FOUNDATIONS OF MATHEMATICS

MATH 3425.001 | SPRING 2026

Instructor: Dr. Deborah Koslover

Office: RBN 4010

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Classroom: RBS 2024

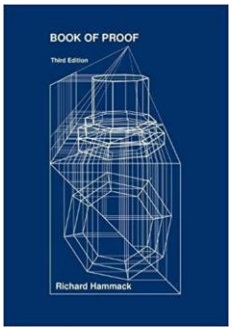
Meeting Time MWF 1:25-2:40 PM

Office Hours: MW 3- 4 PM, TTh 3:30 – 4:30 PM, F 9:30 – 10: 30 AM or by appointment.

Course Description

In this class, you will learn how to write proofs. We will start by studying the logic behind proofs and why proofs work. We will start by constructing very simple proofs like proving that the sum of two even numbers is even. We will then write proof about topics with which you are less familiar: sets, relations functions and number systems. We will eventually work our way up more interesting topics like the different types of infinity. This course has a prerequisite of Math 2414 Calculus II.

Textbook



The Book of Proof by Richard Hammack. This is a free downloadable book that you can find at his website
https://richardhammack.github.io/BookOfProof/Main.pdf
If you want a dead tree version, Amazon sells the paperback for about $25.

Website

You will be using Canvas. Go to www.uttyler.edu/canvas to log into Canvas using your regular patriots account. If you have enrolled in the course, you should have access to the website. You will find important documents, grades, lecture notes, and announcements on Canvas.

Attendance is mandatory and attendance records will be kept. Notify Dr. Koslover in advance if you must miss a class, be late for a class or leave early. (Official University Policy: Class attendance is the responsibility of the student. When a student has a legitimate absence, the instructor may permit the student to complete missed assignments. In many cases class participation is a significant measure of performance, and non-attendance may adversely affect a student's grade. When a student's absences become excessive, the instructor may recommend that the student initiate a withdrawal.)

Learning Outcomes

At the conclusion of the course, the student should be able to:

1. Reason mathematically and apply the rigor necessary to construct proofs and determine the validity of a given argument. (Communicate, construct proofs, critical thinking)

2. Use a variety of techniques – such as mathematical induction, proof by contradiction and direct application of axioms and previously proved theorems – to prove propositions. (Construct proofs)

3. Persuasively communicate mathematical ideas, both verbally and in writing, using clear and concise mathematical language, including terminology, notation and grammar. (Communicate)

4. Draw reasonable inferences and conclusions using mathematical tools such as truth tables, Venn diagrams, digraphs and Hasse diagrams. (Critical thinking)

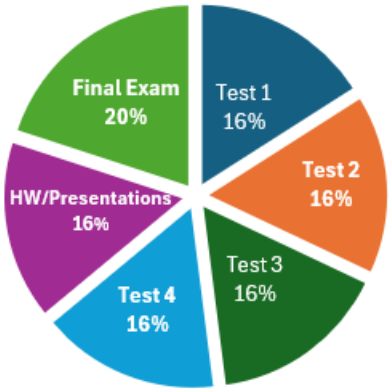
Course Evaluation

At the end of the semester, you will find your final grade on my.uttyler.edu. It will also be posted on Canvas.

A final course grade of

90% is guaranteed to be at least an A
80% is guaranteed to be at least a B
70% is guaranteed to be at least a C
60% is guaranteed to be at least a D.

All grades below 60% will be F.



The Plan

(16%): Homework will be assigned daily. Assignments will appear on Canvas. All students will be expected to do every problem. However, each problem will have 2 students' names attached to it. Those students will treat these particular problems as projects. Solutions to these projects should include the statement of the problem (which can be abbreviated), and a very neat, complete solution. One of the two students will be asked to present their solution in class. You will show your paper on the overhead projector. You will be graded on correctness of work, clarity of presentation and your answers to questions asked. Presented problems will be worth 5 points. All other problems on an assignment will be graded for completion and will be worth 2 points.

Students watching the presentations will be awarded points for insightful questions or comments. Silly comments like "You have nice handwriting" will not get points. If you have done a project problem in a significantly different fashion than the presenter, you may ask to show your solutions for credit.

Solutions, which will be copies of correctly done student projects, will be posted on Canvas. Do not sell to Chegg or similar websites. Do not pass down to future generations of students.

Upload your entire homework assignment to Canvas as a pdf file. No photographs will be accepted.

