Linear Algebra II, Spring 2012
Syllabus

Essential Data

Instructor: Tom Denton
Email: sdenton(at)math.ucdavis.edu
Website: garsia.math.yorku.ca/~sdenton/2012-linalg2/
Classes: MWF 1:30-2:30pm VH 1005;
Office Hours: TEL 2026, Time: M 12.30-1.20, W 2.30-3.30
Text: Primary: The free book at math.ucdavis.edu/~linear.
Secondary (not required): Elementary Linear Algebra 10th edition, Anton and Rorres.

The Official Course Description

Linear transformations and their representation by matrices, change of basis and similarity, eigenvalues and eigenvectors, diagonalization, inner product spaces, orthogonality, the Gram-Schmidt algorithm, least squares approximations, abstract vector spaces, various applications. Prerequisite: One of SC/MATH 1021 3.00, SC/MATH 1025 3.00, SC/MATH 2221 3.00 or GL/MATH/MODR 2650 3.00. Course credit exclusions: SC/MATH 2022 3.00, GL/MATH/MODR 2660 3.00. Prior to Fall 2009: Prerequisite: One of AK/AS/SC/MATH 1021 3.00, AS/SC/MATH 1025 3.00, AK/AS/SC/MATH 2221 3.00 or GL/MATH/MODR 2650 3.00. Course credit exclusions: AK/AS/SC/MATH 2022 3.00, GL/MATH/MODR 2660 3.00.

The Full Course Description

Linear algebra is fantastically important. The reason for this is simple: We understand linear algebra more thoroughly than pretty much any other branch of math. As a result, the first thing to do when faced with a new math problem (pure or applied) is to see how much linear algebra applies to the problem; the parts that aren't linear algebra are the 'hard' part. Our goal for the term is to become more familiar with the basic techniques of linear algebra, especially the topics described in the Official Course Description. There are a lot of fundamental ideas in linear algebra, but we'll do our best to learn what we can in the time available.

Let computers be computers, and people be people! Like many math courses, this course will contain a blend of conceptual and technical learning. Technical competency (ie, messing around with matrices) is extremely important for understanding the concepts of linear algebra. But at the same time, computers are many millions of times better at technical manipulations than even the smartest people are. As such, technical exercises will be assigned to build hands-on ability, but conceptual understanding will be what we're really aiming for.

As of this writing, I'm trying to get together an online system for technical homeworks. Computers are much better than people at grading and giving good feedback for these kinds of exercises!

Our ideas are only as valuable as our ability to communicate them! We'll also have written assignments with a more conceptual bent, due once per week on Friday. For these problems, you are expected to write clearly in complete sentences.

We live in the future! There are many, many resources available beyond the meager words that flow from my mouth. One is your textbook. Another is the Khan Academy. And another is Wikipedia. If you find yourself stuck, feel free to work with these resources, or any others you find helpful. That said, coming to office hours is a great way to get unstuck.

Textbooks are expensive, except when they're free. So the primary text for the class will be the free textbook I co-authored with Andrew Waldron at the University of California, Davis. (math.ucdavis.edu/~linear) But feel free to pick up Anton's book (or any other linear algebra book) for another perspective. I'll also provide notes on any topics we cover in class that aren't in the primary text.

We live in community! Students consistently do better when they work together. I highly encourage studying with your class-mates. Give your problem sets an honest try on your own, and talk to your class-mates when you get stuck. **This is important:** When you work together on homework sets, please write the names of the people you worked with on the work you submit, and write solutions in your own words, even if the basic ideas came entirely from your friend(s).

Structure

We will have a midterm and a final, worth 30% and 40% of the final grade, respectively. The final will be held at the time set for the class. The date of the in-class midterm will be on 17 February, the Friday before reading week. Once a week, on Wednesdays, written assignments will be handed in. There are additional online assignments, due on Fridays, worth 10% of the final grade. Written assignments will be worth 20%.

Understand that make-up midterms and finals take a considerable amount of effort on my part; essentially, I have to write a new exam, proctor it, and grade it. So don't miss the midterm or final.

Ongoing information about the class will be posted on the course website. This includes extra notes, homework assignments and due dates, and the dates that we decide upon for quizzes and tests.