MATH 483-1 ALGEBRAIC GEOMETRY – WINTER 2000

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12/4/99

The course will cover basic concepts and techniques of Algebraic Geometry: Algebraic sets in affine and projective space, affine and projective varieties, morphisms and rational maps, regular and singular points, divisors, differential forms, invertible sheaves and line bundles. The course will end with the Riemann-Roch Theorem for curves (maybe with proof, if time permits) and its applications.

We will not follow closely any particular text; however, most of the material we will cover can be found in Shafarevich's book. Other books that will be useful for the course are listed below. I hope to have them all put on reserve.

If you are willing to accept some Commutative Algebra results (Hilbert's Basis Theorem, Nullstellensatz and a few other) without proof, the prerequisites for this course are rather minimal: familiarity with basic properties of rings, fields and ideals. It is highly recommended (although not required) that you attend the Commutative Algebra course taught by Andrei Suslin this quarter.

Main References:

W. Fulton *Algebraic Curves.*
R. Hartshorne *Algebraic Geometry* (especially chapters 1 and 4).
D. Mumford *The Red Book of Varieties and Schemes.*
I.R. Shafarevich *Basic Algebraic Geometry.*

Other References:

D. Eisenbud, J. Harris *Schemes: The Language of Modern Algebraic Geometry.*
P. Griffiths, J. Harris *Principles of Algebraic Geometry.*
J. Harris *Algebraic Geometry – A First Course.*

For Commutative Algebra, two useful texts are
Atiyah and Macdonald *Introduction to commutative algebra.*
Eisenbud *Commutative algebra with a view toward algebraic geometry.*