MATH 282 Number Theory • MWF (4a) in CMC 206
Winter 2026 • Syllabus & Schedule

(Last Updated: Friday 6th March, 2026)

Instructor. Deewang Bhamidipati (he/him/his)
(You can address me by my first name, pronounced *thee-waang*, or as Professor B.)

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Email Communication: You can always email me if you wish to chat with me about anything!
Please make sure you give me as much information as you possibly can about the subject you intend to discuss when you email me. You are more than welcome to contact me at any time, but I check my email during work hours (Mon – Fri, 8:30 AM – 5:30 PM). You can expect a response from me within one working day. *Never hesitate to reach out, I always want to hear from you.*

Office Hours. This is when you can come to talk to me about anything and everything!

For mathematics-related conversations, it helps to have thought about where you're stuck: my first question will always be *"what have you tried so far?"*, and your response will guide our discussion.

Drop-in Office Hours. Anyone can drop by during the following times:

Mon	Tue	Wed	Fri
3 – 4 PM	10:30 – 11:30 AM	4 – 5:30 PM	12 – 1 PM
CMC 209	CMC 219	CMC 209	CMC 219

Office Hours by appointment. You can schedule a 15 minute one-on-one by emailing me (no Thursday appointments).

Feel free to drop by my office (CMC 219) to chat; my door will indicate my availability.
Wide open: come in. *Slightly ajar:* knock and ask. *Closed:* unavailable or not in office; instead, please email me.

Course Description and Goals. The main goal in this course is to introduce you to the world of number theory, the theory, the techniques and classic theorems that defined the field.

- You will *define* and *understand* the fundamental structures of number theory and their significance.
- You will *apply* appropriate methods to solve problems involving linear Diophantine equations, congruences, and other number-theoretic techniques.
- You will *analyse* the logic and structure underlying major theorems and proofs in number theory.
- You will *evaluate* mathematical arguments for correctness and rigor, constructing counterexamples where claims fail and justifying why particular proof strategies succeed or fall short.
- You will *create* clear, concise, and precisely structured mathematical proofs, demonstrating mastery of proof-writing conventions and creative problem-solving in a writing-intensive setting.

Textbook. The class will have **self-contained lecture notes as its primary source: link to lecture notes**.

These notes are heavily based on *An Illustrated Theory of Numbers* (1st Edition) by Martin H. Weissman but it draws from various other sources as well.

Class Time. Attendance is encouraged as it is the primary place where you will see new content, and get an immediate opportunity to seriously engage with it. Class time will almost always be a mixture of short lectures and group work. I encourage limiting the use of technology in class, like a laptop or a phone, unless a class activity requires its usage.

Fostering a Welcome Environment. *I strive to create an inclusive space where everyone – regardless of background or identity – can discover and develop their mathematical voice. I ask that you engage fully by reflecting on challenges, asking questions, and encouraging one another. Struggles are a normal part of learning together. When we cause harm, I expect us to listen, apologise sincerely, and commit to growth. Behaviour that undermines another person's sense of belonging has no place here; please speak with me or university officials if you experience or witness discrimination or harassment.*

Moodle. I will be using Moodle as the primary course repository, where you will receive course announcements, access homework etc. (Log in at `https://moodle.carleton.edu/` with your Carleton ID.)

Gradescope. Any assignment that needs to be turned in will have to be uploaded to Gradescope.

Ed Discussion. We will be using Ed Discussion as a discussion forum for anything and everything course related. It will be checked frequently and unresolved questions will be answered. You're highly encouraged to collaborate with each other and answer each other's questions; engaging in such discussions amongst yourselves is an incredibly invaluable part of succeeding in this course. You can access it via Moodle.

Assignment Distribution. Deep understanding of Number Theory comes from patient exploration and the refinement of logical arguments, not just sudden flashes of insight. Therefore, assignments in this course are designed to reward your rigour and persistence. I view our assignments as a dialogue – opportunities to refine your mathematical voice.

Component	Weight
Homework	20%
In-class Work	5%
Recap Quizzes	10%
Tests	30%
Proof Portfolio	15%
Topic Showcase	20%
Reflections	*+5%*

- **Homework:** There will be 9 weekly homework assigned. They will release on Mondays and will be due 11:59 PM the following Monday (deadlines will be adjusted for Unit Tests); I will *drop two* lowest scored HWs. You are expected to turn in your homework using LaTeX (see below). Written work will only be accepted for the *first four HWs*; only TeX-ed HWs will be accepted starting with HW 5. I will be sharing HW shells to aid you.

- **In-class Work:** A hybrid of lecture handouts and active problem-solving, these worksheets guide our in-class interaction. They are due 11:59 PM the day following class (e.g., Fri → Sat 11:59 PM) and will be graded on completion. You may complete the lecture section during class, work with a group, or copy from the lecture notes.

