Hunter College of The City University of New York

MATH 313 Theory of Numbers 3 hrs, 3 cr

Text: Elementary Number Theory by James K. Strayer; Waveland Press, Inc. 2002

Appendices

- Mathematical Induction
- Equivalence relations

Divisibility and Factorization

- Divisibility
- Prime Numbers
- Greatest Common Divisors
- The Euclidean Algorithm
- Fundamental Theorem of Arithmetic

Congruences

- Congruences
- Linear Congruences in One Variable
- The Chinese Remainder Theorem
- Groups
- Wilson's Theorem
- Fermat's Little Theorem; Pseudoprime Numbers
- Euler's Theorem
- Arithmetic Functions
- Arithmetic Functions; Multiplicativity
- The Euler Phi-Function
- The Number of Positive Divisors Function
- The Sum of Positive Divisors Function
- Perfect Numbers
- The Mobius Inversion Formula

Quadratic Residues

- Quadratic Residues
- The Legendre Symbol
- The Law of Quadratic Reciprocity

Diophantine Equations

- Linear Equations
- Non-Linear Diophantine Equations; a Congruence Method
- Pythagorean Triplets
- Representation of an Integer as a Sum of Squares (optional)

Rational and Irrational Numbers

- Irrationality of $\sqrt{2}$, $\sqrt{3}$, $\sqrt{2} + \sqrt{3}$
- Criterion for rationality of $k\sqrt{n}$ ($n \in N$), Irrationality of e