Instructor:	Dr. Anthony Várilly-Alvarado	**Time:**	MWF 1:00-1:50PM
Office:	412 Herman Brown	**Classroom:**	Herman Brown 227
Email:	`varilly@rice.edu`	**Office Hours:**	MW 5PM-6PM, Th 2:00-3:00PM

Class Webpage: Look for `Math 365 001 F11` on Owlspace.

Teaching Assistant: The teaching assistant for this course is Letao Zhang. Her office is HB 42 and he will have an office hour/TA session on: time and location TBA. Nick Ryder will also help grade for the course.

Text: *An Introduction to the Theory of Numbers*, Ivan Niven, Herbert S. Zuckerman and Hugh L. Montgomery.

Homework: Due once a week, in class, on **Fridays, in class**. This is a very important component of the course. You should expect to spend a significant amount of time doing homework.

   The homework is not pledged and you can collaborate with other students in the class. In fact, you are very much encouraged to do so. You should write up your solutions individually (in particular, you should not be looking at other people's write-ups while writing your own).

Exams: There will be two in-class midterm exams, on **September 30th** and **November 5th**. There will also be an in-class Final Exam, during the Fall Exam Period. The date of this exam is yet to be determined by the Registrar's Office.

Warning: It is the policy of the Mathematics Department that no final may be given early to accomodate student travel plans. If you make travel plans that later turn out to conflict with the scheduled exam, then it is your responsibility to either reschedule your travel plans or take a zero in the final.

If an exam conflicts with a holiday you observe, please let me know.

Grades: Homework will count for 30% of your final grade. The midterms will each count for 20% of your grade and the final exam will count for 30% of your grade.

Expectations: In my experience as a student, most people do not follow all the details of a Math lecture in real time. During lecture, you should expect to witness the big picture of what's going on. You should pay attention to the lecturer's advice on what is important and what isn't. A lecturer spends a long time thinking on how to deliver a presentation of an immense amount of material; they do not expect you to follow every step, but they do expect you to go home and fill in the gaps in your understanding. Not attending lecture really hurts your chances at a deep understanding of the material.

Disability Support: Any student with a documented disability seeking academic adjustments or accommodations is requested to speak with me during the first two weeks of class. All such discussions will remain as confidential as possible. Students with disabilities will need to also contact Disability Support Services in the Allen Center.

Topics to be covered

We will cover most of the material from the first four Chapters of the text.

1. **Divisibility:** The Euclidean algorithm, greatest common divisors, least common multiples, prime numbers and the Fundamental Theorem of Arithmetic.

2. **Congruences:** Modular arithmetic. Fermat's little theorem, Euler's theorem, Wilson's theorem. The Chinese remainder theorem, prime power moduli and Hensel's lemma.

3. **Cryptography:** The RSA encryption algorithm.

4. **Quadratic residues and quadratic reciprocity:** Residues. Legendre and Jacobi symbols. Quadratic reciprocity. Sums of squares.

5. **Arithmetic functions:** $d(n)$, $\sigma(n)$, $\omega(n)$ and all that. Möbius inversion.

Time permitting we will cover some of the following topics.

6. **Continued fractions and Pell's equation**

7. **p-adic numbers**