa 2001. 5. R. Leitner, W. Matuszewski, Z. Rojek, Zadania z matematyki wyższej I i II, Wydawnictwo Naukowo-Techniczne, Warszawa 1999. 6. M. Gewert, Z. Skoczylas, Analiza matematyczna 1 Definicje, twierdzenia, wzory, Oficyna Wydawnicza GiS, Wrocław 2001.	
	Supplementary literature	7. M. Gewert, Z. Skoczylas, Analiza matematyczna 1 Przykłady i zadania, Oficyna Wydawnicza GiS, Wrocław 2001. 8. W. Krywicki, L. Włodarski, Analiza matematyczna w zadaniach I i II, Wydawnictwo Naukowe PWN, Warszawa 1998. 9. T. Jurlewicz, Z. Skoczylas, Algebra liniowa 1 Definicje, twierdzenia, wzory, Oficyna Wydawnicza GiS, Wrocław 2002. 10. T. Jurlewicz, Z. Skoczylas, Algebra liniowa 1 Przykłady i zadania, Oficyna Wydawnicza GiS, Wrocław 2002. 11. E. Mieloszyk, Macierze, wyznaczniki i układy równań, PG, Gdańsk 2003.	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	1. Find the domain and the set of values of the function $f(x)=\arcsin(3x-2)+$. Determine the inverse function of f . 2. Find the derivative of $y=4x(3x^2+5)^5$. 3. Sketch the graph of the function $f(x)=x-\ln x$. Identify any local extrema and points of inflection. 4. Find the absolute extrema of $f(x)=4x-36x^{-1}$ on the interval $[1,6]$. 5. Calculate $4x^2 \ln x \, dx$. 6. Find A^{-1} if the matrix A is a 2×2 matrix of the elements $a_{ij} = 3i - j$.		
Work placement	Not applicable		

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