

**Prerequisites:** Multivariable calculus, linear algebra, familiarity with proof based analysis ( $\varepsilon$ - $\delta$  language) is highly recommended.

**Professor:** Chao Li, chaoli@nyu.edu

**Lectures:** Thursday, 9:00 - 10:50 am.

**Classroom:** WWH 102.

**Office hours:** Thursdays 1:30 - 3:00 pm in my office, WWH 503.

**Course description:** This is an entry level graduate course on complex analysis. Complex analysis is a beautiful theory with lots of applications in pure and applied math, physics and engineering. I will assume basic knowledge in multivariable calculus (up through integration on surfaces and the Green's theorem), as well as basic linear algebra. Since this is a proof based course, it is highly recommended that everyone is familiar with  $\varepsilon$ - $\delta$  language in real analysis. Here is a list of topics that I would like to cover:

- Analytic functions.
- Cauchy's theorem.
- Power series and Laurent series of analytic functions.
- Calculus of residues.
- Conformal mappings and the Riemann mapping theorem.

**Textbook:** Basic complex analysis, third edition, by Jerrold Marsden and Michael Hoffman.

Two very good references, which are highly recommended for advanced students, are:

- Complex Analysis : An Introduction to The Theory of Analytic Functions of One Complex Variable, Third edition. By Lars Ahlfors.
- Complex Analysis, (Princeton Lectures in Analysis, No. 2). By Elias Stein and Rami Shakarchi.

**Grading:** 30% homework assignments, 30% midterm exam, 40% final exam.

**Homework:** There will be weekly problem sets. Homework assignments are due at 5 pm on Fridays.

**Submitting homework:** You will need to submit a scanned copy of your assignment to Gradescope for grading. When submitting assignments, please label each problem with the page you have them on. The gradescope course page is:

<https://www.gradescope.com/courses/573820>

**Academic Honesty:** Guidelines regarding cheating and plagiarism are laid out in the Graduate School of Arts and Sciences guidelines and will be adhered to strictly. Collaboration is permitted, in fact encouraged, for home assignments; however, all submitted assignments must be written up independently and represent the student's own work and understanding. Furthermore, collaborations must be acknowledged at the top of the assignment, by naming the participants in it.