# Syllabus

MATH 100
Introduction to Proof and Problem Solving
Winter 2024 • MWF: 9:20 – 10:25 AM

---

**Instructor:** Deewang Bhamidipati (he/him/his)
(Please address me by my first name, pronounced as thee-waang; or see NameCoach on Canvas.)

**Office Hours**: Wednesdays, 11:30 AM - 12:30 PM & Thursdays, 10:30 - 11:30 AM
(This is when you come and talk to us if you have any questions, or otherwise.)

**Teaching Assistant(s)**: Sophie Aiken & David Rubinstein

**TA Office Hours**: TBA (will begin Week 2)

**Discussion Sections**: Sections will begin on/after January 16th.

| Sections | Days | Time | Location |
|---|---|---|---|
| 01A | Tuesdays | 1:20 - 2:25 PM | McHenry 1279 |
| 01B | Thursdays | 4:00 - 5:05 PM | McHenry 1270 |

*You are required to enrol in and attend one of the sections. You must enrol in the section you will attend via* `https://my.ucsc.edu` → *Enrollment* → *Enrollment: Edit a Class*. If this doesn't work, attend whichever section works best for you and provide me with this information.

**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 by navigating to it from the Canvas menu on the left on our Canvas course page.

**Gradescope:** Any assessment (see below) that needs to be turned in will have to be uploaded to Gradescope; links and more details will be available on Canvas.

**Learning Outcomes:**

- You will be able to write clearly, concisely, and precisely; this is a writing-intensive course.
- You will understand the structure and importance of theorems, proofs and counterexamples.
- You will be able to abstract appropriately.
- You will be able to critique mathematical writing.
- You will develop your problem-solving skills.

**References:** Lectures will be self-contained, they will largely be based on the following books. You are **not** expected to buy copies of these books.

▷ Proofs: A Long-Form Mathematics Textbook by Jay Cummings (can be bought HERE!).

▷ Mathematical Proofs (A Transition to Advanced Mathematics) by Gary Chartrand, Albert D. Polimeni, Ping Zhang.

▷ Book of Proof by Richard Hammack (available digitally HERE for free!).

**Assessment Distribution:** More details, including deadlines, will be available on Canvas.

- HOMEWORKS (52%)
  - ▷ There will be weekly HW problem sets, a total of 8, which will be due starting Week 2.
  - ▷ You are expected to turn in your HWs using LaTeX (see below).
    Written work will only be accepted for the first five HWs; only TeX-ed HWs will be accepted starting with HW 6.
  - ▷ A random subset of the assigned problems in the Homeworks will be graded for credit.
- PROOF PORTFOLIO (20%)
  - ▷ You will maintain a proof portfolio. It will consist of two parts, and will be a LaTeX submission; you will be provided a LaTeX shell.
  - ▷ The first part will consist of five carefully written and edited proofs, which I will refer to as entries.
  - ▷ 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.
  - ▷ A preliminary draft will be due in Week 5 to obtain feedback from me. This submission must have at least one entry.
  - ▷ A secondary draft will be due Week 8 for peer review. This submission must have at least three entries.
  - ▷ The final portfolio is due by end of the quarter.
- IN-CLASS QUIZZES (10%)
  - ▷ There will be a very short quiz each lecture in-class, where you will be asked to write examples or counter-examples for things introduced by me in the preceding lecture.
  - ▷ The quiz will be worth two points: one for submission and one for correction.
  - ▷ You need to attempt at least one quiz a week; there will be no make-ups for these quizzes.
  - ▷ If you attempt more than one quiz a week, the highest score will be counted.
- SECTION QUIZZES (10%)

  There will be quizzes during your sections, 8 in total (Weeks 2 – 9). The lowest score will be dropped. You TA will give you more details during your first section in Week 2.
- FINAL PROBLEM SET (8%)
  - ▷ There will be a final problem set. A portion of the assessment will address material covered in the Homeworks, while the remaining will address material from the Week 9 & 10 lectures.
  - ▷ You will have at least a week to attempt this problem set.
- EXPLORATION WORKSHEET (5%)

  You will work on a worksheet, chosen from at least five options, which will consist of three questions introducing to a new mathematical field that you may see after this class. It will be due near the end of the quarter.

**Token System:** You will start the quarter with 2 (virtual) tokens. You may redeem these tokens in the following manner:

- ▷ 1 token = a one-day extension on an assessment of your choice (except the final Proof Portfolio submission). Request for extensions need to be made *before* the assessment due date.
- ▷ 2 tokens = a two-day extension on an assessment of your choice (except the final Proof Portfolio submission). Request for extensions need to be made *before* the assessment due date.
- ▷ 3 tokens = a re-do of any HW. Request for re-do must be made *within a day* of scores releasing.

You may earn tokens in the following manner:

- ▷ You will earn a 0.5 token for each weekly reflection survey.
- ▷ You will earn a 0.5 token for attempting extra credit problems in a HW.
- ▷ You will earn at most a 0.5 token a week by asking or answering questions on Ed Discussion.

A token tally will be available on Canvas.

**Grading Scale:** Passing grade is **C** or above.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **A+** | $\geq 95\%$ | **B+** | 80 – 84% | **C+** | 65 – 69% | **D** | 40 – 54% |
| **A** | 85 – 94% | **B** | 70 – 79% | **C** | 55 – 64% | **F** | $< 40\%$ |

**LaTeX:** LaTeX (LAH-tekh or LAY-tekh) is the preferred choice among mathematicians for creating mathematical documents. You will need to learn basic LaTeX for and during this course. This will likely be done by looking at the `.tex` (tekh, the LaTeX file extension) files that I provide you, mimicking the LaTeX in them, and heading to **TeX Stack Exchange** for anything that is not included in them. Most of you will be able to pick up the basics very easily. You can start this journey by using **Overleaf**, both online LaTeX editors. **Please contact me if this is not a viable option for you for any reason**, and, of course, if you need help getting started.

