Math 746 – Topics in Ring Theory (Spring 2016)

- Lecture times and location: MWF 9:55AM – 10:45AM, Van Vleck B305
- Textbook: David Eisenbud, *Commutative Algebra: with a view toward algebraic geometry*
- Course website: http://math.wisc.edu/~svs/746/
- Instructor: Steven Sam steven.sam@wisc.edu
- Office hours: 321 Van Vleck, Mondays 12–1 (shared with 742), Fridays 11–12 (746 only)

Course description

This is a second course in commutative algebra, to be thought of as a sequel to Math 742. We will mostly follow Eisenbud's book. The plan is to cover Chapters 8, 10, 15–21 and Appendices 2, 4. The first main topic is the use of homological methods in commutative algebra. This is mostly a "local" study so will be valuable in algebraic geometry. I also plan to cover computational methods (Gröbner bases) and local cohomology.

This will probably take up most of the semester, but if there is time leftover, possible additional topics are: degeneracy loci, codimension 3 Gorenstein ideals, and matrix factorizations.

Expectations

You are expected to read the textbook, 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 book 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/math746/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 will assign some homework (approximately 5-6 assignments) which will be graded. Each student is expected to write a term paper on a topic related to this class. Depending on enrollment, I might make this a team effort. Some possible topics will be presented later. There will be no exams.

Academic integrity

Additional logistics

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