Math 421 Sec 1 - Complex Variables - Spring 2005
TuTh 9:30 → 10:45 LGRT 113

Professor: Eyal Markman
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Office hours: Tuesday 2:00 → 3:30 pm, Thursday 12:40 → 2:00 pm, and by appointment.
Course Web page: http://www.math.umass.edu/∼markman/ Will be available on the second week of classes. **Please check it often!**

Text: *Complex Variables and Applications,* 7-th Edition, by James Ward Brown and Ruel V. Churchill, McGraw-Hill.

Prerequisites: Math 233.

Homework: Will be assigned weekly and will be due each Thursday, unless mentioned otherwise. The homework will be graded by a special grader. Due to lack of funds, it will not be possible to grade all the homework problems assigned. A few of the homework problems will be corrected and graded every week. Nevertheless, for your own benefit, you will be asked to hand in *all* the homework problems assigned. Your grade on each homework assignment will be calculated as follows:

70% The grade on the corrected problems.

30% Credit for handing in *most* of the homework problems assigned. Partial credit will be given.

Late homework will not be collected. Instead, your three lowest grades will be dropped.
Grades:

Homework–20%
Two Midterms–50% (each 25%)
Final Exam –30%

First Midterm: Thursday, March 3 during class period.

Second Midterm: Tuesday, April 19 during class period.

Final: During the week beginning Saturday, May 14 and ending on Friday, May 20. The precise date will be determined by the scheduling office.

Calculators Policy: Calculators will **not** be allowed in the exams. Calculators and computers may be used to check answers on the homework assignments. Nevertheless, an unsubstantiated answer will not receive credit.

See back . . .

Homework Assignment 1 (Due Thursday, February 3)

Section 2 page 5: 4
Section 3 page 7: 1 (a), (b)
Section 4 page 11: 3, 4 (a), (c), 5
Section 5 page 13: 1 (c), (d), 7, 10
Section 7 page 21: 1 (a), 2, 3, 4, 6 (c)

Syllabus:

1) Complex Numbers: algebraic and geometric properties, polar form, powers and roots.

2) Analytic functions: Differentiability and Cauchy-Riemann equations, Harmonic functions, examples.

3) Elementary functions of a complex variable: exponential and trigonometric functions, logarithms.

4) Path integrals: contour integration and Cauchy's integral formula; Liouville's theorem, Maximum modulus theorem, the Fundamental Theorem of Algebra.

5) Series: Taylor and Laurant expansions, convergence, term-by-term operations with infinite series.

6) Isolated singularities and residues. Essential singularities and poles.

7) Evaluation of Improper integrals via residues.

If time permits:

8) Mappings by elementary functions and linear fractional transformations; conformal mappings.