Introduction to Number Theory

Spring 2016

Instructor:	David Lowry-Duda	**Time:**	TR 13:00 – 14:20
Email:	djlowry@math.brown.edu	**Place:**	CIT 165

Course Pages: http://davidlowryduda.com, or http://www.math.brown.edu/~djlowry.

Office Hours: Check the webpage, or by appointment. You can always send email or post questions to the course website, although meeting in person is probably more productive.

Textbook: J. Silverman, *A Friendly Introduction to Number Theory*, 4th ed., Pearson. The book is also available for free (split into a few different pdfs) at Dr. Silverman's website, http://www.math.brown.edu/~jhs/frint.html. For the remainder of the semester, we will discuss a subset of the following topics, time and interest guiding: public key cryptography and primality testing; Pell's equation, Diophantine approximation, and continued fractions; the Gaussian integers $\mathbb{Z}[i]$, primes as sums of squares, and revisiting unique factorization; irrational and transcendental numbers, linear recurrences, and generating functions.

Prerequisites: High school algebra and an eager and questioning mind will do fine. (The latter is far more important than the former).

Grading Policy: Your grade will be calculated based on several components:

1. Problem sets: 30%

   Problem sets are due within the first few minutes of lecture on the due date; late assignments will not be accepted. Your lowest score will be dropped. You *must* show your work and follow the Homework and Teamwork Policy.

2. Midterms: 2, each worth 20%

3. Final Project: 30%

   Each student will choose a final project. More details about possible final projects will be given during the semester, but one choice is to take the final exam.

Computer and Phone Policy:
Computers and phones are not to be used at any time in the lecture room unless explicitly excepted. If you have an urgent need to use your computer or phone, take it outside the classroom and do it there.

Homework and Teamwork Policy:
The problem sets in this course can be both challenging and open-ended, and I encourage you to work together on them. However, each student must work out and write up their final solutions individually and independently. Please **write up your final problem sets in physical isolation**.

The internet is a great resource, but I implore you to use it wisely. I ask that you don't search for the problems appearing on assignments. **Looking up definitions is OK, but looking up (or asking about) problems is not**. If you find that you are stuck, you can always ask questions during office hours or email the instructor.

When using ideas which are not your own, indicate your source. You will *not* be penalized for collaborating with another student unless:

1. your work is nearly identical to that appearing elsewhere; or

2. you explicitly use an idea without attributing the source.

Important Dates:

First Class .... 28 January
Last Day to Add Class .... 9 February
Long Weekend, No Class .... 23 February
Midterm #1 .... 25 February
Spring Recess, No Class .... 26 March — 3 April
Midterm #2 .... 21 April
Project Deadline .... 3 May
Final Exam Period .... May 13, 2:00PM

Please note the date for the second midterm, which has now been made firm. If you have a conflict with any class or test, let me know far in advance (and at least 1 week before as a strict minimum).