

## Subject card

Subject name and code	Linear algebra, PG_00045352								
Field of study	Data Engineering								
Date of commencement of studies	October 2024		Academic year of realisation of subject			2024/2025			
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	Faculty of Electronics, Telecommunications and Informatics								
Name and surname	Subject supervisor		dr Ewa Kozłowska-Walania						
of lecturer (lecturers)	Teachers		dr Ewa Kozłowska-Walania						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
	Number of study hours	15.0	15.0	0.0	0.0		0.0	30	
	E-learning hours included: 0.0								
Learning activity and number of study hours	Learning activity	ing activity Participation ir classes include plan				Self-study		SUM	
	Number of study hours	30		5.0		40.0		75	
Subject objectives	Students obtain competence in using methods of linear algebra and knowledge how to solve simple problems that are found in the field of engineering, in particular connected to data engineering.								
Learning outcomes	Course outcome		Subject outcome			Method of verification			
	[K6_U04] formulates logical solutions to complex or unstructured problems		Student is able to analyze a problem and choose, from the methods presented during the class, the tools necessary for its correct solution.			[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment			
	[K6_W02] demonstrates advanced preparation in methods and techniques for formulating and solving problems		Student knows the main theorems, methods and tools presented during the lecture and knows how top use them.			[SW1] Assessment of factual knowledge			

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Elements of modular antimetic, tables of addition and multiplication modulo n. Inverse modulo n. Field Zo.   Field of complex numbers. Geometrical interpretation of complex numbers. Complex arithmetic. Complex rouths Simple equations in complex domain.   Ring of polynomials are field K. Roots of polynomials. Fundamental theorem of algebra. Polynomial factorization. Polynomial arithmetic with coefficients from field K~2p. Synthetic division.   Matrices and determinants. Inverse matrix. Matrix equations.   Systems of linear equations. Cramers theorem. Gaussian elimination.   Vectors in R3. dot, cross, and mixed products. Applications of vector products.   Line and plane in 3D space vector, normal, parametric, canonical, intercept forms.   Prerequisites and co-requisites	Outside of a continue	1.						
Field of complex numbers. Geometrical interpretation of complex numbers. Complex arithmetic. Complex rods. Simple equations in complex domain.  Ring of polynomials over field K. Roots of polynomials. Fundamental theorem of algebra. Polynomial accionation. Polynomial arithmetic with coefficients from field K=2p. Synthetic division.  Matrices and determinants. Inverse matrix. Matrix equations.  Systems of linear equations. Cramers theorem. Gaussian elimination.  Vectors in R3, dot, cross, and mixed products. Applications of vector products.  Line and plane in 3D space vector, normal, parametric, canonical, intercept forms.  Prerequisites  No requirements  No requirements  Subject passing criteria  Passing threshold  Final comprehensive test  Subject passing criteria  Passing threshold  Final comprehensive test  Subject passing criteria  Passing threshold  Final comprehensive test  Final comp	Subject contents	Binary operations. Basic algebraic structures: group, ring, filed, linear space.						
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Work placement Not applicable								
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