Spring 2013 advanced calculus MAA 4211, Zweibel DM428 3053483479 zweibelj@fiu.edu
Office hours: MW 1505-1545 and 1705-1800, or by appointment
Prerequisites: C in "linear algebra" and "introduction to advanced mathematics"

Course description: A study of limit operations using logic and properties of the real numbers
Course objective: A rigorous understanding of 1 variable calculus
Course outcome: The successful student will develop some facility at applying logic
and properties of the real numbers to giving written proofs of facts about 1 variable calculus


Course outline: (1) integers, induction, rational numbers, completeness of \( \mathbb{Q} \), real numbers, completeness of \( \mathbb{R} \) (chapter 1, appendix 2.1-2.14); (2) metric spaces: open subsets, closed subsets, compactness, completeness, connectedness (2.15-2.47, 3.1-3.12); (3) numerical sequences and series (3.13-3.37, 3.45); (4) limits of functions, continuity of functions (chapter 4); (5) differentiability of functions, mean value theorem, Taylor’s theorem (5.1-5.15); (6) Stieltjes integral, fundamental theorem of calculus (6.1-6.22); (7) sequences and series of functions, uniform convergence (7.1-7.13, 7.16-7.18, 3.38-3.40, 8.1, 8.3-8.5); (8) elementary transcendental functions (8.6, 8.7); and if possible: (9) fundamental theorem of algebra (8.8); (10) summation by parts (3.41-3.44, 3.46-3.51, 8.2).

Exams: 3 100 point exams, on 2/14 and 3/18 and 4/15, and a 200 point comprehensive final exam on 5/1. Use of calculators, books, notes, or electronic devices on exams is prohibited. Absence from an exam will result in a score of 0 for that exam, unless the absence is caused by circumstances which are beyond the student’s control, and these circumstances are verified by documentation from an appropriate authority (not a family member). If this occurs then a make-up exam will be given.

Grading scale: A=450, A-=425, B+=400, B=375, B-=350, C+=325, C=300