

# Math 251: Matrix Algebra I – Spring 2009

**Instructor:** Luís Finotti  
**Office:** Aconda Court 211-H  
**Phone:** 974-1321 (please do not ask me to call back – leave your e-mail)  
**e-mail:** [finotti@math.utk.edu](mailto:finotti@math.utk.edu)  
**Office Hours:** M 3:30pm-4:30pm W 11am-12pm (*subject to change!*) or by appointment  
**Course Web Page:** <http://www.math.utk.edu/~finotti/s09/m251/M251.html>  
(Careful with lower and upper case letters!)

**Textbook:** H. Anton, “Elementary Linear Algebra”,  
9th Edition. Wiley, 2004.  
**Prerequisite:** Math 152 or Math 148.  
**Class:** TTh 9:40am-10:55am at HSS 56. (Section 4.)  
**Midterms:** 02/17 (Tue) and 03/31 (Tue) during regular class time.  
**Final:** 04/28 (Tue) from 10:15am to 12:15pm.  
**Grade:** 25% for quizzes, 20% for each midterm, 35% for the final.  
**Note the weight of the HWs!**

## Course Description

This is a first course on *Linear Algebra*. We will study matrix algebra, system of linear equations, vector spaces, linear transformations, and eigenvalues/eigenvectors.

The first two of these topics are of computational nature, while the latter topics will be more theoretical, and hence usually considered harder by the students. Therefore, the initial plan is to go *rather fast* through the computational material, so that we can go over the most challenging topics on a better pace.

## Course Structure

We will likely cover the following:

- **Chapter 1:** sections 1-7.
- **Chapter 2:** sections 1-3. (Section 4 very briefly.)
- **Chapter 3:** sections 1-3.
- **Chapter 4:** sections 1-3.
- **Chapter 5:** sections 1-6.
- **Chapter 6:** sections 1-3 (no Gram-Schmidt or QR-decomposition), 5.
- **Chapter 7:** sections 1-3.

The first three chapters will be covered in a faster pace. Chapter 4 might also be covered superficially and briefly. The last three chapters should be the more challenging ones, I hope to have enough time to cover them in a slower pace.

Also, note that this outline is subject to change slightly without prior notice.

## Homework and Quizzes

Homeworks will be assigned after every class and will be posted at the section Homework of the course page (address above). No paper copy of the HW assignments will be distributed in class. **It is your responsibility to check the course page often!** Besides HW assignments, other important information will be posted there. (Check the section Important Notes often!)

The HWs will be collected on Thursdays. Each HW will have problems from the previous week (Tuesday and Thursday lectures). The problems to be turned in, as well as due dates, will be clearly posted in the course page. **The homework turned in will NOT be graded** (unless it will count as a quiz – see below.) I will look through them and keep comments for myself which will affect only border line cases when deciding the final grade for the course. (Again, unless it will replace a quiz, as explained below.) *Borderline students who do not turn in HWs consistently will always receive the lower grade.*

Since the HW will not be graded, we will have HW Quizzes every Thursday, at the beginning of the class. **You will not have extra time if you are late.** The quizzes will consist entirely of HW questions. You will have only ten or fifteen minutes, and so if you hadn't already solved it, you might not have enough time to come up with a solutions. **Points will be taken from messy solutions, and you need to show work in all questions (unless stated otherwise!** The same applies to exams and all graded work!

Every once in a while I might grade two or three HW questions instead of giving a quiz. (So, there will be no quiz that day in class.) This will be done whenever I need the extra time or want to better check how well you are doing your HW. The questions will be graded as a quiz (you need to write the solution properly and show work) and will count as a quiz. *I will not tell you in advance when that will happen!* So, be always prepared.

**Calculators will not always be allowed!** You will need to know how to perform some computations. Later in the course you *might* be allowed to use calculators, but you should never depend on it. *You can only use your calculator if I explicitly say so!* (This includes HW, quizzes, and exams!)

I will do my best to post solutions to the most difficult problems. If I do, they will be posted in the course page.

In my opinion, doing the HW is one of the most important parts of the learning process, so the weight for them is greater than the weight of a single midterm, and I will assume that you will work very hard on them.

Also, you should try to come to my office hours if you are having difficulties with the course. I will do my best to help you. Please try to come during my *scheduled* office hours, but feel free to make an appointment if that would be impossible.

Finally, **it is your responsibility to keep all your graded Quizzes and Midterms!** It is very important to have them in case there is any problem with your grade. You can check all your scores at Blackboard (<http://online.utk.edu/>). (Blackboard will be used *only for scores*. The official course page is the one given above.)

## Missed Work

There will be no make-up quizzes or exams. If you miss a quiz or exam **and have a properly documented reason**, your final will be used to make-up your score.

## E-Mails

**You will have to check your e-mail at least once a week, preferably daily.** I will use your e-mail (given to me by the registrar's office) to make announcements. (If that is not your preferred address, please make sure to forward your university e-mail to it!) I will assume that any message that I sent via e-mail will be read in a week or less, and it will be considered an *official* communication.

## Feedback

I have an *Online Feedback Form* at

<http://www.math.utk.edu/~finotti/php/feedback.html>

where you can anonymously send me your comments and suggestions. I will consider your comments and try to do whatever I can to resolve possible problems before it is too late. So, please, feel free to use it whenever you have any constructive comment or suggestion. (In fact, I would greatly appreciate it.) If you don't want your comments to be anonymous, just send me an e-mail or come by my office and we can discuss the problem.

