Introduction to Number Theory

Spring 2026

Time:	MWF 2:00 – 2:50	**Place:**	111 Thayer St-Watson Institute 114
Office:	Kassar House 014	**Office Hours:**	1:00-2:00 TuTh

Course Pages:

1. https://weizhining.github.io/Teaching/math420sp26/math420.html

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Main References:

- (Textbook) Joseph H. Silverman, *Friendly Introduction to Number Theory,*, Pearson, 4th edition, 2018. ISBN: 9780134689463.

- Lecture notes

Course Descriptions: An overview of one of the most beautiful areas of mathematics. Ideal for any student who wants a taste of mathematics outside of, or in addition to, the calculus sequence. Topics include: prime numbers, congruences, quadratic reciprocity, sums of squares, Diophantine equations.

Prerequisites: No prerequisites.

Tentative Course Outline:

- Introduction;

- Divisibility, prime numbers and fundamental theorem of arithmetic;

- Congruences;

- Quadratic Reciprocity, sum of two squares and sum of four squares;

- Diophantine equations: Fermat's last theorem;

- Diophantine equations: Pell's equations.

Grading Policy: Homework (80%), Final (20%).

- Homework [80%]

  You will be assigned one set of homework examples every week which will be graded. These problem sets will typically be due at **11:59 PM on Friday**. We expect you will also spend sufficient time working on the homework and writing up your solutions neatly.To avoid potential technical issues, you are strongly encouraged to submit your homework at least one hour before the deadline. Late submissions will incur a **20% penalty**. All homework assignments will be posted on Homework page, and submitted using Gradescope. (A guide to submission using Gradescope may be found here and here.)

  A given homework will focus on the component skills and topics taught in the week preceding the deadline, but will also build upon previous material.

  Homework will typically be graded and returned within a week. In a mathematics course, it is a *very good idea to review the comments left in your graded work*, bring questions to class or office hour, fill gaps, and form a solid base for future weeks' work.

Two Lowest Scores Dropped. Your two homeworks with the lowest scores will be disregarded completely and automatically. This policy is primarily to allow for illness and unforeseen or unfortunate circumstances preventing your submission or full effort. Only where extenuating circumstances are documented for three or more weeks in the semester may there be further accommodation on homework. Please reach out in such unfortunate circumstances and we will be happy to support you.

- Final Exam [20%]

  This will be at the end of the semester, timetabled contiguously with other university exams. This will be held on **May 7th at 2:00 PM**, in a location to be determined.

  Question selection will be comprehensive, but likely not cover the full range of topics. You will be well prepared for the final exam if you have diligently worked through homework problems and reviewed your graded solutions.

Shopping Period Due to reduced classroom inventory this spring, our assigned room has extremely limited flexibility and almost certainly will not change. Please rely on Courses@Brown/course page for the most up-to-date course information (syllabus, enrolment cap, and attendance/access plan). In-person attendance during Shopping Period does not confer enrolment preference; seats are reserved first for registered students, then for wait-listed students as space permits. To comply with room capacity requirements, unregistered students may be asked to leave if the classroom fills. Course materials (and any recordings) will be posted on the course page to support students who cannot be in the room.

Help and Support

- **Office hours and times will be posted on the course page.** In office hours we can discuss current homework problems and any other questions you might have. Think of it like free tutoring!

- If you have any non-mathematical, practical, or ethical concerns or questions we welcome you to talk to your instructor in confidence via a medium of your choice; it will be our mission to set things right and support you taking this course. Further personal support can be found through your academic dean; they are a useful resource for academic and personal advising, as well as immediate points of contact in the event of a personal or family-related emergency. See also Brown Counseling and Psychological Services and The Title IX Office.

- **December 2025.** In light of the recent tragedy on campus, we want to acknowledge that this may be a difficult time, and to remind you that you are not expected to navigate it alone. A central, up-to-date list of confidential, academic, and community support options is available on Brown's Ever True Community Resources page. If you are struggling yourself, worried about a friend, or simply feeling shaken or distracted, please consider reaching out to these resources and/or letting your instructor know (as much or as little as you're comfortable sharing) so we can discuss reasonable academic support.

Academic Integrity:

- The instructors of this course take Brown's Academic Code, and academic integrity in general, very seriously. Submitting dishonest work, whether on homework or exams, makes it more difficult to effectively help you and your fellow students learn, and it dilutes the meaning of a Brown degree. It is your responsibility to understand what actions are allowed in this course, and what actions are violations of the Academic Code. Any incidents that appear to violate course rules will be presented to, and adjudicated by, the university's Academic Code committee.

Inclusivity and Nondiscrimination:

- This course strives to be accessible and inclusive to all students, regardless of age, race, nationality, gender identity, sexual orientation, religion, and economic background. We are committed to conducting all interactions with students with a sense of respect and equity. We ask that students interact with other students and instructors in this same spirit. If something happens to make you feel unwelcome or discriminated against, please bring it to our attention so that we can respond accordingly. In addition, Brown is committed to providing support for students with learning differences, physical impairments, and other disabilities. If you think you may need accommodations due to one of these conditions, please contact Student Accessibility Services for more information.