Math 100 Introduction to Proof and Problem Solving - Summer 2023
MWF 9:00 am - 11:30 am PT

Instructor: Jennifer Guerrero (She/Her/Hers)	Office Hours: TBD or by appointment on Zoom

We will be regularly using a Canvas page for this class. Visit canvas.ucsc.edu
All Zoom links will be available on Canvas.

Every student is encouraged to come to my office hours!

Course Learning Objectives

A successful student in this course will...

1) Demonstrate understanding of the key topics (Logic, Proof Techniques, Relations, Functions, etc.) and be able to create clear and logical proofs.

2) Enhance their problem - solving and critical thinking skills.

3) Collaborate with their classmates to solve problems.

4) Develop a math identity and begin to see themselves as members of the greater mathematical community.

5) Be able to produce a document in LaTeX.

Lectures: The lectures will be **synchronous** and will take place on Zoom (so will Office Hours). **Lectures will be recorded** and will be available for asynchronous viewing on Yuja via Canvas. You're highly encouraged to attend the lectures synchronously.

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

References: Lectures will be based on the following books; also listed are some open source books that could be valuable references.
You are not expected to buy copies of these books.

- Mathematical Proofs (A Transition to Advanced Mathematics) by Gary Chartrand, Albert D. Polimeni, Ping Zhang
- Book of Proof by Richard Hammack

Assignments

Pre-lecture Reading: Before each lecture there will be reading material and a short quiz primarily on definitions and some examples. The Pre-lecture Reading will account for 10% of your overall grade.

Post-lecture Reflection: You will be asked to reflect on the lecture and pre-class readings, and indicate what you got and did not get. The Post-lecture Reflection will account for 5% of your overall grade.

Problem Sets: You will be asked to attempt around two or three problems after almost every class, and they will be due by the end of the next class. The specific dates will be announced on Canvas. You will be required to use LaTeX for these starting week 2 (more information about what LaTeX is and how to use it located under assignment guidelines and on Canvas). To motivate you to start using LaTeX, you will get 5% extra credit on assignments 1 and 2 if you use LaTeX. If it is handwritten after week 1 you will lose 5% for the first assignment, 10% for the second one, and so on. These problem set assignments will account for 30% of your overall grade.

Glossary: In this class, you will make a glossary consisting of definitions, examples, and statements of theorems, along with your commentaries on them (ie, put into your own words how you understand the material). You will be creating glossary entries after every class, and the final result will serve as a good reference for you for what you learned during this class. More information on this (including how many entries you will need and sample glossaries from previous courses) is listed under the assignments tab of Canvas. The glossary assignments will account for 25% of your overall grade.

Proof Portfolio Final Assessment: You will create a proof portfolio throughout the term. The proof portfolio will serve as a replacement for the final exam, and will be a chance for you to showcase everything you have learned in this course. You will type up two proofs for each large topic we will cover in the course, and it will account for 30% of your overall grade. **This is something you will be working on the entire Summer Term.** More information about this can be found on Canvas.

Overall Grade Breakdown

Pre-Lecture Reading	10%
Post-Lecture Reflection	5%
Problem Sets	30%
Glossary	25%
Proof Portfolio	30%
TOTAL	100%

Guidelines:

Assignments

- All assignments will be turned in on Canvas either as an assignment or via **Gradescope**. More information on how to use **Gradescope** will be available on the course's Canvas page.
- I encourage collaboration between classmates, but you should write up your own solutions. Anything that you write down you will need to justify!
- Please pay close attention to the presentation and clarity of your solutions. If I cannot read your work then you will not receive credit on the problem.
- 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. You can learn 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. You can start this journey by using Overleaf, an 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.

Communication

- Please contact me primarily via Canvas and give me as much possible information as you can about the subject that you plan on discussing with me.
- You are more than welcome to contact me at any time. You will get a response from me between the hours of 8 am and 7 pm. I aim to respond to you within 24 hours.
- **Please do not hesitate to reach out. I look forward to hearing from you!**

Late Policy: All of your assignments can be turned in up to two days late so long as you reach out to me ahead of time and let me know. Summer moves very fast, so it is important we stay up to date on the assignments: please reach out to me if there are ways in which I can make your ability to succeed easier.

