

MATH 2135: Linear Algebra for Math Majors  
MWF 12:00-12:50, ECCR 151

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Office hours: Tuesday 10-11 am, Wednesday 1-2 pm

Course website: <http://math.colorado.edu/~mayr/teaching/math2135spring19/>

**Course description.** Linear algebra is not only about solving systems of linear equations and calculating with vectors. Its applications are everywhere in math, physics, computer science, and engineering. For example, it provides tools for computer graphics, fitting a line through a cloud of points, analyzing mappings in  $\mathbb{R}^n$ , and the development of dynamical systems.

This is a proof-based course. The difference to *Linear Algebra for Non-Math Majors* is that we cover the material in greater depth and from a more general abstract perspective. Correspondingly there is less emphasis on computation and more on writing proofs.

We will cover the following topics:

- systems of linear equations, Gaussian elimination
- vector spaces over arbitrary fields
- basis, dimension
- linear transformations, matrices
- determinants
- eigenvalues, eigenvectors
- diagonalization of matrices
- inner products and orthogonality

**Assignments.** Every Friday I will post homework problems on the course website. Please hand in solutions at the beginning of class on the following Friday or send a pdf at least 30 minutes before class. Please use “Math 2135 - assignment n” as title for the mail for the  $n$ -th assignment (otherwise I will not find and grade it).

I recommend to first try to solve the homework problems alone with your notes and textbooks. If you get seriously stuck, discuss it with your colleagues, me, etc. In any case write up the solutions that you hand in alone.

There will be a short quiz every Wednesday. There are 2 midterm exams in class on Wednesday, February 20 and on April 3, as well as a final exam in the finals week.

**Grading.** You will be graded on your written work, which will be judged on the basis of correctness, completeness, and legibility. Your final grade will be determined by the scores of your homework, quizzes, midterms, and final exam. To combine these items the following weights will be used:

Homework: 40%

Quizzes: 10%

Midterms: 30%

Final exam: 20%

Late homework will not be accepted. However the 2 lowest homework scores and the 2 lowest quiz scores will not count towards the final grade.

**Text.** We will mainly use the following book which is available for free online:

Sergei Treil. Linear algebra done wrong (updated Sept. 4, 2017).

**University regulations.** I am happy to accommodate disabilities or religious observances, or a request that I address you with a different name or pronoun than my roster indicates. Please contact me as soon as possible.

For details on accommodations and university policies please see the official statements of the Division of Academic Affairs <http://www.colorado.edu/policies>