

Course Information for **Math 453: Elementary Theory of Numbers**  
Section D13/D14, Spring 2019

Number theory is the study of the integers and their properties. It is one of the oldest branches of mathematics, and also one of the largest, with numerous open problems and many deep ideas. This course is an introduction to some of the fundamental ideas in number theory.

In this rigorous mathematical course, you will study and write proofs. Thus you are expected to know how to properly write a mathematical argument, and you should be familiar with standard proof techniques such as induction and proof by contradiction. The official prerequisite is Math 241, but it is recommended that you have already taken a proof-based course, like Math 347.

**Class time:** 11:00-11:50AM MWF in 443 Altgeld Hall

**Textbook:** *Elementary Number Theory*, by James K. Strayer, 2002

**Prerequisite:** MATH 241 or equivalent.

**Instructor:** Siegfried Baluyot

**Email:** sbaluyot@illinois.edu

**Office hours:** Mondays 3:00-4:00 PM and Thursdays 4:30-5:30 PM, or by appointment, in 230 Illini Hall

**Grading policy**

|                                     |                 |
|-------------------------------------|-----------------|
| Homework                            | 14%             |
| Midterm Exams                       | $3 \times 17\%$ |
| Final Exam ( <b>comprehensive</b> ) | 35%             |

**Homework**

There will be weekly homework assignments, to be **turned in on Fridays** at the beginning of class. Late homework will not be accepted. You are encouraged to discuss homework problems with your classmates, but you must write your solutions in your own words. Make sure your solutions are clear and organized, and include all the necessary details. Merely writing down the answer without showing any work will receive little or no credit. Your lowest homework score will be dropped.

### Midterm exam schedule

Midterm exams will be during class time, in our classroom. Make sure your solutions are clear and organized, and include all the necessary details. Merely writing down the answer without showing any work will receive little or no credit.

Midterm 1 Monday, February 11

Midterm 2 Friday, March 8

Midterm 3 Wednesday, April 10

### Covered topics

(All chapters are from *Elementary Number Theory* by James K. Strayer, **2002**)

Divisibility and Factorization Chapter 1

Congruences Chapter 2

Arithmetic Functions Chapter 3

Quadratic Residues Chapter 4

Primitive Roots Chapter 5

additional topics (TBA)

### Study tips

This course is challenging and requires time commitment. Proficiency will be achieved only through hard work, massive problem solving, and active participation in class discussions. Please take advantage of my office hours.