

18.100A REAL ANALYSIS

Spring 2018

Class schedule. TR 9:30 - 11:00 am (Building 4-163)

Website. <https://math.mit.edu/~choiks/18100A.html>

Instructor. Kyeongsu Choi (choiks@mit.edu)

TA. David Corwin (corwind@mit.edu), Campbell Hewett (chewett@mit.edu)

Office hours.

Choi: Tuesday 11 am–noon, Wednesday 2:30–4 pm (Building 2-252B)

Corwin: Monday 11 am–noon, Tuesday 2–3 pm (Building 2-239A)

Campbell: Thursday 3–5 pm (Building 2-231D)

Textbook. *Introduction to Analysis*, A. Mattuck.

Course description. This course provides an introduction to analysis, and the goal is to learn how to prove mathematical theorems in analysis and how to write the proofs in a rigorous way. It is primarily for students with no prior experience with this.

The proofs of one-variable calculus theorems will be discussed with an emphasis in using inequalities. The course will then proceed to uniform convergence of functions and point-set topology.

Problem Sets. The assignments will be posted on Stellar and the course website. They should be handed in Thursday class, submitted on Stellar, or submitted at the problem set box in front to the room 4–174. The graded assignments will be returned the following Thursday.

Exams. There will be one in-class midterm on [Thursday March 22](#). The final exam will take place [Tuesday May 22 1:30PM - 4:30PM Room 4-163](#).

Course grade. P-sets: (1/2), 1.5-hour midterm: (1/6), 3-hour final: (1/3)

Course schedule

1	T	Feb 6	Chap. 1, 2.1-3	Sequences; completeness; estimations
2	R	Feb 8	Chap. 2.4-6, 3	Approximations; limit
3	T	Feb 13	Chap. 4.1-2, 5.1-4	Error terms; limit theorems
4	R	Feb 15	Chap. 5.5, 6.1-2	Subsequences; cluster points (P-1 due)
	T	Feb 20		Monday schedule of classes to be held
5	R	Feb 22	Chap. 6.3-5	B-W theorem, Cauchy sequences
6	T	Feb 27	Chap. 6.5-7.1	Completeness of sets, Test for divergence
7	R	Mar 1	Chap. 7.2-7.3	Absolute convergence (P-2 due)
8	T	Mar 6	Chap. 7.4-6,	Convergence tests
9	R	Mar 8	Chap. 8.1, 9, 10, 11.1	Power series, Continuity
10	T	Mar 13		Canceled due to winter storm
11	R	Mar 15	Chap. 11.2-6,	Limit of functions
12	T	Mar 20	Chap. 12.1-2, 13.1-3	Intermediate-value theorem, Compact intervals
13	R	Mar 22		Midterm 1 (P-3 due)
	TR	Mar 27–29		Spring Break
14	T	Apr 3	Chap. 13.4-5	Uniform continuity
15	R	Apr 5	Chap. 14, 15	Differentiation (P-4 due)
16	T	Apr 10	Chap. 16, 17	Linearization and Taylor approximation
17	R	Apr 12	Chap. 18, 19	Integrability
	T	Apr 17		Patriots Day
18	R	Apr 19	Chap. 19	the Riemann Integral(P-5 due)
19	T	Apr 24	Chap. 20, 21	FTC, Improper integrals
20	R	Apr 26	Chap. 21	Improper integrals
21	T	May 1	Chap. 22	Uniform convergence
22	R	May 3	Chap. 24	Continuous functions on the plane (P-6 due)
23	T	May 8	Chap. 25	Point-set topology
24	R	May 10	Chap. 25	Point-set topology (P-7 due)
25	T	May 15		Review
26	R	May 17		Review
27	T	May 22		Final (Room 4-163, 1:30PM - 4:30PM)