Elementary Analysis: Math 325 – Section 001
Spring Semester 2021
MWF 11:30am – 12:20pm
Oldfather Hall 208

Instructor: Jack Jeffries
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Office Hours: To be announced.
Text: *Understanding Real Analysis, 2nd Edition* by Paul Zorn

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 when circumstances allow. If you are unable to attend due for health reasons, or other reasons, you should let me know, and we will arrange for you to participate by zoom as long as you cannot attend in person. The other two sections of this class are in webinar format; if you do not plan to attend regularly in-person, you should switch to one of those sections.

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 10 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, March 5 and Friday, April 16, and the final exam will be 7:30 to 9:30 a.m. Friday, May 7.

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%

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 Theorem, Cauchy sequences
- continuity of functions, value theorems, uniform continuity
- 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.

ACE Outcome 3: This course satisfies ACE Outcome 3: "Use mathematical, computational, statistical, or formal reasoning (including reasoning based on principles of logic) to solve problems, draw inferences, and determine reasonableness." I will provide examples, you will discuss them in class, and you will practice with numerous homework problems. The exams will test how well you've mastered the material. The final exam will be the primary means of assessing your achievement of ACE Outcome 3.

Face coverings: As with all courses at UNL this semester, everyone in class must adhere to the University's policy on this matter. See the next page for the details.