Math 3150: Analysis I

Basic Information

Instructor: Luke Rogers
Instructor's Office Hours: Tuesdays 1-3pm in MSB414, or by appointment.
Lectures: Tuesdays and Thursdays, 9:30-10:45 in MSB211.
Textbook: Analysis I, by Terence Tao.
Exams: Midterm 1 in class Tuesday 9/30, Midterm 2 in class Thursday 11/6, Final
Grading Scheme: Homeworks 20%, Midterms 20% each, Final 40%.

What is expected of you

It is expected that you will attend all classes, midterms and exams and submit all homework on time. You are also expected to read the book outside class. Reading to be completed before each class is listed in the schedule. Anything mentioned in class may appear on an exam, whether or not it is in the book. Anything in the sections of the book that are listed on the schedule below may appear on an exam, whether or not it was discussed in class. It cannot be emphasized too much that mathematics is learned by doing, so the work you do outside class will be critical to your success in this course.

Final Exam

The final exam is on Friday December 12th from 10:30 AM until 12:30 PM in MSB 211. If for any reason you cannot attend the final, you must contact the Dean of Students office. The focus of the material on the exam will be on Chapters 6,7,9,and 10. You may now download the Solutions.

Office Hours before final

I plan to be in my office from 9am-5pm on Tuesday, Wednesday and Thursday before the exam, except on Wednesday 1pm-2:45pm when I have a meeting I must attend. You can come see me anytime. At times there may be a note on the door with directions to another location where you can find me.

Planned Schedule

Date	Topics	Before Class Reading	Exercises
Tuesday 8/26	Natural Numbers	Chapter 2.1, 2.2	2.2.1-2.2.5, due 9/4
Thursday 8/28	Multiplication	Chapter 2.2, 2.3	2.3.1-2.3.5, due 9/4 Solutions
Tuesday 9/2	Integers and Rationals	Sections 4.1, 4.2	4.1:2,3,5,6. 4.2:1,4,6. Due 9/11
Thursday 9/4	Absolute value, exponential	Sections 4.3, 4.4	4.3.2, 4.4.1, 4.4.2, due 9/11 Solutions
Tuesday 9/9	Review Homework		
Thursday 9/11	Functions, images and inverse images, cartesian products	Sections 3.3-3.5	3.3.2, 3.3.5, 3.3.7, 3.4.1, 3.4.3, 3.5.4, 3.5.5 due 9/18 Solutions

	Cauchy sequences	Sections 5.1, 5.2	5.1.1, 5.2.2, due 9/25
	Construction and ordering of reals	Sections 5.3, 5.4	5.3.4, 5.3.5, 5.4.1, 5.4.4, due 9/25 Recommended: 5.3.2, 5.4.3, 5.4.5, 5.4.8 Solutions
Tuesday 9/30	Midterm 1	Covers Chapters 2 and 4 and maybe some of 3	Solutions
	Least upper bounds, rational powers of reals.	Sections 5.5, 5.6	5.5.2, 5.5.3, 5.6.1, 5.6.2, due 10/16 Hint for Exercise 5.6.1
	Sequences and limits	Sections 6.1, 6.2	6.1.2, 6.1.5, due 10/16 Recommended: 6.1.8, 6.1.9 Solutions
	Sup, inf, limsup, liminf, standard limits.	Sections 6.3-6.5	6.2.2, 6.3.2, 6.3.3, 6.4.4, 6.4.6, 6.5.3 due 10/30 Recommended, 6.4.3, 6.4.7
	Subseqences, Bolzano-Weierstrass, Real powers of reals	Sections 6.6, 6.7	6.6.5, due 10/30 Solutions
10/23, 10/28	Series	Sections 7.1-7.3	7.1.5, 7.2.3, 7.2.6, 7.3.3 Due 11/13
Thursday 10/30	Rearrangement of series, convergence tests	Sections 7.4-7.5	7.5.2, 7.5.3 Due 11/13 Solutions
Tuesday 11/4	Limit points, Heine-Borel theorem, Limiting values of functions	Sections 9.1-9.3	9.1.3, 9.1.12, 9.1.13, 9.2.1, 9.3.1 Due 11/20 Recommended: 9.1.5, 9.3.2 Solutions
Thursday 11/6	Midterm 2	Covers up to end of Chapter 6	
11/11, 11/13	Continuity, left and right limits, maximum value theorem	Sections 9.4-9.6	9.4.1, 9.6.1 Due 12/4
11/19, 11/21	Intermediate value theorem, Monotonic functions	Sections 9.7, 9.8	9.7.2, 9.8.2, 9.8.3 Due 12/4 Solutions Recommended: 9.8.5
Tuesday 11/25	Thanksgiving Break		
Thursday 11/27	Thanksgiving Break		
Tuesday 12/2	Uniform continuity	Section 9.9	Recommended 9.9.3, 9.9.4
Thursday 12/4	Derivatives, mean value theorem	Sections 10.1, 10.2, 10.3	Recommended, 10.1.2, 10.1.7, 10.2.1, 10.2.2, 10.2.6, 10.3.5 Solutions
	Monotonicity and derivative, Inverse function theorem	Sections 10.3, 10.4	