

## **Math 110-01: Introduction to Number Theory**

### **Summer 2019**

**Instructor:** John McHugh

**Email:** jrmchugh at ucsc dot edu

**Office Hours:** Tuesdays and Thursdays 11am-12, McHenry room 4112, or by appointment.

**Class Time and Location:** MWF 1–3:30 PM, Thimann Lab 101

**Textbook:** Martin Weissman, *An Illustrated Theory of Numbers*

**Enrollment Requirements:** MATH 100 or CSE 101.

**Course Content:** Prime numbers and divisibility, the division algorithm, Diophantine equations, unique factorization, rational and irrational numbers, modular arithmetic, and quadratic reciprocity. One of our aims in this course is to study the most foundational and historically important theorems in number theory. Along the way we will discuss the historical development of the field, which can be traced back thousands of years all the way up to the present day. Some of the problems we will encounter are computational. However, throughout the course we will also read and write many proofs. So another aim of this course will be to improve our proof-writing abilities. In terms of the textbook, the plan is to cover chapters 1–8, possibly excluding the chapter on Gaussian and Eisenstein integers. We will attempt to cover one chapter every two lectures.

**Grading:**

- 25% – In Class Work
- 30% – Homework
- 20% – Midterm
- 25% – Final

**In Class Work:** Each class period we will take some time to work on problems, projects, take a quiz, etc. We may work in groups or individually. One of the primary objectives of our in-class work will be to make sure everyone is keeping up with the pace of the course.

**Homework:** Homework will be assigned twice weekly, due on **Tuesdays** and **Fridays** by **5pm**. Homework will be submitted in the basement of McHenry Library in the folder labeled “110 Drop Off” in the math homework filing cabinet. Graded homework can be picked up in the same location, in the folder labeled “110 Pick Up.” I can upload solutions to any of the homework problems on request.

**Late Homework:** Late homework will be accepted. However, each day past the due date will incur a 10% penalty. This means an assignment that would have scored 80/100 points will receive 70/100 points if it is turned in late (rather than 72/100). To hand in late homework, email our class TA Jianqi Liu at jliu230 at ucsc dot edu with pictures or a pdf of your homework.

**Exams:** We will have two exams: one midterm and one final. The final will be cumulative. The midterm will be held on **Wednesday, July 10th** and the final will be held on the last day of class, **Friday, July 26th**. Both exams will be held during normal class time. If there is some reason you cannot attend an exam we can find a time to reschedule.

**Academic integrity:** All students are expected to be familiar with and abide by the academic integrity policy,

<https://ue.ucsc.edu/academic-misconduct.html>

Violations of the policy are taken very seriously.

**Students with Disabilities:** UC Santa Cruz is committed to creating an academic environment that supports its diverse student body. If you are a student with a disability who requires accommodations to achieve equal access in this course, please submit your Accommodation Authorization Letter from the Disability Resource Center (DRC) to me privately during my office hours or by appointment, preferably within the first two weeks of the quarter. At this time, I would also like us to discuss ways we can ensure your full participation in the course. I encourage all students who may benefit from learning more about DRC services to contact DRC by phone at 831-459-2089 or by email at drc@ucsc.edu. See also <http://drc.ucsc.edu/faculty-and-staff/fac-staff-overview/index.html>