Math 1540 - Advanced Calculus 2
Guidelines and Syllabus

Course Overview: The primary goal of this two-semester sequence is to prepare students for the preliminary examination in analysis. As such, its syllabus is identical to that of the exam, which is reproduced at the bottom of this document. Prior exams and other material may be viewed at:

`http://www.mathematics.pitt.edu/graduate/enrolled-students/graduate-handbook`

This second semester will cover uniform convergence, and several variables and vector analysis.

Instructor: Jason DeBlois. My office is Thackeray 407, and my email is `jdeblois@pitt.edu`.
Course website: `http://www.pitt.edu/~jdeblois/S17_acalc.html`
Office Hours: TBD. Check the course website.

Textbook: *Real Mathematical Analysis* (2nd edition), by Charles C. Pugh. (The first edition is also ok.) Supplementary texts (not required):

- *Elementary Classical Analysis*, by Marsden and Hoffman
- *Principles of Mathematical Analysis*, by Walter Rudin

Grades: Your course grade will be determined as follows:

- Homework, 30%. (Assigned and collected weekly.)
- Midterms 1 and 2, 20% each.
- Final exam, 30%.

Academic Integrity: You are encouraged to work on problems with your fellow students, and you may seek inspiration on the web or elsewhere. **But your written solutions to homework and test problems must be your own.** On any assignment, if I discover that you have copied a solution from the web, another student, or any other source, then you will receive a zero score for the entire assignment. If it happens repeatedly, you will fail the course.

Preliminary exam syllabus

(with first semester topics struck through)

Metric spaces: ~~open and closed sets~~, ~~convergence~~, ~~compactness~~, ~~connectedness~~, ~~completeness~~, ~~continuity~~, ~~uniform continuity~~, uniform convergence, equicontinuity and the Ascoli-Arzela Theorem, contraction mapping theorem.

Single variable analysis: ~~numerical sequences and~~ series, ~~differentiation~~, ~~mean value theorem~~, ~~Taylor's theorem~~, function series and power series, uniform convergence and differentiability, Weierstrass approximation theorem, ~~Riemann integral~~, ~~sets of measure zero~~.

Several variables analysis: differentiability, partial derivatives, inverse and implicit function theorems, iterated integrals, Jacobians, change of variable in multiple integrals.

Vector analysis: Stokes theorem, Green's theorem, divergence theorem.