

**MATH 4332/6313**  
**Introduction to Real Analysis, Part II**  
**Spring 2018**

**Class:** Tu&Th 8:30-9:50am, C 106

**Instructor:** Bernhard Bodmann, *bgb@math.uh.edu*

**Office:** PGH 604; Tu 10-11am, Wed 2-3pm,

**Objectives:** This course continues the rigorous introduction to deeper properties of the real numbers, continuous functions, and differentiability needed for advanced study in mathematics, science and engineering. As a continuation of Math 4331/6312, it focuses more on applications of the fundamental concepts. Topics covered are metric spaces, completeness, polynomial approximations, the contraction mapping principle, differential equations, Fourier analysis and convex optimization.

<b>Contents:</b>	<i>Topic</i>	<i>Approx. Time</i>
	Metric spaces and completeness	3 weeks
	Approximation in polynomial spaces	2 weeks
	Dynamical systems and contractions	2 weeks
	Differential equations	1 week
	Fourier series and approximation	3 weeks
	Convexity and optimization	1 week

**Prerequisites:** Math 4331 or 6312.

**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: March 1 and April 5, 2018; 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.

**Disabilities:**

If there are aspects of the instruction or design of this course that result in barriers to your inclusion or accurate assessment or achievement, please notify the instructor as soon as possible. Students are also welcome to contact the Center for Students with DisABILITIES at 713-743-5400 or uhcsd@central.uh.edu to discuss a range of options to removing barriers in the course, including reasonable academic adjustments/auxiliary aids in accordance with the Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 guidelines.

**Counseling:**

Counseling and Psychological Services (CAPS) can help students who are having difficulties managing stress, adjusting to college, or feeling sad and hopeless. You can reach CAPS ([www.uh.edu/caps](http://www.uh.edu/caps)) by calling 713-743-5454 during and after business hours for routine appointments or if you or someone you know is in crisis. No appointment is necessary for the “Let’s Talk” program, a drop-in consultation service at convenient locations and hours around campus. [http://www.uh.edu/caps/outreach/lets\\_talk.html](http://www.uh.edu/caps/outreach/lets_talk.html)