

MATH 100 INTRODUCTION TO PROOF AND PROBLEM SOLVING

Summer 2024

Instructor: Suzana Serboi
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Time: MWF 01:00PM-03:30PM
Place: J Baskin Engr 372

Description: Basic concepts and ideas necessary for upper-division mathematics and techniques of mathematical proof. Introduction to sets, relations, elementary mathematical logic, proof by contradiction, mathematical induction, and counting arguments.

Prerequisites: Satisfaction of the Entry Level Writing and Composition requirements; MATH 11A or MATH 19A or MATH 20A; and MATH 21 or AM 10 or AMS 10A. Prerequisites waived for non-UCSC students.

Canvas: I will be using the Canvas learning management system to post/update the syllabus and other course resources. You can log in at <https://canvas.ucsc.edu> using your CruzID and Gold password.

YuJa: Lectures will be recorded. The recordings will be available after class under the Yuja tab in Canvas.

Attendance: Attendance is highly recommended! If your grade is borderline, I may give you extra credit points for good attendance and participation during lectures.

Office Hours: After class, or by appointment, or post your questions on our class forum Ed Discussion.

Text: Chartrand, Polimeni, and Zhang, *Mathematical Proofs: A Transition to Advanced Math.*, 4th. ed.

Tentative Course Outline (July 29 - August 30, 2024): It is crucial that you read the textbook. The best way to learn how to prove mathematical statements and develop strong mathematical reasoning is through consistent exposure and practice.

- Week 1: Sets (Ch. 1), Logic (Ch. 2), Direct Proof and Proof by Contrapositive (Ch. 3)
- Week 2: More on Direct Proof and Proof by Contrapositive (Ch. 4), Counterexamples, Proof by Contradiction and Existence Proofs (Ch. 5), Mathematical Induction (Ch. 6)
- Week 3: Reviewing Proof Techniques (Ch. 7), MIDTERM, Equivalence Relations (Ch. 9)
- Week 4: Functions (Ch. 10), Cardinality of Sets (Ch. 11)
- Week 5: Proofs in Number Theory, Combinatorics, Calculus, Group Theory (Ch.12-16), FINAL EXAM

Exams: Midterm Exam **Wednesday, August 14**, Final Exam **Friday, August 30**. Note the midterm and final exam will be in person, during class time and I will upload and grade them in Gradescope. More information about the exam content will be provided in Canvas.

Course Policies:

- There are no make-up exams given. If you miss the midterm exam, or your final exam score is higher than your midterm score, your final exam score will replace your midterm score.
- I will drop one homework score to account for ANY issues or unforeseen circumstances. Please DO NOT email me to ask to be excused for missing class or to ask for assignments extensions.

Grading Policy: Homework (40%), Midterm (30%), Final (30%).

Letter Grade Distribution (the final grades may be curved, if necessary):

A+: 100% to 99%; A: < 99% to 94%; A-: < 94% to 90%; B+: < 90% to 86%; B: < 86 % to 82%; B-: < 82 % to 78%; C+: < 78 % to 74%; C: < 74 % to 70%; C-: < 70 % to 66%; D+: < 66 % to 62%; D: < 62 % to 58%; D-: < 58 % to 54%; F: < 54 % to 0%.

Class Communication & Ed Discussion: Course announcements will be made via Ed Discussion and NOT Canvas! Ed Discussion will be used for ALL communication and questions outside of lectures and office hours. You should send me an email ONLY if your question is of a sensitive or personal nature. If you have a question regarding homework, concepts, logistics, etc. - please post it on Ed, talk to me after class or in office hours. Ed is an online threaded discussion platform integrated in Canvas that supports document and image upload, math equations, embedded video, runnable code snippets, and image annotation.

Homework & Gradescope: You will be able to see the assignments and due dates in Canvas and Gradescope. Homework must be submitted via Gradescope. You don't need an extra account for Gradescope - it is integrated in Canvas. See the [instructional video](#) on how to submit an assignment. When you submit your files, you will be prompted to select, for each specified problem, the pages on which the associated work/solution are located. **You are required to accurately identify the pages associated to each problem as described in the video linked above. If you fail to do so, you may lose credit for each problem for which the pages are not correctly identified. It is your responsibility to make sure your submission is legible and easy to read. If you submit work that is difficult or impossible to read, you will not receive credit for it, and you will not be allowed to resubmit.**

A few problems are selected and graded for each homework (some graded for completion and some for correctness and clarity). You should be able to see the grading rubric and comments in Gradescope when the scores are released. If you think a grading error occurred, you can [submit a regrade request in Gradescope](#).

Accommodations for Students with Disabilities: UC Santa Cruz is committed to creating a learning environment that meets the needs of its diverse student body including students with disabilities. If you have a disability, or think you may have a disability, you can work with the Disability Resource Center (DRC) to request disability accommodations. You can find more information about DRC, including contact information and the application process here: <https://drc.ucsc.edu>.

Academic Integrity: Academic dishonesty diminishes the university as an institution and all members of the university community. It tarnishes the value of a UCSC degree. 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. In the event a student is found in violation of the UCSC Academic Integrity policy, he or she may face both academic sanctions imposed by the instructor of record and disciplinary sanctions imposed either by the provost of his or her college or the Academic Tribunal convened to hear the case. Violations of the Academic Integrity policy can result in dismissal from the university and a permanent notation on a student's transcript. 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: <https://ue.ucsc.edu/academic-misconduct.html>.

Title IX: 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.

Summer Session 1 (July 29 - August 30, 2024) Deadlines: Add/Swap - Thursday, August 1; Drop - Monday, August 5 (tuition reversed); Request "W" Grade - Sunday, August 18 (no tuition reversal); Change Grade Option - Sunday, August 25; Grades Due - Thursday, September 5.