Math 407 Honors Complex Analysis, Fall 2020

TEXT: Theodore Gamelin, Complex Analysis, Springer 2001.

This is an advanced undergraduate honors course in Complex Analysis. We will cover Chapters 1-8, 10 and time permitting the Riemann mapping theorem of Chapter 11. Complex analysis is a beautiful and magical subject with applications in diverse pure and applied fields. Functions which have a complex derivative (so called analytic or holomorphic functions functions) are incredibly special. Our presentation will differ somewhat from the text in that we will emphasize the complex difference quotient

$$f'(z_0) = \lim_{h \to 0,\ h \neq 0} \frac{f(z_0 + h) - f(z_0)}{h} \ ,$$

as opposed to writing $f(z) = u(x, y) + iv(x, y)$ and emphasizing the Cauchy-Riemann equations and Green's theorem (although these are certainly important things to know).

Math 405 and Calculus III are prerequisites for the course but I will try to keep the course self-contained. **There will be about 10 problem sets during the semester** (*which will count as 50% of your grade).* **Only problems marked with a * need be handed in** although you should attempt all assigned problems. The honors Complex Analysis will be proof based and also require excellent computational skill based on a good understanding of the material. You are encouraged to discuss problems with your peers **but you are responsible for writing your problem sets independently.** *There will be two midterms (each 25% of your grade) and there will not be a Final exam.*

Academic integrity is very important especially in the present epidemic environment. You may use the text book and course materials for doing your homework and exams **but no looking up solutions on the internet**. It is important to keep in touch with me (I am available for private Zoom sessions with you) and let me know if you are having any difficulties. This course is not easy since it requires an integration of a broad base of mathematical ideas but I hope you will find it rewarding.