University of Gdańsk

Subject card

Subject name and code	Linear Algebra, PG_00204158		
Field of study	Informatics		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
Education level	Bachelor's 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	2	ECTS credits	5.0
Learning profile	practical	Assessment form	exam
Conducting unit			
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Magda Dettlaff	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	30.0	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	0.0	65.0	125

Subject objectives

To familiarize the student with complex numbers, matrices, determinants, various methods of solving systems of equations and issues related to linear space and scalar products. Acquiring accounting skills and practice in using these issues.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[INFPL3_K02] is ready to recognize the importance of knowledge in solving cognitive problems and practical and seeking opinions experts in case of difficulties with independent problem solving	The student recognizes the importance of independently expanding their knowledge. They complete exercises designed to reinforce their knowledge as part of their homework, and consult with the instructor if they encounter any problems.	[SK5] implementation of a problem task
[INFPL3_W01] knows and understands advanced mathematical concepts including the basics of algebra, discrete mathematics (elements of logic and set theory, combinatorics and graph theory), probabilistic methods and applies this knowledge to modeling IT problems, designing algorithms, analyzing data and solving computational problems	The student is familiar with the concepts and theorems in linear algebra covered in the lecture. The student is able to solve equations in the complex number set, perform operations on matrices, and solve systems of equations. The student knows and understands issues related to the linear vector space over a field.	[SW4] test/exam - oral or written [SW5] implementation of a problem task
[INFPL3_U01] can apply mathematical knowledge to formulate, analyse and solve tasks related to computer science, design and analyze algorithms in terms of their correctness and computational complexity	The student is able to select appropriate linear algebra methods for a given optimization or decision-making problem. The student applies knowledge of systems of equations and matrices to construct mathematical models.	[SU4] test/exam - oral or written [SU5] implementation of a problem task

<table>
<tr><td>Subject contents</td><td>Complex numbers: canonical form and trigonometric form. Polynomials—real and complex; Bezout’s theorem. Matrices—basic properties, operations on matrices, inverse matrices, eigenvalues of matrices. Determinants—methods for calculating determinants. Systems of linear equations—Gauss’s elimination method, Cramer’s rules. Linear space—definition of a space, subspaces, vectors, linearly independent and dependent sets of vectors, basis and dimension of a linear space, scalar product of vectors. Familiarizing students with the terminology in English.</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>homeworks</td><td>51.0%</td><td>5.0%</td></tr>
<tr><td>egzam</td><td>51.0%</td><td>35.0%</td></tr>
<tr><td>tests</td><td>51.0%</td><td>60.0%</td></tr>
</table>
</td></tr>
<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>Jerzy Topp, Algebra liniowa, Wydawnictwo Uniwersytetu Gdańskiego, 2015, Gdańsk

T. Jurlewicz, Z. Skoczylas, Algebra i geometria analityczna. Definicje, twierdzenia, wzory. Oficyna Wydawnicza GiS, Wrocław 2024.

T. Jurlewicz, Z. Skoczylas, Algebra i geometria analityczna. Przykłady i zadania. Oficyn Wydawnicza GiS, Wrocław 2024.</td></tr>
<tr><td>Supplementary literature</td><td></td></tr>
<tr><td>eResources addresses</td><td></td></tr>
</table>
</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>Write the complex number 3+3i in trigonometric form, then calculate (3+3i)^8

Find the inverse matrix of a given matrix

State Bezout's theorem

Calculate the dot product of vectors.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
</table>

Document generated electronically. Does not require a seal or signature.