Math 347: Fundamentals of Number Theory I
Winter 2019, MWF 12:00 - 12:50, 106 Deady Hall
Professor Victor Ostrik

Contact Information

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Class webpage: http://pages.uoregon.edu/vostrik/math347winter19/index347.html

Text: Elementary Number Theory, 2nd edition, by Underwood Dudley. W. H. Freeman and Company, San Francisco, 1978. Republished by Dover in 2008. (note: homework assignments will be assigned from the main textbook). We will cover about first 12 chapters.

Other recommended books:
Number Theory by George E. Andrews. W. B. Saunders Company, Philadelphia, 1971. Republished by Dover in 1994.

A Friendly Introduction to Number Theory by Joseph H. Silverman. Pearson 2011.

Exams: There will be one mid-term examination, tentatively on Friday, February 16. The final examination will be held on Wednesday, March 20, at 10:15-12:15.

Homework: There will be weekly homework assignments. The assignments will be collected every Wednesday in the BEGINNING of class. Homework problems will be posted on the class webpage weekly. These are the heart of the course, and the most important activity in terms of helping students internalize the material.

Quizzes: We will also have several quizzes (usually on Fridays).

Grading: Homework 20%, quizzes 20%, midterm 25%, final 35%.

Course Objectives: We will discuss the following topics: congruences, Chinese remainder theorem, Gaussian reciprocity, basic properties of prime numbers.

There are two main objectives of MA347 that are tied together:

(1) Help students develop their skills for understanding and creating mathematical proofs;

(2) Teach students the body of mathematics around elementary number theory (up through quadratic reciprocity and similar topics).

Points (1) and (2) have equal weight, and classroom activities will focus equally on the two objectives.

Learning Outcomes: Students successfully completing this course will be able to

(1) Perform arithmetic and solve linear equations (when possible) for congruences.

(2) State the main theorems of elementary number theory (for example Fermats Little Theorem, Wilsons Theorem, Gausss law of quadratic reciprocity, etc.).

(3) Criticize proofs for correctness and completeness.

(4) Create proofs of basic theorems involving congruences, divisibility, numbers of divisors, and other basic number-theoretic topics.

(5) Create counterexamples to statements obtained from theorems by weakening crucial hypotheses. Weekly homework problems, as well as problems on the midterms and final exam, will provide students with opportunities to demonstrate the level of their abilities relative to the above learning outcomes.

Further Remarks:

- Students should expect to spend at least 10 hours per week outside of lecture working on this course.
- Doing the homework assignments well is the best way to prepare for the exams.
- Students are encouraged to ask questions in the class and during the office hours.

Learning Environment. I am committed to an inclusive learning environment. If you have a disability which may impact your performance on exams, please contact the Accessible Education Center to discuss appropriate accommodations. If there are other disability-related barriers to your participation in the course, please either discuss them with me directly or consult with the Accessible Education Center. You are also encouraged to contact the Accessible Education Center in 164 Oregon Hall at 541-346-1155 or uoaec@uoregon.edu.

Academic Conduct. The code of student conduct and community standards is at dos.uoregon.edu/conduct. In this course, it is appropriate to help each other on homework as long as the work you are submitting is your own and you understand it. It is not appropriate to help each other on exams, to look at other students exams, or to bring unauthorized material to exams.