**Guidelines:**

- ASSESSMENTS
  - ▷ Please turn in the assessments on the due date.
  - ▷ Discuss the assessment with your peers on Ed Discussion. (I insist on this.)
  - ▷ Pay close attention to the presentation and clarity of your reasoning in your answers.
  - ▷ Cite resources you have used while solving the homework.
  - ▷ Name your peers with whom you have discussed the homework.
- COMMUNICATION
  - ▷ You may send me an email (at bdeewang@ucsc.edu), especially if the topic is of a sensitive or personal nature. If your question is math-related, please ask it on Ed Discussion.
  - ▷ Please make sure you give me as much information as you possibly can about the subject you intend to discuss when you contact me.
  - ▷ You are more than welcome to contact me at any time, you will get a response from me promptly between 8 AM - 7 PM, Monday to Saturday.
  - ▷ **Never hesitate to reach out, I always want to hear from you.**

**practice, discuss, ask**

***practice*** problems

***discuss*** problems with your peers

***ask*** me questions; more importantly: ask ***follow-up*** questions

SUBSEQUENT ADDENDUMS, IF ANY, TO ABOVE WILL BE MADE VIA CANVAS.
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 CANVAS.)

**Land Acknowledgement:** The land on which we gather is the unceded territory of the Awaswas-speaking Uypi Tribe. The Amah Mutsun Tribal Band, comprised of the descendants of indigenous people taken to missions Santa Cruz and San Juan Bautista during Spanish colonization of the Central Coast, is today working hard to restore traditional stewardship practices on these lands and heal from historical trauma.

**DRC (Remote) Accommodations:** The Disability Resources Center (DRC) reduces barriers to inclusion and full participation for students with disabilities by providing support to individually determine reasonable academic accommodations. Operations continue via remote appointments. If you have questions or concerns about exam accommodations or any other disability-related matter, email the DRC Schedulers at drc@ucsc.edu for an appointment; you can also visit their website at `http://drc.ucsc.edu`.

**CAPS (Counseling and Psychological Services):** This is a stressful time, so if you are in distress, managing heightened stress and anxiety, or want to get more support and a counselors perspective on something you're going through, CAPS provides a variety of services for your needs, please visit their website for more information `https://caps.ucsc.edu`.

**Title IX:** The university cherishes the free and open exchange of ideas and enlargement of knowledge. To maintain this freedom and openness requires objectivity, mutual trust, and confidence; it requires the absence of coercion, intimidation, or exploitation. The principal responsibility for maintaining these conditions must rest upon those members of the university community who exercise most authority and leadership: faculty, managers, and supervisors.

The university has therefore instituted a number of measures designed to protect its community from sex discrimination, sexual harassment, sexual violence, and other related prohibited conduct. Information about the Title IX Office, the online reporting link, applicable campus resources, reporting responsibilities, the UC Policy on Sexual Violence and Sexual Harassment, and the UC Santa Cruz Procedures for Reporting and Responding to Reports of Sexual Violence and Sexual Harassment can be found at `titleix.ucsc.edu`.

The Title IX Office is actively responding to reports and requests for consultation. If you are not currently working with someone in the office and want to make a report/request a consult, you can expect the fastest response by using our online reporting link. For more information please visit the Title IX Operations under Covid-19 page.

**Report an Incident of Hate or Bias:** UC Santa Cruz is committed to maintaining an objective, civil, diverse and supportive community, free of coercion, bias, hate, intimidation, dehumanization or exploitation. The Hate/Bias Response Team is a group of administrators who support and guide students seeking assistance in determining how to handle a bias incident involving another student, a staff member, or a faculty member. To report an incident of hate or bias, please use the Hate/Bias Reporting Form.

**Religious Accommodations:** UC Santa Cruz welcomes diversity of religious beliefs and practices, recognizing the contributions differing experiences and viewpoints can bring to the community. There may be times when an academic requirement conflicts with religious observances and practices. If that happens, students may request the reasonable accommodation for religious practices. The instructor will review the situation in an effort to provide a reasonable accommodation without penalty. You should first discuss the conflict and your requested accommodation with your instructor early in the term. You or your instructor may also seek assistance from the Dean of Students office.

**Small Group Tutoring:** Small Group Tutoring (SGT) supports students academically to advance educational equity by designing inclusive learning environments outside of the classroom. In SGT, you can expect the Tutor to facilitate cooperative group activities designed to have students work together on the course content and develop study skills for the course, please visit their website for more information `https://lss.ucsc.edu`.

**Academic Integrity:** Academic integrity is the cornerstone of a university education. Academic dishonesty diminishesvthe university as an institution and all members of the university community. It tarnishes the value of a UCSC degree. All members of the UCSC community have an explicit responsibility to foster an environment of trust, honesty, fairness, respect, and responsibility. All members of the university community are expected to present as their original work only that which is truly their own. All members of the community are expected to report observed instances of cheating, plagiarism, and other forms of academic dishonesty in order to ensure that the integrity of scholarship is valued and preserved at UCSC. For the full policy and disciplinary procedures on academic dishonesty, students and instructors should refer to the Academic Integrity page at the Division of Undergraduate Education.