

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 relevant 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 relevant 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.