

Math 2135-001: Intro to Linear Algebra for Mathematics Majors, Fall 2017

General Info

Instructor: Professor David Grant, grant@colorado.edu

Office Hours: (tentatively) M 2-3, F 11-12, W TBD in Math 303 (x2-7208).

Class Meetings: MWF 9–9:50 PM in DUAN G131

Text: S. Andrilli and D. Hecker, *Elementary Linear Algebra*, 5th edition (Elsevier).

Prerequisites. Calculus 2 and MATH 2001.

About the course.

Linear algebra is concerned with the solutions of linear equations and with the geometry of the solutions. Calculus takes complicated phenomena and studies them by introducing derivatives – which are linear functions. Therefore linear algebra has wide applications to physics, engineering, statistics, economics, and of course, mathematics. The basic objects are vectors (points in space) and matrices (arrays) which express how one set of vectors is related to another. A central theme of the course is that vectors and matrices can be manipulated *algebraically*, so in some sense we can deal with them just as if they were numbers.

What makes this course one designed for math majors (and different from MATH 2130) is our reliance upon proof to figure out what is and what is not true (hence MATH 2001 is a prerequisite for the course).

Our use of proofs allows us to understand our fundamental concepts more deeply and completely, by abstracting phenomena we see over and over again, in terms of objects called vector spaces, and the maps between them, called linear transformations. We can then understand the underlying geometry of vector spaces by introducing inner products (the generalization of the notion of angle in Euclidean space), and apply these to functions one sees in physics or probability.

Class meetings.

This course will meet three days a week. Homework will be assigned at every class meeting, and will be due at the next class meeting. The homework consists of two parts: (1) problems from the book which you will be responsible for doing and understanding but don't have to hand in, and (2) two additional problems, whose solutions will be collected and graded. All the assignments will appear on the website: euclid.colorado.edu/~grant/courses/2135/, as will the daily outline of the course. There will be three hour exams, on Fridays Sept. 22, Oct. 20, and Nov. 17, during our regular time and in our usual room. There will be a final exam in our regular classroom on Sunday, Dec. 17, from 7:30 to 10:00 pm. The time has been set in stone by the Dean, so please make sure now that it does not conflict with any of your plans.

Requirements; grading of the course.

Your final grade in this course will be determined by your total score out of **600 possible points**. These points are broken down as follows:

Homeworks counts for a total of **100 pts.** of your final grade. It is no secret that solutions to all the problems in the book can be found online, but to use that resource is to just cheat yourself out of an important learning experience. In any case, you are expressly forbidden to use any printed or online source for the problems you have to hand in. You may work on the homework with other students, but you must write-up the solutions yourself, and, in keeping with good academic responsibility, say who you got help from. Anyone caught violating this principle will lose a full letter grade in the course.

The three hour exams will each be worth **100 pts.** The hour exams are not cumulative. The final exam will make up the remaining **200 pts.** The final will be *cumulative*, with an emphasis on the material covered after the third exam. Anyone caught cheating on an exam will fail the course.

Friendly advice.

Do *all* the homework – students who just do the problems that have to be handed in don't do well on the tests; read a section *before* the relevant lecture, and then again *after* that lecture; don't fall behind. Take advantage of the book's Review Exercises. If you have questions, the sooner you ask them the better.

Et Cetera:

The last day to drop a course without fee or a "W" on your transcript is Sept. 13. Also note that the last day to drop a class in MyCUInfo is Nov. 3.

Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. Please inform me as soon as possible, and well in advance, should you need, due to religious obligations, to miss an exam, homework, or class.

Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records. For more information, see the policies on classroom behavior (www.colorado.edu/policies/student-classroom-and-course-related-behavior) and the Student Code of Conduct (www.colorado.edu/osccr/)

If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to me in a timely manner so that your

needs can be addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the Disability Services website

www.colorado.edu/disabilityservices/students.

Contact Disability Services at 303-492-8671 or dsinfo@colorado.edu for further assistance. If you have a temporary medical condition or injury, see Temporary Medical Conditions under the Students tab on the Disability Services website and discuss your needs with me.

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the academic integrity policy

www.colorado.edu/policies/academic-integrity-policy

and a student Honor Code (www.colorado.edu/honorcode/). Violations of the policy may include: plagiarism, cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, resubmission, and aiding academic dishonesty. All incidents of academic misconduct will be reported to the Honor Code Council (honor@colorado.edu; 303-735-2273). Students who are found responsible for violating the academic integrity policy will be subject to nonacademic sanctions from the Honor Code Council as well as academic sanctions from me. Additional information regarding the academic integrity policy can be found at the Honor Code Office website above. I will expect each student to sign the pledge of the honor code on each exam.

The University of Colorado Boulder (CU Boulder) is committed to maintaining a positive learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct, discrimination, harassment or related retaliation against or by any employee or student. CU's Sexual Misconduct Policy prohibits sexual assault, sexual exploitation, sexual harassment, intimate partner abuse (dating or domestic violence), stalking or related retaliation. CU Boulder's Discrimination and Harassment Policy prohibits discrimination, harassment or related retaliation based on race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. Individuals who believe they have been subject to misconduct under either policy should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127. Information about the OIEC, the above referenced policies, and the campus resources available to assist individuals regarding sexual misconduct, discrimination, harassment or related retaliation can be found at the OIEC website (www.colorado.edu/institutionalequity/).