Math 742 – Abstract Algebra II (Spring 2016)

- Lecture times and location: MWF 1:20PM – 2:10PM, Van Vleck B129
- Textbooks:
  - Allen Altman, Steven Kleiman, A Term of Commutative Algebra
  - M. Atiyah, I. Macdonald, Introduction to Commutative Algebra
  - Serge Lang, Algebra, third ed.
- Course website: http://math.wisc.edu/~svs/742/
- Instructor: Steven Sam steven.sam@wisc.edu
- Office hours: 321 Van Vleck, Mondays 12–1 (shared with 746), Wednesdays 12–1 (742 only)
- Grader: to be confirmed

Course description

The main topics of the course are commutative algebra and Galois theory.

For commutative algebra, I will follow Altman–Kleiman, which is freely available online (I have provided a link on the course website). This is meant to be an updated version of the classic text by Atiyah–Macdonald. We can't go over everything in the book, so I will try to emphasize the important points in lecture and expect you to read what we skip. There are 26 chapters (we will likely omit the last 4), and I plan for this to take up the course before spring break, hopefully ending a few lectures early to begin the Galois theory section. You may find it useful to read Atiyah–Macdonald alongside Altman–Kleiman – the book is quite short and clearly written.

For Galois theory, I plan to follow Lang's book, in particular Chapter V and VI. I anticipate this will take roughly 4-5 weeks.

If all goes according to plan, there will be approximately 1-2 weeks left. There are plenty of useful algebraic topics that could go here: Pfaffians (XV.8–9), division rings (XVII.1–3), Clifford algebras (XIX.4), etc.

Expectations

You are expected to read the textbooks, and it will be infinitely more useful for you if you read ahead of the lectures and prepare questions. In fact, there are far more details in those books than we can reasonably cover in class, so I will often skip many routine proofs and emphasize those which I feel are particularly important. The only way to get comfortable with the material is to work many problems and read many proofs, so read everything we don't cover!

You are encouraged to work on homework with others, but solutions must be written up individually.

If you have questions about the material, you are encouraged to come to office hours. Also, there is a Piazza page for the course: http://piazza.com/wisc/spring2016/math742/home. You are encouraged to discuss the course and its material with one another there. If you have a question about the course, chances are that others have the same question, so it

will be beneficial for all to have it posted to Piazza. However, please refrain from posting solutions to homework.

If there are issues that cannot be discussed on Piazza, please email me.

Grading policy

I don't plan to be overbearing with grades in a graduate course. However, since this is a first-year course, I need to make sure you're keeping up with homeworks and readings. Thus, we will adopt the following scale:

- Homework: 60%
- Exam 1: 20%
- Exam 2: 20%

The goal of the exams is to prepare you for the qualifying exam. So I will plan for one to take place after we finish commutative algebra, and one after we finish Galois theory and I will try to base them on past qualifying exams.

Your solutions in homework and exams will be graded for clarity and correctness. While it is important to get the right answer, it is equally as important to be able to communicate those ideas clearly. So, when appropriate, explanations should be given in complete sentences. To encourage this and to help you practice mathematical exposition, **homework must be typed starting with HW3**. I encourage you to learn LaTeX to accomplish this.

Homework is due most Fridays. I plan for there to be 12 homeworks.

Late homework policy: It is important that you do the homework. I know that it is not always possible to finish everything on time, so I will allow 2 late homeworks (to be turned in by the Monday after).

Academic integrity

http://www.students.wisc.edu/doso/academic-integrity/

Additional logistics

Students that need special accommodations should talk to me as soon as possible.