

# Math 405 Syllabus, Spring 2024

## Professor Information

Dr. Jamie Juul  
Email: [jamie.juul@colostate.edu](mailto:jamie.juul@colostate.edu) or message me on Canvas  
Office Hours: see Canvas  
Office: Weber 121

## Course Content and Objectives

This course aims to introduce students to some of the main areas of number theory. The objectives of this course are to give students the necessary skills to **solve a variety of problems** using techniques from number theory, and to **write clear and convincing solutions** to these problems, including appropriate mathematical **proofs** relating to these topics. We will cover many, if not most, of the sections from the textbook. The topics we will cover include Diophantine equations, distribution of primes, multiplicative functions, finite fields, cryptography, quadratic reciprocity, quadratic number fields, and elliptic curves.

## Class Meetings

Engineering E 205, 2-2:50pm M, W, F.

## Textbook and Materials

- Number Theory: In Context and Interactive, by Karl-Dieter Crisman  
Available online here <https://math.gordon.edu/ntic/ntic/frontmatter-1.html>. Or download a pdf here <https://math.gordon.edu/ntic/download.html>
- We may use some other (free) sources throughout the semester, which will be posted to Canvas.
- You will find all class information, assignments, course materials etc. on **Canvas**.

## Assessments and Grading

### Problem Sets

There will be a problem set due almost every week at 11:59pm on Thursdays.

- Late homework will **not** be accepted, except in extraordinary circumstances. One homework grade will automatically be dropped from your homework score.
- Start working on each problem set as early as possible to give yourself plenty of time to complete the problems and get help if necessary.
- Your work should be complete (use complete thoughts and show all work) and typed or written neatly, the problems should be in order. You will upload a pdf of your finished work to Canvas.
- You are permitted (and encouraged) to work with classmates on problem sets. However, you should try each problem on your own first and you **must** write up your own solutions.

## Exams

There will be two midterm exams tentatively scheduled for

Friday, March 1

Friday, April 19

**Do not miss exams.** In the case of a missed midterm exam with a well-documented excuse, contact me to set up an alternate assessment. If you do not contact me in a timely fashion, no makeup will be given.

## Final Project

You will complete a final project consisting of a 3-5 page paper and presentation on a topic in number theory of your choice. More details will follow.

## Grading

Rubrics will be provided for homework and the final project. The raw score for your final grade will be computed by taking a weighted average of your scores as follows.

**Problem Sets:** 40% (lowest score dropped)

**Exams:** 30%

**Final Project:** 30%

Final letter grades will be determined based on this score and will be no worse than the traditional grading system (90% for A-, 80% for B-, etc.).

## Getting Help

If at any time during the semester you need help with the course materials, assignments, etc. you should seek assistance. There are many resources available to you, and you are encouraged to use them. **Do not fall behind** in the course. If you need help you can:

- come to office hours,
- talk to your classmates, and/or
- email me with a question or to arrange a time to meet outside office hours,
- check <https://mathematics.colostate.edu/about/mathematics-tutoring/> for tutoring options.

## Accommodations

Students who require any type of accommodations should be in contact with the Student Disability Center and should ensure I know about any accommodations as soon as possible.

## Academic Integrity

This course will adhere to the Academic Integrity Policy of the Colorado State University General Catalog and the Student Conduct Code. Students are expected to have read these documents. Penalties for violations may range from point deductions on any assignment to failure of the course.

Copying another student's work (even with their permission) is plagiarism, as is copying from solutions manuals, websites, or other sources. **Each student's solutions must be written in his or her own words.**

**For exams, each student's work must be entirely his or her own.** You are not permitted to look at another student's paper, talk with another student, use resources that have not been explicitly allowed, or get help from any person other than me.