Instructor. Christel Rotthaus
Office. D321 Wells Hall
Email. rotthaus@math.msu.edu
Phone. 353 8498
Office Hours. MWF 1.30-2.30pm, and by appointment

Text. *Ideals, varieties, and algorithms*, second edition, by D. Cox, J. Little, D. O’Shea, Springer

Course Objectives. This course is an introduction into algebraic geometry with an emphasis on computational aspects. We will roughly cover the first four chapters of Cox, Little, and O’Shea’s book. After introducing algebraic varieties we will study Groebner bases. Groebner bases have been introduced about 20 years ago to solve computational questions in commutative algebra and algebraic geometry. We will use Groebner bases to study problems concerning polynomial ideals and algebraic varieties. In the third chapter we will explore elimination theory and the classical theory of resultants. The fourth chapter is an introduction into the foundations of algebraic geometry. We will prove Hilbert’s Nullstellensatz and study the correspondence between ideals and varieties.

Homework, Exams and Grading. Your grade will be determined by

- one presentation: tentative date: week of October 23
- Final exam: Date for the final exam: Tuesday, December 12, 3:00-5:00pm
- Presentations, homework: Every student in this class has to do an in-class-presentation (about 15-20 minutes).

Homework problems will be assigned at the beginning of each class. It is essential to your understanding of what is going on in class that you work hard on them on a day-to-day basis. The problems assigned will be collected each week on Friday. Your solutions must be written up neatly and logically, with appropriate explanation (in complete sentences) of what you are doing. Some of the homework problems will be graded. You may discuss any of the problems with each other, as long as you work alone and use your own wording to write up the homework to be handed in. Late assignments will not be accepted.

In general, the University policy concerning academic integrity applies to this class. According to the Spartan Life Booklet, General Student Regulations, ".. no student shall claim or submit the work of another as one’s own"

After each class read your notes, read the section in the book, and do the assigned homework problems. You should do at least two hours of work outside of class for each class section. Attend all classes.
Point distribution:
- Presentation 100 Points
- Final 200 Points
- Homework 200 Points

Grading scale:
- 4.0 • 92% or above
- 3.5 • 85 - 91%
- 3.0 • 78 - 84%
- 2.5 • 71 - 77%
- 2.0 • 64 - 70%
- 1.5 • 57 - 63%
- 1.0 • 50 - 56%
- 0.0 • 49% and below

Important dates.

Friday, September 1. Open add period by computer enrollment ends.

Tuesday, September 14 - Friday, September 8. Students go to Undergraduate Office, A212 WH, for Mathematics enrollment changes (late adds, dropping back to a lower course, section changes) DEADLINE: Friday, 9/8/06, 5:00PM.

Thursday, September 21. Last day to drop with no record of course on transcript; end of tuition refund period.

Tuesday, October 17. MIDDLE OF SEMESTER: Last day to drop a course or withdraw from all courses with no grade reported.

Friday, December 8. Last Day of Classes - Fall 2006

Tuesday, December 12, 3:00-5:00pm. Final exam