Math 42: Introduction to Number Theory

Course Syllabus

Spring 2011

Contact

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Goals

Mathematics is the queen of the sciences, and number theory is the queen of mathematics.

-Carl Friedrich Gauss

One of the goals of this class is to understand this quotation–what is it about number theory that Gauss found so beautiful and intriguing? More broadly, we will see mathematics as an empirical science, building problem solving and reasoning skills.

Topics to be Covered

- Modular Arithmetic
- Divisibility
- Linear Diophantine Equations
- Chinese Remainder Theorem
- Prime Factorization in $\mathbb{Z}$ and $\mathbb{Z}[i]$
- Quadratic Reciprocity
- Continued Fractions

Requirements

- **Homework:** Homework consists of two parts: graded problem sets and ungraded problems. Graded problem sets will be given weekly. Ungraded problems will be given daily, with at most two due on a given day. While you will not be graded on the content of your solutions of daily problems, it is important that you do them, as they will be the jumping-off point for class discussion. ***No late assignments will be accepted.***
- **Exams:** There will be three exams: two in-class midterms (tentatively March 1 and April 12) and a final (on May 13 at 2pm, location TBA).

- **Attendance:** While attendance is not technically required, you are strongly encouraged to attend all classes. If for some reason you must miss class, please email ahead of time to arrange turning in the problem of the day. You are responsible for getting notes from a classmate.

Grading

- Homework: 20%
- Midterm 1: 25%
- Midterm 2: 25%
- Final Exam: 30%

There will be some opportunities for extra credit throughout the semester. You can receive extra credit for presenting ideas on problems of the day or doing extra credit problems on problem sets.