

Math 336, (Honors) Advanced Calculus

Lecture: MTWTh 10:30, SIG 230
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Text: *Complex Variables* (required)
Author: Stephen Fisher

Math 336 is an introduction to complex analysis. I plan to cover the basics: complex numbers, complex functions, analytic and harmonic functions, sequences, series, elementary functions, complex integration, Taylor and Laurent series, residue calculus, conformal mapping, and applications of harmonic functions. I will also steal some time and modify the syllabus toward the last third of the quarter and talk about the prime number theorem and the Riemann Hypothesis. I might also talk about primes in an arithmetic sequence. Don Marshall has written an excellent set of notes for the graduate course in complex analysis. You should consult them as a second text, although of course they are at the graduate level. A link is on the 336 website.

As part of the course, I will ask you to write an expository paper on a mathematical topic of your choosing. This paper should read somewhat like a book review. The source material should come from a mathematical journal. During the quarter, I will post links on the 336 website to papers that I think are suitable. I have posted some links on the 334 and 335 website that are also recommended. I will also suggest journals that have articles that can be read by students at your level. If none of the suggestions I make

appeal to you, I am open to your own suggestions. The topics need not be related to the material of 334/5/6 (for example combinatorics or number theory might appeal to you). In any case, I want you to discuss your choice with me before proceeding. I'd like you to make this choice before May 7 and submit a draft paper on May 21. The final paper will be due on May 31. This paper will count 10% of your course grade.

Homework will be collected at regular intervals and will count 20% of the course grade. You might find the homework this quarter to be harder than previous quarters. We are starting to function at the senior, early graduate, level now. Some of the problems have a vagueness that will generate some discussion. Don't be discouraged if you find them difficult.

There will be two 50-minute midterm tests which will each count 20% of the course grade. The midterm tests will be closed book but you will be allowed to bring notes on one side of a notebook size sheet of paper. There will be a two hour closed book final exam which will count 30% of the course grade. For the final you will be allowed to bring notes on both sides of a notebook size sheet of paper. No calculators will be allowed on tests.

Here are the homework assignments :

DATE	ASSIGNMENT (from Fisher)
Mar 30	§1.2: 18, 31, 37; §1.4: 29, 36, 37
Apr. 6	§1.5: 5, 10, 19, 23; §1.6: 7, 10, 11; §2.1: 16, 23, 25, 26
Apr. 13	§2.3: 6, 8, 17; §2.4: 18, 19, 20, 22
Apr. 20	§2.5: 4, 17, 23b; §2.6: 1, 10, 12, 26b
Apr. 23	MIDTERM
Apr. 27	§3.1: 6, 13, 19, 20; §3.2: 4, 5, 8, 16, 17
May 4	§3.3: 4c, 5d, 6, 7b, 10; §3.4: 4, 10, 12, 13, 14
May 11	§4.1: 4, 5, 8, 9, 12, 13; §4.3: 1, 4, 8, 11
May 18	§4.3: 18, 20, 21, 22; §4.4: 13
May 21	MIDTERM
May 25	§4.5: 1, 5, 10, 15; §5.1: 1, 6
June 1	§5.2: 2, 15; §5.3: 1, 14, 22
June 4	FINAL EXAM (8:30-10:20 a.m.)

These assignments are due at the beginning of class on the due date.