Math 427: Complex Analysis and Applications (Autumn 2003)

Lectures:	MWF 1:30–2:20, Mor 116
Professor:	A. Greenbaum, C-434 Padelford, 543-1175
Office Hours:	M,W 4:00–5:00, Th 5:00–6:00
e-mail:	greenbau@math.washington.edu
Web Address:	http://www.math.washington.edu/~greenbau Course materials: Click on "Math 427".
Grader:	Tiantian Luo

Prerequisites for Math 427: Math 327 or 335 (minimum grade 2.0); recommended: Math 328.

Text: *Complex Analysis for Mathematics and Engineering* by John Mathews and Russell Howell, 4th Edition, Jones and Bartlett Publishers, Sudbury, MA, 2001. ISBN 0-7637-1425-9.

Some other good references (available in the Math Library) are: *Complex Variables and Applications* by James Ward Brown and Ruel V. Churchill; *Fundamentals of Complex Analysis with Applications to Engineering, Science, and Mathematics* by Edward B. Saff and Arthur D. Snider.

Course Description: This course will cover the following:

1. Complex numbers. Algebra, geometry, and topology of complex numbers.
2. Complex functions. Limits and continuity, branches of functions. Differentiation and analytic functions. The Cauchy-Riemann equations and harmonic functions.
3. Power series. The complex exponential and logarithm function. Trigonometric and inverse trigonometric functions.
4. Complex integration. Contour integrals. The Cauchy integral formula.
5. Taylor and Laurent series. Uniform convergence.
6. The residue theorem. The argument principal and Rouché's theorem.
7. Basics of conformal mapping.

We will cover material in Chapters 1–9 of the text. The approximate schedule will be:

- Chapter 1: 3 lectures. Chapter 2: 3 lectures. Chapter 3: 3 lectures.
- Test 1 (tentatively scheduled for Wednesday, Oct. 22).
- Chapter 4: 3 lectures. Chapter 5: 3 lectures. Chapter 6: 4 lectures.
- Test 2 (tentatively scheduled for Monday, Nov. 17).
- Chapter 7: 3 lectures. Chapter 8: 4 lectures. Chapter 9: 2 lectures.
- Final: Fri., Dec. 12, 2:30–4:20.

Grading: Your grade will be based on the following:

- Test 1, Oct. 22. Chapters 1–3. (100 points)
- Test 2, Nov. 17. Chapters 4–6. (100 points)
- Weekly problem sets. (100 points)
- Final exam, Dec. 12. Cumulative, but with emphasis on Chapters 7–9. (200 points)

Homework: There will be weekly problem sets. You are encouraged to form study groups early in the quarter and to discuss the solutions to homework problems. However, you should write up solutions in your own words. **Late homework cannot be graded.** (The grader is a new Math graduate student with a heavy workload.) If you must miss a class, hand in the homework ahead of time. If you do not turn in a homework assignment, your homework grade will be computed based on what you do turn in, with some adjustment for missing problem sets.