Welcome to Linear Algebra

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What is Linear Algebra?

Linear algebra is the study of **linear maps**.

- In Calculus, you learn how to approximate any function by a linear function.
- In Linear Algebra, we learn about how linear maps behave.
- Combining the two, we can approximate how any function behaves.

What is Linear Algebra good for?

- In an abstract sense, linear algebra is arguably the most used tool in higher math.
- In computer graphics, linear algebra is used to help represent 3-dimensional objects in a two dimensional grid of pixels.
- Differential equations are often very difficult (or impossible) to solve exactly; we use linear algebra to understand approximate solutions in a vast number of engineering applications such as fluid flows, vibrations, heat transfer, etc.
- Google's famed Page Rank algorithm is based on linear algebra

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- Determine geometric information about a linear transformation, including computing determinants, eigenvalues, and eigenvectors.

Standards Based Grading

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You will be given several opportunities to demonstrate mastery throughout the semester, and if at first you don't succeed, you can try again without any penalty.

SBG

The course material is broken down into 23 learning **standards**.

- Each attempted exercise will be simply marked according to whether or not your solution demonstrates mastery of the relevant standards.
- Each solution that demonstrates complete mastery counts as a **checkmark** for that standard.
- Up to two checkmarks may be earned for each standard. Your grade depends on the total number of checkmarks you earn this semester (up to 46).
- Standards will be assessed several times, and there's no penalty for incorrect solutions. So, if you don't succeed the first time, keep studying and try again!

Assessment Opportunities

Checkmarks may be earned as follows.

- **Quizzes**: Each day at the end of class we will have a quiz. This is how you should earn most of your checkmarks.
- **Midterm**: There will be a single midterm exam the week of Fall Break to give you the chance to catch up on missed standards.
- **Final Exam**: Your final opportunity to demonstrate mastery, cumulative over the entire course.
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The assessment method (quiz/exam/etc.) you used to earn a checkmark isn't important: I only care that you learn the material and demonstrate that mastery to me before the end of the semester!

Interpreting Feedback

On each assessment, for each standard you will receive one of the following marks.

- **M** means you demonstrated **Mastery** of that standard. Great job! Check off another box on your progress sheet.
- * means you have a minor mistake, but if you can correct it, this mark will be changed to **M**.
- **R** means you made a good faith effort and demonstrated partial understanding, but not complete mastery. You are eligible to **Reattempt** the standard outside of class.
- **B** means there was **No Significant Evidence** of understanding.

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Marks other than **M** do not improve your course letter grade, but they don't hurt you either.

Course Grades

A	• Earn 40 mastery checkmarks. • Complete 10 homework reports. • Have an 80% attendence record.	OR	45
B	• Earn 35 mastery checkmarks. • Complete 8 homework reports. • Have an 80% attendence record.	OR	40
C	• Earn 30 mastery checkmarks. • Complete 6 homework reports. • Have an 80% attendence record.	OR	35

Homework

Homework is practice.

- I will not collect or grade homework problems.
- A list of suggested exercise for practice is in Sakai, sorted by standard. You should work as many or as few of these as you need to master the material.
- **Caveat discipulus**: Most students do not work as many homework exercises as they should.
- If you need help or feedback, come to my office hours.
- I will collect homework reports each week (blank form in Sakai).

Class structure

- The course is divided into six modules, each lasting about 2 weeks.
- At the beginning of each module is one review day working through examples from previous courses and standards.
- The next 3-4 class days will consist of lectures covering several exercises/activities that will help you master the course standards.

Office Hours

Choose up 3 one-hour long periods your team would like me to have an office hour during. Rank them in order of your preference.

I have the following constraints:

- They must be during business hours, i.e. 8-5.
- I teach another class from 12:30-1:45 on TR
- I have departmental meetings/seminars 3:30-5 on Thursdays