University of Gdańsk

Subject card

Subject name and code	Linear algebra, PG_00143981		
Field of study	Informatics		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2024/2025
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	
Conducting unit			
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Magda Dettlaff	
	Teachers	dr inż. Magda Dettlaff mgr Maciej Stankiewicz dr hab. Karol Horodecki dr Felix Huber dr inż. Paweł Mazurek	

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
[INFL3_U04] can create, run and test programs using dedicated tools and design patterns	The student is able to use basic IT tools, ex. R, Mathematica, for algebraic calculations.	[SU5] implementation of a problem task [SU6] demonstration of practical skills
[INFL3_W01] has knowledge in mathematics covering the basics of algebra, discrete mathematics (elements of logic and set theory, combinatorics and graph theory), probabilistic methods	The student knows the basic concepts of linear algebra discussed during the lecture.	[SW4] test/exam - oral or written [SW5] implementation of a problem task
[INFL3_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	Is able to program basic algorithms from linear algebra, ex. calculating the determinant.	[SU5] implementation of a problem task [SU6] demonstration of practical skills
[INFL3_K02] can precisely formulate questions to deepen his/her own understanding of a given topic or to find missing elements of reasoning	The student is able to use the knowledge acquired during classes to independently solve tasks.	[SK8] observation of student's independent or team work

Subject contents

Complex numbers: canonical and trigonometric forms. Polynomials. Matrices - basic definitions and properties, inverse matrix. Determinants and methods of their calculation. Systems of linear equations - solving methods. Linear space - definitions, properties, vectors in linear space, linearly independent and dependent vectors, dimension and basis of space, dot product.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
test 1	50.0%	30.0%
test 2	50.0%	30.0%
homeworks	0.0%	0.0%
egzam	50.0%	40.0%

Recommended reading

Basic literature	Jerzy Topp, Algebra liniowa, Wydawnictwo Uniwersytetu Gdańskiego, 2015, Gdańsk T. Jurlewicz, Z. Skoczylas, Algebra i geometria analityczna. Definicje, twierdzenia, wzory. Oficyna Wydawnicza GiS, Wrocław 2016. T. Jurlewicz, Z. Skoczylas, Algebra i geometria analityczna. Przykłady i zadania. Oficyn Wydawnicza GiS, Wrocław 2015.
Supplementary literature	A. Mostowski, M. Stark, Elementy algebry wyższej, PWN, Warszawa 1963
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed

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

Work placement

Not applicable

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