

# MT 290: NUMBER THEORY FOR TEACHERS

## COURSE SYLLABUS

### SPRING 2014

**Instructor:** Li-Mei Lim  
**Office:** Carney 214  
limei.lim@bc.edu  
www2.bc.edu/limei-lim

**Course time:** MWF 2  
**Course location:** Fulton 310

## 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? We will work to answer this question through guided exploration. Two overarching goals for the class are to gain confidence and proficiency in solving unfamiliar problems and to have practice in presenting mathematics in written and oral formats.

## TOPICS TO BE COVERED

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

## TEXTBOOK

There is no textbook for the class. Some suggestions for supplementary texts may be suggested as the semester progresses.

## 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.***
- **Class Participation:** The course will be structured to include group work and short presentations as a significant portion of class time. Your active participation is crucial to the success of the class.
- **Exams:** There will be three exams: two in-class midterms and a final exam. The midterms are tentatively scheduled for ***February 10*** and ***March 26***. The final exam will be ***Friday, May 9 at 9am***, location TBD.

## GRADING

- Homework: 15%
- Class Participation: 15%
- Midterm 1: 20%
- Midterm 2: 20%
- Final Exam: 30%

## MAKE UPS, MISSING CLASS, ETC.

If you miss class, it is your responsibility to get notes from a classmate. No late homeworks will be accepted. A make up exam is never guaranteed and will only be given in extenuating circumstances. Should you need a make up exam, give as much notice as possible and provide appropriate documentation (e.g. a note from a doctor or dean). **Please keep exam times in mind when making travel plans.**

## GETTING HELP

To get the most out of this class, it is important that you ask questions when you have them and get all the help you need. Here is a list of suggestions and resources.

- **Ask questions during class.** You are strongly encouraged to ask questions during class. Don't be afraid to look stupid; chances are someone else has the same question.
- **Come to office hours.** Office hours are great for getting more one-on-one help. Come ask questions about homework, past exams, or topics from class.
- **Go to free tutoring.** Free tutoring is offered in Carney Hall, Room 309. Undergraduate math majors (who might even be your graders!) are available to give help on a first-come, first-served basis. You can also sign up for tutoring at the Connors Family Learning Center in O'Neill Library.
- **Form study groups.** Your peers are a wonderful resource. Explaining your work to others will help you to learn the material better, while helping your classmates too. It's win-win! Just be sure to write solutions up on your own.

## ACADEMIC HONESTY

Collaboration on problem sets is encouraged, but solutions must be written up individually. Books, notes, calculators, and other aids will not be allowed on any exams. You are expected to follow Boston College's Policies and Procedures regarding Academic Integrity. Any violation of BC's codes or class policies will be handled in accordance with BC's policies, outlined at <http://www.bc.edu/integrity>