Final Exam Information and Study Guide, Number Theory, Spring 2015

Exam Information

- The final exam is Friday, May 22nd from 11:30AM to 2:30PM in DCC 337.
- The exam will be extra credit. It cannot lower your existing grade but can add up to 5 points to your current course average.
- The entire exam will be closed book and closed note. Cellphones, calculators, computers, tablets and headphones will not be allowed on the exam.

Exam Study Guide

1. The exam will cover sections: 1.1,1.2,1.3,1.4,1.5,1.7,2.1,2.2,2.3,5.1,5.2,5.3,5.4,10.1,10.2,10.10.

2. The exam may ask for definitions of one or more of the following:
   - divisibility and divisor, greatest common divisor, prime number,
   - the mobius function, the Euler Totient function, congruence,
   - residue class, complete residue system, reduced residue system,
   - exponent modulo $m$, primitive root, index of an integer to a given base

3. The exam may ask for careful and detailed proofs of one or more of the following theorems
   - 1.1abcde,1.7,1.8,5.2ab,5.4,5.11,5.12,5.16,5.17,10.1a

   Be sure to understand all details of the proofs as the exam may ask for further explanations of some of the details. There may also be questions where certain numbers are given and you will be asked to show how the proofs work for these numbers.

4. In addition to the above Theorems, the exam may ask for a complete statement of the Fundamental Theorem of Arithmetic (1.10).

5. In addition to the above Theorems, the exam may ask questions that require knowledge of one or more of the following theorems.
   - 1.fghijk,1.2,1.3,1.5,1.9,1.11,1.12,1.14,2.2,5.1,5.2cd,5.3,5.7,5.9,5.13,5.16,5.19,10.1bc,10.2,10.10

6. There may be questions like question 7 on exam 3 concerning the use of index arithmetic to solve various equations.

7. You should understand how linear congruences can always be solved quickly by the Euclidean Algorithm. There may be questions that require solutions to linear congruences by trial and error, but you will not be asked questions that require the execution of the Euclidean Algorithm.

8. You should understand and be able to explain modular exponentiation.

9. There will be questions that ask for examples and/or counterexamples.

10. There will be multiple choice and/or true-false questions.