- **Recap Quizzes:** Every Wed (except for weeks with Unit Tests) there will be a take-home "recap quiz" – 2 questions added to Wed's in-class work based on the week's material. This is a vehicle for me to give you quick and regular feedback.

- **Tests:** There will be two in-class tests (15% each) on Fridays of Weeks 4 & 8.

  > **Corrections Policy.** You have the opportunity to earn back 50% of the points you missed on any problem where you lost significant credit (typically $\geqslant 2$ points) on a graded Unit Test.

- **Proof Portfolio:** The proof portfolio will consist of two parts, and will be a LaTeX; you will be provided a LaTeX shell.
  The first part will consist of four entries – four carefully written and edited proofs. The second part asks you to write a roughly page-long essay on what you have learned in the course and role that proofs play in mathematics.

  > **Submission Timeline.** A first draft will be due in Week 3, which must have at least one entry. A second draft will be due Week 6 and must have at least two entries. The final submission will be due 11:59 PM, Fri, Week 9.

- **Topic Showcase:** You will explore, in a small group, topics that are natural complements and sequels to the material we cover in the course, resulting in a final presentation to your peers. A collection of topics will be released in Week 6 for you to choose from.
  - ▷ **Exploration Worksheet (7.5%):** On Mon, Week 8, you will work through a guided worksheet on the topic of your choosing; due Fri, Week 8, 11:59 PM.
  - ▷ **Planning Conversation (5%):** During Weeks 9 & 10 you will schedule a one-on-one with me to discuss an early draft of your presentation. Expectations and additional information will be shared on Moodle by Week 6.
  - ▷ **Showcase Presentation (7.5%):** The final presentation will be during final time: **Saturday (03/14) from 3:30 - 6 PM**.

- **Reflections (Extra Credit):** To earn the full +5%, you must complete 5 out 8 weekly surveys, the mid-term survey in Week 4 and the term-end survey in Week 10.

Grading Scale. A *pass* (or S) = (**C–** or better). There is no **A+**

		B+	87 – 89%	**C+**	77 – 79%	**D+**	67 – 69%		
A	≥ 93%	**B**	83 – 86%	**C**	73 – 76%	**D**	63 – 66%	**F**	< 60%
A–	90 – 92%	**B–**	80 – 82%	**C–**	70 – 72%	**D–**	60 – 62%		

LaTeX (LAH-tekh or LAY-tekh) is the preferred choice of mathematicians for creating mathematical documents, which you will be learning to use for and during this course. This will be done by looking at the "shells" that I provide you, mimicking the LaTeX in them. Solutions to TeX-related issues can be found on TeX Stack Exchange or by asking on Ed Discussion. I am confident you will pick up the basics quickly. Start by creating an account on **Overleaf**, a free online LaTeX editor.

Please let me know if this is not a viable option for you for any reason, and, of course, if you need help getting started!

To-do in Weeks 1 & 2: Attend one office hours at least once.

Submission Guidelines for Homework & In-class Work. Please submit on the due date on Gradescope.

> **Extensions.** If you need an *extension*, **all you need to do is ask**. However, you must **ask before 7 PM on the due date**. You are *guaranteed a one-day extension* if you request it by this time.
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> Under exceptional circumstances, an extension of up to two days may be granted.

You are encouraged to work on assignments with your peers but **what you turn in must be written in your own words**. You may seek clarification of concepts and definitions from other textbooks or online sources, but do not intentionally search for solutions to specific problems. Using solution sites like Chegg or generative AI tools is considered academic dishonesty (please refer to the AI Usage Policy below).

If you are tempted to seek solutions: *please pause.* You may instead do any or all of the following:

- Ask your question (anonymously, if you wish) on Ed Discussion, our discussion platform
- Come to office hours to chat with me
- Work with a friend

Generative AI Usage Policy As artificial intelligence becomes more pervasive, we must be conscious of how we use it and what intellectual work we delegate to it. In mathematics, learning comes through practice, productive struggle, and developing your own problem-solving abilities.

My main goal is to help you become a better mathematical communicator. I want to see your authentic work and thinking process, not AI-generated solutions, because I am invested in your specific mathematical journey!

Limitations of AI Tools. AI tools like ChatGPT, Claude, and Gemini can sometimes be useful, but their output often contains biases, inaccuracies, and incomplete information. These tools present information with authority but are not always correct – think of them as that overconfident friend who didn't actually do well in this course. Using AI requires careful evaluation, and you are responsible for ensuring accuracy. Moreover, relying on AI for assignments will not prepare you for exams or presentations where you must demonstrate your own understanding.

