

$$a \equiv b \pmod{p}$$

Theory of Numbers, Spring 2023 Math 3110 Sections 001, 002, and 780, 3 credits

Instructor: Dr. Greg Oman (associate professor)

e-mail: goman@uccs.edu

Office Hours: Monday, Wednesday, 12:30–1:30 pm (and can meet via Zoom/Teams with an appointment IF you can't make this time OR are in the 780 section)

Course Web Page: <https://faculty.uccs.edu/goman/math-3110-spring-2023/> (click on “Math 3110, Spring 2023”)

Class Schedule: M,W 1:40-2:55 pm (section 001) in ENG 105 and 3:05-4:20 pm in ENG 107 (section 002)

Text: *Elementary Number Theory, 7th Edition, by David Burton*

Course Objectives: Upon successful completion of the course, you should

- understand the various proof techniques used to prove mathematical statements
- be able to formulate and write coherent mathematical proofs using these techniques
- understand basic properties of divisibility and congruences in the integers and be able to both solve problems and write proofs involving these concepts
- similarly, understand theorems and be able to both compute and prove statements involving the prime numbers
- be able to use the Division Algorithm in proofs and computation
- understand and be able to work with some standard number-theoretic functions
- be able to work with and understand various recursively-defined sequences (e.g. the Fibonacci numbers)

Graded Components of the Course: Your grade in the course will be based on three tests, a final, and homework. The weight of these various components is as follows:

1. Tests: each test is worth 15% of your grade.
2. Final: the final exam is worth 30% of your grade.
3. The homework is worth 25% of your grade.

I plan to drop either one or two of your lowest homework scores before calculating your final grade (I will decide later how many to drop; this may be influenced somewhat by issues with attempted cheating, attendance, etc.). I reserve the right to see a **DOCUMENTED EXCUSE** in order to allow you to make up work or turn in assignments late.

(OVER)

I will decide plus and minus cutoffs before assigning final grades; modulo this, here is the grading scale:

90% – 100%: A or A-
80% – 89%: B+, B, or B-
70% – 79%: C+ or C (I don't give the grade C-)
60% – 69%: D+, D, or D-
< 60%: F

Homework *All assignments will be posted NOT ON CANVAS but on the course webpage (see first page) and turned in on Canvas (PDF only).*

Extra Help For anyone unfamiliar with PASS, it is an acronym for “peer-assisted study sessions.” The PASS leader is Stephanie Klumpe. Please do consider attending one of the sessions early in the semester to get a feel for how this sort of extra help works (note that the PASS leader will NOT be doing all your homework problems for you).

Stephanie's sessions will be held Wednesdays from 11–12:30 in Engineering 187 and Fridays 4:30–6 in Engineering 247.

Disability Services Please let me know of any additional accommodations you may require. Such accommodations should be approved by the Office of Disability Services, and they should have paperwork for you to give me. Let me know if you have questions.

Tentative Dates for Tests I *tentatively* plan to give the first exam on **Wednesday, February 8**, the second test on **Wednesday, March 22**, and the third test on **Wednesday, April 26**. The final exam will be given on the date/time dictated by the university's final exam schedule.