

Math 200a Fall 2014: Graduate Algebra I.

MWF 1-1:50pm, 5402 AP&M

Professor D. Rogalski

1. CONTACT INFORMATION

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2. BASIC COURSE INFORMATION

- **Course description** This is a first course in graduate level abstract algebra. At least one course at the undergraduate level in abstract algebra covering some group and ring theory is a prerequisite.

The main aim of the course is to give PhD and masters students in mathematics sufficient background for their further studies. Consequently the pace of the course is quite fast, and homework assignments are designed to be challenging. Graduate students specializing in other subjects who have a particular interest in pure mathematics sometimes find this course to be a good fit for them, but I stress again that this course is not designed as a first course in abstract algebra. Students with minimal prior background should consider taking the undergraduate algebra course Math 100a instead. If you are not sure if you should take this course, please discuss it with me.

- **Office hours** Please take advantage of office hours to ask questions about the course material or if you need advice on how to approach the homework problems. If you cannot make either Professor Rogalski's or your TA's scheduled office hours, please make an appointment to talk to one of us at a different time.

- **Qualifying exam** The three quarter sequence 200a-c is preparation for the qualifying exam in algebra which will be given in May 2015, and again in September 2015. These exams will be tailored to the topics we cover in the course this year. The May exam will take place in the middle of Math 200c, and will cover roughly the material in 200a-b plus the first part of 200c. However, students are not be required to take the qualifying exam, and the grade in Math 200c will be independent of the qualifying exam.

Copies of some recent qualifying exams in algebra can be found on the math department's website as part of the mathematics department graduate student handbook, see

<https://www.math.ucsd.edu/handbook/graduate/academics/qualifying-exams/>

- **Textbook** The main textbook is *Abstract Algebra* by Dummit and Foote, 3rd edition. Most of what is covered in 200a-b will be found in there. I will not always follow the presentation in Dummit and Foote closely and may order some topics differently, but I will try to give references to which sections correspond to what we are covering at the moment, and will try not to conflict with Dummit and Foote's notation. Other good textbooks you could consult for reference include *Algebra* by Hungerford and *Algebra* by Isaacs. For 200c, we will follow the text *Introduction to Commutative Algebra* by Atiyah and MacDonald.

- **Homework** Homework will be assigned weekly and due on Friday (time deadline to be announced). The first homework will be due on Friday October 17 (end of week 2). To facilitate the process of getting the HW to your TA, there will be a HW box in the basement of AP&M marked with the name of our class, where you should hand in your assignments. The assigned problems will be posted on the class website. Only selected problems will be scored, but you are responsible for completing and understanding all problems, and exam problems are often modeled on homework problems. You are free to discuss the homework problems with the professor, the TA, or each other, but your final write-up of the problems must be your work alone. Submitting solutions that are not your own work, for example copying from an online solution bank, is academically dishonest.

- **Exams** There will be one in-class midterm, scheduled for Friday November 14 (week 6). No homework will be due the week of the midterm. The final exam will be Monday, December 15, 2014 from 11:30am-2:30pm. No notes, books, or other aids can be used during exams.

- **Grading** Your grade will be based roughly on the following percentages: Homework 25%, Midterm 25%, Final Exam 50%. Your grade in this class is meant to suggest 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. If time allows we may begin to introduce module theory at the end of this quarter.

Because group theory is covered in most undergraduate abstract algebra courses, this is the subject I will assume every student has seen the basics in. For this reason, we will go over the topics in Chapters 1-3 of Dummit and Foote very quickly.