

LECTURE: TTh 11 – 12:20 in CURY 110

INSTRUCTOR: William Cherry

OFFICE: GAB 405

PHONE: 565-4303

E-MAIL: [wcherry@unt.edu](mailto:wcherry@unt.edu)

WEB PAGE: <http://wcherry.math.unt.edu/math3000>

OFFICE HOURS: TTh: 1–3:30; W: 7–9 p.m.,

and by appointment Mondays, Fridays, and Wednesday mornings.

PREREQUISITE(S): Math 1720

TEXT: Steven R. Lay, *Analysis, with an Introduction to Proof*, Fourth Edition, Prentice Hall, 2005.

WEBASSIGN CLASS KEY: unt 4291 6064

GRADES: There will be six components to your final grade, weighted as follows:

Web Homework: 15%

Paper Homework: 15%

Class Presentations: 5%

Quizzes: 5%

In Class Tests: 30% (15% each)

Final Exam: 30%

Students are also expected to complete a student evaluation of teaching.

IMPORTANT DATES:

FINAL EXAM: Tuesday, December 11, 10:30–12:30

IN CLASS TESTS: Tuesday, October 2 and Tuesday, November 20

ATTENDANCE: Class attendance will be taken by the daily quizzes. **Students who miss more than 6 of the daily quizzes will have their final grade lowered by ONE FULL LETTER GRADE. No late homework** will be accepted, and homework assigned for in class presentation must be presented as scheduled. **Students must plan to attend the in-class and final exams.** Makeup exams will be given only in extremely exceptional circumstances, such as serious illness, and must be arranged in advance.

ACADEMIC DISHONESTY: Cheating on exams is a serious breach of academic standards and will be punished severely. UNT's full policy on academic integrity can be found at:

<http://vpaa.unt.edu/academic-integrity.htm>.

STUDENT EVALUATION OF TEACHING EFFECTIVENESS (SETE): The SETE is a requirement for all organized classes at UNT. This short survey will be made available to you at the end of the semester, providing you a chance to comment on how this class is taught. Please be sure to complete this important survey for all of your classes.

*Note: It is the responsibility of students with certified disabilities to provide the instructor with appropriate documentation from the Dean of Students Office.*

## Course Description

A better title for this course might be “how to think like a math major.” This class will be considerably different than any previous math class you have probably had. Unlike your previous classes, there are no important mathematical “facts” to learn from this class. Generally, we will not be learning any computational “rules.” Instead, the important part of this class is teaching you to learn how to “prove” mathematical statements and to learn to communicate like a math major. “Answers” are not the important part of this class, but rather formal explanations as to why the “answers” are correct. You will recognize some of the ideas presented in this class from your calculus courses, but we will look at them much more critically here than you did in calculus.

## Learning Objectives

Math 3000 contributes to the following mathematics undergraduate program objectives:

### Mathematical Reasoning

- MR 1. Read, understand, formulate, explain, and apply mathematical statements.
- MR 2. Formulate conjectures by considering examples that move from the specific to the general.
- MR 3. Distinguish between valid and fallacious arguments.
- MR 4. State and apply important results in key mathematical areas, with the ability to provide proof-based arguments of these and related results.
- MR 5. Use a variety of techniques – such as, mathematical induction, proof by contradiction, or direct application of axioms and previously proven theorems – to prove propositions.

### General skills

- GS 1. Solve mathematical problems individually and cooperatively.
- GS 2. Formulate strategies for solving novel analytical – both theoretical and applied – problems.
- GS 3. Communicate, both verbally and in writing, mathematical ideas at a variety of levels from technical to intuitive.

## Where to get help

Math 3000 is NOT one of the courses eligible for math lab tutoring. If you are having trouble, please make full use of your instructor’s and TA’s office hours and the TA’s help sessions. If the scheduled office hours are not convenient for you, make an appointment for another time. Working together with other students is also a good way to get help, but just be sure you are also able to work alone when it comes time to take the tests.

## Web Homework

You will turn in much of your homework for this class online via

<http://www.webassign.net>

From the home page, click on the “I have a class key” link on the right and enter the class key for this class, which is:

unt 4291 6064

Note that you will have to purchase an access key for \$19.95 from WebAssign. The WebAssign access fee is non-refundable, but access is free for the first two weeks of class. If you are not sure you will remain in the class, you should wait to purchase the access code.

## Paper Homework

In this course, “how” you write up your homework is the most important aspect of homework. Often you are told the “answer” in advance, and the goal of the homework problem is to “prove” the answer is correct.

**Homework assignments must be neatly written and must not cram solutions into too small a space.** One problem per page is recommended.

**NO late homework will be accepted.**

## Class Presentations

Every student will be assigned a presentation as part of a group to be given during one of the class meetings.

## Daily Quizzes

Most class days will begin or end with a short quiz on recent course material. The quizzes will not be intended to be especially challenging. They are intended to ensure you are keeping up with the reading. Your four lowest quiz grades will be dropped before computing final grades.

## Tentative Course Outline

The following is intended to provide a rough outline of what will be covered when in class. Depending on how quickly students master certain concepts, more or less time may be devoted to particular topics than indicated here. Students should consult the more detailed schedules that will be distributed weekly during the course for more up-to-date information on what will happen each week.

Tuesday	Thursday
	8/30: Interior, Boundary, & Sets §13&5
9/4: Sets §5	9/6: Sets §5
9/11: Open & Closed §13	9/13: Logic & Quantifiers §1–2
9/18: Quantifiers §2	9/20: Quantifiers §2
9/25: Topology §13	9/27: Accumulation/Review §13
10/2: <b>TEST 1</b>	10/4: Accumulation §13
10/9: Induction §10	10/11: Induction §10
10/16: Ordered Fields §11	10/18: Ordered Fields §11
10/23: Ordered Fields §11	10/25: Completeness §12
10/30: Compactness §14	11/1: Compactness §14
11/6: Compactness §14	11/8: Functions §7
11/13: Functions §7	11/15: Functions/Review §7
11/20: <b>TEST 2</b>	11/22: <b>Thanksgiving</b> No Class
11/27: Cardinality §8	11/29: Cardinality §8
12/4: Relations §6	12/6: Relations §6
12/11: <b>Final Exam</b> 10:30–12:30	

**Homework** (either web, paper, or both) will be due most every class day.

Most every class we will have a short **quiz**.

We will have student **presentations** most class days.