

**Math 105A–02**  
**Summer 2023**

**Instructor:** John McHugh

**Email:** jrmchugh at ucsd dot edu

**Office Hours:** Monday, 12PM – 3PM, or by appointment. Office hours will be held on zoom, and a link can be found on our Canvas course page.

**Teaching Assistant:** Deewang Bhamidipati

**Email:** dbhamidi at ucsd dot edu

**Office Hours:** Wednesday and Friday, 11AM – 12:30PM. Deewang’s office hours will also be held on zoom.

**Class Time and Location:** TuTh 11AM – 12:30PM, zoom. A zoom link can be found on our course canvas page. Some weeks, the lectures will be pre-recorded.

**Textbook:** *Mathematical Analysis*, 2nd ed., Apostol

**Course Content:** We will begin with a review of some of the content of Math 100 (or equivalent): sets, functions, numbers, methods of proof. We will then discuss the topology of the real line and  $\mathbb{R}^n$ , including the Bolzano-Weierstrass and Heine-Borel Theorems. We will then move onto the main content of the course: limits, continuity, and derivatives. Time allowing, we may discuss the Riemann-Stieltjes integral.

**Course Outline:** This is a rough outline for the course.

- Tues, June 27th: Introductions, review of sets and functions
- Thurs, June 29th: More sets and functions, Chapter 1
- Tues, July 4th: (no class)
- Thurs, July 6th: Chapter 1, Cauchy-Schwarz Inequality
- Tues, July 11th: Topology of  $\mathbb{R}^n$
- Thurs, July 13th: Bolzano-Weierstrass and Heine-Borel
- Tues, July 18th: Compact Sets
- Thurs, July 20th: Sequences, convergence
- Tues, July 25th: Complete metric spaces, limits
- Thurs, July 27th: **Midterm**
- Tues, Aug 1st: Continuous functions
- Thurs, Aug 3rd: More continuous functions. Uniform continuity.
- Tues, Aug 8th: Definition of the derivative.
- Thurs, Aug 10th: More on derivatives.

- Tues, Aug 15th: Rolle's Theorem, Mean-Value Theorem
- Thurs, Aug 17th: Intermediate-Value Theorem
- Tues, Aug 22nd: Taylor's formula with remainder
- Thurs, Aug 24th: The Riemann-Stieltjes integral
- Tues, Aug 29th: More on integrals
- Thurs, Aug 31st: **Final Exam**

**Grading:**

- 50% – Homework
- 25% – Midterm
- 25% – Final

**Homework:** Homework will be assigned (roughly) weekly. Homework will be submitted on Gradescope. Please upload clear photos and write legibly, for the sake of the grader. I encourage you to use LaTeX to typeset your solutions. Each question on the homework will be worth 5 points. The grader will only grade some of the problems, chosen at random. I will drop your 2 lowest homework grades at the end of the course.

**Late Homework:** You can submit late work within 3 days of the due date, but each day late will incur a 5 percent penalty.

**Exams:** We will have two exams: one midterm and one final. **The midterm will be held on Thursday July 27th. The Final will be held on Thursday August 31st.**

**DRC Accommodations:** The Disability Resources Center reduces barriers to inclusion and full participation for students with disabilities by providing support to individually determine reasonable academic accommodations. If you have questions or concerns about exam accommodations or any other disability-related matter, please contact the DRC office, located in Hahn 125 or at 831-459-2089 or [drc@ucsc.edu](mailto:drc@ucsc.edu) .

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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.

**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](http://titleix.ucsc.edu).

The Title IX/Sexual Harassment Office is located at 105 Kerr Hall. In addition to the online reporting option, you can contact the Title IX Office by calling 831-459-2462.