

Title Elements of Mathematics II	Code 1010331121010340276
Field Automatics and Robotics	Year / Semester 1 / 2
Specialty -	Course core
Hours Lectures: 1 Classes: 1 Laboratory: - Projects / seminars: -	Number of credits 3
	Language polish

Lecturer:

Dr Andrzej Maćkiewicz ,
E-mail: andrzej.mackiewicz@sol.put.poznan.pl-

Faculty:

Faculty of Electrical Engineering
ul. Piotrowo 3A
60-965 Poznań
tel. (061) 665-2539, fax. (061) 665-2548
e-mail: office_deef@put.poznan.pl

Status of the course in the study program:

Obligatory subject for students of Automatics and Robotics

Assumptions and objectives of the course:

Acquaintance with the most important theoretical and computational problems of the Linear Algebra arising in applications of mathematics.

Contents of the course (course description):

- ? Analysis of Algorithms (General Rules).
- ? Special Linear Systems of Equations.
- ? Polynomial Interpolation and Applications. Spline Functions.
- ? Eigenvalues and Eigenvectors,
- ? Diagonalization and Powers of A. Difference Equations.
- ? Differential Equations and $\exp(tA)$.
- ? Orthogonal Matrices and Gram-Schmidt Algorithm.
- ? Linear Least Squares Problem. Kalman Filters (an introduction).
- ? Complex Matrices; Fast Fourier Transform.
- ? Trigonometric Interpolation and Least Squares Approximation.
- ? Positive Definite Matrices and Minima of Quadratic Forms.
- ? SVD Decomposition. Image Compression.
- ? Fundamental Theorem of Linear Algebra. Elements of the Mathematical Programming Duality Theory.

Introductory courses and the required pre-knowledge:

Calculus and Basic Linear Algebra. Basic programming skills.

Courses form and teaching methods:

Lectures and class exercises.

Form and terms of complete the course - requirements and assessment methods:

Oral examination and evaluation of student software projects.

Basic Bibliography:

-

Additional Bibliography:

-

