Math 355: Linear Algebra
Spring 2019

Linear algebra doesn’t sound like it ought to be complicated, but there’s a surprising amount of depth to it. It is much more than solving linear equations; in this course, you will learn about the geometry of Euclidean $n$-space, matrices and determinants, abstract vector spaces and linear transformations, eigenvalues and eigenvectors, and, not least, why all of this stuff is useful! Mastering this subject requires being able to visualize the geometry, internalize the concepts, and manipulate the algebra; we will try to emphasize all three aspects throughout the course. Along the way, you’ll get more than a taste of how mathematics is really done - with precise definitions, clear language, and logical reasoning.

Instructor: Stephen Wang (sswang@rice.edu)
TAs: Ethan Gwaltney (ethan.gwaltney@rice.edu), Asgeir Valfells (asgeir.valfells@rice.edu), Shawn Williams (shawn.williams@rice.edu)

Classroom and Course Times: MWF 2-2:50 in Brockman 101 during the first 7 weeks, except for Fridays in Keck 100. Classrooms TBA after that.

Office and Office Hours: Herman Brown Hall 410, tentatively Mondays 7-9pm and Thursdays 2-3:30, or by appointment. Monday office hours are likely to be in Herman Brown 447. The TAs will have office hours on Mondays 3-5 as well, location TBA.

Textbook: A good text is Lay’s *Linear Algebra and its Applications*, 5th edition. You do not have to buy it, but maybe around 30% of the written homework will be assigned from it. We will roughly cover chapters 1-7.

Exams: This course will have two midterms and a final exam. The first midterm will be 7-9pm on Thursday February 14. The second midterm is likely to be Thursday March 28 at the same time. If you have conflicts with those dates please let me know as soon as possible.

The final exam will be scheduled. The date for the final exam is set by the Registrar’s office and is not available at this time. It is the policy of the Mathematics Department that no final may be given early to accommodate student travel plans. If you make travel plans that later turn out to conflict with the scheduled exam, then it is your responsibility to either reschedule your travel plans or take a zero on the final.

Homework: Homework will be in two flavors. Online homework will be posted on [http://webwork.math.rice.edu](http://webwork.math.rice.edu). Use your Rice NetID as your login, with your Student ID (S followed by 8 digits) as your initial password (you can change this). These will usually be due on Fridays.

Written homework will be due weekly, usually at the beginning of class on Wednesdays. No late homework will be accepted, barring a serious emergency. However, the lowest-scoring homework assignment of each type will be dropped.
**Day-to-day Requirements:** For roughly the first half of the course, on Mondays and Wednesdays, students are expected to have completed an online learning sequence in preparation for the in-class activities by 1:00pm. Since this sequence is necessary for the class activities, late submissions will not be accepted. However, a student’s lowest-scoring sequence will be dropped. These sequences are graded, but mostly for completeness.

This online material is on edge.edx.org. Students will receive an email invitation to register. Make your username your preferred first name followed by last name or last initial. If you do not get an invitation, email Steve immediately.

**Grades:** Your course grade will be based 20% on each midterm, 30% on the final exam, 20% on the homework, and 5% on the online learning sequences. The remaining 5% will be based on your participation in, and preparation for, class, including performance on quizzes.

**Collaboration Policies:** For the online learning sequences, you should work alone. Outside assistance should be limited to asking questions about parts of videos that you did not understand.

For homework, you should work individually on the problems at first. Collaboration and discussion with others is encouraged, but only after you have given the problems a good amount of independent thought. Similarly, I am happy to talk with you about the homework, but only provided that you’ve worked on it before coming to me. If you have worked with others on the online homework, you must make sure that you can re-create all of the necessary work to arrive at an answer on your own, before you submit the answer. For the written homework, please note the names of any collaborators on each problem. Furthermore, the final write-ups should be done by yourself, alone. You should understand what you are writing well enough that you need not refer to any writing or notes produced during your collaboration. Under no circumstances are you to seek help from books or internet sites (other than the official course book and site) without express permission, nor are you to consult (directly or indirectly) material from past versions of Math 355.

There will come a time during the semester when computational tools such as Mathematica/Matlab or Wolfram Alpha will be useful. Until then, however, you should not use software (including web applications, or calculator functions that go beyond normal arithmetic) unless otherwise specified. You should show the steps you took in order to arrive at your answer, and explain your reasoning and justification in complete sentences. If you used a technological aid to do one of the steps, you should note that as part of your write-up (e.g., “I used Mathematica to row reduce this matrix.”).

Following these instructions is part of your duty under the Rice Honor Code.

**Disability Support:** Students who think they may need accommodations in this course because of the impact of a disability should give me a written letter from Disability Support Services within the first two weeks of the course.