MATHEMATICS 311: COMPLEX ANALYSIS

Class: MTWF 3:10–4:00 PM, taught over Zoom
Instructor: Jerry Shurman
Contact: Email jerry@reed.edu
Hours: My office is Greywood 113, extension 7351, but generally I will be away from campus this semester. Under exceptional, compelling circumstances, an in-person meeting may be possible
Text: Marsden and Hoffman, *Basic Complex Analysis*, third edition (Freeman). This book is modern and friendly, with lots of pictures, worked examples, motivation. The lectures will follow the basic outline of the text for the first half of the course. After that we get to choose from a bouquet of topics. With the basics under control you can make informed choices that reflect your tastes.
Homework: Assignments will be given weekly. Please turn in typeset work, each paper created by a group of two or three students. When possible, it is good to get started on the work early, and to reach out to me with questions as necessary, rather than follow the stressful "night before it is due" approach.
Exams: A take-home midterm and a take-home final.

Classical complex analysis is a blend of mathematics as a realm of ideas and as a collection of problem-solving tools. The theory of analytic functions of one complex variable is clean and elegant, and it answers many practical questions on the line and in the plane. I hope to convey some of my enthusiasm for the subject to you.

I will try to make my teaching clear, direct, simple and cheerful, and in return I assume that you are here because you want to be. Since this is an upper division class I expect a certain amount of mathematical maturity from my students—not necessarily quickness or background, but interest, curiosity, and above all, willingness to work and learn. If you have trouble with the material, struggle with it a while before seeking clarification. The best way to learn is actively. What you figure out for yourself will be far more vivid than anything I explain. On the other hand, though my standards will be high and I will not back off from them, I will do all I can to help you.

I welcome all feedback. Please don't feel shy or afraid to talk to me.

During lecture, try to stay involved with what's going on and not just watch the formulas on the board. Taking detailed notes is not as important as listening to absorb as much as you can of what's being done and to what purpose. After lecture you may want to review your notes and pad them out when we aren't working from the book. Best of all, skim (don't read in detail) each section of the text before the lecture on it; then you can follow the main themes in the lecture much more readily; and finally it is easy to read the section thoroughly after the lecture since you'll have a good grasp of its essentials. When we depart from our text later in the term, I'll try to provide appropriate readings for those who want them.

This technique for reading mathematics—skim first, then go back to consolidate—is extremely valuable. The alternative is to get bogged down in details until you lose the flow of the argument and no longer see why things are happening. A

good way to check your understanding is to try summing things up periodically in a sentence or two, e.g., we used method X to prove theorem Y that describes object Z in terms W. If you get stuck on some step or detail, don't stop there. Skip it and move on. One last tip for math reading: it's much easier to do with pen and paper at hand—writing out steps you're unsure of is less draining than doing them in your head, so you won't tire of concentrating as quickly.

Though stopping my office randomly is unlikely to find me, you're welcome at my office during the listed hours or by appointment. I would enjoy seeing you and giving you help if you need it.

This course will cover a lot of ground and move quickly, so stay caught up. Math is fun when you're on top of it. Which brings me to my most important point: enjoy the course.