

Spring 2012, Advanced Calculus, MAA4211, Zweibel, DM428, 3053483479, zweibelj@fiu.edu

Office hours: TR 2-3, 4-4:45, or by appointment

Prerequisites: $\geq C$ in "linear algebra" and "introduction to advanced mathematics"

Exams: 2 100 point exams, on 2/14 and 4/3, and a comprehensive final exam, worth 160 points, on 4/24 at 12-2. 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=324; A-=306; B+=288; B=270; B-=252; C+=234; C=216

Course description: A study of limit operations, using 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 explanations of facts about 1 variable calculus

Text: Walter Rudin, Principles of Mathematical Analysis, 3rd ed., McGraw-Hill,

ISBN 9780070542358

Course outline: (1) real numbers, completeness of \mathbb{R} , topology (chapter 1, 2.1-2.30); (2) limit operations (including differentiation, integration, summation of infinite series), continuity (3.1-3.5, 3.13-3.21, 3.23, 3.24, 3.26-3.32, 4.1-4.12, 4.25-4.34, 5.1-5.6, 6.1-6.7, 6.12-6.16, 6.20); (3) compactness, uniform continuity, extreme-value theorem, integrability criteria, fundamental theorem of calculus (2.31-2.34, 3.5-3.7, 4.13-4.21, 5.7-5.15, 6.8-6.11, 6.17-6.19, 6.21, 6.22); (4) completeness, Cauchy criterion, convergence tests, uniform convergence, interchange of limit operations (3.8-3.12, 3.22, 3.25, 3.33-3.51, 7.1-7.13, 7.16-7.18, 8.1-8.8); (5) connectedness, intermediate value theorem (2.45-2.47, 4.22-4.24)