

ECO s395M

Real Analysis

Summer 2025, Second Session – Unique IDs 79250 and 79255

Instructor: Dr. Kirk Blazek
Lecture: MTWTh 9:00-10:45 in RLP 1.104
Summer Office: BRB 3.134K
(Rest of the year) PMA 13.140
Email: blazek@math.utexas.edu
Office Hours: MTWTh 8:00-9:00
and 12:45-1:30
TA: Xinrong Liu
TA's Office: BRB 3.120
TA's Office Hours: Tuesday 1-2pm and Friday 12-1pm
TA's Review Session: Friday 9:30-10:30 in RLP 1.104
TA's Email: xinrong.liu@utexas.edu

Catalog Description: This is an introductory course in real analysis. The main topics covered will be properties of Euclidean spaces, metric spaces, compactness, and rigorous treatments of continuity, single-variable differentiation and integration, and sequences and series of real-valued functions. Be aware that *this is a rigorous class focused on proofs and an abstract approach to mathematics.*

Prerequisites: There is no official prerequisite for this class, though you are expected to have some familiarity with proof techniques. Please speak with the instructor if you are unsure whether or not you are prepared to take this course.

Text: (Required) Lay, Stephen, *Analysis, with an Introduction to Proof*, 6th edition, Pearson, 2014.

(Recommended) Rudin, Walter, *Principles of Mathematical Analysis*, McGraw-Hill, 1976.

(Recommended) Ok Efe, *Real Analysis with Economic Applications*, Princeton, 2007.

(Recommended) Galovich, Steven, *Doing Mathematics: An Introduction to Proofs and Problem Solving*, 2nd edition, Thomson/Brooks Cole, 2007.

Review Sessions: Every Friday there will be a review session led by the TA. The purpose is to answer homework questions and help to explain and expand topics if you have any trouble. This is a challenging class, and the TA is there not just to talk about homework, but to give a different perspective on the topics. There can be numerous ways to approach the concepts from class, and the TA will be there to provide another point of view.

Homework: Problem sets will be assigned twice a week. Homework will be due on Tuesdays and Fridays (except for the first Tuesday of the course). Partial credit will be awarded, but remember that in order to receive full credit your work must be clear enough to be read and understood by others. You may collaborate on the problems, but your final write-ups must be your own work. Copied solutions are unacceptable.

Late Policy: Homework is due in class the day it's due, and will not be accepted late. The lowest homework grade at the end of the course will be dropped. If you are unsure if you will be able to attend class to turn in the homework on time, you should make arrangements to turn it in early or have someone bring it for you.

Exams: This course will have a midterm and a final. The midterm will be given on July 30th in class at the usual time and the final will be on Friday, August 15th from 4-7pm. Exams must be taken with no outside assistance, whether written, electronic, or otherwise.

Makeup Exams: If you are going to miss an exam, you must let me know *immediately* in order to discuss possible arrangements.

Emergencies: If an emergency situation comes up that will result in you being unable to turn in an assignment or exam, please let me know as soon as possible so we can try to work something out.

Grading: The overall grade will be determined by the exams given during the class as well as the homework.

30%	Midterm
40%	Final Exam
30%	Homework
100%	Total

Honor Code: The core values of the University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the University is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community.

Students with Disabilities: If you are a student with a disability, or think you may have a disability, please contact Disability and Access (D&A) to determine your eligibility for accommodations. You may refer to D&A's website for contact and more information. If you are already registered with D&A, please deliver your accommodation letter to me as early as possible so we can discuss your approved accommodations.

Schedule (Subject to Change):

- **July 14th:** Chapters 1 and 2- Preliminaries and review of some fundamental concepts
- **July 15th:** 3.1-3.2 - Induction and Ordered Fields
- **July 16th:** 3.3-3.4 - Completeness
- **July 17th:** 3.4 - The Topology of \mathbb{R}
- **July 21st:** 3.5-3.6 - Compact Sets and Metric Spaces
- **July 22nd:** 4.1-4.2 - Convergence of Sequences
- **July 23rd:** 4.3-4.4 - Monotone Sequences, Cauchy Sequences, and Subsequences
- **July 24th:** 5.1 - Limits of Functions
- **July 28th:** 5.2-5.3 - Continuity of Functions
- **July 29th:** 5.4-5.5 - Uniform Continuity and Continuity in Metric Spaces
- **July 30th:** Midterm
- **July 31st:** 6.1 - The Derivative
- **August 4th:** 6.2-6.3 - The Mean Value Theorem and l'Hospital's Rule

- **August 5th:** 6.4 - Taylor's Theorem
- **August 6th:** 7.1-7.2 - The Riemann Integral
- **August 7th:** 7.3 - The Fundamental Theorem of Calculus
- **August 11th:** 8.1-8.2 - Infinite Series
- **August 12th:** 9.1, 9.2 - Uniform Convergence of Functions
- **August 13th:** 8.3, 9.3 - Applications of Power Series
- **August 14th:** Review
- **August 15th:** Final Exam