

**MATH 558 SYLLABUS**  
**SPRING 2015**  
**MWF 1:30-2:20 BRINK 328**

**Instructor:** Jennifer Johnson-Leung  
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Brink 303  
Office hours: Thursday 12-2pm and by appointment.

**Textbook:** Kenji Ueno, *Algebraic Geometry 1: From Algebraic Varieties to Schemes*

**References:** I will be supplementing with the following texts

- Smith *An Invitation to Algebraic Geometry*
- Eisenbud and Harris *Geometry of Schemes*
- Hartshorne *Algebraic Geometry*

There are of course other great references (eg, Shafarevich). Those of you feeling particularly ambitious can read *Elements de Geometrie Algebrique (EGA)* by Grothendieck.

**Learning Outcomes:**

- (1) The student will improve in the ability to write proofs.
- (2) The student will develop further understanding of and ability to use common modes of algebraic and geometric reasoning.
- (3) The student will learn basic ideas in the theory algebraic varieties and schemes.

**Pre-requisites:** We will assume the commutative algebra that we developed last semester, and dive right in with Hilbert's Nullstellensatz.

**Topics:** I expect to cover the entire book, though I will supplement with other references. If it goes quickly, then we'll discuss some topics out of Ueno's second book (eg. coherent sheaves and proper morphisms).

**Attendance:** *You are expected to come to every class having read the assigned sections of the text and attempted all exercises assigned in the previous class. Some of these problems will be presented on Friday afternoons.*

**Homework:** There will be homework for each class (see **Attendance** above). There will also be longer written assignments due approximately every two weeks. Electronic submissions will not be accepted, though typed homework may be printed and submitted. Points will be assigned for clarity. Do not turn in a rough draft or a paper with many erasures. Late homework will be accepted but may not be graded promptly.

You may discuss the homework with each other, but you must write up the final form of your homework without having looked at the final form of anyone else's homework. At the end of the homework please write the names of everyone you worked with for that assignment.

**Exams:** There will be one mid-term and one final exam, which will have some take-home component. We will discuss specifics of the exams later in the semester.

**Grading:** This is a graduate class. Grades will reflect the level of preparation that you have demonstrated for a Qualifying or Comprehensive exam in algebraic geometry (should one exist). An A means you are fully prepared, a B that you will be prepared with some additional review and study, and a C that you need significant additional work. I hope everyone will earn an A, but this will require hard work on your part. Everyone should earn at least a B. Earning a C in a graduate course is generally not considered to be acceptable progress. Homework will be worth half of your grade, the midterm a sixth and the final a third. It is imperative that you attend class and complete the homework in a timely manner.

**Disability Accommodations:** Reasonable accommodations are available for students with documented temporary or permanent disabilities. All accommodations must be approved through Disability Support Services in order to notify your instructor(s) as soon as possible regarding accommodation(s) needed for the course.

**Plagiarism and Cheating:** Work on exams and quizzes should be entirely your own, with no help of any kind from any other source. (You may of course ask questions of the instructor or other proctor, but there is no guarantee you will get an answer.)

You are encouraged to discuss the homework problems with other students. You may also look up additional sources on the homework. However, you must write your solutions independently. Excessive similarity in style and phrasing between the homework solutions of two students or between the solutions of one student and a found source will be considered suspicious and may result in a zero on the assignment. Academic dishonesty may result in a failing grade in the course.