

# Math 214: Linear Algebra

## Spring 2017

Jay Daigle

### Course Goals

In this course we will learn the basics of linear algebra, integrating three different perspectives. We will study the **geometry** of vectors and higher-dimensional spaces, the **algebra** of real vectors and matrices, and the **formal systems** of vector spaces and linear transformations. We will see how the three perspectives interrelate, and how each can be used to better understand the other two.

Mathematics is a fundamentally linguistic activity. In this course we will learn to speak and write the language of mathematics; understanding, writing, and communicating proofs will be a substantial portion of the course.

Topics will include: geometry and manipulation of vectors, lines, and planes; systems of linear equations; vector spaces and linear transformations; matrix arithmetic, inverses, and determinants; bases, spanning sets, and linear independence; and eigenvectors and eigenvalues.

### Instructor Info

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|------------------------|---|--|
| <b>Lectures:</b>       | MWF 9:35 - 10:30 PM   | Fowler 302   |
| <b>Instructor:</b>     | Jay Daigle  | <b>Office Hours:</b> MWF, 12:30 - 1:45 PM                    |
| <b>Office:</b>         | Fowler 305  | <b>Often in Office:</b> MWF, 10:40 - 1:45 PM, 3:00 - 4:00 PM |
| <b>Email:</b>          | gdaigle@oxy.edu   | R, 11:30 - 1:30 PM, 4:30 - 5:00 PM                           |
| <b>Course Webpage:</b> | <a href="http://jaydaigle.net/linear">http://jaydaigle.net/linear</a> |  |

### Textbooks

The official textbook for this course is *Linear Algebra: A Modern Introduction*, 4th edition, by David Poole. The ISBN is 978-1-285-46324-7.

I do **not** plan to rely heavily on this text during the course, since I plan to present the material from a different perspective. I will be posting my course notes on the course website as we go, and you can use those as a reference for the material.

You shouldn't need to purchase the book to complete the course, but I will be using it as my primary reference as I put the course notes together.

If you would like more references or other perspectives, you may wish to check out:

- Linear Algebra: Ideas and Applications by Richard Penney, available online through the library
- Linear Algebra: Step by Step by Kuldeep Singh, available online through the library
- A First Course in Linear Algebra by Rob Beezer, available free online
- Linear Algebra by Jim Hefferon, available free online

### Grading

- Homework: 30%
- Midterms: 15% each
- Final: 25%

## Details

- **Exams:** There will be three midterms and a final. Tentative dates for the midterms are February 17, March 24, and April 14.

The final exam is at 8:30 AM on Wednesday, May 10, in the usual classroom.

- **Homework:** Homework is in many ways the most important part of this class. Math is a skill, and, like all skills, requires practice to develop and learn. I encourage you to collaborate with classmates on your homework. However, you must turn in your own writeup in your own words.

I strongly encourage you to start the homework sets early. In addition to making them easier to finish on time, it's often easier to understand the material we cover if you go into the lectures with some specific questions; thus it's useful to at least read even the questions you're not prepared to start on yet.

Each homework assignment will have one or two "starred" problems. These are not necessarily the hardest problems, though they will rarely be the easiest. They are the problems which will benefit the most from starting early; some of them will require you to think deeply to come up with a new perspective, while some others may simply be quite long.

Homework is due in class on the due date, which will usually be Friday. Late homework will not be accepted except by prior arrangement or a note from Emmons or the deans. Please email me at least the night before the due date if you need to request an extension. (I often keep late hours; don't feel shy about emailing at two in the morning).

The homework assignment with the lowest score will not be counted. This includes homework which is not turned in, so missing one homework will not significantly affect your grade. However, it is still important to master that material on every homework assignment.

- **Disabilities:** It is the policy of Occidental College to make reasonable accommodations for qualified individuals with disabilities. If you are a person with a disability and wish to request accommodations to complete your course requirements, please make an appointment with the course instructor as soon as possible to discuss your request. For information on documentation requirements, contact the Center for Academic Excellence (x2545).