

**Math 325-001 - Elementary Analysis****Spring 2009**

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 Office Hours: 11:00 to noon, MWF

**Textbook** *Elementary Analysis: The Theory of Calculus*  
 Kenneth A. Ross, Springer, 1980, ISBN: 0-387-90459-X.

**Final Exam** Wednesday May 6, 3:30 to 5:30 pm

You are welcome to drop by outside of office hours although I may be busy (in which case we can make an appointment), or out of the office (leave a message, preferably using email).

**Course Summary.** This course is an introduction to two aspects of mathematics:

- (1) **the basic ideas of analysis**, which not only underlie calculus, but are also widely used in modern mathematics, both pure and applied.
- (2) **proofs and abstraction**, meaning understanding and writing proofs, which includes constructing examples. Proofs are *the* defining characteristic of mathematics.

The focus on proofs makes the course more abstract than earlier courses and we'll spend some time on how to find and present proofs. In terms of material, we'll cover almost all of the non-starred sections in the first five chapters and perhaps a few sections from Chapter VI. This course is excellent preparation for senior or graduate math courses.

**Other References.** These are other books that treat either the course material in a somewhat different way or discuss ways of finding and presenting proofs.

- Analysis:**
- *Calculus*, Tom M. Apostol, Blaisdell Publishing Co., 2nd ed., 1967.
  - *A First Course in Real Analysis*, 2nd ed., M.H. Protter, C.B. Morrey, Springer, 1977.
  - *Calculus*, Michael Spivak, 4th ed., Publish or Perish, Inc., 2008.
- Proofs & Abstraction:**
- *How to Read and Do Proofs*, Daniel Solow, Wiley, 1982.
  - *How to Solve It*, G. Polya, Princeton Univ. Press, 2nd ed., 1957.
  - *Chapter Zero*, 2nd ed., Carol Schumacher, Addison Wesley, 2001.

**Grading.** I expect  $n$  and  $m$  to be between 12 and 15.

comprehensive final exam	150	150
2 mid-term exams	100 each	200
$n$ weekly assignments	$225/n$ each	225
$m$ weekly quizzes	$25/m$ each	25
total		600

**Grade Scale.** I may lower the following cutoffs.

A+	555	B+	470	C+	410	D+	350
A	510	B	450	C	390	D	330
A-	490	B-	430	C-	370	D-	310

**Expectations.** Performance at a high level is expected. At a minimum, this means knowing the material from the prerequisite courses, reading the textbook before lectures, taking notes during lectures, and doing the homework afterward. If you want to pass this class, plan to spend an average of two hours outside the class for every hour in class.

**Exams.** There will be two midterm exams, one in mid to late February and another at the end of March. Each will be two hours at a mutually convenient time outside of class. The final will be comprehensive, with a slightly higher emphasis on the material since the last midterm.

Makeup tests will be given only for University sanctioned reasons and require documentation.

**Assignments.** Assignments are *vital* to understanding the material of the course. There will be weekly assignments of 4 to 6 questions, due at the start of class, typically on Wednesday. While late assignments may occasionally be accepted, this is entirely at the instructor's discretion. So be prepared to explain why you are unable to turn the assignment in on time. Turning assignments in late will typically involve a penalty of 10 to 20 percent.

Assignment solutions should be in your own words and you should fully understand everything you turn in. It is okay to talk to other students about the assignment questions in general terms, but not to copy their solutions out in detail. For example, "To do question 2, you need to use the Mean Value Theorem and then divide out the extra factor of  $x^2 - 2$ ." is okay; "Here's a photocopy of my solution" is *not*. Any assistance from anyone other than the instructor should be acknowledged in your assignment.

**Quizzes.** Quizzes will be take 2-5 minutes at the start of class on most Fridays. They will ask for either a definition or the statement of a theorem. They are intended to be easy points for those who review their notes and keep up with the material. There are no quizzes on the weeks when we have a midterm or during the final week of classes.

**Project (optional).** This involves learning some mathematics beyond the course material and

- (1) giving a 10-15 minute presentation in class about the topic, and
- (2) preparing report of about 5-10 pages on the topic.

If you do it, then the project grade replaces your lowest term test (assuming it's higher, of course).

**Academic Dishonesty.** Academic dishonesty includes cheating on any test, plagiarism, fabricating an otherwise justifiable excuse to avoid or delay timely submission of academic work, and helping or attempting to help another student commit academic dishonesty. For a comprehensive list, see Section 4.2 of the Student Code of Conduct. In particular, plagiarism includes three acts: "(1) failing to cite quotations and borrowed ideas, (2) failing to enclose borrowed language in quotation marks, and (3) failing to put summaries and paraphrases in your own words" (Hacker, A Writer's Reference, 4th edition, p. 83).

I can, and will, lower grades, up to giving an F in the course, of students caught committing academic dishonesty. As this is an advanced course, I will view academic dishonesty in this course particularly seriously. Both the determination of academic dishonesty and the penalty can be appealed (again, see Section 4.2 of the Student Code of Conduct).

**Department Grading Appeals Policy** The Department of Mathematics does not tolerate discrimination or harassment on the basis of race, gender, religion, or sexual orientation. If you believe you have been subject to such discrimination or harassment, in this or any other math course, please contact the department. If, for this or any other reason, you believe your grade was assigned incorrectly or capriciously, then appeals may be made to (in order) the instructor, the department chair, the department grading appeals committee, the college grading appeals committee, and the university grading appeals committee.