Intro to Functions of a Complex Variable (Math 4520/5400)

Class info:

MWF 10-10:50am in Wooten Hall 213

Instructor:

Dr. Sean Griffin

Assistant Professor

GAB 409

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Office hours:

(Tentatively) Mon and Thurs 1-2pm in GAB 409.

[I will poll the class the first week to see if these need to be changed to better accommodate the class]

Textbook (required):

Complex Analysis for Mathematics and Engineering by Mathews and Howell, 6th edition

Course description:

We will start by reviewing multiplication of complex numbers in rectangular and polar coordinates. Then we will study differentiability of functions of one complex variable, followed by Taylor and Laurent series and contour integration. We will see some proofs of theorems during lecture, and there will be some proof-based questions on the homework, but the course will focus more on concrete examples and computations than a typical math major course. For Math 4520, no prior exposure to proofs will be assumed.

Learning objectives:

- Chapters 1-2: Complex numbers and complex-valued functions.
- Chapters 3-5: Analytic and harmonic functions, power series, and elementary functions.
- Chapters 6-8: Complex integration, contour integration, Taylor and Laurent series, Residue Theorem.
- Chapter 10: Conformal mappings.
- Limited selections from chapters 9, 11, and 12 as time permits.

Math 5400 Students: Graduate students enrolled in 5400 will be given some extra weekly problems, and some different problems (more proof-based) on each exam.

ODA accommodations:

If you have ODA accommodations, please let me know early so that we can figure out the best way to accommodate you. We can discuss further by appointment (see more info below).

Week 1 Homework (due Aug 22):

The following problems will be due Aug 22, submitted either on paper at the beginning of class or electronically through Canvas:

- Sec 1.1 #3a (and explain how you found the solutions, don't just write the final answer)
- Sec 1.2 #1acdf, #2bc, #6cd (I will say more about problem #6 in class).
- Sec 1.3 #2bc, #3, #4bc, #6b

Math 5400 student: Also Sec 1.3 #10 and #14.

Exams:

There will be 2 midterm exams and 1 final exam:

- Midterm 1, in class on Wed, Sept 24
- Midterm 2, in class on Wed, Nov 5
- Final Exam (cumulative), in our usual classroom on Saturday Dec 6, 8-10am

You will **not** be allowed to use notes or a calculator on the exams and quizzes.

Homework/Quizzes:

Each week, there will either be a quiz on Friday (10-20 mins long) **or** a homework assignment due on Friday. Whether there is a quiz or homework each week will be announced ahead of time.

Week 1: Homework due on Aug 22 (no quiz)

Week 2: Quiz on Friday Aug 29 (no homework to be handed in, but a problem list will be released which the quiz will be based on)

Week 3: TBA

*You may improve your grade on up to 3 of the quizzes by handing in the problem list associated to that quiz as homework. Then, I will replace your quiz grade with the average of the quiz grade and the homework grade.

GenAI policy:

Use of Generative AI (e.g. ChatGPT, Gemini, etc.) or other online aids like Chegg to solve the specific problems assigned as homework or to make up a quiz is **NOT** allowed.

However, feel free to use it to study for quizzes and exams. Just be aware that if you do use GenAI, you are responsible for verifying whether its explanations are accurate or not. Generative AI is known to hallucinate and fill in its knowledge gaps with false information, so use it at your own risk for studying.

Grades:

Grades will be broken down with the following percentages:

- Quizzes + Homework: 20%
- Midterm 1: 20%
- Midterm 2: 20%
- Final Exam: 40%

The letter grade cutoffs will not be the standard ones but will be updated after each exam. I will announce the current grade curve after each midterm.

Attendance

Attendance outside of quizzes and exams is not required, but obviously I strongly encourage you to come to class!

Late homework/missing exams

A penalty of 20% (of the overall point total) per day will be deducted for each day your homework assignment is late.

If you need to miss a quiz or an exam because of an authorized absence, please let me know as soon as possible.

Academic integrity:

Please review the academic integrity policy here:

https://policy.unt.edu/sites/policy.unt.edu/files/06.003%20Student%20Academic%20Integrity.pdf

ODA (expanded):

The University of North Texas makes reasonable accommodation for students with disabilities. Students needing a reasonable academic accommodation must first register with the Office of Disability Access (ODA) to verify their eligibility. If a disability is verified, the student will request their letter of accommodation. ODA will provide faculty with a reasonable accommodation letter via email to begin a private discussion regarding a student's specific needs in a course. Students may request reasonable accommodations at any time, however, ODA notices of reasonable accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of reasonable accommodation for every semester and must meet with each faculty member prior to implementation in each class. Students are strongly encouraged to meet with faculty regarding their accommodations during office hours or by appointment. Faculty members have the authority to ask students to discuss such letters during their designated office hours to protect the privacy of the student. For additional information, refer to the Office of Disability Access website.