

Math 200a Fall 2011: Graduate Algebra I.

MWF 2-2:50pm, 5402 AP&M

Professor D. Rogalski

1. CONTACT INFORMATION

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2. BASIC COURSE INFORMATION

- **Course description** This is a rigorous course in graduate level algebra. At least one course at the undergraduate level in abstract algebra covering some group and ring theory, as well as a good knowledge of linear algebra, are prerequisites. Students with little or no prior background in algebra should consider taking Math 100 instead. Please come see me if you have any questions if this is the right course for you.

- **Qualifying exam** The three quarter sequence 200a-c is preparation for the qualifying exam in algebra which will be given in May 2012, and again in September 2012. These exams will be tailored to the topics we cover in the course this year.

- **Textbook** The main textbook is *Abstract Algebra* by Dummit and Foote. Most of what we cover in the first two quarters will be found in that textbook, though a few minor topics may be covered only in class. Generally, I think you will find it helpful both to read the book thoroughly and to attend lectures. I will follow the general order of topics as the book for the most part and try to stick to its notation, but will not follow its presentation closely. The book is full of many more worked examples than we can possibly do in lecture, and you may find this helpful. On the other hand, the book's comprehensive treatment can make the subject seem denser than it is, and in class I generally strive to emphasize the most important points.

Other good textbooks you could consult for reference include *Algebra* by Hungerford and *Algebra* by Isaacs.

In the spring quarter, I plan to cover some more advanced commutative ring theory. Some of this is in Chapters 15-16 of Dummit and Foote but I will work mainly out of Atiyah-MacDonald, *Introduction to Commutative Algebra* for this unit.

- **Homework** Homework will be assigned weekly and due on Fridays. The assigned problems will be posted on the class website. Only selected problems will be graded, but you are responsible for completing and understanding all problems. You are free to discuss the homework problems in general with the professor, the TA, or each other, but your final write-up of the problems must be your work alone. If you actually submit solutions that are not your own work, for example directly copying from an online solution bank, you will not get credit and I will have to report you for academic dishonesty.

- **Exams** There will be one in-class midterm, tentatively scheduled for Wednesday November 2, 2011. The final exam will be Wednesday, December 7, 2011 from 3:00-6:00 pm.

- **Grading** Your grade will be based on the following percentages: Homework 25%, Midterm 25%, Final Exam 50%. Letter grades for graduate students are really just advisory. Your grade in this class is meant to reflect how your current performance corresponds to your likely result on the qualifying exam to be held next year: A = PhD Pass, A- = Provisional PhD Pass, B+/B = Master's Pass, C or less = not likely to pass the qual.

- **Topics** The topics for the fall quarter will be group and ring theory, Chapters 1-9 in the text, though we will not cover absolutely everything in those chapters. We will cover the most basic material about groups and rings very quickly, as a kind of review. In particular, I will assume you learned the majority of the topics in Chapters 1-3 in a prior course and we will just give a whirlwind review of them over the first week.

The topics for the winter will be module theory and field theory, Chapters 10-14. If time permits we may begin module theory at the end of the fall quarter.