

Math 457: Honors Abstract Algebra I - Fall 2013

Instructor and General Information

Instructor: [Luís Finotti](#)

Office: Ayres Hall 251

Phone: 974-1321 (don't leave messages! -- [e-mail](#) me if I don't answer!)

e-mail: finotti@math.utk.edu

Office Hours: MW 9-10 or by appointment.

Textbook: E. A. Walker, "[Introduction to Abstract Algebra](#)", Random House/Birkhauser, New York, 1987. (*Freely available!* You can use the link above, or here is a [local copy](#).)

Prerequisite: Math 351.

Class: MWF 10:10am-11:00am at Ayres 121. (Section 001.)

Exams: Midterms: 10/07 (Monday) and 11/18 (Monday); [Final](#): 12/09 (Monday) from 8:00am to 10:00am.

Grade: 25% for HW (lowest score dropped) + 20% for each Midterm + 35% for the Final. **Note the weight of the HWs!**

Back to the [TOP](#).

Course Information

Course Content

In this course (and in its sequel, Math 458) you will be introduced to algebraic structures such as [groups](#), [rings](#), [vector spaces](#) (beyond Math 251/257) and [fields](#). We will also learn a little (but not much) about [modules](#).

It is *very* important that you already have some practice with writing proofs (which was covered in Math 300/307) and familiarity with [matrices](#) and [linear algebra](#) (which was covered in Math 251/257). You will have to write many proofs in this course, and some examples we will look into will be related to matrices. Therefore, **I will assume you have the proper background from both Math 300/307 and Math 251/257**. If you had difficulty in those courses, you might need to review the material. (I would gladly try to help you with that if you come to my office hours.)

Math 351 is also a prerequisite for this course, but I will assume less and quickly review the necessary topics. Most important is basic properties of integers (primes, divisibility, GCD, LCM, etc.) and integers modulo n (e.g., [modular arithmetic](#)).

Chapters and Topics

The main go of the *sequence* (i.e., this course together with Math 458) is to cover Chapters 2 to 6 from the text, and hopefully have some time for selected topics from Chapters 7 (e.g., Section 7.3) and 8 (e.g., Section 8.2). (Chapter 1 is prerequisite! Feel free to take a look to refresh your memory.)

In this course, we will cover Chapters 2, 3 and as much of Chapter 4 as possible, hopefully at least to Section 4.5. This will cover most of Group Theory, Linear Algebra (Vector Spaces) and Ring Theory.

Note that this outline is subject to change slightly without prior notice.

Homework Policy

Homeworks will be assigned after every class and the selected problems and due dates will be posted at the section [Homework](#) of this page. No paper copy of the HW assignments will be distributed in class. **It is your responsibility to check this page often!** Besides HW assignments, other important information will be posted here. (Check the section [Important Notes](#) often!)

The HWs will be due on Wednesdays. **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 HWs, exams and all graded work!)

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

If you like to do your HW early, you can do problems in the list of [Problems Likely To Be Assigned](#) below, even before I assigned them. I might change a problem or two for the actual assignment, but that is not very likely. I hope to be able to keep this list ahead of the class, so that you can always start early. It will also be useful if I, for some reason, delay to post problems.

Also, some times I might get too ambitious in posting problems, i.e., I might think we will cover a section during the week, put exercises from it in the next assignment, and then end up not being able to finish it. In this case I might have to take a few problems off the assignment. The bottom line is the following: the assignment is not final until I remove the "More to come" from it. (If you've done problems which were removed, just saved them for the following week.)

Finally, if there is still a "More to come" in an assignment on a Friday, please write me right away so that I can update it. If I only realize on Tuesday (or Wednesday morning!) that an assignment was not complete (with the "More to come" still there) and nobody tried to contact me, I may add new problems just then, giving you little time to finish the assignment. (If I delay in replying, you can proceed with the [Problems Likely To Be Assigned](#).)

