MATH 4332

Introduction to Real Analysis, Part II
Spring 2016

Class: Tu&Th 2:30-3:50pm, F 154
Instructor: Bernhard Bodmann, bgb@math.uh.edu
Office: PGH 604; Tu 12-1pm, Wed 1-2pm,
TA: Alex Bearden, cabearde@math.uh.edu

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, 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.

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<th>Topic</th>
<th>Approx. Time</th>
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<tr>
<td>Metric spaces and completeness</td>
<td>3 weeks</td>
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<tr>
<td>Approximation in polynomial spaces</td>
<td>2 weeks</td>
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<td>Dynamical systems and contractions</td>
<td>2 weeks</td>
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<td>Differential equations</td>
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<td>Fourier series and approximation</td>
<td>3 weeks</td>
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<td>Convexity and optimization</td>
<td>1 week</td>
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Prerequisites: Math 4331.

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

Exams: Midterms: February 25 and March 31, 2016; 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.