DMA-SAP-431 APPLIED LINEAR ALGEBRA

SEMESTER: Spring
CREDITS: 6 ECTS (4 hrs. per week)
LANGUAGE: English
DEGREES: SAPIENS program

Course overview
This is a foundation course in linear algebra. By its nature, linear algebra has many applications in abstract mathematics and in real life. We will present theoretical concepts with their motivation and applications.

The class time will be devoted to lectures where the students should gain an understanding of basic concepts and methods, realize connections between various parts of linear algebra and eventually build a global picture of linear algebra. The material we cover is also meant as an introduction to a more abstract level of learning or using mathematics.

Prerequisites
Basic knowledge of Calculus and High School Algebra.

Course contents and methodology
Methodology
Lecture, solving calculation problems during exercises.

Contents

I. LINEAR SYSTEMS (Chapter 1 in [1]).

II. VECTOR SPACES (Chapters 3 and 4 in [1]).
   Vector Spaces and Subspaces. Linear Independence, Basis and Dimension. Coordinates.
III. LINEAR TRANSFORMATIONS (Chapters 3 and 4 in [1]).

Linear Transformations and Isomorphisms. The Matrix of a Linear Transformation.

IV. ORTHOGONALITY (Chapter 5 in [1]).


V. EIGENVALUES AND EIGENVECTORS (Chapter 7 in [1]).


VI. POSITIVE DEFINITE MATRICES (Chapter 8 in [1]).


Textbooks


Grading

The overall grade will be obtained as follows:

- Three midterms (15%, 25% and 35% respectively)
- Homework (25%)

The students who fail or want to improve their grades will do a final exam the last day of the course.

The exams are all closed notebook, closed textbook and no calculator. The course will not be graded on a curve, i.e., there is no bound on the numbers A’s, B’s, C’s, etc.