

APPLIED COMPLEX VARIABLES: MATH 3160

Summer 2018

Instructor: Huy B. Dinh	Time: TTH 8:00 AM – 9:30 AM
Email: hdinh@math.utah.edu	Place: LCB 225

Canvas Page: <https://utah.instructure.com/courses/500364>

Office Hours: TTH 9:30 AM - 10:30 AM and by appointment JWB 121

Main Reference: Complex Variables and Applications, by Brown and Churchill, 8th or 9th edition

- 9th edition, printed version ISBN: 978-0073383170
- 8th edition, printed version ISBN: 978-0073051949

Prerequisites: A letter grade of 'C' for better MATH 2250 or (MATH 2270 and MATH 2280).

Course Description and Expected Learning Outcomes: Analytic functions, complex integration, Cauchy integral theorem, Taylor and Laurent series, residues and contour integrals, conformal mappings with applications to electrostatics, heat, and fluid flow.

Grading: The grades will be calculated as follows

Assignment	Total Score %
Homework	15 %
Quizzes	15 %
Midterm (June 14th)	20 %
Midterm (July 12th)	20 %
Final (August 2nd)	30 %

Students may view their grades through Canvas which is accessible from the main University of Utah website www.utah.edu. To log in, you use the same student ID and password that you use for Campus Information System. Grades will be posted the day that they are calculated. You are advised to check your grades to ensure there are no mistakes. Please immediately inform me of any mistakes which you find via email.

Tentative Grading Scale:

A	A-	B+	B	B-	C+
[100, 93]	(93, 90]	(90, 87]	(87, 83]	(83, 80]	(80, 77]
C	C-	D+	D	D-	E+
(77, 73]	(73, 70]	(70, 67]	(67, 63]	(63, 60]	(60, 0]

Class notes: Class notes will follow the textbook(s) and be posted the week before the lectures. They will include examples with explanations. You are encouraged to read the notes before class. During lecture, you will see the material in a different form and are encouraged to ask questions.

Homework: Homework will be due every Thursday. Homework will be posted on the Monday of the previous week. Solutions to homework problems will be posted after the homework is due. **Extra Credit** sections will be given with on each homework. Completed extra credit will count towards upcoming exams. You are encouraged to discuss problems.

Quizzes: There will be a quiz every Tuesday based on the previous week's material. Quiz questions will be similar to homework questions with rare exceptions or will be used to follow along with the lecture. Quizzes on exam review days will be practice exams and quizzes, on weeks following exams, will be lecture guides. Your three lowest quizzes will be dropped.

Exams: Time conflicts with exams must be brought to my attention, by email, at least one week before the exam. No exceptions. All exams may test all of the previous material from before the exam date. Review dates will be given before each exam. Final exam score will replace lowest midterm grade if higher.

ADA Statement: The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, 581-5020 (V/TDD). CDS will work with you and the instructor to make arrangements for accommodations. All information in this course can be made available in some alternative format with prior notification to the Center for Disability Services.

Student Responsibilities: All students are expected to maintain professional behavior in the classroom setting, according to the Student Code, spelled out in the Student Handbook. You have specific rights in the classroom as detailed in Article III of the Code. The Code also specifies proscribed conduct (Article XI) that involves cheating on tests, collusion, fraud, theft, etc. Students should read the Code carefully and know you are responsible for the content. According to Faculty Rules and Regulations, it is the faculty responsibility to enforce responsible classroom behaviors, beginning with verbal warnings and progressing to dismissal from class and a failing grade. Students have the right to appeal such action to the Student Behavior Committee. <http://regulations.utah.edu/academics/6-400.php>

Other Rules:

- Class disruptions and disrespectful behavior towards myself or other students will not be tolerated.
- There are no makeup or retakes for exams or quizzes. Contact me if there are any issues.
- If you are caught cheating, then you will receive a zero on the assignment and be reported to the Dean of Students. Additionally, cheating international students will be reported to the International Students Office.
- Let me know as soon as possible if there are any issues which severely impact your performance as a student in the course. I am willing to help in all cases to the best of my abilities, but I will have less options if I have less time to address issues.

Date	Content
May 15	complex algebra, moduli, triangle inequality, conjugates, exponential form, argument, roots, regions
May 17	function limits, limits at ∞ , Continuity
May 22	derivatives, differentiation, Cauchy-Riemann relations, analytic functions, harmonic functions
May 24	exponentials, logarithms, branch cuts, log identities
May 29	power functions, trigonometric functions, zeros, hyperbolic functions, inverse hyperbolic
May 31	derivatives of power functions, line integrals, contours, contour integrals
June 5	integrals with branch cuts, bounding contour integral moduli, antiderivatives, Cauchy-Goursat
June 7	Cauchy-Goursat, simply and multiply connected domains, Cauchy Integral Formula
June 12	Midterm 1 Review
June 14	Midterm 1
June 19	Cauchy Integral Formula with extensions and consequences
June 21	Fundamental Theorem of Algebra, Maximum Modulus Principle
June 26	sequences, convergence of sequences, Taylor series
June 28	negative power series, Laurent series
July 3	isolated singular points, residues, Cauchy residue theorem, residue at infinity, classifying singular points
July 4	residue at poles, zeros of analytic functions, zeros and poles
July 10	Midterm 2 Review
July 12	Midterm 2
July 17	improper integrals, Fourier integrals
July 19	Jordan's lemma, indentation theorem, application to Laplace-Fourier Transforms
July 24	Holiday!
July 26	Conformal Mappings and applications
July 31	Final Review
August 2	Final Exam, 3:00 PM to 5:00 PM, LCB 225