> **Permitted Uses of AI Tools.** You may use generative AI tools in the following limited ways.
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> **While these are permitted, I prefer you ask questions on Ed Discussion, come to office hours, or visit the MSSC for support before turning to AI.**
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> - Asking AI to help explain difficult concepts. **Exercise critical thinking: AI often gives oversimplified or incorrect responses, or uses computational techniques different from those emphasised in this course.**
> - Looking up individual mathematical terms. **However, you must be able to explain any concept you use yourself.**

Remember: You use AI at your own risk. If AI provides incorrect information and you use it without verification, you remain responsible for the inaccuracy, and this will be reflected in your assignment grade.

> **Prohibited Uses of AI Tools.** The following actions are strictly prohibited:
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> - Do not use AI to solve homework problems, provide solutions, or give step-by-step guidance for assignments.
> - Do not use AI to brainstorm, outline, draft, or edit your mathematical writing.

- Do not use AI tools (like Otter.ai) to record or summarise class meetings, office hours, or lectures.
  (I retain the copyright to my teaching materials.)

Take your own notes during class and rewrite them afterward to digest information. This practice is essential for mathematical understanding; having AI do this undermines your learning.

Academic Integrity. This course assumes that all work submitted by students, including drafts and final products, is generated by you, working individually or in groups. The easiest way to ensure your work does not come under suspicion is to avoid using AI for prohibited purposes.

Remember that you have reliable human resources available: your instructor, classmates, and the MSSC are here to help you understand the material.

If You Suspect You Have Violated This Policy. If you realise you may have used AI inappropriately, please reach out to me immediately. I value honesty and will work with you to address the situation constructively, focusing on your learning rather than punishment.

Questions and Support. Please speak with me if you have any questions, concerns, or thoughts about this policy. I am here to support your learning, and I want you to feel confident about the expectations for our course.

Subsequent addendums, if any, to above will be made via Moodle announcements.
I reserve the right to change any particular of the syllabus above.
(**any changes will be to your advantage**, and you will be informed of them promptly via Moodle.)

Other Important Information

Land Acknowledgement: We stand on the homelands of the Wahpekute and Mdewakanton bands of the Dakota Nation. We honor with gratitude the people who've stewarded the land through the generations and their ongoing contributions to this region. We acknowledge the ongoing injustices that we have committed against the Dakota Nation, and we wish to interrupt this legacy, beginning with acts of healing and honest storytelling about this place.

Accommodations for Students with Disabilities: The Office of Accessibility Resources (OAR) promotes access and equity for all students of Carleton. OAR collaborates with students who have disabilities to provide and/or arrange reasonable accommodations. If you have, or think you may have, a disability (e.g., mental health, attentional, learning, autism spectrum disorders, chronic health, traumatic brain injury and concussions, vision, hearing, mobility, or speech impairments), please contact oar@carleton.edu to arrange a confidential discussion regarding equitable access and reasonable accommodations

Religious Accommodations: Carleton College welcomes diversity of religious beliefs and practices, recognising the contributions differing experiences and viewpoints can bring to the community. As your instructor, I am committed to providing equivalent educational opportunities to students of all belief systems. There may be times when an academic requirement conflicts with observance of religious holidays and cultural practices. If at all possible, please contact me during the first week of classes to discuss any such potential conflicts. We can work together to determine a reasonable accommodation for religious practices.

Student Well-Being: These are stressful times. Your health and well-being should always be your first priority. At Carleton, we have a wide-array of resources to support students. It is important to recognize stressors you may be facing, which can be personal, emotional, physical, financial, mental, or academic. Sleep, exercise, and connecting with others can be strategies to help you flourish at Carleton. For more information, check out Student Health and Counseling (SHAC), the Office of Health Promotion, or the Office of the Chaplain.

Title IX: Carleton is committed to fostering an environment free of sexual misconduct. Please be aware all Carleton faculty and staff members, with the exception of Chaplains and SHAC staff, are "responsible employees". Responsible employees are required to share any information they have regarding incidents of sexual misconduct with the Title IX Coordinator. Carleton's goal is to ensure campus community members are aware of all the options available and have access to the resources they need. If you have questions, please contact Carleton's Title IX Coordinator titleix@carleton.edu, or visit the Title IX website.

Academic Integrity: Academic integrity is the cornerstone of a college education. Academic dishonesty diminishes the college as an institution and all members of the college community. It tarnishes the value of a Carleton degree. All members of the Carleton community have an explicit responsibility to foster an environment of trust, honesty, fairness, respect, and responsibility. All members of the community are expected to present as their original work only that which is truly their own. Students must acknowledge all outside resources, collaboration, and external materials used in their work. All members of the community are expected to report observed instances of cheating, plagiarism, and other forms of academic dishonesty to ensure that the integrity of scholarship is valued and preserved at Carleton. Academic dishonesty cases are handled by the Academic Standing Committee, which determines responsibility and assigns appropriate sanctions. For the full policy and disciplinary procedures on academic dishonesty, students and instructors should refer to the section on Academic Integrity in the Campus Handbook.