MATHEMATICS 4200-1
Introduction to Complex Variables
Fall semester 2002

text: *Basic Complex Analysis, third edition*
by Jerrold E. Marsden and Michael J. Hoffman
when: MWF 11:50-12:40 p.m.
where: JTB 120; we may try LCB 225 at some point.

instructor: Prof. Nick Korevaar
office: LCB 204
telephone: 581-7318
email: korevaar@math.utah.edu
office hours: M 2-2:50 p.m., T 11-12 a.m., W 2-2:50 p.m.
problem session: Th 10:45-12:30 p.m., in LCB 225

course home page: www.math.utah.edu/ ∼korevaar/4200fall02

prerequisites: Math 3210-3220 or equivalent; we will use concepts from analysis including estimation via the triangle inequality, continuity, the derivative matrix and differentiability of multivariable functions, path integrals and Green's Theorem. You will be expected to learn the key theorems in this course, and your homework will include theoretical problems along with computations and applications.

course outline: The unfortunately named "imaginary" and "complex numbers" were originally introduced by Geronimo Cardano in the 1500's as an algebraic artifice to factor polynomials. Probably all of you first encountered $i = \sqrt{-1}$ and complex numbers $a + bi$ when factoring quadratic equations. You may know that complex numbers share the same field axioms for addition and multiplication as do the real numbers. You have also seen Leonhard Euler's beautiful formula from the 1600's,

$$e^{i\theta} = cos(\theta) + isin(\theta)$$

and its applications to differential equations. However it was not until the 1800's that mathematicians including Karl Friedrich Gauss, Augustin Cauchy, Peter Dirichlet, Karl Weierstrass and Georg Friedrich Bernhard Riemann more fully developed the field known as Complex Analysis. This is a core area of study and to the present day remains an essential tool in many areas of mathematics and science.

In this course we will systematically develop the theory, the calculus and the magic of complex analysis, chapters 1-5 of our text. In chapter 8 we will see some classical applications of complex analysis to partial and ordinary differential equations. Time permitting we will also see applications to minimal surfaces and Julia set fractals.

grading: There will be two midterms, a comprehensive final examination, and homework. Each midterm will count for 20% of your grade, homework will count for 30%, and the final exam will make up the remaining 30%. All exams will be given in our classroom.

Exam 1:	Monday September 30
Exam 2:	Monday November 11
Final Exam:	Wednesday December 11, 10:30 a.m. - 12:30 p.m.

Homework assigned by Friday of each week will be collected the following Friday, in order that it may be graded. Note that in addition to office hours you may attend a weekly tutoring session in LCB 225, Thursdays from 10:45-12:30. This will be a chance for you to try out and refine your homework ideas and class understanding. I and some of your classmates will be there to listen and to offer helpful suggestions.

It is the Math Department policy, and mine as well, to grant any withdrawl request until the University deadline of Friday October 18.

ADA statement: The American with Disabilities Act requires that reasonable accomodations be provided for students with physical, sensory, cognitive, systemic, learning, and psychiatric disabilities. Please contact me at the beginning of the semester to discuss any such accommodations for the course.