

Math 351: Algebra I – Fall 2009

- Instructor:** Luís Finotti
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Office Hours: MW 9am-10am (*subject to change!*) or by appointment
Course Web Page: <http://www.math.utk.edu/~finotti/f09/m351/M351.html>
(Careful with lower and upper case letters!)
- Textbook:** J. Rotman, “A First Course in Abstract Algebra (with Applications)”, 3rd Edition, 2006. Prentice Hall.
Prerequisite: Math 300 (and Math 251/257).
Class: MWF 10:10am-11:00am at HBB 103. (Section 1.)
Midterms: 09/30 (Wed) and 11/04 (Wed) during regular class time.
Final: 12/09 (Wed) from 10:15am to 12:15pm.
Grade: 25% for quizzes/HWs, 20% for each midterm, 35% for the final.
Note the weight of the quizzes/HWs!

Course Description

This course is a one-semester introduction to Abstract Algebra. (Math 455/456 and 457/458 are year long courses on the same subject, and hence cover much more.) The emphasis will be given to integers and polynomials, which are examples of commutative rings. The other main topic to be covered (at least superficially) is groups.

This course might be a bit of a shock to many students, as up to now most will not have dealt with discrete, rather than continuous (in the calculus sense) structures and proofs, which is what you usually deal with in calculus, differential equations, and when working with real numbers. So, it might take a little time for you to get use to the ideas and techniques used in this course.

Being an upper level course for math majors, most of the course will be spent on proofs (as in Math 300), and you will have to read and write many. *I will assume you are comfortable doing both.* We will also deal with induction and set theory (again from Math 300.) Other than that, there is really very little in terms of background knowledge necessary.

Course Structure

I will try to cover most of chapters 1 to 3, while skipping material with which you should be familiar (from Math 300), such as parts of sections 1.2 and 2.1. I might also introduce topics that are not necessarily covered in the text, or maybe from later sections. Hence, be aware that **I will not necessarily follow the book too closely**, but I will do my best to not deviate too much. I might, though, cover Chapter 3 (Ring Theory) before Chapter 2 (Group Theory), as I find it would be better to make sure we have enough time to cover rings well. (Our text was designed to allow that.)

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 due on Wednesday, 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. **Note that you will also be graded on how well it is written, not only if it is correct!** (Remember, how to communicate your proofs is part of the course.) The same applies to exams and all graded work!

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! (This includes HW, quizzes, and exams!) As you will see, you won't miss them either.

I will do my best to post solutions to the most difficult problems. If I do, they will be posted in this 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, HW, 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. (Blackboard will be used *only for scores*. This is the official site for the course.)

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.

Additional Bibliography

Here are some other books you might find helpful:

- T. Hungerford, "Abstract Algebra: An Introduction", 2nd Ed., 1997. Brooks/Cole.
- S. Lang, "Undergraduate Algebra", 3rd Ed., 2005. Springer.
- I. Herstein, "Abstract Algebra", 3rd Ed., 1996. Wiley.
- J. Fraleigh, "A First Course in Abstract Algebra", 7th Ed., 2002. Addison Wesley.
- J. Gallian, "Contemporary Abstract Algebra", 7th Ed., 2009. Brooks/Cole.
- M. Artin. "Algebra", 1st Edition. Prentice Hall, 1991.
- I. Herstein, "Topics in Algebra", 2nd Ed., 1975. Wiley.

First of all, one should be careful that most books start with groups, not rings. The first two do, so might be good references. On the other hand, in most cases one can just skip to the sections on rings and find very few references to groups, so the others are also helpful.

Hungerford was my first option as the text for this course, but was too expensive. Herstein's "Abstract Algebra" was also considered as a text.

Fraleigh and Gallian are easy to read and very complete, while Artin and Herstein's "Topics in Algebra" are of a higher level, and are often times used in honors courses.

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)