Complex Function Theory · Math 365 · Fall 2010

MW 2:30-3:50 in Serra 128

Dr. Diane Hoffoss, 147 Serra, x7781, dhoffoss@sandiego.edu
Office Hours: MW 4-6, T 1:30-3:30 (2:30-4:30 on 9/7)

Supplies

Text: *Complex Variables: Harmonic and Analytic Functions* by F.J. Flanigan

Stapler: Any assignment you turn in which is longer than one page must be stapled. Loose papers, or folded/torn corners, will not be accepted.

Goals

Our goal for this course is to understand complex numbers and the many nice properties of functions from the complex plane to itself.

Complex analysis is fun and interesting, and there are a lot of cool theorems which make many calculations very simple. Part of the reason this topic is fun is that all the things that you wish would work with real numbers actually do work with complex numbers. I really like this material – I hope I can convince you to like it as well!

Grading Scale

Your final grade will be determined using the percentages below.

Homework	.....	25 %
Exam 1, Oct 6	.....	25 %
Exam 2, Nov 10	.....	25 %
Exam 3, Dec 20 @ 2	.....	25 %

All assessment will be based on the clarity of your explanations and the conceptual correctness of your argument.

Note: Laughing at the professor's jokes can only improve your grade.

Homework

Homework is a critical component of any math course. Homework will assigned every class period, and will be due every Wednesday at the beginning of the class period. I will normally assign 4 or 5 problems per class period, but I will probably not be able to grade every problem. However, I will be happy to go over any homework problem you have turned in with you in office hours. No late homework will be accepted under any circumstances, but your lowest homework score will be dropped.

The homework problems you turn in for a grade must be carefully written up. I advise working each problem out on scratch paper first, and then writing it out in a well-organized manner on the paper you turn in.

I encourage you to discuss the homework problems with your classmates. Feel free to work together to try to come up with the main ideas or even an outline of the proofs, and to scratch through calculations together. However, *your final write-up of the problems must be done on your own, with every written word coming directly from your own brain*, not copied from another student, from scratchwork of a joint proof write-up that you have written with someone else, etc. Turning in work that does not adhere to this rule constitutes an Academic Integrity violation.

Exams

You will have 3 exams: one on October 6, one on November 10, and one December 20 from 2-4. These exams will be closed notes, closed friends, open brain, and under the honor system. Plan to be in class on those dates; I will not, except in the most extraordinary, amazing circumstances, give a make up exam. Please schedule your trips, illnesses, and deaths of family, friends, and pets to not overlap these dates. Any make-up exam I do give will be a lot harder than the original test.

Learning Outcomes

You will have succeeded in this course if by the end of the semester you

- recognize complex numbers on the complex plane, and understand what actions some basic complex functions perform;
- understand what harmonic functions are and how they are related to complex analytic functions;
- recognize when a complex function is analytic;
- know how to integrate complex functions around around closed curves;
- can expand complex functions as Taylor or Laurent series;
- understand the different types of singularities of complex functions, and how those singularities affect the values of line integrals around closed curves;
- know various important results in Complex Function Theory such as the Cauchy-Riemann Equations, the Harmonic Conjecture, the ML-inequality, the Cauchy Integral Theorem, the Maximum Modulus Theorem, Liouville's Theorem, and the Residue Theorem.