

Instructor: Ravi Fernando, ravif@illinois.edu.

Section M13, TuTh 9:30-10:50am in 149 Henry Administration Building

Office hours: times TBA in Altgeld 216.

Course description: Math 416 is a rigorous, abstract treatment of linear algebra. Topics include vector spaces, linear transformations, eigenvalues and eigenvectors, diagonalizability, and inner product spaces. The course concludes with a brief introduction to the theory of canonical forms for matrices and linear transformations.

Textbook: The main textbook for this course is *Linear Algebra* by Friedberg, Insel, and Spence. I will be using the 5th edition; however, you are welcome to use the 4th edition instead if you can find it for a lower price. The two editions contain essentially the same content, and I will alert you to any differences in the homework problems that I assign.

I will occasionally also use the free online textbook *A First Course in Linear Algebra* by Robert Beezer, which can be accessed at <http://linear.ups.edu/html/fcla.html>.

Grades: Your final numerical grade will be computed as follows:

- Final exam: 30%
- 2 midterm exams: 22.5% each
- Homework: 25%

When assigning final letter grades, I will only curve up. Thus a cumulative average of 90% guarantees at least an A-, an 80% guarantees at least a B-, and so on. I will publish unofficial letter grade conversions after each midterm to give you a rough sense of the curve.

Exams: We will have two in-class midterms on October 1 and November 5, both Tuesdays. (Note: the second exam is on Election Day, so please plan ahead if you intend to vote!) According to the university final exam schedule, our final exam will take place on Friday, December 13 from 1:30 to 4:30pm. The final exam will be cumulative; midterms will not be cumulative except to the extent that mathematics is inherently cumulative.

Homework: Homework will typically be assigned every week. Homework assignments will be posted to the Files tab of Canvas, and you will submit your completed homework on Gradescope (you should be added to the Gradescope course soon). Your lowest homework score will be dropped. Homework submitted late without a documented excuse will be graded with a 20% penalty per day late, rounded up to the nearest point.

You can submit your homework either as a PDF or as multiple pictures. To make the grader's job easier, I have a few formatting requests:

- If you are submitting pictures of your homework, please upload them in the correct order and orientation.

- If you do your homework on a tablet, please be sure to export it as a multi-page PDF, rather than a single long page (which is difficult for the grader to read).
- Regardless of the format, when Gradescope prompts you to do so, please indicate which problems appear on which pages of your submission. (You can mark a problem as appearing on multiple pages, or multiple problems as appearing on one page—so you don't need to think about this until you're submitting your work.)

Besides this, if you plan to continue in mathematics, it will very likely be to your advantage to become proficient in writing mathematics with \LaTeX (the typesetting software that I used to make this and other course documents). If you are interested, you can find a guide to getting started with \LaTeX in the Files tab of Canvas, filed under “Handouts”.

Attendance and make-ups: It is expected that you will attend every class, unless you feel sick or have a similarly good excuse (COVID exposure, athletic travel for UIUC, death in the family, religious observance, etc.) In these cases, your absence will be excused; I will make my lecture notes available so that you can see what you missed. If you need to miss an exam (with a valid, documented excuse), contact me **as soon as possible**—preferably at least a week in advance of the exam in question. Most likely, I will address this by adjusting the weightings of your other exams, rather than giving a make-up.

Academic honesty: As always, you are expected to follow the UIUC student conduct code. You are encouraged to work on homework in groups; however, you must write your final solutions up on your own. If you are unsure whether something is allowed, please ask.

Resources for students with disabilities: To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact me and the Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES you may visit 1207 S. Oak St., Champaign, call 333-4603 (V/TTY), or e-mail a message to disability@illinois.edu. A direct link to apply for services at DRES:

<https://www.disability.illinois.edu/applying-services>

Mental health: Significant stress, mood changes, excessive worry, substance/alcohol misuse or interferences in eating or sleep can have an impact on academic performance, social development, and emotional wellbeing. The University of Illinois offers a variety of confidential services including individual and group counseling, crisis intervention, psychiatric services, and specialized screenings which are covered through the Student Health Fee. If you or someone you know experiences any of the above mental health concerns, it is strongly encouraged to contact or visit any of the University's resources provided below. Getting help is a smart and courageous thing to do for yourself and for those who care about you.

- Counseling Center (217) 333-3704
- McKinley Health Center (217) 333-2700
- National Suicide Prevention Lifeline (800) 273-8255

- Rosecrance Crisis Line (217) 359-4141 (available 24/7, 365 days a year)

If you are in immediate danger, call 911.

Community of Care: As members of the Illinois community, we each have a responsibility to express care and concern for one another. If you come across a classmate whose behavior concerns you, whether in regards to their well-being or yours, we encourage you to refer this behavior to the Student Assistance Center (217-333-0050 or <https://odos.illinois.edu/community-of-care/referral/>). Based on your report, the staff in the Student Assistance Center reaches out to students to make sure they have the support they need to be healthy and safe.

Further, as a Community of Care, we want to support you in your overall wellness. We know that students sometimes face challenges that can impact academic performance (examples include mental health concerns, food insecurity, homelessness, personal emergencies). Should you find that you are managing such a challenge and that it is interfering with your coursework, you are encouraged to contact the Student Assistance Center (SAC) in the Office of the Dean of Students for support and referrals to campus and/or community resources.