

Syllabus

Math 595 Algebraic Geometry II

Fall 2009

Course Title: Math 595, Algebraic Geometry II

CRN: 42955

Lecturer: Dr. Li Li

Time/Room Number: 09:30 AM - 10:50 AM, room 243 Altgeld Hall.

Prerequisites: familiar with algebraic varieties and sheaves. Knowing the language of schemes is helpful, but not required.

Text: Hartshorne, *Algebraic Geometry*, GTM 52, Springer-Verlag. (Chapter 3)

Also suggest: Schenck, *Computational algebraic geometry*. London Mathematical Society Student Texts, 58. Cambridge University Press, Cambridge, 2003.

Course description: The aim of this course is to give an introduction to sheaf cohomology in algebraic geometry. I will cover the following topics, with emphasis on practical computation (by hand or by Macaulay 2):

1. A review of homological algebra, in particular derived functors and cohomology of sheaves.
2. Cohomology of sheaves on schemes, Ext groups, Duality and higher direct image maps.
3. Flat morphisms and smooth morphisms.
4. Introduction to Vanishing Theorems.