

Real Analysis 1, Mathematics 3345, Section 001
Fall 2024

Instructor: Dr. William Blair

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Course Schedule: Class meets in RBN 03041 MoWeFr 10:10 AM - 11:05 AM.

Course Website: You MUST activate your Canvas account. To do so, go to <https://uttyler.edu/canvas>. This is also the address to login. If you are registered in the course, you already have access to the course. All important documents will be posted on Canvas.

Office hours: MWF 2:00 - 3:00 RBN 4008 (or by appointment)

Required Text: *Understanding Analysis*, 2nd ed, by Stephen Abbott. ISBN: 978-1493927111

Note: There are copies of this book in the department library for you to use.

Course Description: This course is concerned with the rigorous proofs underlying the theory of calculus. We will carefully examine such topics as limits, continuity, differentiation, and integration. Eventually we will have built enough theory to prove some of the deeper results presented in calculus such as the Mean Value Theorem and the Fundamental Theorem of Calculus.

Course Prerequisites: A grade of C or better in MATH 2414 and MATH 3425.

Course Outline: Chapters 1-7 of the text, in part or in full, as time permits

Student Learning Outcomes: By the end of this course, the successful student should be able to:

- Prove facts about convergence and divergence of sequences of real numbers
- Prove facts about continuity, differentiation, and integration of functions
- Construct examples and counterexamples displaying basic properties concerning continuity, differentiation, and integration

Approximate Course Schedule:

Week	Textbook Sections
1 (Aug 26 - 30)	1.1 , 1.2 , 1.3
2 (Sep 2 - 6)	(September 2 is Labor Day holiday, no class) 1.4, 1.5
3 (Sep 9 - 13)	1.6, 2.1, 2.3
4 (Sep 16 - 20)	2.4, 2.5, 2.6
5 (Sep 23 - 27)	(Exam 1 Monday September 23), 2.7, 3.1
6 (Sep 30 - Oct 4)	3.2, 3.3
7 (Oct 7 - 11)	3.4, 4.1, 4.2
8 (Oct 14 - 18)	4.3, 4.4
9 (Oct 21 - 25)	4.5, 4.6, (Exam 2 Friday October 25)
10 (Oct 28 - Nov 1)	5.1, 5.2, 5.3
11 (Nov 4 - 8)	5.4, 6.1, 6.2
12 (Nov 11 - 15)	6.2 continued, 6.3, 6.4
13 (Nov 18 - 22)	6.5, 6.6, (Exam 3 Friday November 22)
* (Nov 25 - 29)	Thanksgiving holiday week (no class)
14 (Dec 2 - 6)	7.1, 7.2, 7.3
15 (Dec 9 - 13)	Finals Week

Grading: Scores will be posted on Canvas. After the end of the semester, final course grades will be available on my.uttyler.edu. A final course grade of 90% is guaranteed to be at least an A, a final course grade of 80% is guaranteed to be at least a B, a final course grade of 70% is guaranteed to be at least a C, and a final course grade of 60% is guaranteed to be at least a D. All grades below D will be F. The breakdown of your final course grade into categories is given below.

Homework: 40%

Midterm exams: 10% each (there will be 3)

Final exam: 30%

If you have any questions about the grading of a particular homework or exam, you must contact me no more than one week after the day I return the graded assignment in class, whether you are present during that class or not.

Attendance: It is your responsibility to attend class. Attendance is mandatory. This means, among other things, coming to class on time and prepared. Before class begins, you should turn off cell phones and any other electronic devices. Students are responsible for all announcements made during lecture.

Homework: One homework assignment will be assigned every Friday and will be due the following Friday. To account for a hectic semester, the lowest homework grade will be dropped. You may submit homework handwritten (so long as it is legible) or typeset using \LaTeX (preferred).

Late homework will NOT be accepted.

Since the grading scheme of this course is different from the typical math class with so much focus on writing, we need to make it clear what is and is not cheating for the purposes of this course.

The following are all perfectly acceptable and even encouraged:

- Working together with other students in class to figure out how to solve a problem.
- Asking tutors at the university such as those at the MLC for help.
- Coming to office hours and asking me for help.
- Copying typesetting techniques for L^AT_EX off the internet, if you choose to T_EX your homework. For example, suppose you want to write something like $\int_a^b f(x) dx$ but cannot figure out how to keep the dx from crowding the $f(x)$. It is perfectly acceptable for you to Google how to do this, copy someone else's L^AT_EX code for this, and paste it into your T_EX file.

The following are NOT allowed and will be considered cheating:

- Copying an answer from another student in class. (In other words, it is fine to work with your friends in class to figure out how to solve a problem, but the solution you write up needs to be your own.)
- Copying an answer from an answer key or website.
- Asking a service, website, or AI tool to solve a problem for you. The penalty for cheating may range from a reduction in score on a homework assignment to failing the course, depending on the severity of the infraction.

Exams: Students should expect to write high quality proofs on all exams. The focus will not be on memorization of terminology nor will the test consist of a series of routine calculations. There will be three midterm exams (approximate dates listed above) and a comprehensive final exam.

Final Assessment: The final exam will very likely be Wednesday December 11 10:15 a.m.-12:15 p.m. If this date/time is inaccurate, the correct one will be provided to you with sufficient time to plan for it.

Cell Phones: Cell phones are not permitted in class. You must silence them and put them away before class begins.

Calculators: You will not be allowed to use a calculator while completing graded assignments.

Absences: Make-ups for **documented** absences that are **required** as part of a UT Tyler obligation (e.g. athletes participating in an event, students 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 and at the sole discretion of the instructor. Prior notification is still required. **Under no circumstances will make-ups be granted without prior notification.** Leaving early for a break is NOT grounds for a make-up, so please make your travel plans accordingly. In almost all cases, missed work will be assigned a 0.

Academic Integrity: Your work must be your own. Violations will be processed according to the established guidelines of the department, college, and university. Violations of academic integrity include, but are not limited to, cheating, fabrication, or plagiarizing. A range of academic sanctions may be taken against a student who engages in academic dishonesty. Below are ideas related to academic integrity.

Resources you are encouraged to utilize in this course include the textbook and unassigned problems, notes from class, assigned homework problems, your fellow Math 3345 students, the Math Learning Center, and your instructor. E-mail is the best way to contact me. I reply to email from 9:00 A.M.–4:00 P.M. Monday–Friday.

A note about a resource NOT allowed in this course: while the internet may be a valuable resource, using it to unethically acquire answers for your work will be considered a violation of academic integrity and processed accordingly. Similarly, copying answers from other students' assignments, past or present, violates the idea that your work must be your own.

University Policies: Monday, September 9 is this semester's Census Date, the deadline for all registrations, schedule changes, and section changes. Monday, November 9 is the last day to withdraw from one or more courses. For university policies concerning Students' Rights and Responsibilities, Grade Replacement/Forgiveness, State-Mandated Course Drop Policy, Disability Services, Student Absence due to Religious Observance, Student Absence for University-Sponsored Events and Activities, Social Security and FERPA Statement, please see the University Policies and Information file on this course's Canvas page.

Course Policy Regarding AI:

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 or 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 this course, AI is **not permitted** in this course at all.

Notice: All policies and information above provide general guidelines for the course and may be amended throughout the course as needed at the discretion of the instructor. Any changes will be directly communicated to students through email, announcement in Canvas, or verbally in the classroom.