One special problem, which will be called problem zero, will appear on every assignment except the first. It will read "Look at the solution to the previous homework assignment and find a problem that you think you missed. Explain your error or your confusion and whether it is now resolved. Please do not pick a problem where your error was misreading the problem, doing the wrong problem or making an arithmetic mistake. Pick a mathematical confusion or error.

If you think you did every problem perfectly, discuss something that you learned while doing the assignment, reading the solutions or watching presentations. Choose something that will help you as a student, perhaps a different way of doing a problem. Describe what you found. The point is not to redo the problem. The point is to state what your mathematical misunderstanding is and whether you resolved it."

The real purpose of homework is practice. I encourage students to discuss the homework only in general terms outside of class. It is good to share general ideas, but you will not be likely to pass unless you do the hard work of learning to write proofs yourself. Do not just copy your friend's assignments or search for solutions on the internet. Yes, your homework grade may be reduced following this advice, but it is only worth 16% of your grade. If you do not practice solving problems and writing those solutions independently, you may not be able to pass the exams. That will affect 84% of your grade.

It's not that I'm so smart, it's just that I stay with problems longer. _Albert Einstein

TESTS (16% each) and FINAL EXAM (20%): There will be four tests and a final exam. These exams will test your knowledge of the material taught in the class and practiced on the homework. As on the homework and the in-class presentations, students should expect to write high quality proofs on all exams. While some memorization of definitions and some computations will be required, it will not be the main emphasis.

Success is dependent on effort. _Sophocles

Final Exam: Wednesday, April 29, 2:45 – 4:45 PM

Please don't plan your travel to start before the date the final exam is scheduled!

Make-ups

Make-ups for **documented** absences that are **required** as part of a UT Tyler obligation (e.g. athletes participating in an event, participating in a debate contest, etc.) or for religious observation will be granted. For all make-ups of this type, prior notification of at least one week and documentation are required. Other make-ups are granted only in extreme cases such as hospitalization and at the sole discretion of the instructor.

Make-ups will be allowed for the following excused absences.
1) Illnesses, with a doctor's note, no exceptions.
2) Your child's illness, with a doctor's note.
3) Court appearances, including citizenship court, with documentation
4) Weddings, funerals or military advancement with documentation **and** a photograph showing that you attended the event.

Doctor's notes must be dated either before you miss the class or within 2 days after you missed the class, unless you or your child are hospitalized. In case of hospitalization, bring evidence of hospitalization.

Make-ups for tests must be taken within 3 days after returning to class except for lengthy illnesses or hospitalizations.

Other Details

Calculator Policy: Generally, calculators will not be needed, but you are welcome to use non-graphing calculators for all quizzes and tests. However, you may not use your phone as a calculator. Additionally, all work must be shown. When calculators are needed, I will have some available.

Cell phones and other electronic devices: Please set your cell phones to silent mode. If you are expecting an emergency call, please notify the instructor in advance, sit near the door, and answer the phone outside. You will not be allowed to wear electronic devices (except hearing aids) during an exam. During tests, cell phones must be turned off and placed in sight on your desk.

AI is not permitted in this course at all.: I expect that all work submitted by students for this course to be their own. I have carefully designed all assignments and class activities to support your learning. Doing your own work, without human or artificial intelligence assistance, is best for your efforts in mastering course learning objectives. For this course, I expressly forbid using ChatGPT or any other artificial intelligence (AI) tools for any stages of the work process, including brainstorming. Deviations from these guidelines will be considered a violation of UT Tyler's Honor Code and academic honesty values.

Calendar

JANUARY			FEBRUARY			MARCH			APRIL		
MON	WED	FRI	MON	WED	FRI	MON	WED	FRI	MON	WED	FRI
12	14	16	2	4	6	2	4	6	6	8	10
First Day			9	11	13	9	11	13	13	15	17
19	21	23				Spring Break					Test 4
MLK Day			16	18	20	16	18	20	20	22	24
26	28	30									
Census Day		Test 1	23	25	27	23	25	27	27	29	29
					Test 2			Test 3		Final Exam	
						30	1	3	Final 2:45 – 4:45		
						Drop day					

Each student will have one opportunity to rewrite missed problems on ONE test to earn up to 50% of the lost points. When you get a test back, if you decide to use your golden ticket, you will have one week to turn in the rewrites.

The tests will get progressively harder, so you are encouraged to save your ticket for test 3 or test 4. However, you may choose to apply the ticket on any test.

The ticket may not be used on the final exam.

You may not use the ticket retroactively at the end of the semester.

Tickets are not transferable.