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 HWs 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 and feedback*. This is the official site for the course.)

Missed Work

There will be no make-up exams and I will not accept late HWs. If you miss an exam or HW **and have a properly documented reason**, your final will be used to make-up your score.

The way this works is as follows: imagine you missed a midterm (and had a documented excuse). The points from the problems on the final involving the sections of the corresponding midterm will make your midterm grade. For example: let's say that you missed Midterm 1, which, say, involved Sections 2.1-9 and 3.1-4. If questions 1 to 3 of the final (which is comprehensive!) are the questions from those sections and you get 24 out of 30 in those questions, your Midterm 1 grade will be 80 out of 100 (as 24 is 80% of 30).

E-Mail Policy

I will assume you check your e-mail at least once a day. 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 less than twenty four hours, and it will be considered an *official* communication.

Blackboard and Feedback

[Blackboard](#) will be used mainly for grades and feedback. The main content will be posted in this page.

There you can post an introduction (a blog post that all enrolled in the class can read) and/or keep a journal (that only you and I can read), if you want. (Certainly not required!)

There you can also post questions, both math related or about the course structure. (I've created a different forum for each. Please use

the appropriate one!) The former is moderated by me (your post has to be approved by me before appearing), while the second is not. Again, all students will be able to read these and offer help.

I will also have surveys posted frequently to have feedback from you. These will be anonymous, *except for the first one (Initial Survey)*. You are not required to answer them, but I really greatly appreciate it.

Lastly, there is also a link for (general) Feedback. Please, post all comments and suggestions there as often as you want. (I really appreciate your input.) *These can be posted anonymously (or not)*. Just make sure to check the option before posting. **Others students and myself will be able to respond and comment.** If you prefer to keep the conversation private (between us), you can send me an [e-mail](#), but then, of course, it won't be anonymous.

Back to the [TOP](#).

Legal Issues

Conduct

All students should be familiar and maintain their *Academic Integrity*: from [Hilltopics 2013/2014](#), pg. 46:

Academic Integrity

The university expects that all academic work will provide an honest reflection of the knowledge and abilities of both students and faculty. Cheating, plagiarism, fabrication of data, providing unauthorized help, and other acts of academic dishonesty are abhorrent to the purposes for which the university exists. In support of its commitment to academic integrity, the university has adopted an Honor Statement.

All students should follow the *Honor Statement*: from [Hilltopics 2012/2013](#), pg. 16:

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](#).

We are in a honor system in this course!

Disabilities

Students with disabilities that need special accommodations should contact the [Office of Disability Services](#) 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](#).

Campus Syllabus

Please, see also the [Campus Syllabus](#).

Back to the [TOP](#).

Problems *Likely To Be Assigned*

This list is subject to change without prior notice. The official assignments will be posted [below](#).

Section 2.1: 1, 3, 7, 11, 15, 16, 19, 23.

Section 2.2: 3, 4, 5, 9, 12, 13, 16(a) and (d), 22, 23, 26.

Section 2.3: 1, 4, 7, 9, 12, 14, 19, 22, 29, 37.

Section 2.4: 5, 6, 7, 8.

Section 2.5: 1, 2, 3, 4, 9, 11, 14.

Section 2.6: 1, 3, 6, 7, 8.

Section 2.7: 1, 4, 6, 10, 15, 17, 20.

Section 7.3: 1, 2, 3, 4, 5 (except (b) and in (d) should say "... divides $q-1$..."), 7, 10.

Section 4.1: 1(a), (c), 9, 13. Also, take a look, but *do not turn in*, 2, 3, 8, 11.

Section 4.2: 2, 4, 5, 10, 11, 14, 29, 34. Also, take a look, but *do not turn in*, 8, 9, 12, 25.

Section 4.3: 1, 2, 3, 4.

Section 4.4: 2, 3, 10, 12, 13, 14, 16, 24.

More to come!

Back to the [TOP](#).
