

# Algebraic Geometry I

## Math 986 – Fall 2013

### Section 001

### Syllabus

**Instructor:** Dr. Jim Brown

**Office:** Martin O-324

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**Class Meeting:**

MWF: 10:10 - 11:00 Daniel 401

**Office Hours:** M: 14:00 - 15:00

Th: 10:00 - 11:00

(and by appt. if you don't want to fight off the ugrads)

**Textbook:**

*An Invitation to Algebraic Geometry* by K. Smith, ISBN 0-387-98980-3

*Algebraic Geometry* by R. Hartshorne, ISBN 0-387-90244-9

*Lectures on Algebraic Geometry I and II* by G. Harder, ISBN 3-834-81844-5  
and 3-834-80432-0

**Material:** affine and projective varieties, Hilbert's Nullstellensatz, the Zariski topology, the sheaf of regular functions, regular and rational maps, dimension, the Zariski tangent space, the concept of smoothness, degree, the Hilbert polynomial, blowing up, divisors, line bundles and maps to projective space, the Riemann-Roch formula for curves. Considerable attention will be paid to the rich examples of classical algebraic geometry: Grassmannians, flag varieties, curves, Segre and Veronese maps, blow-ups, quadrics, determinantal varieties. We will also touch on the idea of schemes and of varieties as functors, though these concepts will be developed only as examples, not formally

or precisely.

**Grading:** There will be homework collected roughly every two weeks. You are strongly encouraged to work with others on the homework sets, but you must turn in your own solutions.

The grading scale will be no worse than the following:

$\geq 90\%$  A

$\geq 80\%$  B

$\geq 70\%$  C

$\geq 60\%$  D

This means if your final grade is a 90%, you will receive an A for sure. However, it may be the case that your final grade is an 85% and you receive an A.