Linear Algebra (MA327)

University of Campinas

Fall 2016

1 Description

This course offers an introduction to the fundamental concepts of Linear Algebra, which is a common language used in different areas of human knowledge, such as physics, natural sciences, economics, data science, and engineering. Numerous examples illustrating the most abstract concepts are discussed. In addition to teaching Linear Algebra, the objective is to utilize it as a model for mathematical reasoning.

2 Program

Linear systems. Real vector spaces. Subspaces. Bases and dimensions. Linear dependence and independence. Finite dimensional spaces. Linear transformations and their matrix representations. Kernel and image. Direct sum of subspaces. Projections. Eigenvalues and eigenvectors. Inner product. Orthogonality. Gram-Schmidt orthogonalization process. Cauchy-Schwarz inequality. Adjoint of a linear transformation. Symmetric and orthogonal matrices. Diagonalization.

Bibliography

[1] Kostrikin, A. I., & Manin, Y. I. (1997). *Linear Algebra*. CRC Press.
[2] Hoffman, K. M., & Kunze, R. (1971). *Linear Algebra*. 2nd ed., Pearson.
[3] Lang, S. (1987). *Linear Algebra*, Springer Verlag.
[4] Halmos, P. (1950). *Finite-Dimensional Vector Spaces*, Springer Verlag.

CB06 / Tuesdays & Thursdays - 2:00pm-4:00pm

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