Tentative Course Outline

Daily Learning Objectives will be available on the Pre-lecture Reading in Canvas
Specific due dates will be posted on Canvas

The following schedule is based on Mathematical Proofs (A Transition to Advanced Mathematics) by Gary Chartrand, Albert D. Polimeni, Ping Zhang.

Week	Mon.	Wed.	Fri.
July 25, 27, 29	1.1 - 1.6	2.1 - 2.9	2.10,3.1-3.2
August 1, 3, 5	3.3, 4.1-4.2	4.2 - 4.5	5.1-5.4
August 8, 10, 12	5.4-5.5,6.1	6.2-6.4,7.1,7.3	**OH Day**
August 15, 17, 19	7.1,7.3,8.1-8.2	8.3 - 8.6	9.1 - 9.6
August 22, 24, 26	10.1 - 10.3	10.4-10.5	**OH Day**

This Syllabus is subject to change. Any changes will benefit the students in this class.

Other Important Information

Summer Deadlines:

- (Session 2) Drop: Monday, August 7th (tuition reversed) Request for "W": Sunday, August 20th (no tuition reversal)

You will not be dropped for non-attendance or non-payment, you must drop yourself. Dropping before the deadline results in a full-tuition reversal/refund. Withdraw posts a W for the grade and full tuition is charged (no refund). For all dates and deadlines, including 'change of grade option' (P/NP) and grades due, here is the summer academic calendar: https://summer.ucsc.edu/studentlife. For questions about dropping, requesting a W grade for a course, or withdrawing from the summer quarter, email summer@ucsc.edu.

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 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.

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.

Title IX/Care Advisory: The Title IX Office is committed to fostering a campus climate in which members of our community are protected from all forms of sex discrimination, including sexual harassment, sexual violence, and gender-based harassment and discrimination. Title IX is a neutral office committed to safety, fairness, trauma-informed practices, and due process.

Title IX prohibits gender discrimination, including sexual harassment, domestic and dating violence, sexual assault, and stalking. If you have experienced sexual harassment or sexual violence, you can receive confidential support and advocacy at the Campus Advocacy Resources & Education (CARE) Office by calling (831) 502-2273. In addition, Counseling & Psychological Services (CAPS) can provide confidential, counseling support, (831) 459-2628. You can also report gender discrimination directly to the University's Title IX Office, (831) 459-2462. Reports to law enforcement can be made to UCPD, (831) 459-2231 ext. 1. For emergencies call 911.

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, dehumaniza- tion 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.

Academic Honesty:All members of the UCSC community benefit from an environment of trust, honesty, fairness, respect, and responsibility. You are expected to present your own work and acknowledge the work of others in order to preserve the integrity of scholarship. Cheating of any type is unacceptable and will result in disciplinary action. If you need help, please ask! Please see UCSC's academic misconduct policy for more information at UCSC Academic Misconduct.

Student Resources:

- Counseling and Psychological Services: Many students at UCSC face personal challenges or have psychological needs that may interfere with their academic progress, social development, or emotional wellbeing. The university offers a variety of confidential services to help you through difficult times, including individual and group

counseling, crisis intervention, consultations, online chats, and mental health screenings. These services are provided by staff who welcome all students and embrace a philosophy respectful of clients' cultural and religious backgrounds, and sensitive to differences in race, ability, gender identity and sexual orientation.

- Tutoring and Learning Support: At Learning Support Services (LSS), undergraduate students build a strong foundation for success and cultivate a sense of belonging in our Community of Learners. LSS partners with faculty and staff to advance educational equity by designing inclusive learning environments in Modified Supplemental Instruction, Small Group Tutoring, and Writing Support. When students fully engage in our programs, they gain transformative experiences that empower them at the university and beyond.

- Slug Support Program: College can be a challenging time for students and during times of stress it is not always easy to find the help you need. Slug Support can give help with everything from basic needs (housing, food, or financial insecurity) to getting the technology you need during remote instruction. To get started with SLUG Support, please contact the Dean of Students Office at 831-459-4446 or you may send us an email at deanofstudents@ucsc.edu.

- Slug Help/ Technology: The ITS Support Center is your single point of contact for all issues, problems or questions related to technology services and computing at UC Santa Cruz. To get technological help, simply email help@ucsc.edu.

- On Campus Emergency Contacts: For all other help and support, including the health center and emergency services, start here. Always dial 9-1-1 in the case of an emergency.