
Math 322: Elliptic Curves

SPRING 2019

Basic Course Information

Instructor: Prof. Jen Paulhus

Time and Location: MWF 2:00-2:50 PM in 2245 Noyce Science Center

Office Hours: M: 11AM - 12PM, Tu: 1:30PM - 3PM, Th: 9:30AM - 11AM

Office: 2519 Noyce Science Center

e-mail: paulhus@math.grinnell.edu

webpage: <http://www.math.grinnell.edu/~paulhusj/teaching/ma322s19.html>

Text: *Rational Points on Elliptic Curves*, 2nd edition, Silverman and Tate

Material Covered: We will cover much of the book

Grading Policies

Homework: Homework assignments will be posted on the class PWeb page and the class webpage. Homework assignments will be due *at the beginning* of class most Fridays. However, if you L^AT_EX your assignment (and you are on time to class that day), you may submit the assignment before 7 PM on PWeb without a late penalty. Late homeworks will drop one full letter grade for each day they are late (counting weekends). So if you turn in a handwritten assignment at the end of the day on Friday, your grade on that assignment will be lowered by one letter grade. The grading rubric for homework, along with suggestions on good mathematical writing, may be found on PWeb. Homework is 45% of your grade.

Midterm Exam: There will be a midterm exam, likely right before Spring Break. The exam will be 25% of your grade.

Research: One of the goals of the course is to give you an opportunity to experience aspects of mathematics research. There will be a variety of activities during the semester which together will count for 30% of your grade. In particular, there will be a large research project at the end of the semester in lieu of a final exam.

MASSS: The department hosts a student seminar series which runs many Tuesdays at 11 AM. I will give bonus credit up to $\frac{1}{4}$ of a point on your final grade if you attend at least 3 of these talks and, for each one, send me a *quality* paragraph (via email) by 5 PM on the Friday immediately following it describing what the talk was about and a new mathematical concept you learned from the talk.

Brief solutions for the homework and your grades will be posted on the course PWeb page.

Computer Program

We will occasionally use a computer program called *Magma*. We have a license for this program on all MathLan computers, through a generous grant from the Simon Foundation.

Learning Goals

The primary goals of this class are to (1) introduce you to the beautiful and deeply useful topic of elliptic curves and (2) provide you with some experience with mathematical research. There are many important components to good math research. You will gain experience with: literature searches, making conjectures based on computational evidence, dealing with open ended questions, reading and absorbing research level papers, writing comprehensive mathematics, and presenting mathematics clearly in front of an audience.

Other Class Policies

Each Friday I will post a tentative schedule for the next week, listing particular pages of the textbook I intend to cover each class period. You should spend a bit of time before each class reading the intended pages. This serves two purposes. (1) Reading math before the lecture greatly improves understanding during the lecture and (2) some of the content and proofs in this class are quite technical, and it is better for you to work through the technicalities first yourself. The class time will be spent discussing difficulties you encounter from your reading, talking about the high level structure of the material, and making deeper connections among the topics.

Cell phone usage is strictly prohibited during class. I typically do not allow laptops or tablets in class, but if you would like to take notes on such a device, come talk to me.

Please show up on time, please do not leave in the middle of class unless it is an emergency, and please keep conversations among yourselves during class to an absolute minimum.

Accommodations

Grinnell College makes reasonable accommodations for students with documented disabilities. Students need to provide documentation to the Coordinator for Student Disability Resources, John Hirschman, located on the 3rd floor of the Rosenfield Center (x3089) and discuss your needs. Students should then notify me within the first few days of classes so that we can discuss ways to ensure your full participation in the course and coordinate your accommodations.

Academic Honesty

Make sure you are familiar with the college's guidelines for academic honesty which you can find here: http://catalog.grinnell.edu/content.php?catoid=12&navoid=2537#Honesty_in_Academic_Work My policies and guidelines may be found on the homework rubric. There are very serious consequences if you are found to be in violation of one of these policies. A typical first offense is a zero on the particular assignment, your final grade in the course is dropped a full letter grade, and you are ineligible to receive honors from any department.

Attendance and Work Load

You are expected to attend every class and you are responsible for all material presented and changes announced during class. This is one of the most advanced mathematics courses on this campus. I set homework assignments with the expectation that most of you will spend at least 10-12 hours of dedicated time a week outside of class on each one, in addition to time preparing for class.

Success In My Classes

Students come to this class with different backgrounds, skills, and experiences. Usually the most successful students in my class have two things in common: they work hard and effectively, and they are able to self-reflect honestly and then make adjustments to their behaviors accordingly.