

Course Overview

Linear algebra is a remarkable subject, being both mathematically beautiful and pervasive in practical applications. The central goal is to study systems of linear equations; these generalize the familiar scalar equation $y = mx + b$ to higher dimensions. Major topics include the solution of equations by Gaussian elimination, linear combinations of vectors and linear independence, the four fundamental spaces associated with a matrix, inner products and orthogonality, determinants, eigenvalues, and singular values.

Essential Information

Professor David Maxwell
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Text **Introduction to Linear Algebra**,
5th edition, *Gilbert Strang*

Prerequisites

The course prerequisite is a C or better in Math 201 (Calculus II).

Class Time

There will be three one-hour lecture classes each week. Although I'll be doing a lot of the talking during lectures, you are strongly encouraged to stop me at any point to ask questions. I'll try to ask you questions along the way as well. Lectures are more interesting and relevant when you participate actively.

Lecture Times

MWF 10:30-11:30 Greuning 412

Office Hours

My office hours will be posted on my web site and outside my office door. You are very welcome to schedule an appointment outside of my regular office hours; please send me an email and we will arrange a time.

Piazza

We will use the Piazza social media site for announcements and after-class questions and discussions. See the course web page for instructions on how to sign up.

Homework and Quizzes

Homework will be assigned daily and collected weekly on Friday at the start of class. It would be a good idea to start working on problems within a day of when they are assigned. A large subset of the assigned problems will be graded by our class grader, and the remainder will be evaluated on the basis of completion.

I will accept from every student a single late homework without any questions. Hand in a piece of paper when the homework is due with a note on it to let me know that you are taking your late homework, and the homework will then be due on the next homework's due date (or one week later, whichever comes first). The late homework freebie cannot be used for the first two homework sets, nor can it be used for the final assignment.

We will have weekly 15-20 minute quizzes on Fridays. These will cover topics similar to those on the homework that was handed in that day. Quizzes cannot be made up unless there are extenuating circumstances

(e.g. a school sponsored absence, a death in the family, a hospitalization). Your lowest quiz score will be dropped.

Labs

In addition to the more routine homework, there will be about three labs (i.e short projects) covering more in-depth material. More details on the labs will be announced along with your first lab.

Matlab/Octave

Real-world problems in linear algebra are solved using computer software. We will use the software program Matlab on assignments and for the labs. I do not expect that you have any Matlab experience, and I will provide materials to help you get up to speed in using Matlab. Matlab is available from the bookstore at an educational price of about \$100, is available on the computers in the Chapman Math Lab, and in some other computer labs around campus. You also have the option of using free software, Octave, that has a Matlab-like interface. It's a little more awkward to use Octave, but it is free. Instructions for installing Octave will be available on my web page.

Chapman Math Lab

The Math Lab in Chapman 305 has tutors available at scheduled times throughout the week. The tutors are most experienced at answering calculus questions, but you might find that some of the tutors (especially the graduate students) would welcome the opportunity to discuss something other than calculus. The hours for the Math Lab are posted on its door and on a link from the department's home page at <http://www.dms.uaf.edu>.

Midterms

There will be two midterm exams. These will **not** be comprehensive, and are tentatively scheduled for Friday, October 6 and Friday, November 10.

Final Exam

There will be a comprehensive final exam 10:15am – 12:15pm, Wednesday December 13.

Evaluation

Course grades will be determined as follows:

Homework	14%
Quizzes	10%
Labs	10%
Midterm 1	18%
Midterm 2	18%
Final	30%

Letter grades will be assigned according to the following scale. This scale is a guarantee. I reserve the right to lower the grade cutoffs, but I will not raise them.

A+	97–100%	C+	77–79%	F	≤ 59
A	93–96%	C	70–76%		
A-	90–92%	C-	(not given)		
B+	87–89%	D+	67–69%		
B	83–86%	D	63–66%		
B-	80–82%	D-	60–62%		

Tentative Schedule

Week	Topics and Events
8/28 – 9/1	Section 1.1, 1.2, 1.3
9/4 – 9/8	Section 2.1, 2.2 Monday: Labor Day
9/11 – 9/15	Section 2.3, 2.4, 2.5
9/18 – 9/22	Section 2.6, 2.7, 3.1
9/25 – 9/29	Section 3.2, 3.3
10/2 – 10/6	Section 3.4, 3.5 Friday: First Midterm
10/9 – 10/13	Section 3.6, 4.1, 4.2
10/16 – 10/20	Section 4.3, 4.4, 5.1
10/23 – 10/27	Section 5.2, 5.3
10/30 – 11/3	Section 6.1, 6.2, 6.3 Friday: Last day to withdraw with a 'W'
11/6 – 11/10	Section 6.4, 6.5 Friday: Second Midterm
11/13 – 11/17	Section 6.6, 6.7, 7.1
11/20 – 11/24	Section 7.2, 7.3 Thursday: Thanksgiving
11/27 – 12/1	Section 8.1, 8.2, 8.3
12/4 – 12/8	Catch up Friday: Last day of class
12/11 – 12/15	Exam Week Wednesday: Final exam at 10:15am

Rules and Policies

Attendance

Attend every class. Although attendance is not directly part of your grade, it is very easy in a math class to fall behind after skipping even one class. In my experience, people who skip math classes fail math classes. Nobody wants that.

Collaboration

You are encouraged to work together in solving the written homework problems. But each student must write up his or her solutions independently. Cloning (copying another student's homework) is not permitted and is a form of Academic Dishonesty (see below). If you receive significant help solving a problem, it is customary to make a note in your homework to give the person who helped you credit.

Late Homework

Written homework is due at the start of class on the date due.

You may turn in one homework late, with no questions asked, so long as you notify me before the time the homework is due. This no questions asked policy cannot be used for the first two assignments, nor can it be used for the final assignment. The late homework is then due when the next homework is due (or one

week later, if that gives you more time).

If there are extenuating circumstances in your life you may be able to hand in more than one late homework. Please see me in such an event.

Quizzes cannot be made up except under extreme circumstances. Your lowest quiz score will be dropped.

Makeup Exams

You can make up an exam if certain extenuating circumstances prevent you from taking it and if you inform me in advance. Contact me as soon as possible if you are going to miss an exam.

Disabilities Services

I will work with the Office of Disabilities Services (203 Whitaker, 474-7043) to provide reasonable accommodation to students with disabilities.

Cell Phones

Turn off your cell phone before you come to class.

Incomplete Grade

Incomplete (I) will only be given in Computer Science, Mathematics or Statistics courses in cases where the student has completed the majority (normally all but the last three weeks) of a course with a grade of C or better, but for personal reasons beyond his/her control has been unable to complete the course during the regular term. Negligence or indifference are not acceptable reasons for the granting of an incomplete grade. (Note: this is essentially the old University policy.)

Late Withdrawals

A withdrawal after the university deadline from a Department of Mathematical Sciences course will normally be granted only in cases where the student is performing satisfactorily (i.e., C or better) in a course, but has exceptional reasons, beyond his/her control, for being unable to complete the course. These exceptional reasons should be detailed in writing to the instructor, department head and dean.

Academic Dishonesty

Academic dishonesty, including cheating and plagiarism, will not be tolerated. It is a violation of the Student Code of Conduct and will be punished according to UAF procedures.