MATH 631

Algebraic geometry I: Introduction to algebraic varieties and schemes

- MWF 1:00-2:00 PM, EH 4096
- Course webpage: *www.math.lsa.umich.edu/ mmustata/631-09.html*
- Office hours: Fridays 9:00-10:00, and by appointment.
- There will be a one hour weekly problem session (day and time to be decided). I will distribute the problem sheets one week in advance, so you have time to think about the problems. Every other week, I will also give a homework assignment. The grade in the course will be based on the homework.

This is the first half of a one-year course. The goal of the first part will be to introduce algebraic varieties and schemes. The second half will be devoted to cohomology, and to geometric applications (curves and surfaces). Here is a rough outline of the course:

1) Affine algebraic subsets and Hilbert's Nullstellensatz
2) Dimension theory
3) Sheaves and ringed spaces
4) Schemes in the geometric context, i.e. varieties with nilpotents
5) Projective varieties and schemes
6) Fiber products; separated and proper morphisms
7) Coherent sheaves
8) Divisors and line bundles; projective morphisms
9) Nonsingular varieties; differentials and the tangent bundle