

MATH 4399-001
Independent Study: Real Analysis I
The University of Texas at Tyler, Fall 2026

Time and Place: MoWeFr 2:30 PM - 3:25PM, HPC 3010

Instructor: Pamela Delgado, Ph.D

Office: RBN 4009

e-mail: pdelgado@uttyler.edu

Office Hours: Tues and Thurs: 9 am to 10:30 am, in my office Room RBN 4009.

Right after class is also a good time to ask me questions, unless I have a previously arranged appointment with other students.

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: Topics include set theory, the real number system, Lebesgue measure, the Lebesgue integral, differentiation and integration, classical Banach spaces.

Prerequisite: MATH 4341 or equivalent.

Textbook: *Measure, Integration and Real Analysis*, by Sheldon Axler. A free PDF of the book can be accessed from the author's website <https://measure.axler.net/>

Grading procedure:

Homework and Quizzes 25%

Exam 1 25%

Exam 2 25%

Final exam 25% (comprehensive)

Grading scale:

A: Greater or equal to 85%, **B:** greater or equal to 70%, strictly less than 85%,

C: greater or equal to 55%, strictly less than 70%, **D:** greater or equal to 40%, strictly less than 55%,

F: strictly less than 40%.

Exam Weeks:

Exam 1: Week of Sep 28th

Exam 2: Week of Nov 2nd

Final exam: Wed Dec 9th, from 2:45 pm to 4:45 pm

Important Dates:

- September 8th. Census date: Last date to withdraw without incurring grades of "W" or "Q".
- October 30th. Last day to withdraw from one or more courses with a W.

For more important dates visit: <https://www.uttyler.edu/academics/academic-calendar-26-27/academic-calendar-15-week-and-summer.php>

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. The lowest homework grade will be dropped. 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 consult any resources to solve the exercises. However, anything you submit must be something you understand and can explain to me or the class.

Solutions to the assigned homework problems may be available online; however, they often use notation, definitions, or methods that differ from those presented in lecture, and may also omit important steps or justifications. For these reasons, such solutions are not acceptable in this 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.

Additional exercises may be assigned throughout the term for practice; these will not count toward your course grade.

Evaluations: We will have two exams and a comprehensive final exam. The weeks of the exams are listed above. Exams will be 2-hours long, outside regular lecture time. We will determine the date and time of exam 1 and exam 2 the first week of classes.

We will also have regular quizzes, which will be announced during the prior lecture. The lowest quiz will be dropped.

Attendance: Students are expected to attend every lecture and to arrive on time. If a lecture is missed, it is the student's responsibility to catch up on the material covered and to find out about any announcements made during class.

Make-up Exams/Evaluations: Make-up evaluations are **only given if you have a legitimate justification; documentation to support your justification must be provided.** Make-up evaluations 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 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 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.

Grade Revision Requests for Evaluations: If you believe there is an error in the grading of an exam, quiz, or other in-class evaluation, you must submit a request for a grade review within three (3) business days of the evaluation being returned to the class. Requests made after this deadline will not be considered. You must also present the original evaluation in good condition (not torn, altered, defaced, or missing pages). I reserve the right to refuse review requests if the evaluation has been damaged or modified in a way that prevents fair re-grading. A grading scale/rubric is always applied, so grade revision requests must be based on a specific grading issue (e.g., points not added correctly, a correct step was overlooked, or your work matches the rubric) and not on a general belief that your grade "should be higher".

On quizzes and exams, incorrect work may be penalized, even if you later arrive at a correct final answer. This is especially important if you present more than one solution/approach for the same problem: if multiple solutions are shown, I will grade what is written, and contradictory or incorrect reasoning can reduce your score. To avoid this, present only the solution you intend to be graded, and clearly cross out any abandoned work.

Learning outcomes: After completing this course, you will be able to:

- Describe Riemann and Lebesgue integration, as well as discuss the differences between and similarities of the two theories.
- Prove classical theorems concerning Lebesgue integration.
- Solve problems in measure theory.

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 5341:

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 only outside of lecture; however, if you choose to use them, you do so at your own risk**, given that you might obtain incorrect answers or answers based on results not studied in class. Even when the answers are correct and consistent with our lectures, 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—and therefore no 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.

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.

- Book Chapters for exam 1: Chapter 1, first part of Chapter 2.
- Book Chapters for exam 2: Second part of Chapter 2, Chapter 3, and first part of Chapter 4.
- Additional Book Chapters for final exam: Second part of Chapter 4, and Chapter 5.

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.