

Math 415 – Applied Linear Algebra

Fall 2014; Sections AL1, AL2

Instructor. Armin Straub

Email. astraub@illinois.edu

Course website. <http://math.illinois.edu/~astraub/>

Office. 247A Illini Hall

Office phone. (217) 300-0426 (please use e-mail whenever possible)

Office hours. MW, 12:30-1:30pm, or by appointment

Class schedule.

Section AL1 meets MWF, 9:00-9:50am, in 151 Everitt.

Section AL2 meets MWF, 11:00-11:50am, in 151 Everitt.

Head TA. Mahmood Etedadi Aliabadi (etedadi2@illinois.edu)

Textbook. *Linear Algebra and Its Applications*, 4th Edition, by Gilbert Strang (Cengage Publishing, 2011)

Material covered. This is an introductory course emphasizing techniques of linear algebra with applications to engineering; topics include matrix operations, determinants, linear equations, vector spaces, linear transformations, eigenvalues, and eigenvectors, inner products and norms, orthogonality, equilibrium, and linear dynamical systems.

In the text, this roughly corresponds to: 1.2–1.7, 2.1–2.6, 3.1–3.4, 4.2–4.4, 5.1–5.6, 6.1–6.3

Grading

Exams. There will be three midterm exams and a comprehensive final exam. Notes, books, calculators or computers are not allowed during any of the exams.

Our exam schedule is:

- Midterm Exam 1: Thursday, September 25 — 7:00-8:20pm
- Midterm Exam 2: Thursday, October 23 — 7:00-8:20pm
- Midterm Exam 3: Thursday, November 20 — 7:00-8:20pm
- Final Exam: Friday, December 12 — 7:00-10:00pm

For the midterm exams, conflict exams are planned on Fridays at 5:00pm.

There will be lectures held at the usual time on the Wednesday and Friday before and after each midterm exam. Instead, there will be no class on September 19 and October 20 as well as a third date, which will be announced later.

Make-up policy. There will be no make-up exams for either the three midterm exams or the final exam. Instead, if you miss an exam and have a valid excuse, your exam will be marked as ‘excused’. An ‘excused’ exam means that this exam will not be taken into account in the computation of your grade. **Valid excuse must be documented** by an ‘absence letter’ issued by the Emergency Dean.

Quizzes. Very short quizzes will be given each week in the discussion sections. The main purpose is to make sure that no one gets lost. It is a way for you and for us to monitor your progress. Your performance on the quizzes will count towards your overall grades, but only for 10% and we will even drop your two lowest scores on the quizzes.

Grades. Your grade will be based on the total sum of your scores on three midterm exams, quizzes, and the final exam.

- Midterm Exams: 60% in total (8% on weakest exam, 26% on each of the other two)
- Quizzes: 10% in total (2 lowest quiz scores dropped)
- Final Exam: 30%

For each exam and quiz, you receive a numerical score, which translates to letter grades as: A+ for >97%, A for >93%, A– for >90%, B+ for >87%, B for >83%, B– for >80%, C+ for >77%, C for >73%, C– for >70%, D+ for >65%, D for >55%, and F for less than 55%

Online grades. Your grades will be posted to the Illinois Compass2g system which you can access at: <https://compass2g.illinois.edu>. Please check your grades weekly and report any discrepancies in recorded grades within two weeks.

Extra credit and leeway in semester grade. Due to the size of the class, there will be **no extra credit**. Similarly, with so many students, there are always many cases where students are close (sometimes even very close) to the next letter grade, and at the end of the semester make the case that they should receive higher grades. Unfortunately, in almost all cases, we cannot grant the request without being unfair to other students. So make sure you take every exam and quiz seriously, so that you will get the grade you want. It is in part to make up for this inflexibility that your weakest midterm exam score carries significantly less weight and that the two lowest quiz scores are dropped.

Course organization

Online material. This syllabus as well as relevant information and material for this course, including lecture slides and discussion problems, can be found at our course website.

Lecture slides. For lectures, I will use a mix of slides and the blackboard. The slides contain purposeful blanks and will be posted before class, so you have the option to print out the slides and bring them to class.

Attendance. Attendance of all lectures is strongly recommended. You are encouraged to (quickly) read through the lecture slides before class, so you know what to expect and don't get lost in details. I will also try to make the lectures more helpful for your learning by challenging you with questions¹, as well as by providing details and emphasis that you will not get from just reading the slides.

Textbook. The slides are meant to be self-contained and you may find that you don't need the textbook. It is up to you whether you want to buy the book (older editions are fine, too) or not. It is a good book and a fine companion to the lectures.

Homework. There will be no graded homework. However, each week a number of exercises will be posted as preparation for the discussion section. You are strongly encouraged to try to solve all the exercises. Solutions to the exercises will be discussed in the discussion sections.

Discussion sections. Discussion sections will start meeting in the second week of the semester. The purpose of these sections is to give you an opportunity to ask questions and to discuss the weekly discussion problems with a TA. At the end of each discussion section will be a short quiz. Besides AL1 and AL2, there are two more sections, both taught by Philipp Hieronymi. In your discussion section, there will be students from all four sections. Moreover, the exams for all four sections will be the same (both midterms and finals).

Getting help. Instead of TA office hours, we are planning to offer help sessions. Four evenings a week, a classroom is staffed by one (or more) of our TAs and you are free to go and ask any questions you may have. Times and location will be posted later.

Moreover, we are (experimentally) using Piazza for online discussions and questions. Rather than emailing questions to me or a TA, you are strongly encouraged to post them on Piazza so that the whole class can join and benefit from the discussion (you have the option to post your question anonymously). You can find our class at:

<https://piazza.com/illinois/fall2014/math415/home>

Dates of interest.

http://www.registrar.illinois.edu/registration/deadlines_FALL2014.html

- Monday, September 1: Labor Day
- Friday, October 17: Last day to drop without grade of W
- November 22–30: Fall Break
- Wednesday, December 10: Last day of instruction
- December 12–19: Final examination period

Emergency information. Please review carefully:

http://www.math.illinois.edu/Bourbaki/emergency_syllabus_info.pdf

1. In the words of Paul Halmos, "Don't just read it; fight it!" For a cartoon: <http://abstrusegoose.com/353>