

Math 551: Modern Algebra I – Fall 2007

Instructor: Luís Finotti
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Office Hours: MWF 11:15am-12:15pm (*subject to change!*) or by appointment
Course Web Page: <http://www.math.utk.edu/~finotti/f07/m551/M551.html>
(Careful with lower and upper case letters!)

Textbook: D. Dummit and R. Foote, “Abstract Algebra”,
3rd Edition, 2003, Wiley.
Note: There is an *ERRATA* available in the course page.
Prerequisite: Undergraduate Abstract Algebra.
Class: MWF 10:05am-11:05am at Ayres 309A. (Section 1.)
Midterms: 09/27 (Th) and 11/06 (Tu) from 5pm to 7pm in room TBA.
Final: 12/13 (T) from 10:15am to 12:15pm.
Grade: *Roughly:* 20% for homeworks, 20% for each midterm, 40% for the final.
Note the weight of the HWs!

Course Information

This is the first course of the graduate sequence in *Modern Algebra*. We will likely cover topics in *Group Theory* and *Ring Theory* in this course, leaving *Modules* and *Field/Galois Theory* for the second semester.

The amount to be covered is *very* large, and thus the pace of the class might be a bit fast. In order to not go too fast, **I will assume some background in Groups and Rings**. These will be only basic topics that anyone should have seen in an undergraduate algebra course. I might quickly remind you of some of these basic facts, but I might skip some altogether. In this category are included: definitions and basic examples of groups and rings, subgroups and subrings, definitions of normal subgroup and ideal, homomorphisms and isomorphisms, and others. On the other hand, if I skip a fact or definition with which you are not familiar, the students should feel free to stop me and ask about it.

Also, in the same spirit of keeping the pace reasonable, I would like to propose:

- *Evening Midterms:* This way we do not lose class time with exams. I will be as flexible as possible with the dates/times.
- *Extended Class Time:* If all are able, I think it would be to the students advantage to have a one-hour lecture instead of a fifty minute lecture. If all are having classes and/or teaching at Ayres Hall (or nearby), a five minute interval should be enough to get you to your classes. (We could also try something in between.)

Both of these will be left to the students choice, but I should advise you that I'd likely have to go quite fast if either one of these suggestions is not feasible.

Course Structure

We will likely cover the first two parts of the textbook (leaving the latter two for the second semester). These include the first nine chapters. Some sections might be left out depending on time, some we will go over very quickly, since they should be review, but we will certainly cover all topics required for the prelim.

Homeworks

Homeworks will be assigned after every class and will be posted at the course home page at

<http://www.math.utk.edu/~finotti/f07/m551/M551.html>

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 Wednesdays. Each HW will have problems from the previous week (Monday, Wednesday and Friday lectures). The problems to be turned in, as well as due dates, will be clearly posted on the course page. Note that not all of the problems turned in will be graded, but you won't know which until you get them back.

No late HWs will be accepted, except in extraordinary circumstances which are properly documented.

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.

I will do my best to post solutions. Please check 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 equal to 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.

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, write me an e-mail letting me know ASAP. 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 *On-line 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:

- S. Lang. “Algebra”, 3rd Edition. Springer, 2005. – Probably the best *reference* algebra book there is.
- I. Isaacs, “Algebra: A Graduate Course”, 1st Ed., 1994. Brooks Cole. – Particularly good in group theory and non-commutative algebra.
- B.L. van der Waerden, “Algebra I, II”, 2nd Ed., 2003, Springer. – A classic.
- N. Jacobson, “Basic Algebra I and II”, 2nd Ed., 1985. W H Freeman & Co. (Out of print.) – Another standard book.
- T. Hungerford, “Algebra”, 1st Ed., 1974, Springer. – Another standard book.

Here are some which are more on the level of *undergraduate* algebra:

- J. Fraleigh “A First Course in Abstract Algebra”, 7th Ed., 2002. Addison Wesley.
- J. Gallian, “Contemporary Abstract Algebra”, 6th Ed., 2005. Houghton Mifflin Co.
- M. Artin. “Algebra”, 1st Edition. Prentice Hall, 1991.
- I. Herstein, “Topics in Algebra”, 2nd Ed., 1975. Wiley.

The first two books are considered “easier” books. The Artin’s book is of a bit higher level (and has a slightly different focus).

The last one is a “standard” text for a first course in abstract algebra, but have a higher level of difficulty than the previous two. It’s been used for the honors section of the undergraduate algebra course here at UT, and it might be even on the level of a graduate course.

Legal Issues

Since this is a graduate course, I assume we will not have misconduct problems, but it is my duty to ask you to read the sections below. (On the other hand, I would consider any kind of lack of academic integrity from a graduate student a much more serious offense, and would feel obligated to take the appropriate measures with maximum rigor.)

Conduct. All students should be familiar with and maintain their *Academic Integrity*: from *Hilltopics 2007/2008* (<http://web.utk.edu/~homepage/hilltopics/HILLTOPICS2007-08.pdf>) pgs. 39-40:

Academic Integrity

The responsibility for learning is an individual matter. 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 all work presented be the student's own work, not only on tests, but in themes, papers, homework, and class presentation. There is a clear distinction between learning new ideas and presenting them as facts or as answers, and presenting them as one's own ideas. It is part of the learning process to incorporate the thoughts or ideas of others into one's own mind and presentations with the purpose of learning and enlarging on personal boundaries of knowledge.

All students should follow the *Honor Statement*: from *Hilltopics 2007/2008*, 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/Undergraduate/undergrad/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)