Subject card

Subject name and code	Linear Algebra, PG_00047356
Field of study	Electronics and Telecommunications

Date of commencement of studies	October 2023	Academic year of realisation of subject	2023/2024
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	3.0
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 Robert Fidytek
	Teachers	mgr Anetta Brękiewicz-Sieg
		dr Robert Fidytek
		mgr Dorota Grott

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	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	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
	Number of study hours	30	3.0	42.0	75

Subject objectives	Students obtain competence in the range of using methods of 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] Knows and understands, to an advanced extent, mathematics necessary to formulate and solve simple issues related to the field of study	Student defines the basic concepts of linear algebra and analitic geometry necessary to solve simple engineering problems in the domain of education.	[SW1] Assessment of factual knowledge
	[K6_U01] can apply mathematical knowledge to formulate and solve complex and non-typical problems related to the field of study and perform tasks, in an innovative way, in not entirely predictable conditions, by:n- appropriate selection of sources and information obtained from them, assessment, critical analysis and synthesis of this information,n-selection and application of appropriate methods and toolsn	Student uses basic notions and formulas of matrix and vector calculus. Student analyses a given problem from analitic geometry. Student uses complex numbers and studies complex functions.	[SU4] Assessment of ability to use methods and tools

Subject contents	Calculus of vectors. Basis vectors. Matrices. Calculus of matrixes. Determinants and their properties. Inverse matrix. Rank of a matrix. Eigenvalues and eigenvectors of a square matrix. Systems of linear equations. Line and plane in space. Complex numbers. Operations on complex numbers.
Prerequisites and co-requisites	

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Final test	50.0%	85.0%
	Activity	0.0%	15.0%

Recommended reading	Basic literature	1. Jurlewicz T., Skoczylas Z., Algebra i geometria analityczna. Definicje, twierdzenia, wzory, Oficyna Wydawnicza GiS 2. Jurlewicz T., Skoczylas Z., Algebra i geometria analityczna. Przykłady i zadania, Oficyna Wydawnicza GiS 3. Jurlewicz T., Skoczylas Z., Algebra i geometria analityczna. Kolokwia i egzaminy, Oficyna Wydawnicza GiS
	Supplementary literature	1. Jankowska K., Jankowski T., Zbiór zadań z matematyki, Wydawnictwo Politechniki Gdańskiej 2. Kajetanowicz P., Wierzejewski J., ,,Algebra z geometrią analityczną", Wydawnictwo Naukowe PWN
	eResources addresses	Adresy na platformie eNauczanie: WETI - EiT sem.1 gr. 1, 7- Algebra liniowa 2023/24 (R.Fidytek) - Moodle ID: 33110 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=33110 WETI - EiT sem.1 gr. 1, 7- Algebra liniowa 2023/24 (R.Fidytek) - Moodle ID: 33110 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=33110
Example issues/ example questions/ tasks being completed		1. Solve the matrix equation $AX=B$, where A and B are given matrices. 2. Using the Cramer formula find the unknown x from the system of equations: $2x+y+3z+2t=3$, $3x+z=1$, $5y-2x+z=1$, $-5x+4y+2z=1$. 3. Find the roots of the equation $z^4 +16i=0$. Give their algebraic form. 4. Finf the general equation of the plane passing through the point $A(-1,2,4)$ and perpendicular to the line $2(x-1)=y+2=-3z$. 5. Find the Laplace transform for the given function $f(t)=1/2(\sin t - t \cos t)$.
Work placement		Not applicable