

MATH-3425 FOUNDATIONS OF MATHEMATICS

The University of Texas at Tyler, Fall 2024

Time and Place: MoWeFr 2:30PM - 3:45PM, Ratliff Building North (RBN) 03041

Instructor: Pamela Delgado, Ph.D

Office: RBN 4009

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Office Hours: Mondays from 1 pm to 2 pm, Wednesdays from 9 am to 10 am, Fridays from 9 am to 10 am. Room RBN 4009.

Office hours can also be arranged at a different time if the times above do not work for you, please email me 2 business days in advance so we can find a common time to meet.

Overview: This course involves the study of elementary logic, intermediate set theory, relations, functions, and cardinality. It will introduce students to some of the fundamental techniques and methods for proving mathematical statements and theorems. The ability to write correct and clear mathematical proofs is essential in the study of rigorous mathematics, and this course emphasizes constructing logical arguments and writing proofs.

Prerequisite: A grade of C or better in Calculus II.

Textbook: *Book of Proof* 3rd edition, by Richard Hammack. A free PDF of the book can be downloaded from the following website

<https://richardhammack.github.io/BookOfProof/>

Grading procedure:

Four exams 60% (each worth 15%)

Final exam 20% (comprehensive)

Homework 10%

Classwork 10%

Grading scale:

A:90-100%, B: 80-89%, C: 70-79%, D: 60–69%, F:<60%.

Exam dates:

Exam 1: Wed Sep 18th

Exam 2: Wed Oct 9th

Exam 3: Fri Nov 1st

Exam 4: Fri Nov 22nd

Final exam: Wed Dec 11th, from 2:45 pm to 4:45 pm

Important Dates:

- September 9th. Census date: Date to withdraw without incurring grades of “W” or “Q”.
- November 4th. Last day to withdraw from one or more courses with a W.

For more important dates visit:

<https://www.uttyler.edu/schedule/files/2024-2025/academic-calendar-2024-2025-main-20240724.pdf>.

Homework: Homework will be assigned regularly. You must submit your solutions on Canvas as a pdf file by the due date and time. Your solutions must be correct, complete, legible, and written neatly for full credit. No extensions or make-up assignments will be granted for missed homework. Each assignment will include exercises of varying difficulty. I will select specific exercises for grading, with an emphasis on those of medium to high difficulty. **The main goal of homework is to help you prepare for the exams in this course.** You are encouraged to collaborate

with your classmates, and you may use any resources to solve the exercises. However, anything you submit must be something you understand and can explain to me or the class. Moreover, struggling with an exercise or proof is a vital part of the learning process. It challenges you to think deeply and helps solidify your understanding. Don't skip this important step in your mathematical development by immediately searching for solutions elsewhere. Make sure to give it a serious attempt on your own first; only then will discussing the exercise with your classmates or looking at others' solutions add real value to your exam preparation.

Classwork: We will have regular in-lecture activities counting towards your grade. These activities will vary; you can expect worksheets to be completed during lecture, group work, presenting your work on the board to the class, among others. I will clearly state during the lecture if an activity counts towards your classwork grade. Your classwork grade will be based on effort, not on correctness. Poor attendance will negatively affect your classwork grade.

Make-up Exams/Missed classwork: Make-up evaluations and/or make-up classwork are **only given if you have a legitimate justification; documentation to support your justification must be provided.** Make-up evaluations/classwork must be completed within three days of your return to your academic duties. It is the responsibility of the student to communicate with me promptly and regularly until arrangements for the missed work have been established. If this criterion is not met, make-up evaluation/work won't be granted.

Legitimate justifications for make-up evaluations/classwork include illness (affecting you or your child), pregnancy related absences, or academic conflict that will prevent you from being in class. If you know you will be missing classes, you need to contact me as soon as you become aware of the lecture you will miss. **In case of illness as justification for a missed evaluation, you will need to present a doctor's note dated within 72 hours of the missed lecture.** You can also go to the Health Clinic on campus, to make an appointment call (903) 939-7870. Pregnant and parenting students must work with the Parenting Student Liaison to satisfy the requirement of documentation supporting your justification. You can reach out to Parenting Student Liaison at parents@uttyler.edu. Approval for make-up evaluations/classwork due to personal reasons will be granted only in exceptional circumstances for substantial grounds, and documentation will still be required. Early flights home, bus tickets to leave town, and family vacations are NOT valid excuses to miss or reschedule a final exam.

