Math 706: Theory of Numbers

SPRING 2019, Ref 17642, Distance Course
http://www.math.ksu.edu/~cochrane/m706/m706s19.html
Offered through K-State Global Campus:

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Text: The only required text is the set of class notes posted below.
The following books are recommended supplementary reading:
An Introduction to the Theory of Numbers, Fifth Edition, by Ivan Niven, Herbert Zuckerman and Hugh
Montgomery.

Prerequisites: A first course in Modern Algebra or Abstract Algebra is recommended, but not required.

Class Notes
Lecture, Homework and Exam Schedule

Course Summary:
Number Theory, the study of the natural numbers 1,2,3,4, ..., is one of the oldest branches of mathematics and
yet it continues to be a very active area of research today. Number Theory is rich with beautiful theorems and
elegant patterns. Its unsolved problems have challenged the greatest mathematical minds and given rise to
much of modern mathematics.

The class will cover the divisibility properties of the integers, primes and primality tests, modular arithmetic,
Chinese Remainder Theorem, quadratic reciprocity, arithmetic functions such as the Euler phi-function, the
Mobius inversion formula, recurrence sequences and properties of the Fibonacci sequence, diophantine
equations, including systems of linear equations, quadratic equations, pythagorean triples, and an
introduction to elliptic curves and their application to factoring integers. Along the way we will study
various algebraic properties of the ring of integers including the group structure of the multiplicative group
of units modulo m.

Grading: Your grade will be based on homework, one midterm and a final exam.
Bi-weekly homework assignments: 60%
Midterm: 20%
Final: 20%

Important dates: Tuesday, January 22, Class Begins
March 11-15, Spring Break
Tuesday, March 19, Midterm target date
Friday, May 10, Last day of class
May 13-17, Final Exam (Time to be arranged)

Statement Regarding Academic Honesty: Kansas State University has an Honor and Integrity System based
on personal integrity, which is presumed to be sufficient assurance that, in academic matters, one’s work is
performed honestly and without unauthorized assistance. Undergraduate and graduate students, by registration, acknowledge the jurisdiction of the Honor and Integrity System. The policies and procedures of the Honor and Integrity System apply to all full and part-time students enrolled in undergraduate and graduate courses on-campus, off-campus, and via distance learning. The Honor and Integrity System website can be reached via the following URL: www.k-state.edu/honor. A component vital to the Honor and Integrity System is the inclusion of the Honor Pledge which applies to all assignments, examinations, or other course work undertaken by students. The Honor Pledge is implied, whether or not it is stated: “On my honor, as a student, I have neither given nor received unauthorized aid on this academic work.” A grade of XF can result from a breach of academic honesty. The F indicates failure in the course; the X indicates the reason is an Honor Pledge violation.

**Statement Regarding Students with Disabilities:** Students with disabilities who need classroom accommodations, access to technology, or information about emergency building/campus evacuation processes should contact the Student Access Center and/or their instructor. Services are available to students with a wide range of disabilities including, but not limited to, physical disabilities, medical conditions, learning disabilities, attention deficit disorder, depression, and anxiety. If you are a student enrolled in campus/online courses through the Manhattan or Olathe campuses, contact the Student Access Center at accesscenter@kstate.edu, 785-532-6441; for Salina campus, contact the Academic and Career Advising Center at acac@kstate.edu, 785-826-2649.

**Statement Defining Expectations for Classroom Conduct:** All student activities in the University, including this course, are governed by the Student Judicial Conduct Code as outlined in the Student Governing Association By Laws, Article V, Section 3, number 2. Students who engage in behavior that disrupts the learning environment may be asked to leave the class.