

Math 251: Matrix Algebra I – Summer 2010

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Office Hours: MTuTh 11am-12pm (*subject to change!*) or by appointment
Course Web Page: <http://www.math.utk.edu/~finotti/sm10/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: MTuWThF 1:30pm-3pm at HSS 56. (Section 1.)
Midterms: 06/15 (Tue) and 06/29 (Tue) during regular class time.
Final: 07/07 (Wed) during regular class time also.
Grade: 25% for quizzes, 20% for each midterm, 35% for the final.
Note the weight of the HWs!

Course Description

Firstly, this is a summer course, in which 16 weeks are squeezed into 5. So, as you can imagine, the pace is quite fast. You cannot just “catch up on the weekends” in a course like this, as by then we will have covered way too much material. You should catch up immediately if you fall behind, as you will not be able to follow classes and things just start to accumulate in a faster pace than you will likely be able to catch up. **I strongly recommend that you review, do problems, and study every day.**

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 the selected problems and due dates 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's web page often!** Besides HW assignments, other important information will be posted there. (Check the section Important Notes often!)

The HWs will be due Mondays and Thursdays, when you will either turn in your HW or take a quiz on problems taken directly from the HW set due on that day. In the former case, two or three problems will be graded and count the same as a quiz. In the the latter, the HW will not be collected at all. **You will not know in advance if the HW will be collected or if there will be a quiz**, and hence you should be prepared for either one.

The quizzes will take place at the *beginning* of the class. **You will not have extra time if you are late.** You will have only ten or fifteen minutes to take a quiz, and so if you hadn't already solved the HW problems, you might not have enough time to come up with a solutions.

Points will be taken from messy solutions in all assignments, and you need to show work in all questions (unless stated otherwise)! (This same applies to quizzes, HWs, exams and all graded work!)

Calculators will not be allowed! I've given in the past the students the option of using calculators in second part of the course, but due to how this would affect the exams, they have always chosen to **not** use them. So, I decided to just take the "no calculators" policy from the beginning. (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.

Legal Issues

Conduct. All students should be familiar with and maintain their *Academic Integrity*: from *Hilltopics 2009/2010* (http://dos.utk.edu/files/hilltopics_09_10.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 2009/2010*, 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 (Sexual Harassment)

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

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, 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, 15, 16, 17, 23.

Section 1.7: 1, 2, 4, 5, 11, 12, 13 (only matrix A), 15, 18.

Section 2.1: 3(a), (d), 4, 7, 9, 12, 13, 17.

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

Section 2.3: 2, 3, 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, 13.

Section 3.2: 1(a), (e), 2(a), (c), 3, 4, 5(a), 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, 19, 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, 22(a), 23.

Section 5.5: 2(c), (d), 3(b), (c), 5(b), 6(c), 7, 8(c), 9(c), 10(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: 16(c), (f).

Section 6.2: 2, 4, 11, 15, 18(b), (c), 21.

Section 6.3: 3, 4, 9, 11, 13, 14.

Section 6.5: 2, 3, 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.