

Topics

Considering the varied background of the registered students, it is difficult to run a course satisfying everybody, but I hope all of you will take away something from the course.

We will start with a crash course on Commutative Algebra and Homological Algebra. In the second part, we will define K_0 of rings and Chow groups of rings. We will do some important calculations and prove some basic theorems. Some of the theorems need more Algebraic Geometry than can be covered, but I hope to at least state the results precisely and illustrate uses of Grothendieck -Riemann Roch theorem (without denominators). In the last part, I will define and construct Quillen's theory of higher K-groups. As some of you know, this is an abstract definition with precious few actual computations, so not much will be done with these groups.

Time

Classes meet MWF 11-12 in Lopata 201

Prerequisites

Math 5031-2, Algebraic Topology is a plus, but I will recall some of the basics.

Texts

For Commutative Algebra there are many texts (e.g. Lang, Serre's Local Algebra, Matsumura, Atiyah-MacDonald, Eisenbud). Similarly, Homological Algebra is covered in many books (Lang, Weibel, Serre, Matsumura). Many aspects of K_0 -theory is covered in these books- Manin's article in Russian Mathematical Surveys, Weibel's book, Fulton's Intersection Theory. Chow groups are extensively dealt with in Fulton's book. Higher K-theory is dealt with by Weibel, Srinivas and others in their books. Algebraic Topology is covered in all standard texts (Hatcher, Spanier etc.).

Office Hours

My office is Cupples I, room 111A, and my office hours are on Tuesdays from 3-4pm, or make an appointment by email.