Course Information for Math 6421 Algebraic Geometry Fall 2013

This is a graduate-level course in algebraic geometry. The detailed contents of the course will depend on the background and aims of the students, but at a minimum we seek to give an overview of the main objects, tools, and questions in the field, and to hint at some of the connections to other areas of mathematics and science.

Instructor:

- Douglas Ulmer, Professor and Chair, School of Mathematics
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- Office hours: Mondays 2:00 - 3:00, Tuesdays 3:00 - 4:00, or by appointment. Check my web site for changes.

Course info:

- Title: Algebraic Geometry I
- Number: 6421-A (90213)
- Course Meetings: TTh 1:35 - 2:55 in Skiles 171
- Objectives: Master the fundamentals of algebraic geometry at the graduate level.
- Audience: PhD students in Mathematics and related fields. Others with an interest in algebraic geometry.
- Prerequisites: A graduate course in algebra (at the level of texts such as Dummitt and Foote or Lang) and familiarity with basic ideas of geometry such as manifolds.
- Topics:
  - Affine varieties, regular functions, morphisms
  - Abstract and projective varieties, rational functions, rational maps
  - Finite morphisms, dimension, dimension of fibers, irreducibility
  - Tangent space and local properties, intersection multiplicities
  - Smooth models of curves
  - Elliptic curves, introduction to Weil conjectures

Resources:

- Text: “Basic Algebraic Geometry I” (third edition) by I. R. Shafarevich
- Alternates: “Algebraic Geometry” by R. Hartshorne, “Algebraic Curves” by W. Fulton, and “Algebraic Geometry” by J. Harris are recommended.

Requirements and grades:

- Homework will be assigned regularly, collected, and graded.
- There will be a take-home final and/or final paper assignment in lieu of a final exam.
- Grades will be based on the percentage of possible points earned. Homework will count for 60% of points possible and the final project/paper will count for 40%.
- Cutoff percentages for A, B, C, D are 90%, 80%, 70%, and 60% respectively.

Other important policies and tips:

- **Collaboration and plagiarism**: Discussing ideas and homework exercises with your peers is not only acceptable, it is a good idea. However, you must write your own solutions and proofs in your own words. Copying another's words or otherwise passing off someone else's work as your own is plagiarism and will result in a score of 0 on the entire assigmemnt in question. Egregious cases will be dealt with more harshly. **ASK** if you have **any questions whatsoever about this**
- Homework is due at the beginning of class, usually on Tuesdays. Late homework is strongly discouraged. It will be accepted up to 48 hours after the due time and will be assessed a 20% penalty.
- The Georgia Tech Honor Code applies 100% without exception. Know it and live it.
- Experience shows that attendance in class is very much to the student's benefit. It is strongly encouraged and offers the opportunity to earn quiz points.
- Class time will be used to discuss difficult ideas, points of confusion, etc., not to go over basics in the text. Read assignments before class and come prepared with questions.