

MAT 472 — INTERMEDIATE ANALYSIS I — FALL 2006

Line No.: 66350
Time: TuTh 12:15-1:30 PM
Room: EDB L1-32
Instructor: Jack Spielberg
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Office Hours: MW 2:00 - 3:30, and by appointment
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webpage: <http://math.asu.edu/~jss>
Points: Final (cumulative): 40%
Midterm: 20%
Weekly Homework: 40%

The final exam will **NOT** be given on the day specified in the schedule of final exams. It will be a special time: Saturday, December 9, from 1:00 - 2:50 p.m. The location will be announced later.

Homework will be posted weekly on the course webpage, and it is your responsibility to get it from there. Homework is due in class on the due date. The homework is the most valuable part of the course. All problems in the homework require careful proofs. You should **always recopy** your solutions before handing them in. **Always write correct English with complete sentences.** I know that it is hard to write proofs, but it is also hard to read poorly written homework papers. You may talk about the problems with other students, but you must write up your own solutions in your own words.

I welcome questions at any time. Please don't hesitate to ask me during class if there is something that you don't understand or that you want to discuss. (The only exception is a question about the grading of your homework or exam paper. Please ask these questions before or after class, or in office hours.) You may also ask questions in office hours, or any other time that you catch me in my office (if I am too busy, we can set up another time). You may also ask questions by email.

As a courtesy to me and to the other members of the class, please turn off cell phones, pagers, watch beepers, etc. before entering the classroom, and do not eat in the classroom.

Course Description (also on the webpage)

This is a rigorous foundation for analysis in metric spaces, with emphasis on the real line. Among the most important topics are compactness, uniform continuity, uniform convergence, and differentiation and integration of functions of one real variable. With any luck, we'll also see the Baire Category Theorem, the Weierstrass Approximation Theorem, and the Arzela-Ascoli Theorem.

This course is the first part of our qualifier sequence in analysis (the second part being MAT 473). The final exam also serves as the first half of the graduate program's qualifying exam in Real Analysis. However, the use of the final exam in determining final grades for this course is independent of its use by the graduate program. This course gives an adequate preparation for graduate real analysis (MAT 570 at ASU).

Prerequisites: The formal prerequisites are MAT 342 (Linear Algebra) and MAT 300 (Mathematical Structures, our introduction-to-logic-and-proofs course). While MAT 371 (Advanced Calculus) is not formally required, many students find it essential as a warm-up for this course. The coverage of MAT 472 includes that of MAT 371 (and much more), at a significantly more sophisticated level.

Textbook: The lectures will be self-contained, so that it is not required to buy a book. However, it is very useful to have a book (especially if you don't trust your note-taking ability). Any text covering topology in metric spaces and advanced calculus on the real line will be helpful. I recommend the text *Principles of Mathematical Analysis, 3rd edition* by Walter Rudin. This is available in a (somewhat) reasonably priced paperback edition, e.g. from Amazon. (Try the url:

http://www.amazon.com/gp/product/0070856133/ref=sr_11_1/103-5241456-3887867?%5Fencoding=UTF8

You can also try the British publisher at

<http://www.mcgraw-hill.co.uk/html/0070856133.html>

The ISBN number is 0070856133. The price will depend on the exchange rate. It's also sometimes possible to find used copies at www.bookfinder.com)