Mat 572 — Complex Analysis I — Fall 2023

Line No. 94196
Time MW 3:00-4:15 PM
Room WXLR A111
Instructor Jack Spielberg
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Text Ahlfors, *Complex Analysis, 3rd edition*, McGraw-Hill, 1979 (but see below).

Course Description

This is the first half of a two semester course in complex analysis at the graduate level. The material is a beautiful blend of analysis and topology. The familiar functions and tools of real-variable calculus have a rich and deep structure that only becomes visible in the context of the complex numbers.

The first semester of this sequence is intended to be accessible to strong undergraduates. The fundamental prerequisite is complete comfort in reading and creating epsilon-delta arguments, the definition and use of continuity, uniform convergence of functions, and convergence of infinite series. Thus the formal prerequisites are MAT 371 (one semester of Advanced Calculus) and three semesters of calculus.

Topics to be covered include analyticity, power series representation of analytic functions and the standard transcendental functions, Schwarz's lemma and Mobius functions, winding numbers and Cauchy's integral theorems, Laurent series and singularities, and residue calculations.

There are many good books on complex analysis. I will ask the bookstore to have copies of Ahlfors, but other choices (or earlier editions) are also fine as a reference for the course. Bookfinder, Amazon, or Google might help locate a less expensive copy. The lectures are meant to be self-contained, so that in theory no text need be purchased.

There will be weekly homework assignments, a midterm exam, and a final exam.

Some suggested texts:

Complex analysis, 3rd Ed. Ahlfors, McGraw-Hill.

Complex analysis, Bak and Newman, Springer-Verlag.

Functions of one complex variable, Conway, Springer-Verlag.

Questions about the course are welcome, and should be addressed to the instructor.