MAT-215
Linear Algebra
Spring 2018

Time and Location

M/W/F 14:00-14:50
Robert N. Noyce '49 Science Center, Room 2243

Instructor

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Phone: 641-269-3035
Web: `http://www.math.grinnell.edu/~ortizmar/`

Office Hours

See my web site to book an appointment in my office hours. If none of the available times work for you, please, send me an email with your availability and we will work something out.

If my office door is open you are more than welcome to stop in and ask if I am available. Even if I am with another student, feel free to knock and see if you can sit in, or if I can give you a good time to come back.

Course Mentors

Details regarding course mentors will be announced as schedules are finalized.

Textbook

Title: Linear Algebra
Author: Joseph R. Mileti
Edition: A current copy will be provided on PWeb

Topics to be covered

This is course will provide a proof based introduction to Linear Algebra. Beyond the basics of set theory and the structure of mathematical arguments, major topics to be covered include:

- vector spaces and subspaces
- linear systems
- linear independence
- bases
- linear transformations
- the range and null space of transformations
- determinants
- eigenvalues
- eigenvectors

Learning Goals

In addition to learning about linear algebra, we will strive to develop stronger math communication skills. We will practice critically reading logically structured mathematical arguments, clearly writing and presenting original solutions and ideas, and working with a diverse collection of collaborators.

Grading

Your overall grade will be made up of

- 25% Graded Homework
  - 15% Problem Sets
  - 10% Writing Assignments
- 10% Participation
- 40% Midterm Exams
  - 10% Midterm 1 (tentatively 2/16)
  - 15% Midterm 2 (tentatively 3/16)
  - 15% Midterm 3 (tentatively 4/27)
- 25% Final Exam (time and date designated by the college)

Your final letter grade will be assigned based on the guidelines established by the college and provided in the student handbook:

- A - Excellent
- B - Good
- C - Satisfactory
- D - Passing
- F - Failing

Plus or minus designations may be applied.

Graded Homework

It is required that you submit your work on time, in a neat and professional manner that follows the submission guidelines for each assignment. You may collaborate with peers who are also taking this course, in either section, by discussion the problem and working to find a solution together. You must always credit your collaborators. The final write-up of any result must be your own work, and you should never share this draft with another student.

Problem Sets

You will complete and submit two problem sets each week. A selection of these problems will be evaluated for a grade.

Writing Assignment

You will complete and submit one writing assignment each week. A selection of these proofs will be evaluated for a grade.

Participation

Participation includes: coming to class prepared to contribute meaningfully, asking and answering questions in a respectful manner, staying on task, and responding to feedback requests in a timely manner. If I have any concerns regarding your participation, I will inform you before reducing your score.

Midterm Exams

There will be three midterm exams. The scope of each will be announced once determined.

Final Exam

The Final Exam is cumulative. Its date and time is determined by the college.

Other Policies and Information

Outside Resources

You are allowed to utilize the assigned textbook, myself, and your peers in your completion of work related to this class, except for exams. No resources other than yourself may be used in completion of exams. Use of other texts, students not in this course, information found online, or any other resource not explicitly allowed, is prohibited.

Expected Time Commitment

Outside of class meetings, I expect that you will be allotting 10-12 hours per week to this class. This includes reading, working on homework assignments, reviewing notes, and any other time you spend honing your understanding of the concepts we encounter. I expect that this will be enough time for you to not only practice working on problems, but also to improve your math communication skills when writing your own notes and solutions. If you find that you are regularly exceeding this amount of time, please let me know so that we might address this issue.

Expected Class Conduct

The classroom is meant to be a safe space for all participants and respectful discourse is expected at all times. Exploring mathematical concepts with others requires that all participants feel comfortable asking any questions they might have. Asking and answering questions are skills that will improve with practice and are, arguably, the most important skills you can ever develop. Asking or responding to questions in a condescending manner is unacceptable, and damaging to the classroom environment.

To reduce the potential for distraction, cell phones are prohibited during class time, for any purpose whatsoever (including use as a clock or calculator) unless explicit permission is given. They should be out of reach and out of sight at all other times. If you require access to your cell phone during any class period, please clear this with me ahead of time so that your participation score is not affected. Use of computers in class is acceptable, provided that they are used exclusively for assigned class activities or taking notes.

An Active Approach to Learning Mathematics

To learn more about active learning techniques, and some research supporting the adoption of such methods over traditional lecture, you might start with the following:

- "What Does Active Learning Mean For Mathematicians?" `http://www.ams.org/publications/journals/notices/201702/rnoti-p124.pdf`
- The American Mathematical Society published a six part series on active learning: `http://blogs.ams.org/matheducation/tag/active-learning-series-2015/`

- "Assessing Long-Term Effects of Inquiry-Based Learning: A Case Study from College Mathematics" https://link.springer.com/article/10.1007/s10755-013-9269-9
- "Active learning increases student performance in science, engineering, and mathematics" http://www.pnas.org/content/111/23/8410.full

Excessive Class Absences or Missed Exams

If you fail to attend four consecutive class meetings, or fail to attend a total of seven class meetings, you will receive an F in the course. If you fail to attend a midterm exam, or fail to attend the final exam, you will receive an F in the course.

If you expect to miss a class, and do not wish to have that absence count against your total allowed, you must submit a request via e-mail at least one week prior to the absence. If you expect to miss an exam, you must submit a request via e-mail for alternate arrangements at least two weeks prior to the exam date. Such requests are only granted under extraordinarily compelling circumstances.

Academic Honesty

Grinnell College's Academic Honesty policy is located in the Student Handbook available online at http://catalog.grinnell.edu/content.php?catoid=12&navoid=2537#Honesty_in_Academic_Work. It is the College's expectation that students be aware of and meet the expectations expressed in this policy. In addition, in this course, it is my expectation that students may collaborate on group assignments, but not on any exams. If you have questions about how a particular assignment relates to the College's policy, I will gladly consult with you in advance of the assignments due date.

Additionally, if you suspect academic dishonesty, please alert me or other authorities immediately. Due to the consideration of the final distribution of scores, it is possible for the actions of others to affect your final standing.

Disability Statement

I strive to create a fully inclusive classroom, thus I welcome individual students to approach me about distinctive learning needs. In particular, I encourage students with disabilities to have a conversation with me and disclose how our classroom or course activities could impact the disability and what accommodations would be essential to you. You will also need to have a conversation about and provide documentation of your disability to the Coordinator for Disability Resources, John Hirschman, located on the 3rd floor of the Rosenfield Center (x3089).

Religious Holidays

I encourage students who plan to observe holy days that coincide with class meetings or assignment due dates to consult with me in the first three weeks of classes so that we may reach a mutual understanding of how you can meet the terms of your religious observance and also the requirements for this course.