

MATH 513. THEORY OF NUMBERS I, SPRING 2020

SYLLABUS

Instructor: Dr. Micah B. Milinovich
Office: Hume Hall 304
Office hours: Mon. 9:30am – 10:30am, Wed. 9:30am – 10:30am
Email: mbmilino@olemiss.edu

Course Information

Texts: Underwood Dudley: *Elementary Number Theory*, second edition, Dover, 1978.
Time/Place: MWF: 11:00am - 11:50am, Hume Hall 331

Course Description

This course is meant to be an introduction to the theory of numbers. It will cover at least the following basic topics in elementary number theory: Mathematical Induction, Unique Factorization, Euclid's Algorithm and the Greatest Common Divisor Function, Congruences, Euler's Phi Function, Wilson's Theorem, Fermat's Little Theorem and Euler's Theorem, the Infinitude and Distribution of the Primes, Mersenne and Fermat Primes, Perfect Numbers, Gaussian Integers, Sums of Two and Four Squares, Pythagorean Triples, Primitive Roots, and the Quadratic Reciprocity Law.

Course Learning Objectives

The aim of the course is to enable students understand concepts, develop problem solving skills, apply concepts and theories learned in class to solve problems, prepare for higher level courses, and enhance both critical thinking and analytical reasoning abilities.

Homework

Homework will be assigned once a week and collected one week later, at the beginning of class. The homework, which will be a mix of problems and proofs, will be designed to supplement your understanding of the course lectures. The solutions are to be presented in a professional, clean, and well-organized manner. While you may discuss homework with each other, it is expected that you write up your solutions *individually*, however you are encouraged to attend office hours to discuss your solutions before the due date.

Test and Final Exam

There will be three mid-term exams (*tentative dates*: 2/19, 3/23, 4/22) and a final exam on Monday, May 4th at noon.

Course Expectations

Since this is a 500 level course, there are different expectations for undergraduate and graduate students enrolled in the course. The undergraduate homework/exams will be a mix of proofs and problems, focussing more on the understanding of important theorems and the problem solving aspects of number theory. In addition to completing the homework assigned to the undergraduates each week, graduate students will be expected to complete a weekly set of supplemental homework problems that will focus on theoretical aspects of number theory. The examinations for the undergraduate and graduate students will be different.

Grading

There will be three mid-term exams, each counting for 15% of the course grade and a final exam counting for 25%. The remainder of the grade is based upon homework scores which will account for 30% of the course grade.

This course will use the plus/minus grading system. The following grade scale will be used to determine your final grade: 93% A, 90% A-, 87% B+, 84% B, 80% B-, 77% C+, 74% C, 70% C-, 60% D. I reserve the right to make the grading scale easier.

Additional Policies

1. Each student is responsible for work missed due to absences. If a test is missed, a grade of zero will be given.
2. Any person who must miss a scheduled test or quiz because of an official university function must reschedule with the instructor to take the test at a time *before* the test is scheduled to be given. No other rescheduling will be allowed. If asked for by the instructor, official documentation must be provided.
3. A student who wishes to discuss the grading policy, testing policy, or wishes to have a conversation regarding the instructor of the course should make an appointment with the course supervisor in the Department of Mathematics.
4. Any student having three or more final exams scheduled for the same day may arrange with the instructor to take either the 12:00 noon or 7:30pm exam at another time. This is the only reason that a final exam may be rescheduled. The student is required to take the final exam at the time scheduled.

Course Withdrawal

The withdrawal deadline is Monday, March 2nd, 2020. After the course withdrawal deadline, courses dropped will be recorded on University records and the W grade will be recorded if the student is not failing the course at the time of withdrawal; otherwise the grade recorded will be F. After the course withdrawal deadline, a student may drop a course only in cases of extreme and unavoidable emergency as determined by the student's academic dean. Dropping the course after the deadline will not be permitted because of dissatisfaction over an expected grade or because the student has changed his or her major.

Academic Needs

It is the responsibility of any student with a disability who requests a reasonable accommodation to contact the Office of Student Disability Services (915-7128). Any request for extended testing time made through that office must be made prior to the date of the test.

Academic Honesty

The following statement is the policy of Department of Mathematics regarding academic honesty: Cheating on any exam, quiz, classwork, or homework, theft of exam questions or possession of exam questions prior to the time for the exam shall all be offenses subject to the appropriate penalties. The penalty for commission of any offense set out above is failure in the course, and subject to the approval of the Chancellor, dismissal or suspension from the university.