Math 422 Applicable Analysis
Spring 2000

Instructor: **Sumio Yamada**
E-mail: yamada@math.cornell.edu
Office: Malott 590
Lectures: MWF 12:20-1:10, Goldwin Smith 134
Office Hours: W 1:30–3:30, or by appointment

TA: **Lek-Heng Lim**
E-mail: lekheng@math.cornell.edu
Office: Malott 101
Recitation: T 1:25–2:15, Rockefeller 127
Office Hours: By appointment

The aim of this course is to introduce certain ideas from mathematical analysis, which have been proven to be useful tools in applications in the areas of natural sciences as well as engineering. Those ideas are as deep as they are useful, and it is hoped that the beauty and the elegance of the subjects be conveyed in the course of learning the material.

The first subject to be presented and mastered is complex analysis, which corresponds to the Chapter 1–7 of the textbook *Complex Variables and Applications* by Brown/Churchill. The central topic is so called Cauchy's theorem.

The second topic is the subject of Distribution and Fourier Transform. It is treated in Chapter 1–4 of Strichartz's book *A Guide to Distribution Theory and Fourier Transforms*.

The third topic, as time permits, will be the subject of Fundamental Solutions to Laplace/heat/wave equations. They often are called Green's functions. We will see how the theory of Distribution and Fourier Transform can be effectively used to solve the equations. You can find the relavant material in Chapter 5 of Strichartz's book.

Those three subjects are loosely related to each other, and I will try to explain the connections as much as I can.

The textbooks for the course are the two books mentioned above. I will be following the relavant parts of the books more or less, yet presentations of certain subjects may differ substantially from the way they are explained in the books.

The grading will be based on weekly assignments (50%) one in-class midterm (20%) and one take-home final (30%). The date for the midterm exam will be announced shortly.

In this course, the emphasis will *not* be on proving statements formally/rigorously. Instead mastery of the technical aspects (i.e. ability to compute) will be emphasized and you will be expected to train yourself in various computational skills through the homework assignments as we proceed through the semester.