

Math 360: Advanced Calculus I
Fall 2013
TTh 12–1:30, DRL 4C6

Instructor	Teaching Assistant
Philip Gressman	Haggai Nuchi
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Office Hours: W 5:45–6:30 Th 4:30–5:30 or by appointment	Office Hours: M 4:15–5:15 Th 3:20–4:20
Lab Sessions:	
101: M 6:30–8:30 DRL 4C6 102: W 6:30–8:30 DRL 4C6	

Course Description: From the registrar: “A study of the foundations of the differential and integral calculus, including the real numbers and elementary topology, continuous and differentiable functions, uniform convergence of series of functions, and inverse and implicit function theorems. MATH 508-509 is a masters level version of this course.”

This course is an introduction to the rigorous mathematical reasoning underlying single variable calculus. The facts we encounter in this course (the Intermediate Value Theorem, Mean Value Theorem, L’Hospital’s Rule, and so on) should already be familiar to you. What is likely unfamiliar to you are the proofs of these statements. Successful students in this course will, *through extensive practice*, develop the skills necessary to read, understand, and create mathematical proofs.

Prerequisite: Math 240 or equivalent.

Text: Principles of Mathematical Analysis, 3rd edition, by Walter Rudin. We will cover most of the material in chapters 1–8.

Website: Course materials will be posted on Canvas: <<https://upenn.instructure.com/>>.

Homework: This course will feature weekly homework assignments. Submissions must be submitted to Haggai before 2pm on Friday. Other relevant facts and expectations about homework:

- For practical and environmental purposes, paper copies of the assignments will not be distributed; instead, the assignments will be posted in .pdf format on the course website, roughly one week before the due date.
- In formulating responses to the homework questions, style matters:
 - Each response should begin with a statement explaining what you intend to show and/or what question is being answered.
 - Each response should be organized according to the rules of English composition (i.e., with complete sentences, organized paragraphs, punctuation, and the like). When you incorporate mathematical symbols into writing, the key point to consider is whether the english and the symbols combined make complete and meaningful sentences when read aloud.
 - This course is an excellent time to learn to use the mathematical typesetting software known as \LaTeX . It is free, open-source, available on essentially all computing platforms, and more widely-used than all other options combined. Some of the more common software options include:
 - * LyX (free, all major platforms) – WYSIWYG editor
 - * TeXnicCenter (free, all major platforms)
 - * Scientific Workplace (paid software)
 - * TeXShop (free, Mac only)
 - * various others <http://en.wikipedia.org/wiki/Comparison_of_TeX_editors>

I will post \LaTeX templates on the course website. You are still free to submit hand-written work, but Haggai has permission to assign a score of zero to submissions which are difficult to read.

- As the writer of a proof, the burden is on you to persuade your reader. Good proof-writers always provide thorough explanations of their reasoning rather than leaving the reader to fill in gaps.

Each homework will be specifically graded for both accuracy and style. For full points, homework answers must not only be accurate, but neat, persuasive, and well-written.

- *Late assignments will only be accepted under truly unusual circumstances.*
- You are encouraged to work together on the homework and come to office hours, etc. However, homework assignments must be written up independently, in your own words. *Any significant deviations from this rule will be considered cheating.*
- This textbook is perhaps one of the most commonly-used mathematical textbooks in the world. As such, solution manuals are easy to find online. DO NOT USE THEM. Reading proofs is much easier than writing proofs; solution manuals have nothing to teach about *finding* solutions (which is a much more important issue than merely *knowing* solutions). If you're not convinced that solution manuals are potentially harmful to you, google "overconfidence effect" or "illusion of understanding."

Exams: There will be two in-class exams tentatively scheduled on Tuesday, October 1, and Thursday, November 7. The final exam will be Wednesday, December 18, 12:00–2:00 (room TBA). Missing a midterm exam is a serious issue. Depending on circumstances, you may or may not be allowed to make up a missed midterm exam. The rules for a missed final exam are set by the Provost and are available online.

Lab: Attendance and participation in your lab section is mandatory. Participation includes presenting your work at the board when asked to do so.

Grading: Your grade for the course will be based on numerical scores for homework and lab sessions (40%), midterm 1 (15%), midterm 2 (20%), the final exam (25%).

Significant Dates

Wednesday	August 28	No Lab
Monday	September 2	No Lab (Labor Day)
Wednesday	September 4	No Lab (Rosh Hashanah)
Tuesday	October 1	Midterm 1, in class
Thursday	October 10	No class (Fall Break)
Thursday	November 7	Midterm 2, in class
Monday	November 25	No Lab
Wednesday	November 27	No Lab
Thursday	November 28	No class (Thanksgiving)
Wednesday	December 18	Final Exam, 12pm–2pm