MATH 3146 – Section 001
Complex Variables
Spring 2026

Instructor:
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Office: MONT 411

Meeting: Tu/Th 2:00pm-3:15 pm in MONT 112

Office Hours: Tuesday 9:30-10:30 am
Thursday 10:30-11:30 am
Friday 12:30-1:30 pm
or by appointment (i.e., email me if you cannot make it at the above times)

Text: *Complex Variables and Applications,* 9th Edition, by James Ward Brown and Ruel Churchill

Prerequisites: MATH 2110 and 2410, or MATH 2420 or MATH 2144. Not open for credit to students who have passed MATH 5046.

Goals & Expectations: The goal for the semester is to learn, to understand, and to be able to work with the main ideas of complex variables and functions, including functions of a complex variable, integration in the complex plane, and conformal mappings. This means that you should not only be able to work through problems similar to those done in class and on the homework, but also that you should be able to articulate the ideas presented in the course in a clear and coherent manner. This course will have concrete and abstract components. Being able to explain why something is true will constitute a significant part of the course.

Course Objectives: Upon successful completion of this course, you will have demonstrated that you can:

1. Perform arithmetic operations with complex numbers using both rectangular and polar forms
2. Use properties of analytic functions, including identifying and differentiating various common analytic functions
3. Evaluate and apply properties of contour integrals
4. Identify a function's power series and residue at a point, and use this information to evaluate a contour integral
5. Collaborate with others to build mathematical understanding for all members of your community

Participation: The best way to learn math (or anything, for that matter) is to practice it actively. You will spend time in class working on problems with your peers and talking to others about your solutions to problems. Therefore, your participation is crucial to everyone's learning.

Each student in this class is vital to the success of the classroom community, which is why it is important that we all respect each other, carefully consider one another's ideas, and value each other's contributions. I am very serious about helping to create a classroom environment in which anyone feels free to ask questions, raise concerns, make mistakes, celebrate successes, and so on. You are expected to behave courteously and respectfully to your classmates and to me, but please

do not stop yourself from asking a question because you fear it will sound stupid or obvious. We are all here to learn together, which means we will struggle often.

Homework: You will be given a list of problems each week to complete. Homework will be collected weekly and graded on the basis of completion. Your lowest homework grade will be dropped from your grade at the end of the semester.

Quizzes: Each Thursday in class, you will take a short quiz. For credit, your solutions must be fully correct and complete. You will be able to revise and resubmit quizzes for credit within one week after they are returned with a grade. One quiz will be dropped from your grade at the end of the semester.

Exam 1: There will be one midterm exam, tentatively scheduled for **Thursday, March 5** during class. Please plan to be in class on that day.

Final : There will be a cumulative final exam for the course, to be scheduled by the Registrar during the week of May 4-10. Please check Student Admin in March to find the date and time of the Final Exam.

If you must miss an exam, please contact me as soon as you know you will miss it.

Grading Policy: Your graded work will be returned to you in a timely manner, usually within a week. If you believe there is a grading error, please work with me ASAP to resolve it.

Grading: Your final course grade will be calculated as follows:

Component	**Percentage of Final Course Grade**
Homework	15
Quizzes	25
Exam 1	25
Final Exam	35

Letter Grade	**Overall Weighted Percentage**
A	93-100%
A-	90-92.99%
B+	87-89.99%
B	83-86.99%
B-	80-82.99%
C+	77-79.99%
C	73-76.99%
C-	70-72.99%
D+	67-69.99%
D	63-66.99%
D-	60-62.99%
F	0-59.99%

How to Succeed in this Course: This course may involve more conceptual and abstract ideas than you are used to seeing in mathematics classes. This will take some adjustment, and now is the best time to develop the habits that will help you succeed. These include:

- carefully completing all readings and assigned homework before class
- actively participating in class
- attend class and complete quizzes
- see me for help revising quiz questions to make sure you get credit for each one
- asking and answering questions to and from your peers and instructor
- focusing on developing the ability to explain your ideas, both verbally and in writing, correctly using the vocabulary defined in the course
- finding your mathematics support community – classmates, office hours, etc.

Diversity, Equity, and Inclusion: In learning, we must embrace diversity of race, gender, sexual orientation, ability, background, age, beliefs, ethnicity, and other visible and non-visible categories. As your instructor, I will do my best to foster a culture of equity and justice in this class and in the university as a whole. Discrimination will not be tolerated. By joining this classroom community you are committing to taking a growth mindset, which means we will work together to learn from each other and be more compassionate.

Academic Integrity: Please respect your and others' work and academic experience. You are expected to turn in work that reflects your own understanding of the topics. Therefore, your writing should not bear resemblance to that of any other student in the course or to any other sources used, and any ideas used for which any other party had a share in developing should be cited as such.

You may use any citation format – for example, a parenthetical at the end of your solution: "(I worked with Jaime from my group on #4)," or, "(I got the idea for my solution to #2 from 3Blue1Brown on YouTube: https://www.youtube.com/watch?v=P2LTAUO1TdA&t=2s&ab_channel=3Blue1Brown)."

Tentative Course Schedule

Week 1	Complex numbers and operations
Week 2	Properties of complex numbers, polar coordinates
Week 3	Real-valued functions of a complex number
Week 4	Roots; Limits, Continuity
Week 5	Cauchy-Riemann equations; Analytic functions
Week 6	Elementary complex functions
Thursday, March 5 (Week 7)	**Exam 1**
Week 7	Differentiation; Integration
Week 8	Contour integrals, Antiderivatives
March 15-22	**Spring Recess – No Class**
Week 9	Cauchy-Goursat Theorem; Cauchy Integral Formula
Week 10	Sequences, Series; Taylor series
Week 11	Laurent series; Residues, Singular points
Week 12	Cauchy's Residue Theorem
Week 13	Classifying isolated singularities
Week 14	Applications of residues; Harmonic conjugates
Final Exam week May 4-10	**Final Exam**

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