

SU DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE
 SYLLABUS (*Tentative*)
 MATH 402/512: *Theory of Numbers*

- OBJECTIVES:** To study some of the fundamental topics of classical number theory while developing techniques of proof associated with this discipline.
- PREREQUISITE:** MATH 210 and/or MATH 306 (both recommended).
- TEXT:** “Elementary Number Theory,” by David M. Burton; McGraw-Hill Publishing Company, Sixth edition, 2007.

<i>Topics</i>	<i>Weeks</i>
<i>Preliminaries</i> Mathematical induction; Binomial Theorem; early number theory	1.0
<i>Divisibility Theory in the Integers</i> Division algorithm; greatest common divisor; Euclidean Algorithm; Diophantine Equations	2.0
<i>Primes and Their Distribution</i> Fundamental Theorem of Arithmetic; Sieve of Eratosthenes; Goldbach Conjecture	1.5
<i>Theory of Congruences</i> Basic properties of congruence; divisibility tests; linear congruences	1.5
<i>Fermat’s Theorem</i> Fermat’s Little Theorem; Wilson’s Theorem; Fermat-Kraitchik Factorization Method	1.5
<i>Number-Theoretic Functions</i> Divisor functions $\tau(n)$ and $\sigma(n)$; Möbius μ -function; greatest integer function	1.5
<i>Euler’s Generalization of Fermat’s Theorem</i> Euler’s ϕ -Function; Euler’s Theorem	2.0
<i>Tests</i>	1.0
<i>Additional Topics (as time permits)</i>	2.0

EVALUATION

Homework, Participation and Projects	40-60%
Tests and Final Examination	40-60%

Graduate students will be assigned special or additional homework problems or projects.

NOTE: ONCE A STUDENT HAS RECEIVED CREDIT, INCLUDING TRANSFER CREDIT, FOR A COURSE, CREDIT MAY NOT BE RECEIVED FOR ANY COURSE WITH MATERIAL THAT IS EQUIVALENT TO IT OR IS A PREREQUISITE FOR IT.