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 special calculus involving functions based upon the arithmetic of complex numbers. At the heart of complex analysis are the class of functions defined through their differentiability, the so-called *analytic* functions. The goal of this course will be to understand the many amazing properties with which these 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 maps. Numerical and computer visualization will be an important accompaniment to the lectures and assigned work. The rudiments of numerical computing and graphics will be introduced through the use and modification of downloadable 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 introduced during the term.

Professor: David Muraki, office K10538, phone 604.291.4814

Lectures: monday/wednesday/friday at 1:30-2:20pm in AQ 3159

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

TA: Alan Meichsner, tuesday tutorials & thurs 1:30-2:30 in K9512.2

Reading: *Complex Variables and Applications*
JW Brown & RV Churchill, McGraw-Hill (7^{th} ed, 2004)

Webpage: *www.math.sfu.ca/∼muraki* & follow class link; or via webct
updated weekly — assignments, computing demos & announcements
link to online notes from main library

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 webpage
Matlab/Maple accessible via campus network & assignment lab

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