

MATH 4331
Introduction to Real Analysis
Fall 2013

- Class:** Tu&Th 2:30-3:50pm, CBB108
- Instructor:** Bernhard Bodmann, *bgb@math.uh.edu*
- Office:** PGH 604; Tu 11am-noon, W 1-2pm,
- TA:** Alex Bearden, *cabearde@math.uh.edu*
- Objectives:** This course provides a rigorous introduction to deeper properties of the real numbers, continuous functions, and differentiability needed for advanced study in mathematics, science and engineering. It is assumed that the student is familiar with the material of Math 3333, including an introduction to the real numbers, basic properties of continuous and differentiable functions on the real line, and an ability to do epsilon-delta proofs.
- Contents:**
- | <i>Topic</i> | <i>Approx. Time</i> |
|--|---------------------|
| The topology of \mathbb{R}^n | 1 week |
| Limits, continuity and compactness | 1 week |
| Monotonicity and intermediate values | 1 week |
| Differentiation and the Riemann Integral | 2 weeks |
| Normed vector spaces | 2 weeks |
| Limits of functions | 2 weeks |
| Metric spaces | 1 week |
| Dynamical systems and contractions | 2 weeks |
| Differential equations and fixed points | 1 week |
- Prerequisites:** Math 3333 or 3334, as well as Math 3325.
- Text:** Kenneth Davidson and Allan Donsig, “Real Analysis with Applications: Theory in Practice”, Springer, 2010; or (out of print) Kenneth Davidson and Allan Donsig, “Real Analysis with Real Applications”, Prentice Hall, 2001.
- Exams:** Midterms: October 8 and November 12, 2013; in-class exams. Final exam (cumulative), date to be announced by the registrar.
- Assignments:** You will be asked to hand in approximately ten assignments, which will be due on Thursdays in the lecture. Solutions will be posted online.
- Final Grade:** Final exam contributes 30%, midterms 20% each, assignments 30%. All grades are summed and divided by the total number of points you can collect in the course. A percentage of 46% or more is D- , 54% or more is D, 62% or more is C, 70% is B-, 77% is B, 85% or more is A- , of 90% or more is A.