Math 131A: Real Analysis, Lecture 3

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Course Webpage: www.math.ucla.edu/~hendricks/Math131A.html

Location and Time: MWF 11-11:50, MS 6229. TA Discussion Section R 11-11:50, MS 6229.

Content: This course is a rigorous introduction to real numbers and real analysis, point-set topology in Euclidean space, functions, and continuity. It is intended as a first course in abstract mathematics, and will focus on building skills in reading and writing proofs.

Textbook: K.A. Ross, *Elementary Analysis: The Theory of Calculus.* Springer–Verlag 1980. **Second Edition.**

Prerequisites: Math 32B or 33B (or equivalent). Math 115A is recommended.

Homework: Homework will be assigned weekly and due at the beginning of Friday's lecture. Homework must be stapled and contain your name, the assignment number, and "Math 131A" on the first page, or it will not be accepted. Do not submit homework by e-mail. **No late homework will be accepted.** However, your lowest homework score will be dropped when computing your grade.

Working in groups on homework is highly encouraged, but you must write up all solutions yourself and write down with whom you worked at the top of each assignment.

Exams: There will be two in-class midterms, tentatively scheduled for Monday, October 21 and **Friday, November 15**. There will also be a final exam **Wednesday December 11, 8:00-11:00 a.m.** Make-up exams are strongly discouraged, and should not be needed given the grading system. If you have extraordinary circumstances, contact me as soon as possible (preferably the week before) so we can discuss alternate arrangements.

Grading: Your grade will be one of the following, whichever is higher:

- Homework: 20%, Midterms 1 & 2: 20% each, Final: 40%
- Homework: 20%, Highest Midterm: 20%, Final: 60%

A reasonable curve will be applied to the final scores.

Schedule: We will approximately follow the schedule of topics at http://www.math.ucla.edu/ugrad/courses/math131abc/131Aoutline.shtml , replicated here for your convenience.

Week	Section	Topics
1	1,2	Induction and Rational Numbers.
2	3,4,5	Real Numbers, Least Upper Bound Axiom, ± &infin
3	7,8,9	Limits of Sequences, Limit Theorems.
4	10	Monotone Sequences, Cauchy Sequences, Midterm I.
5	11,12	Subsequences, Bolzano-Weierstrass, Limsup and Liminf.
6	14(*1),15, 17	Convergence Tests, Continuous Functions.
7	18,19,20	Limit Theorems, Uniform Continuity.
8	28,29	Derivative, Mean Value Theorem, Midterm II.
9	31,32,33	Taylor's Theorem, Riemann Integral, Properties of Riemann Integral.
10	34	Fundamental Theorem of Calculus, Review of Course.