Instructor: McFeely Jackson Goodman Office: Evans 751 Email: mjgoodman@berkeley.edu Course Website https://math.berkeley.edu/~mjgoodman/teaching/185S23 Office Hours: Mondays 2-3pm, Wednesdays 1-2pm, Fridays 10-11am.

GSI: Max Hlavacek Office: Evans 1061 Email: mhlava@berkeley.edu Office Hours: Monday-Friday 1-3pm in Evans 762

Lecture

Monday, Wednesday, Friday 8-9am in Cory 289. Wednesday 1/18/23 through Friday 4/28/23. (No Class 2/20, 3/27, 3/29, 3/31).

Textbook

Complex Variables and Applications Ninth Edition James Ward Brown and Ruel V. Churchill, McGraw Hill, ISBN : 9780073383170.

Additional Reading:

Complex Analysis, Theodore W. Gamelin, Springer, ISBN: 9780387950693. (https://link.springer.com/book/10.1007/978-0-387-21607-2)

Course Content

We will study functions of complex variables, analytic functions, contour integrals, power and Laurent series, zeros, singularities, and residues, and conformal maps (as time allows). See below for an approximate schedule. Most, but not all, of the content we will cover is in the textbook. We will cover most, but not all, of the content in the textbook, chapters 1-9. Homework and exams will cover the material discussed in class and in the relevant chapters of the textbook or supplementary materials, which will be indicated. Math 53, 54, and 104 or equivalent are crucial prerequisites for this course, and comfort with the material from those courses is expected.

Lecture structure

I will announce in advance the sections of the textbook that will be covered each week. I expect you to read the corresponding sections before each lecture. Lecture will be most useful if you are already aquatinted with the ideas being discussed, have made an attempt at understanding concepts, methods, and proofs, and can bring questions about the reading. In lecture, I will answer those questions, summarize and illustrate the main concepts, sketch proofs, work through examples, and discuss any supplementary material (such as background or extensions). Examples in class will be similar the the ones found on homework and exam questions.

I hope to encourage an open and interactive classroom. Please ask any questions at any time out of curiosity or confusion. Acknowledging and working through gaps in understanding is the best way to learn mathematics. It is likely that some of your classmates have the same question, and you are doing everyone a favor by asking. I will ask questions as well, to check understanding and keep us engaged with the material. I encourage you to try to answer, even if you are not completely sure.

In order to succeed in this course, you should come to every lecture. If you cannot come to lecture due to extenuating circumstances, please reach out to me to discuss catching up.

Homework

There will be 11 homework assignments. Homework problems will be posted on bCourses, gradescope, and the class webpage on Tuesdays. Solutions will be **due the following Tuesday, uploaded to gradescope by 10pm**. Typed work or scans of neat handwritten work are both fine. You will be asked to match the pages of your submission to the assigned problems. The first HW will be due on 1/31. There will be no HW due on 3/7 (midterm 1), 3/28 (spring break), or 4/18 (midterm 2). HW 11 will be due on Friday 5/5. No late homework will be accepted. The two lowest homework scores will be dropped. Working together is encouraged, but the homework you hand in must be written up by you in your own words or it will receive no credit. In order to succeed in this course, you should complete and understand every homework problem yourself, to the best of your ability, even if you do so after the homework is due, or after it is returned.

Exams

There will be two take home midterm exams and one in class final exam. For the take home midterms, you may use the textbook, your class notes, previous assignments, and other class materials, but no other materials or resources (no internet, software, etc.) You must work alone and discuss the exam with no one. Solutions will be submitted electronically on gradescope, like homework. The final exam will be closed book, with no notes, electronic devices or outside materials of any kind.

- Midterm 1, released Tuesday 2/28, due Tuesday 3/7 10pm.
- Midterm 2, released Tuesday 4/11, due Tuesday 4/18 10pm.
- Final Exam, Monday 5/8, location TBA, 8-11am.

Grading

Final Grades will be determined by : Homework 20%, Midterm 1 25%, Midterm 2 25%, Final Exam 30%. Grades will be posted regularly on bCourses, and any mistakes should be reported immediately.

Communication and Help

For logistical questions and very brief/simple mathematics questions, please email me. For any mathematics question please come to my office hours, our GSI office hours, or send me an email to set up an individual meeting. Feel free to email me to set up an individual meeting to discuss any concerns or other questions as well.

Other Resources

Follow this link for resources on integrity, accommodations and support in various areas of student life: https://evcp.berkeley.edu/programs-resources/academic-accommodations-hub

Follow this link for help getting the technology you need: https://technology.berkeley.edu/STEP

UC Berkeley is committed to creating a learning environment that meets the needs of its diverse student body. If you anticipate or experience any barriers to learning in this course, please feel welcome to discuss your concerns with me.

If you have a disability, or think you may have a disability, you can work with the Disabled Students' Program (DSP) to request an official accommodation. The Disabled Students' Program (DSP) is the campus office responsible for authorizing disability-related academic accommodations, in cooperation with the students themselves and their instructors. You can find more information about DSP, including contact information and the application process here: https://dsp.berkeley.edu. If you have already been approved for accommodations through DSP, please meet with me so we can develop an implementation plan together.

Week	Topic	Section in Brown & Churchill
1 (no class 1/16)	Complex Numbers	\$1 - 12
2	Analytic Functions I	\$13 - 21
3	Analytic Functions II	$\S{22}-27$
4	Elementary Functions	\$30 - 40
5	Integrals I	$\S{41}-47$
$6 \pmod{2}{20}$	Integrals II	\$48 - 53
7	Integrals III	\$54 - 59
8	Series I	\$60 - 67
9	Series II	\$68 - 73
10	Residues I	§74 - 81
Spring Break		
11	Residues II	\$82 - 87, \$28 - 29
12	Residues III	\$88 - 94
13	Conformal Maps I	-
14	Conformal Maps II	_

Tentative Schedule (subject to change)