Introduction to Complex Analysis

Complex numbers arise when the familiar arithmetic of the real number system is supplemented with the square root of minus one, $\sqrt{-1}$. This course will be an introduction to complex analysis, which is a specialized calculus involving functions that depend on a complex-valued variable. At the heart of complex analysis is the class of *analytic* functions that have a derivative with respect to its complex variable. The goal of this course is to understand the many amazing properties with which these complex-valued functions are endowed.

The highlights of the course will be: discussions and proofs of the elementary theorems of analytic function theory; series representations of functions; methods for evaluating complex contour integrals; and the geometry of conformal mappings. Some numerical and computer visualization will accompany the lectures and assigned work. The rudiments of numerical computing and graphics will be introduced through the use and modification of web-posted Matlab scripts and Maple worksheets.

The overlap of complex variable theory with other branches of mathematics include geometry & topology, number theory, and Fourier analysis. Various of these applications of complex analysis will be discussed during the term.

Professor: David Muraki, office K10538, phone 778.782.4814

Lectures: 1:30-2:20pm in C9000

Office Hours: Tuesday 3:00-5:00pm, or by special arrangement

TA: Sophie Burrill, Thursday tutorials, and
office hours, TBA in K9512.1

Reading: *Complex Variables and Applications*
JW Brown & RV Churchill, McGraw-Hill (8^{th} ed, 2009)

Webpage: webct & *www.math.sfu.ca/∼muraki* (back-up)
updated weekly — assignments, computing demos & announcements

Communication: webct-based discussion postings as primary class e-mail
muraki@sfu.ca: private class-related e-mail correspondence only
muraki@math.sfu.ca: urgent correspondence only please

Computing: Matlab & Maple will be the environments for computing
lecture & homework scripts will be posted on class webct
Matlab/Maple accessible in Assignment Lab (AQ3144)

Responsibilities: weekly assignments
active participation in class & webct discussions } (≈ 35%)
midterm (≈ 25%) & final exam (≈ 40%)