

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, 7th Edition, 2011.

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

EVALUATION

Short Quizzes	25%
Tests	50%
Final Exam	25%

Graduate students will be assigned special or additional homework/test 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.