Learning outcomes:

- Apply critical thinking to assess the validity of a mathematical proof.
- Construct correct and complete mathematical proofs using the various proof techniques studied in class.
- Use rigorous mathematical reasoning to communicate proofs clearly, both orally and in writing.

Artificial Intelligence Statement:

From the University Policies and Information:

*“UT Tyler is committed to exploring and using artificial intelligence (AI) tools as appropriate for the discipline and task undertaken. We encourage discussing AI tools’ ethical, societal, philosophical, and disciplinary implications. All uses of AI should be acknowledged as this aligns with our commitment to honor and integrity, as noted in UT Tyler’s Honor Code. Faculty and students must not use protected information, data, or copyrighted materials when using any AI tool. Additionally, users should be aware that AI tools rely on predictive models to generate content that **may appear correct but is sometimes shown to be incomplete, inaccurate**, taken without attribution from other sources, and/or biased. Consequently, an AI tool should not be considered a substitute for traditional approaches to research. You are ultimately responsible for the quality and content of the information you submit. Misusing AI tools that violate the guidelines specified for this course (see below) is considered a breach of academic integrity. The student will be subject to disciplinary actions as outlined in UT Tyler’s Academic Integrity Policy.”*

For Math-3425:

As stated above, you may use any resources to solve the exercises on your Homework. For this course, **the use of AI tools is permitted for homework assignments only, but it is important to understand that you do so at your own risk**, given that you might obtain incorrect answers; and while AI may sometimes provide correct answers, relying solely on these tools **defeats the purpose of homework as a learning tool**. Homework is designed to help you understand and apply the material, which is essential for your success in this course. If you merely copy answers from AI without fully engaging with the problems, **you may find yourself unprepared for in-class evaluations, where NO electronic devices, including AI tools, will be allowed.** Ultimately, this approach could negatively

impact your performance on exams and your overall understanding of the subject.

Academic Integrity: All students have the responsibility to demonstrate honesty and uphold the ethical standards of academic conduct in their academic endeavors. Academic dishonesty will be addressed seriously.

Resources:

- The Mathematics Learning Center (MLC), RBN 4021, is an open access computer lab for math students. There are tutors on duty for several hours each day to assist students, mostly on early-career courses. For more information about the MLC including the tutoring schedule visit: <https://www.uttyler.edu/academics/colleges-schools/arts-sciences/departments/mathematics/math-learning-center>.

University Policies and Resources: See <https://www.uttyler.edu/offices/academic-affairs/files/syllabus-information.pdf> for important information on University policies and resources including Student Accessibility and Resources, student rights and responsibilities, Withdrawing from Class, Incomplete Grade and Grade Appeal Policy, Military Affiliated Students, Students on an F-1 Visa, Academic Honesty and Academic Misconduct, FERPA, Absences Policy, and campus carry.

UT Tyler is proud to be a tobacco-free campus.

Schedule: The following is a TENTATIVE schedule for lectures and is subject to change.

Week	Chapters from class textbook
Week 1 (Aug 26 - Aug 30)	Chapter 1
Week 2 (Set 2 - Sep 6)	Chapter 2
Week 3 (Set 9 - Sep 13)	Chapter 4
Week 4 (Set 16 - Sep 20)	Chapter 5 + Exam 1
Week 5 (Set 23 - Sep 27)	Chapter 6 + Chapter 7
Week 6 (Set 30 - Oct 4)	Chapter 7 cont. + Chapter 8
Week 7 (Oct 7 - Oct 11)	Chapter 8 cont. + Exam 2
Week 8 (Oct 14 - Oct 18)	Chapter 9
Week 9 (Oct 21 - Oct 25)	Chapter 10
Week 10 (Oct 28 - Nov 1)	Chapter 11 + Exam 3
Week 11 (Nov 4 - Nov 8)	Chapter 12
Week 12 (Nov 11 - Nov 15)	Chapter 13
Week 13 (Nov 11 - Nov 15)	Chapter 13 cont.
Week 14 (Nov 18 - Nov 22)	Chapter 14 + Exam 4
Thanksgiving Break	
Week 15 (Dec 2 - Dec 6)	Chapter 14 cont.
Finals Week (Dec 9 - Dec 13)	

A message from your instructor:

To make the most out of the learning journey we are about to embark on, it is important we create an environment in our class that is safe and supportive for everyone to participate and share their input, regardless of race, gender, class, sexual orientation, etc. Both you and I have a duty to treat everyone with respect and courtesy, and you can expect the same treatment for yourself. This will allow for a space in which our individualities enrich the learning process.

The instructor reserves the right to change this syllabus, with due notice to the class, to best benefit the needs of the students.