MTH 470 - Theory of Functions of a Complex Variable
Winter 2021 – K. Schilling

Class meets on Tuesdays, 5:30-8:15pm, synchronously (i.e., together) on-line using Collaborate Ultra. (The link to Collaborate Ultra is in upper left hand corner of our Blackboard site, directly under the name of the course.) I will record all of our class meetings. The prerequisite for this course is MTH 222 with a grade of C (2.0) or better.

In MTH 121-222 you studied the calculus of functions on the real numbers. In this course we will study the calculus of functions on the complex numbers. The properties of functions $f : \mathbf{C} \to \mathbf{C}$ are in some ways similar to functions on the real numbers, and in other remarkable and beautiful ways quite different, as we will see.

Our text is *A First Course in Complex Analysis* by Beck et. al., available as a free pdf download from http://math.sfsu.edu/beck/complex.html. I hope to cover chapters 1-9, with some judicious skipping. This is quite ambitious. We will study the algebra, geometry and topology of the complex plane, differentiation and integration of complex functions (including the Cauchy-Riemann equations and Cauchy's Theorem and Integral formula), analytic and meromorphic functions (including Taylor and Laurent series), classification of isolated singularities, and residues.

Office hours
My email address is ksch@umich.edu

You can reach me by email any time; I will reply as soon as possible, almost always the same day. We can correspond by email, or we can meet virtually using Collaborate Ultra. The "Course Room" is open all day every day, so you can meet with me or with each other at any time.

My official office hours will be held in the Course Room, Mondays 12:15-1:00pm, Tuesdays 3-4pm, Thursdays 4-5pm, and any time by appointment, until further notice.

Homework
There will be weekly homework assignments. The first assignment or two will use WebWork, a computerized homework system. After that, you will upload your written assignments, which will be a mixture of computational problems and proofs, onto Blackboard. I will carefully read and grade them, for content, style and readability.

Assignment 1 is posted on WebWork, and is due on Tuesday, January 26, at 5:30pm (i.e., before our second class meeting).

It is essential that you keep up with the homework assignments. It is impossible to learn mathematics passively; the only way to learn the material is by solving problems. In other words, Mathematics is not a spectator sport.

Grades
There will be one take-home midterm exam (tentatively due on Tuesday March 2), one required project (on a pure or applied topic beyond class material) which you will write up and present to the class at the end of the semester, and an optional take-home final exam. Course grades will be based on

	Class participation	Homework	Midterm exam	Project	Final exam
	10%	50%	20 %	20%	
or	10%	50%	10%	10%	20%.