## Problems *Likely* To Be Assigned

This list is subject to change without prior notice. The official assignments will be posted at our course page (address above).

**Section 1.1:** 1, 2, 3(a), (b), 4(a), (c), 5(a), (c), 6, 11, 12, 13.

**Section 1.2:** 1, 3, 5(a), (c), 6(b), (d), 7(b), 8(b), 10(b), 12, 14(a), (b), 17, 21, 22.

**Section 1.3:** 1, 2, 3(g), (j), (k), 5(a), (b), (d), (h), (j), 7(a), (d), (e), 8, 12(b), 13(a), 14(a), 18(a), 21.

**Section 1.4:** 1(b), (d), 3(d), 4(b), 5(b), 6(a), 7(c), (d), 9(b), 13, 14, 17, 20(b), 21, 29.

**Section 1.5:** 1, 3, 5, 7(a), (d), 9, 14, 15.

**Section 1.6:** 2, 7, 11 (you can use any method here), 15, 16, 17, 23.

**Section 1.7:** 1, 2, 4, 5, 11, 12, 13 (only matrix  $[i_j A_j / i_i]$ ), 15, 18.

**Section 2.1:** 3(a), (d), 4, 7, 12, 13, 17.

**Section 2.2:** 1(b), 2, 3, 4, 6, 9, 12, 14(a).

**Section 2.3:** 2, 4, 5, 6, 7, 12, 14(a), (b), 15(a), (b) (this means use only (a) and (b) from 14 in 15), 16.

**Section 3.1:** 6, 7, 8, 9, 10, 11.

**Section 3.2:** 1(a), (e), 2(a), (c), 3, 4, 7.

**Section 3.3:** 1(a), (d), 2(a), (d), 3, 4(a), (c), 5(a), (c), 9, 12, 16.

**Section 4.1:** 3, 7, 9(d), 11(c), 14(d), (e), 16, 18(b), 20.

**Section 4.2:** 1, 3, 5, 7, 9, 12, 16, 20.

**Section 4.3:** 1, 2(b), (c), 4, 5(b), 6(b), 7, 8, 11, 13, 15, 19(a), (c), 22.

**Section 5.1:** 1, 5, 6, 7, 9, 11, 12, 15, 18.

**Section 5.2:** 1, 2(b), (c), 3(c), (d), 4(a), (b), (c), 5(b), (c), 7, 8(a), 10(c), (d), 11(a), (b), 13.

**Section 5.3:** 1, 3(a), (c), 5, 6(a), (b), 8, 9, 11, 13, 15.

**Section 5.4:** 1, 3(a), (c), 4(a), (c), 7(b), (c), 8(c), 9(b), 10(b), 14, 16, 18(b), (c), 19, 23.

**Section 5.5:** 2(c), (d), 3(b), (c), 5(b), 6(c), 7, 8(c), 9(c), 11(b), (c), 12(c), 13.

**Section 5.6:** 2(b), (c), 3(b), (c), 4, 5, 7, 8, 9, 12, 13.

**Section 6.1:** 3(a), 4(a), 6, 8(b), 9(a), (d), 10(c), 11, 13(a), 14, 16(c), (f).

**Section 6.2:** 2, 4, 6(a), 8(a), 11, 15, 18(b), (c), 21.

**Section 6.3:** 3, 4, 6, 8, 9, 11, 13, 14.

**Section 6.5:** 2, 4, 5, 6, 9, 11.

**Section 7.1:** 4(a), (c), (f), 6(a), (c), (f), 7, 9, 10, 11, 20.

**Section 7.2:** 1, 2, 6, 7, 9, 13, 16, 17, 19.

**Section 7.3:** 1(b), (c), (e), 3, 5, 7, 9.

## Legal Issues

**Conduct.** All students should be familiar with and maintain their *Academic Integrity*: from *Hilltopics 2008/2009* ([http://dos.utk.edu/files/hilltopics\\_08-09.pdf](http://dos.utk.edu/files/hilltopics_08-09.pdf)) pg. 40:

### ***Academic Integrity***

*Study, preparation and presentation should involve at all times the student's own work, unless it has been clearly specified that work is to be a team effort. Academic honesty requires that the student present his or her own work in all academic projects, including tests, papers, homework, and class presentation. When incorporating the work of other scholars and writers into a project, the student must accurately cite the source of that work.*

All students should follow the *Honor Statement*: from *Hilltopics 2008/2009*, pg. 11:

### ***Honor Statement***

*"An essential feature of The University of Tennessee is a commitment to maintaining an atmosphere of intellectual integrity and academic honesty. As a student of the University, I pledge that I will neither knowingly give nor receive any inappropriate assistance in academic work, thus affirming my own personal commitment to honor and integrity."*

You should also be familiar with the *Classroom Behavior Expectations* found at

<http://www.math.utk.edu/Courses/Expectations.pdf>.

**Disabilities.** Students with disabilities that need special accommodations should contact the *Office of Disability Services* (<http://ods.utk.edu/>) and bring me the appropriate letter/forms.

**Sexual Harassment and Discrimination.** For *Sexual Harassment* and *Discrimination* information, please visit the *Office of Equity and Diversity* at <http://oed.admin.utk.edu/> and check

[http://oed.admin.utk.edu/docs/complaint\\_sex\\_harass.pdf](http://oed.admin.utk.edu/docs/complaint_sex_harass.pdf) (Sexual Harassment)

<http://oed.admin.utk.edu/docs/DiscrimCompProc.pdf> (Discrimination)