Complex Variable

MAA 4402 and MAA 5404
Spring 2025

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Time: MWF period 7
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Textbook: Complex Variable and Applications   9th edition
Brown and Churchill

Complex analysis is not only of use in other branches of mathematics, but also in various fields of engineering. The course, like calculus, concerns functions of a single variable and covers limits, derivatives, integrals, and series. However, because the variable is a complex number, rather than a real number, the subject has a completely different flavor than calculus – in my opinion simpler and more elegant.

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Homework

(These will change in accordance with Edition 9 of the textbook.)

Sec 3 (Pg 7) #1

Sec 5 (Pg 13) #1,5

Sec 6 (Pg 16) #1,2,10a

Sec 9 (Pg 23) #1,2,5,6

Sec 11 (Pg 30) #1,2,4

Sec 12 (Pg 34) #1-4

Sec 14 (Pg 43) #2,4,8

Sec 18 (Pg 54) #3b,5,10,11

Sec 20 (pg 61) #1,8a,9

Sec 24 (pg 70) #1ac,3ab,4a

Sec 26 (pg 76) #1c,2c,4c,6

Sec 29 (pg 85) #4

Sec 30 (pg 89) #1b,2,6,8ac,10

Sec 33 (pg 95) #1,2,5,8

Sec 34 (pg 99) #1

Sec 36 (pg 103) #1,2,3,8c

Sec 38 (pg 107) #5a

Sec 42 (pg 119) # 2,3,4

Sec 46 (pg 132) #1-6,13

Sec 47 (pg 138) #1,2,5,

Sec 49 (pg 147) #2,3,5

Sec 53 (pg 159) #1,2,3,4,6

Sec 57 (pg 170) #1-4,7

Sec 59 (pg 177) #1,2,3,7,8

Sec 61 (pg 185) #4

Sec 65 (pg 195) #1-4,9,11

Sec 68 (pg 205) #1-6

Sec 72 (pg 218) #1-4,6,7

Sec 73 (pg 224) #1,2a,3,4

Sec 77 (pg 237) #1,2,4

Sec 79 (pg 242) #1,2

Sec 81 (Pg 247) #1,2,3b,4,5,7

Sec 83 (pg 254) #2-5,7

Sec 84 (pg 257) #1,4,6

Sec 86 (Pg 265) #1,2,4,9

Sec 88 (Pg 273) #1-3

Sec 91 (Page 282) #1

Topics

Complex numbers
  rectangular and polar form
Analytic functions
  limits and the derivative
  Cauchy-Riemann equations
  harmonic functions
Examples
  exponential and log functions
  complex exponents
  trig functions
  linear fractional transformations
Integrals
  contour integral
  antiderivatives
  Cauchy-Goursat Theorem (and Morera's Theorem)
  Cauchy Integral Formula
  Liouville's theorem and the Fundamental Theorem of Algebra
  maximum modulus principal
Series
  geometric series
  power series
  Taylor series
  Laurent series
  Residues and poles
  isolated singularities
  residue theorem
  residues at poles
  behavior of a function near a singularity
Evaluating real integrals

Grades

Four exams, a few questions on each exam. The lowest grade is dropped if all four exams are taken. Each exam has equal weight.

Exam 1. February 3

Exam 2. February 26

Exam 3. March 26

Exam 4. April 21

There will be four homework assignments, each due the class before the corresponding exam. Students will have a chance to present their solutions. The homework itself will count toward the final grade.

The exams will be graded on a sliding scale, the harder the exam, the more lenient the grading. Out of 100, it will never be stricter than 90A, 80B, 70C, 60D.

Exam and homework grades will be posted on the canvas Grades section within a week, but usually sooner.

Campus Resources

The course will be conducted in accordance with the Academic Honesty Policy and policy regarding the use of copyrighted material.

Students with disabilities requesting accommodations should first register with the Disability Resource Center by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Academic advise and tutoring, as well as health advise (physical and mental) is available to students.

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: Attendance Policies

Information on current UF grading policies for assigning grade points may be found at: Grades

Students are expected to provide feedback on the quality of instruction in this course by completing a course evaluation online via GatorEvals. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals or in their Canvas course menu under GatorEvals.

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