

Course description

Course abbreviation:	KMF/ZNMAE	Page:	1 / 2
Course name:	Matrix Algebra		
Academic Year:	2019/2020	Printed:	24.05.2024 15:55

Department/Unit /	KMF / ZNMAE			Academic Year	2019/2020
Title	Matrix Algebra			Type of completion	Examination
Accredited/Credits	Yes, 5 Cred.			Type of completion	Combined
Number of hours	Lecture 2 [HRS/WEEK] Tutorial 2 [HRS/WEEK]			Course credit prior to	YES
Occ/max	Status A	Status B	Status C	Counted into average	YES
Summer semester	0 / -	0 / -	0 / -	Min. (B+C) students	not determined
Winter semester	0 / -	0 / -	0 / -	Repeated registration	NO
Timetable	No			Semester taught	Winter, Summer
Language of instruction	English			Internship duration	0
Optional course	Yes			Ev. sc. – cred.	S N
Evaluation scale	A B C D E F				
No. of hours of on-premise					
Auto acc. of credit	No				
Periodicity	K				
Substituted course	KMF/INMAE				
Preclusive courses	N/A				
Prerequisite courses	N/A				
Informally recommended courses	N/A				
Courses depending on this Course	N/A				

Course objectives:

To afford students more remarkable knowledge on vector spaces, matrix theory and their use in practices.

Requirements on student

Credit requirements: active participation in seminars with at most three hours absent, and at least 50% success in written test. The course is completed by an oral exam; student should demonstrate an active knowledge of predefined topics.

Content

Euclidean vector spaces: orthogonalization, orthogonal and unitary matrices, orthogonal projection, decompositions of matrices and their applications.

Linear mappings of vector spaces: matrix of linear mapping, automorphisms, projections, orthogonal mappings, quotient vector spaces.

Linear operators: similar matrices, minimal and characteristic polynomial, polynomial matrices, Cayley-Hamilton theorem, invariant subspaces, eigen-subspaces, canonical Jordan form and its applications.

Bilinear and quadratic forms.

Prerequisites - other information about course preconditions

Prerequisite for successful mastering of this subject is knowledge of linear algebra within the range the basic course of mathematics.

Competences acquired

Students will obtain survey of the linear algebra which enable them to home study new trends in their professional field in future.

Fields of study

Guarantors and lecturers

- **Guarantors:** Mgr. Alena Pozdílková, Ph.D. (100%)
- **Lecturer:** Mgr. Alena Pozdílková, Ph.D. (100%)
- **Tutorial lecturer:** Mgr. Alena Pozdílková, Ph.D. (100%)

Literature

- **Recommended:** Halmos, P. R. *Finite-dimensional vector spaces*. New York, 1958.
- **Recommended:** Friedberg, S.H., Insel, A.J., Spence, L.E. *Linear Algebra*. Prentice Hall, 2003.
- **Recommended:** Nicholson, K.W. *Linear algebra with applications*. Washington, 1990.
- **Recommended:** Gelfand, I. M. *Lineární algebra*. Praha, 1953.
- **Recommended:** Abadir, K.M., Magnus, J., R. *Matrix Algebra*. Cambridge, 2005.
- **Recommended:** Meyer, C. D. *Matrix Analysis and Applied Linear Algebra*. SIAM, 2001.

Teaching methods

Monologic (reading, lecture, briefing)
 Methods of individual activities
 Skills training

Assessment methods

Written examination
 Discussion
 Systematic monitoring

Course is included in study programmes: