

**Instructor:** Nathan Pflueger

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office: Kassar 219

office hours: Wednesday 3:00-4:20

**(modified)** Thursday 1:45-3:15 (with my dog, Charley)**Grader:** Daniel Keliher

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**Course webpage:** [math.brown.edu/~pflueger/math42](http://math.brown.edu/~pflueger/math42)**Time and location:** MWF 2:00-2:50 Barus & Holley 165

**Course topics:** Number theory is one of the most beautiful and ancient parts of mathematics, and is still a vibrant area of modern research. It is concerned with properties of whole numbers, especially how numbers break down into primes and which equations admit whole-number solutions. This course will introduce the basic ideas of number theory. One of the most striking applications of number theory from the past century is its use in cryptography; a significant part of the course will develop the material needed to discuss a famous cryptosystem called RSA. The course will end with a selection of topics, possibly including sums of squares, Diophantine equations, continued fractions, and the use of imaginary and complex numbers in number theory.

**Prerequisites:** There are no prerequisites for this course. In particular, no knowledge of calculus will be assumed or needed.

**Textbook:** *A Friendly Introduction to Number Theory* by Joseph Silverman, fourth edition. We will most likely cover chapters 1 through 18, and a selection of the remaining chapters.

**Homework:** Problem sets will be assigned every week and due on Fridays. *Late work will not be accepted for any reason.* However, your lowest two homework scores will be dropped. Some homework problems will be quite challenging, and much of your learning will come from working on problems. Plan to start in advance, ask questions, and work together.

**Writing proofs:** Some problems in this course will involve writing mathematical proofs, or understanding proofs of important theorems. This process will be new to many of you, so we'll devote a fair amount of class time to learning how to read and write proofs. Proofs are an acquired taste, and I cannot promise you will all love them, but they allow a depth of appreciation of and satisfaction with the material that is difficult to find elsewhere.

**Computation:** The advent of computers in the last century has revolutionized work on number theory, largely by allowing extensive experiments. Therefore I hope to spend some class time showing how to write computer programs to study number theory problems. I may offer some opportunity for you to write code as part of the course, but it will not be required.

**Collaboration policy:** You are encouraged to work together freely on the homework assignments, but you must write your answers entirely by yourself.

**Exams:** There will be three exams in this class: two in-class midterms and a final exam. *Notify me at least well in advance if you need to re-schedule an exam.*

	Time limit	Date and time
Midterm 1	50 minutes	Friday 2/20 in class
Midterm 2	50 minutes	Friday 3/20 in class
Final exam	3 hours	Monday 5/11, 2pm-5pm

All exams will be closed-book. Calculators will not be permitted.

**Grades:** Your final course grade will be computed as follows.

Homework	20%
Midterm 1	20%
Midterm 2	20%
Final exam	40%

**Disability support:** Please inform me if you have a disability or other condition that might require modification of these procedures. You should also contact the Student and Employee Accessibility Services at 401-863-9588 or SEAS@brown.edu.