Elementary Analysis: Math 325 – Section 002
Fall Semester 2022
TR 2:00pm – 3:15pm
Louise Pound Hall 003

Instructor: Jack Jeffries
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Office Hours: to be announced
Textbook: *Understanding Real Analysis, 2nd or 3rd Edition* by Paul Zorn. You are encouraged to read through the book as a supplement to our work in class and homework. My typed lecture notes will also be available on the course website.

Course Description: I view this course as having two central goals:

One goal is to develop your ability to read, write, and understand rigorous mathematical proofs. The only way to get better at writing good proofs is by doing so. There will be a heavy emphasis on weekly problem sets in this course and most of the problems will require you to develop original, rigorous proofs of mathematical statements. Writing good proofs is a difficult skill to master and success in this course will require a sustained effort on your part along with my help.

The second main goal is to learn about real analysis, which, at least from our point of view, will mean developing rigorously the material of calculus. We will start with a short list of axioms that characterize the real numbers. Using them, and the rules of logical reasoning, we will prove many of the theorems you accepted on faith when you took calculus.

The first course that I took in analysis as a student was one of the most inspiring classes I ever had. I hope to share the beauty of this subject with you.

Class engagement policy: This is an in-person class. Class time will involve lecture, discussion, and groupwork, as well as quizzes. The expectation for the class is that you will participate in person as health and quarantine circumstances allow. If you are unable to attend in person, you should let me know, and we will arrange for you to participate some other way while you cannot attend in person.

Grading policy: Your grade will have four components: problem sets, quizzes, exams, and participation.

The problem sets will be assigned and collected approximately once per week, except for exam weeks. I anticipate there being about eight problems sets total. You are encouraged to work together on the problem sets, but each of you will hand in your own solutions, written in your own words, and your work must demonstrate a true understanding of the material. Never hand in something that you do not completely understand. You can ask me about I ask that at the top of each assignment you list the students, if any, with whom you collaborated and any outside references you use. Please hand in all assignments on time.

We will have short quizzes in class on a semi-regular basis. Quiz times will be discussed in class. The participation grade is based on your participation in class. If you fulfill the class engagement policy then you will get the full score; I expect everyone to do so. This part of the grade is an excuse for me to give you easy points.

There will be two midterm exams and a final exam. The midterms will take place during class on Friday, October 15 and Friday, November 19 (subject to change), and the final exam will be **Thursday, December 15, 1pm–3pm**, location to be confirmed.

The following table summarizes the grading scheme:

Components of your grade:

Component	Value
Problem Sets	35%
Quizzes	20%
Midterm Exams (two)	10% each
Final Exam	20%
Participation	5%

Letter grades will be based on the usual 10 point scale (90 cutoff between A-/B+, etc.); however, grade cutoffs may be lower (i.e., grades may be higher).

Syllabus: The plan is to cover the majority of the text, skipping some of the less important sections but covering the high points. The main topics we will learn about are as follows:

- basic terminology and notation, proof techniques, the axioms of the real numbers
- sequences, convergence of sequences, Bolzano-Weierstrass, Cauchy sequences
- continuity of functions, value theorems,
- formal definition of the derivative and its properties, Mean Value theorem
- (if time permits) Riemann integrals, Fundamental Theorems of Calculus

Students With Disabilities: Students with disabilities are encouraged to contact the instructor for a confidential discussion of their individual needs for academic accommodation. It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities office, 132 Canfield Administration, 472-3787 voice or TTY, `http://www.unl.edu/ssd`.

Department Grading Policy: Students who believe their academic evaluation has been prejudiced or capricious have recourse for appeals to (in order) the instructor, the department vice chair, the department chair, the departmental appeals committee, and the college appeals committee.

Academic Honesty: Academic honesty is essential to the existence and integrity of an academic institution. The responsibility for maintaining that integrity is shared by all members of the academic community. The University's Student Code of Conduct addresses academic dishonesty. Students who commit acts of academic dishonesty are subject to disciplinary action and are granted due process and the right to appeal any decision.