Math 6220: Complex Analysis

Spring 2022

February 3, 2022

INSTRUCTOR DETAILS

Instructor: William Feldman (he/him/his)

Office: JWB 101

Office Phone: (801) 581-4279 (better use email or Zoom)

Email: feldman@math.utah.edu

Webpage: http://www.math.utah.edu/~feldman/MATH_6220_S22.html

Zoom room: see canvas

Office Hours: TBA, will be held in Zoom room listed above. I hope to transition to in person office hours later in the semester.

Accessibility and Support: Email is the best way to reach me, I will respond as promptly as I can, but generally expect to receive a response during "business hours". You can also set up a time to meet with me on Zoom or in person at my office.

TA DETAILS

The course also has a graduate TA / grader. Details TBA.

COURSE DETAILS

Course type: In person

Class time: MWF 2:00PM-2:50PM

Location: AEB 306

Webpage: http://math.utah.edu/~feldman/MATH_6220_S22.html

COVID note: If I am sick or if someone in the class tests positive for COVID we may need to hold some lectures on Zoom. Please be prepared for that possibility. Any lectures held on Zoom will be recorded. If you need to miss class for any COVID related reason but the lecture will not be on Zoom that day please let me know so I can prepare some kind of accommodation.

COURSE MATERIALS

Primary Textbook:

Complex Analysis, Stein and Shakarchi.

Other sources:

Complex Analysis, Ahlfors.

Functions of One Complex Variable, Conway.

Introduction to Complex Analysis, Noguchi.

Additional course materials will be shared online via CANVAS.

COURSE DESCRIPTION

Passing this course with an **A** grade will count as a high pass on the ODE qualifying exam, and passing with a **A**− or **B**+ will count as a pass. The course will also help you prepare for the ODE qualifying exam if you prefer to go that route or are unsatisfied with your grade in the course.

Topics (see also http://www.math.utah.edu/dept/gradbull.pdf)

- Holomorphic functions, Cauchy-Riemann equations, Cauchy's Theorem, Cauchy's integral formula, Maximum principle, Taylor series for holomorphic functions, Liouville's theorem, Runge's Theorem. Normal families, isolated singularities, Laurent series, residue theorem, applications to compute definite integrals, Rouche's Theorem. Conformal mappings, examples, Schwartz lemma, isometries of the hyperbolic plane, Montel's theorem, Riemann mapping theorem. Infinite products, Weirstrass factorization theorem. Analytic continuation, monodromy. Elliptic functions. Picard's theorem.

IMPORTANT DATES

Exams: Midterm exam date is Wednesday, March 2. Final exam date is Monday, May 2, 2022 at 1:00 – 3:00 pm.

University calendar: https://registrar.utah.edu/academic-calendars/spring2022.php

Holidays:

- MLK Day (Monday, Jan 17)
- Presidents Day (Monday Feb 21)
- Spring break (Sun-Sun March 6-13)

GRADING POLICY

- Calculation of final grade:
  - **40%** - Homework
  - **20%** - Midterm Exam - There will be an in-class hour exam on Wednesday March 2 (subject to change at instructors discretion with reasonable notice).
  - **40%** - Final Exam - The final exam is on Monday, May 2, 2022 at 1:00 – 3:00 pm.
- Your final letter grade will be determined by the following rubric:
  - **A** : 90%+
  - **A-** : 85%-90%
  - **B+** : 80%-85%
  - **B** : 70% - 80%
  - **C** : below

  Note that, as per the department's graduate bulletin an **A** in the course counts as a high pass on the ODE qualifier, and an **A**− or **B**+ counts as a pass on the ODE qualifier.
- Double check the accuracy of all recorded homework, online assignments, and exam grades. Also you should keep as record all your graded assignments. If you see any error in your grades on Canvas/Gradescope, reach out to me as soon as possible.

HOMEWORK

Problem solving is the most important part of this course. The problems will likely be quite challenging, it is important to devote sufficient time to thinking about and carefully writing your homework assignments.

Homework problems will be assigned in sets every other Friday due 2 weeks later. Approximately 6-7 problems per week, start working on the homework as they are assigned not at the last minute! You should turn in your solutions via gradescope. **Please use gradescope's functionality to associate pages with specific problems.** LaTeX or hand written and scanned solutions are both acceptable. Due dates are semi-flexible, but if you turn in your homework after that problem has already been graded without an excuse you may be subject to a 30% penalty to your grade on that problem. The lowest homework set grade will be dropped at the end of the semester.

LATE ASSIGNMENTS/MISSED ASSIGNMENTS/REGRADING POLICIES

- Homework assignments will not be considered late until 11:59pm on the day they are due. If you need an extension let me know, but this option should be used sparingly and with good reason.
- Regrades: If you notice a mistake in grading you can return your assignment/quiz/test to me to be regraded. You should submit the assignment in question along with a note explaining where you believe the grading error was.

COVID related details

University leadership has urged all faculty, students, and staff to **model the vaccination, testing, and masking behaviors** we want to see in our campus community.

These include:

- Vaccination
- Masking indoors
- If unvaccinated, getting weekly asymptomatic coronavirus testing

Vaccination:

- Get a COVID-19 vaccination if you have not already done so. Vaccination is proving highly effective in preventing severe COVID-19 symptoms, hospitalization and death from coronavirus. Vaccination is the single best way to stop this COVID resurgence in its tracks.
- Many in the campus community already have gotten vaccinated:
  - More than 80 percent of U. employees
  - Over 70 percent of U. students
- Visit http://mychart.med.utah.edu/, http://alert.utah.edu/covid/vaccine, or http://vaccines.gov/ to schedule your vaccination.

Masking:

- While masks are no longer required outside of Health Sciences facilities, UTA buses and campus shuttles, CDC guidelines now call for everyone to wear face masks indoors.
- Check the CDC website periodically for masking updates— https://www.cdc.gov/coronavirus/2019-ncov/vaccines/fully-vaccinatedguidance.html
- Treat masks like seasonal clothing (i.e. during community surges in COVID transmission, masks are strongly encouraged indoors and in close groups outside).

Testing

- If you are not yet vaccinated, get weekly asymptomatic coronavirus tests. This is a helpful way to protect yourself and those around you because asymptomatic individuals can unknowingly spread the coronavirus to others.
- Asymptomatic testing centers are open and convenient: Online scheduling Saliva test (no nasal swabs) Free to all students returning to campus (required for students in University housing) Results often within 24 hours Visit alert.utah.edu/covid/testing
- Remember: Students must self-report if they test positive for COVID-19 via this website: https://coronavirus.utah.edu/.