MAT 324: Applied Complex Analysis
Spring 2021
Syllabus

Course Website: `https://sites.google.com/view/ksackel/teaching/mat-342-spring-2021`

Required Technology: Due to the continued influence of COVID-19 on society, this course will take place completely online. You will only need access to Zoom, Blackboard, and the course website, in order to complete this course. Any concerns about any of the technology which will be used should be addressed in a prompt manner by e-mailing the instructor.

Time and Location: MWF 11:45am-12:40pm, held synchronously on Zoom (the Zoom link may be accessed via Blackboard). Lectures will be recorded and posted to the course webpage, likely under password protection. The first lecture is February 1 and the last lecture is May 7.

Instructor: Kevin Sackel, `kevin.sackel@stonybrook.edu`

Office Hours: Office Hours will be held over Zoom (via Blackboard) at the following times:

- Mondays, 1-2pm (if you attend, you can just stay on the same Zoom link as class!)
- Fridays, 3-4pm

Students may also (and are encouraged to) reach the instructor by appointment. (The instructor also has MLC office hours on Wednesdays 1-2pm, though typically there are many students from a variety of courses and so you may have to wait to ask a question.)

Grader: Jonathan Galván Bermúdez

Textbook: *Complex Variables and Applications*, 9th edition, by Brown and Churchill

Course Description (from bulletin): Complex numbers, analytic functions, the Cauchy-Riemann and Laplace equations, the Cauchy integral formula and applications. Fundamental Theorem of Algebra and the Maximum Principle. The Cauchy residue theorem and applications to evaluating real integrals. Conformal mappings.

Elevator Pitch: In calculus (and more rigorously in real analysis), one learns how to understand functions of real variables at the level of the infinitesimal, allowing one to take derivatives and integrals. One may ask whether this calculus extends in a natural way to the

setting of complex numbers. We will see that not only is this possible, but that the notion of being complex differentiable is actually quite strong, from which one may draw an immense number of powerful conclusions which are useful throughout mathematics of all flavors, pure and applied.

Graded Assignments:

- Weekly homework assignments, worth 50% of the final grade, due Mondays at 11:00 PM, to be submitted via Blackboard.
- Two 5-to-10-minute oral exams, to be held over Zoom on an individual basis, each worth 25% percent of the final grade, occurring on the weeks of March 22 and May 3. You will be given the main questions beforehand so that you know what to study and can properly prepare. If you are uncomfortable communicating verbally in English, let the instructor know, and every reasonable attempt will be made for finding suitable accommodations. Further details will be disseminated to students as the exams approach.

Reading Expectation: You will be expected to read one lecture ahead in the textbook, so that the material is not new when it is presented (though you are not expected to completely understand all of the material before it is discussed in lecture). This will lead to a more active discussion with audience participation and interaction.

Student Accessibility Support Center Statement:

If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact the Student Accessibility Support Center, Stony Brook Union Suite 107, (631) 632-6748, or at sasc@stonybrook.edu. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Academic Integrity Statement:

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at `http://www.stonybrook.edu/commcms/academic_integrity/index.html`

Critical Incident Management:

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of University Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety

of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.