Mathematics 350

Number Theory (3)

(Effective Spring 2014)

Prerequisite: Math 314.

Catalog Description: The integers: well-ordering, different bases, divisibility, primes, and factoring. The fundamental theorem of arithmetic and the division algorithm. Diophantine equations and applications of congruences. Pseudorandom numbers, pseudoprimes, and cryptography.

Learning Outcomes for Major: This course addresses one or more of the student learning outcomes for the major.

Upon completion of his/her degree from the University of Tennessee at Martin with a major in mathematics, the graduate will be able to:

i. apply mathematical concepts and principles to perform numerical and symbolic computations.
ii. use technology appropriately to investigate and solve mathematical and statistical problems.
iii. write clear and precise proofs.
iv. communicate effectively in both written and oral form.
v. demonstrate the ability to read and learn mathematics and/or statistics independently.

Teaching Objectives: The student will:

1. Identify and apply various properties of and relating to the integers including the Well-Ordering Principle, primes, unique factorization, the division algorithm, and greatest common divisors.
2. Identify certain number theoretic functions and their properties.
3. Understand the concept of a congruence and use various results related to congruences including the Chinese Remainder Theorem.
4. Solve certain types of Diophantine equations.
5. Identify how number theory is related to and used in cryptography.

Text(s): A Friendly Introduction to Number Theory, Joseph H. Silverman, Pearson Education, Fourth Edition, 2012. ISBN: 978-0-321-81619-1.

Outline:

Chapter	Title (Sections)	Days
1–30+	Cover these chapters as necessary to meet course objectives.	37
	One period tests	4
	Total days	41

Disability Services: The University of Tennessee provides reasonable accommodations (academic adjustments and auxiliary aids) to ensure equal access to educational content and university programs for students with disabilities. Any student eligible for and requesting accommodations due to a disability must provide instructors with a letter of accommodation from Disability Services. For additional information, please contact the Disability Services office at 209 Clement Hall, (731) 881-7605.