

MATH 250C - INTRODUCTORY LINEAR ALGEBRA - SYLLABUS

Instructor: Dennis Kriventsov

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Office Hours: T 18:00-19:20 HILL 524 (tentative)

Meetings: TTh 19:30-20:50 SEC 117

Textbook

The textbook for this class is Friedberg, Insel, Spence, *Elementary Linear Algebra: A Matrix Approach*, 2nd edition, Pearson (2008), ISBN 0-13-187141-2. Make sure you are getting the right text: the authors have written other textbooks on linear algebra that are completely different, and this seems to confuse online stores (make sure it says "Matrix Approach" and "Elementary"). The text is very expensive if you buy a new copy, but used or electronic copies are at least somewhat more affordable. You do not need a new copy.

Prerequisites

The official prerequisites for this class are Precalculus (Math 115 or 111-112) OR placement into Calculus. The course is completely independent of calculus.

Contact Information

You can contact me by email anytime. I will hold office hours before class on Tuesdays at 18:00 in my office (Hill 524), subject to change. I typically hold extra office hours around exam time.

Goals

We will cover the following broad topics:

- Matrices, matrix and vector manipulation
- Solving systems of linear equations
- Diagonalization, eigenvalues and eigenvectors
- Orthogonal and symmetric matrices

This course is intended as a first look at linear algebra, focused on universally relevant concepts in their most concrete forms. The emphasis is on conceptual understanding more than on computation or proof, and this will be reflected on the exams (but there will be some computational or proof-based questions as well).

Class Structure

- We will be using Canvas extensively for all class material.
- There will be short quizzes weekly on Canvas. They will be worth 10% of your grade.
- There will be several MATLAB assignments. They will be worth 10% of your grade.
- There will be weekly suggested homework assignments. They will not be collected, and will not contribute to your grade.
- There will be two midterm exams (25% each) and a final exam (30%).

Software

We will be using MATLAB during this course. You will not be expected to master the software, but if you have never used it before you will need to take a few hours to learn how to operate it at a basic level. I will provide basic demonstrations during lectures when relevant. MATLAB also has quite good documentation.

MATLAB is potentially expensive, but you have complete access to it through Rutgers. Go to <https://software.rutgers.edu/product/3554> and click on the big link there. You will need to sign up for a MathWorks (the company that makes MATLAB) account using your Rutgers email. You may need to set your password again after receiving an email.

There are then two options for how to use MATLAB: you can install it on your personal computer, or you can work with it online in a browser window. Installing it may be more convenient, depending on your hardware situation. I will attempt to use the online version in my lectures so that my user interface is identical to yours. None of the computations we will be doing are particularly demanding, so you should not worry about your computer's ability to handle them.

For the graded MATLAB assignments, it is expected that you use MATLAB. For the suggested homework problems, you can use MATLAB to help you. If you have extensive programming experience you are free to use other software instead (Mathematica, python, R, your own C code, etc.), but I generally will not be able to help you if you get stuck or confused.

Exams

The midterm exams will be on Thursdays **Oct 12** and **Nov 16**, in the usual classroom SEC 117, in person. The location of the final will be announced later, but it will take place on **Dec 21, 20:00-23:00**. You will not be tested on MATLAB usage. If you cannot attend an exam, you must let me know in advance. There will be no makeup midterms, and there will be no makeup final except when required by university policy.

The exams will feature many conceptual problems. The MATLAB assignments are not representative of what exam problems will be like, but the suggested homework is; I strongly recommend doing these suggested problems.

All students in the course are expected to be familiar with and abide by the academic integrity policy (<http://academicintegrity.rutgers.edu/academic-integrity-at-rutgers>). Violations of the policy are taken very seriously.

MATLAB assignments

The graded MATLAB assignments will be due once a week (but not every week) at 19:30 on Thursdays. I will provide directions for how and what to submit (they will be submitted through Canvas online). Make sure to leave plenty of time to work on them and to get help if you struggle, especially if this is your first time using MATLAB. Late assignments will not be accepted.

Suggested homework

Each week, on Thursdays, I will assign a number of homework problems (mostly but not always from the textbook). They will not be collected or graded. I strongly encourage doing these problems as preparation for the exams and quizzes.

Quizzes

There will be weekly quizzes on Canvas. They will become available Monday night (19:30), be open for 24 hours, and close at the beginning of class on Tuesday (19:30). They should take about 5 minutes to do (and there will be a 10 minute time limit). The lowest quiz score will be dropped. Quizzes not completed during the 24 hour window will be assigned a score of 0.

Schedule

The schedule below is provisional, and subject to change.

| Dates | Sections |
|--------------|----------------------|
| 9/5-9/7 | Intro, 1.1, 1.2, 1.3 |
| 9/12-9/14 | 1.4, 1.6 |
| 9/19-9/21 | 1.7, 2.1 |
| 9/28-9/30 | 2.3, 2.4 |
| 10/3-10/5 | 2.5, 2.6, (2.7) |
| 10/10-10/12 | Review, Midterm 1 |
| 10/17-10/19 | 3.1, 3.2 |
| 10/24-10/26 | 4.1, 4.2 |
| 10/31-11/2 | 4.3, 5.1, 5.2 |
| 11/7-11/9 | 5.3, 5.5 |
| 11/14-11/16 | Review, Midterm 2 |
| 11/21 | 6.1 |
| 11/28-11/30 | 6.2, 6.3 |
| 12/5-12/7 | 6.4, 6.5, 6.6 |
| 12/12 | Review |
| 12/14, 12/19 | No class |
| 12/21 | Final |

Student Wellness Services

Counseling, ADAP & Psychiatric Services (CAPS) (848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901 / www.rhscaps.rutgers.edu/medical-counseling-services/counseling

CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professional within Rutgers Health services to support students' efforts to succeed at Rutgers University. CAPS offers a variety of services that include: individual therapy, group therapy and workshops, crisis intervention, referral to specialists in the community and consultation and collaboration with campus partners.

Violence Prevention & Victim Assistance (VPVA) (848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901 / www.vpva.rutgers.edu/

The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling and advocacy for victims of sexual and relationship violence and stalking to students, staff and faculty. To reach staff during office hours when the university is open or to reach an advocate after hours, call 848-932-1181.

Disability Services (848) 445-6800 / Lucy Stone Hall, Suite A145, Livingston Campus, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854 / <https://ods.rutgers.edu/>

Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: <https://ods.rutgers.edu/students/documentation-guidelines>. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please complete the Registration form on the ODS web site at: <https://ods.rutgers.edu/students/registration-form>.

Scarlet Listeners (732) 247-5555 / <http://www.scarletlisteners.com/>

Free and confidential peer counseling and referral hotline, providing a comforting and supportive safe space.