

## MATH 567, NUMBER THEORY I, FALL 2008, SYLLABUS

Instructor: Bob Vaughan  
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Office Hours: TWR 2.30-3.30 and otherwise by arrangement.  
Class: TR 9:45-11:00am, 106 McAllister. NOTE CHANGE  
Schedule #: 152173.  
Text: An introduction to the theory of numbers,  
by Niven, Zuckerman and Montgomery,  
fifth edition, Wiley, 1991.

The following texts are useful for further reading.

Apostol, Introduction to Analytic Number Theory,  
Springer Verlag 0-387-90163-9.  
Davenport, Multiplicative Number Theory, 3rd edition,  
Springer Verlag 0-387-95097-4.  
Samuel, Algebraic Theory of Numbers 1972, Kershaw (out of print).

Homework: Due every Tuesday.  
Complete solutions of all problems are required on time.  
Harder problems can be discussed with others.  
Grading: Based on Homework and Attendance.

### Topics

Divisibility, Chapter 1.  
Congruences, Chapter 2.  
Primitive roots, Chapter 2.  
Arithmetical Functions, Chapter 4.  
Quadratic Reciprocity, Chapter 3.  
Sums of squares, Chapter 3.  
Prime numbers, Chapter 8.  
Diophantine equations, Chapter 5.  
Rational approximation, Chapter 6.  
Algebraic numbers, Chapter 9.  
Other topics which might be touched upon, if time permits, are  $p$ -adic numbers and automorphic forms.

All Penn State Policies (see <http://www.psu.edu/ufs/policies/47-00.html#49-20> and <http://www.science.psu.edu/academic/Integrity/index.html>) regarding ethics and honorable behavior apply to this course.