



Subject card

Subject name and code	Mathematics for engineers, PG_00062713						
Field of study	Technologies for Industry 5.0						
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		
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		assessment		
Conducting unit	Mathematics Center -> Vice-Rector For Education						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Hanna Guze				
	Teachers		dr Hanna Guze				
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		5.0		95.0	175
Subject objectives	Students obtain competence in using methods of mathemaical analysis, linear algebra and geometry, and knowledge how to solve simple problems that are found in the field of engineering.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_K01] is aware of the need to constantly update and enrich knowledge and practical skills, and improve professional, personal and social competences		Student understands the need of lifelong learning, and is able to inspire others and organize their learning process.		[SK1] Assessment of group work skills		
	[K6_W01] demonstrates knowledge and understanding of mathematics, physics, chemistry and IT tools at the level necessary to formulate and solve typical engineering and technological problems		Student names basic properties of elementary functions. Student defines the basic concepts of linear algebra. Student calculates determinants of any degree. Student gives a graphic interpretation of the systems of linear equations. Student examines the linear independence of vectors. Student examines the position of lines and planes in space. Student uses the basic operations on complex numbers. Student determines the real and complex roots of polynomials.		[SW1] Assessment of factual knowledge		
	[K6_U01] applies knowledge of mathematics, physics, chemistry, IT tools and other engineering disciplines to solve theoretical, engineering and technological problems		Student combines knowledge of mathematics with knowledge from other fields. Student uses methods of mathematical description of phenomena in the physical and mechanical processes.		[SU3] Assessment of ability to use knowledge gained from the subject		

Subject contents	Elementary functions and their properties.		
	Elements of Linear Algebra: matrices (definition, types of matrices, operations, inverse matrix), determinants (definition, properties), systems of linear equations (Cramer's rule, Kroneckera - Capelli theorem, Gaussian elimination).		
	Analytic Geometry: vectors (dot product, cross product, mixed product, and their application), equations of line and planes in space.		
	Trigonometric functions and their basic properties.		
	Complex numbers: algebraic and trigonometric form, complex conjugate, modulus, arithmetic operations, root of complex numbers, solving equations.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	tests ana activity during classes	0.0%	50.0%
	Written final exam	50.0%	50.0%
Recommended reading	Basic literature	1. K.T. Jankowscy, Zbiór zadań z matematyki , Wydawnictwo PG, 2. T. Jankowski, Linear algebra, Wydawnictwo Politechniki Gdańskiej, Gdańsk 2001, 3. K.T. Jankowscy, Funkcje wielu zmiennych. Całki wielokrotne. Geometria analityczna. Wydawnictwo PG,	
	Supplementary literature	1. T. Jurliewicz, Z. Skoczylas, Algebra liniowa 1, Oficyna Wydawnicza GiS, 2. J. Topp, Algebra liniowa, Wydawnictwo PG, Gdańsk 2005,	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	1. Solve the following matrix equation. 2. Solve the given system of linear equations. 3. Find the area of the triangle with verices A, B and C, and find an equation of the plane that passes through these points. 4. Find the roots of the given complex numer.		
Work placement	Not applicable		

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