Course information

- Course: Mathematics 140C MWF 10:00–10:50 MSTB 118 (SPRING 2007)
  Webpage for the course: *www.math.uci.edu/∼brusso*
- Prerequisite: Math 140AB. Rigorous study of differentiation and integration of real-valued functions of one real variable. All of this can be found in the six chapters of the text for 140AB, namely, *Elementary Analysis:The Theory of the Calculus*, by Kenneth A. Ross. This includes the set of real numbers and the completeness axiom; sequences of real numbers, continuity, uniform continuity, sequences and series of functions, differentiation and integration up to the fundamental theorem of calculus.
- Instructor: Bernard Russo MSTB 263 Office Hours MWF 11:00-11:42 and by appointment (appointments can be arranged by email—*brusso@uci.edu*)
- Discussion section: TuTh 10:00–10:50 MSTB 120
- Teaching Assistant: TBA
- Homework: There will be approximately 30 assignments with about one week's notice before the due date. Most, but not all of these assignments will be from the textbook (Buck).
- Grading: The in-class exams are "closed book and notes." Homework and take home midterm are "open book and notes".

First midterm (in class)	April 25 (Wednesday of week 4)	20 percent
Second midterm (take home)	May 23 (approx)(Wednesday of week 8)	20 percent
Final Exam (in class)	June 11 10:30-12:30 (Monday)	40 percent
Homework	approximately 30 assignments	20 percent

- Holiday: Monday May 28
- Text: R. C. Buck, Advanced Calculus — Two copies of this text will be on reserve in the Science Library. If you are willing to use these reserve copies to access the homework assignments, you do not need to purchase the text (it's about $70 and it is definitely worth having as a reference for advanced calculus if you are planning to go to graduate school in mathematics). The reason is that all proofs done in class will be posted on my webpage. In fact, if you consult the previous versions of the course that I taught in Fall 05 and Fall 06, you will find the 60 page notes there (I call them "Minutes of the Meetings"). Our course will follow the material in these notes rather closely.
- Material to be Covered. (Page numbers refer to the text Buck)

  Schwarz inequality Theorem 1, page 13 (1 lecture)

  topology §1.5 pp 28–33: open, closed, boundary, interior, exterior, closure, neighborhood, cluster point (5 lectures)

  compactness §1.8 pp 64–67: Heine-Borel and Bolzano-Weierstrass properties (Theorems 25,26,27, page 65) (3 lectures)

  continuity §§2.2–2.4: Uniform continuity, extreme value theorems (Theorems 1,2,6,10,11,13 on pages 73,74,,84,90,91,93) (3 lectures)

  differentiation (of functions) §3.3: Implies continuity, characterization by approximation (Corollary, page 129 and Theorem 8, page 131) (2 lectures)

  integration §4.2: Integrability of continuous functions (Theorems 1,4 on pages 169,176) (5 lectures)

  differentiation (of transformations) §§7.2–7.6: Boundedness of linear transformations, characterization by approximation, chain rule, mean value theorem, inverse function theorem, implicit function theorem (Theorems 5,8,10,11,12,16,17,18 on pages 335,338,344,346,350,358,363,364) (9 lectures)