



Subject card

Subject name and code	Linear Algebra, PG_00021032						
Field of study	Mathematics						
Date of commencement of studies	October 2021		Academic year of realisation of subject		2021/2022		
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	2		ECTS credits		5.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Department of Nonlinear Analysis and Statistics -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Zdzisław Dzedzej				
	Teachers		dr inż. Anita Zgorzelska dr hab. Zdzisław Dzedzej mgr inż. Tomasz Gzella				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	30.0	0.0	0.0	0.0	60
	E-learning hours included: 0.0						
	Adresy na platformie eNauczanie: Algebra liniowa 2/ 2022 - Moodle ID: 21768 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=21768						
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		5.0		60.0	125
Subject objectives	Learning of Elements of linear algebra						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_W07		linear properties in calculus and other parts of mathematics		[SW1] Assessment of factual knowledge		
	K6_W02		formulates and proves basic theorems		[SW1] Assessment of factual knowledge		
	K6_U08		complex numbers, determinants, matrices, eigenvalues		[SU4] Assessment of ability to use methods and tools		
	K6_U03		proper use of algebraic objects		[SU3] Assessment of ability to use knowledge gained from the subject		
	K6_U01		proving simple properties of matrices, linear independence or orthogonality of vectors		[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools		

Subject contents	linear maps, kernel, image; matrix of a linear map, change of bases;		
	scalar multiplication, unitary spaces; orthogonal bases, ortogonalisation of Gram-Schmidt;		
	orthogonal matrices, symmetric matrices;		
	eigenvalues and eigenvectors;		
	diagonalisation;		
	bilinear forms and quadratic forms;		
	canonical form;		
Prerequisites and co-requisites	linear algebra I		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	colloquia	50.0%	50.0%
	exam	50.0%	40.0%
	activity	0.0%	10.0%
Recommended reading	Basic literature	A. Romanowski,Linear algebra, PG 2003 T. Jurlewicz, Z. Skoczylas, Linear algebra GiS 2005 J. Rutkowski, linear algebra in problems PWN 2008	
	Supplementary literature	J. Topp, Algebra liniowa PG 2007 G. Banaszak, W. Gajda, Elementy algebry liniowej, WNT 2002	
	eResources addresses	Algebra liniowa 2/ 2022 - Moodle ID: 21768 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=21768	
	Example issues/ example questions/ tasks being completed	Find eigenvalues and diagonal form of a given matrix A.	
Work placement	Not applicable		