

TO THE STUDENTS

Hi,

This course is an introduction to the central topics of Bioengineering. The principles of problem definition, team design, engineering inventiveness, information access and communication, ethics and social responsibility are emphasized.

The authors of this book are faculty members of Bioengineering. Each of them presents a short lecture on some of the things they are doing, and a sample of their writing. This volume is a collection of these lecture notes and papers. By meeting your faculty members, listening to them and reading the lecture notes and papers, you will get an idea about their personal interests and achievements. Overall, you will get a feeling about Bioengineering as a discipline.

An objective of this course is to let you learn a little bit about what a bioengineer is expected to do and to behave in the industry. In the industry, you are expected to design and to work in teams with other people. Our course assignments are aimed in this direction.

Bioengineering is a young discipline. It is still developing rapidly. New knowledge is added every day. In the development of new knowledge, the application of the methods and results of classical disciplines is most important. That is why your university asks you to take courses in mathematics, physics, chemistry, humanities, etc. To help you realize that this is the case, I am introducing design as a major approach to bioengineering in this course. You are asked to think yourself. Then you are asked to think with some friends as a team, advancing your project together. At the end of the course, you gain not only some knowledge, but also some friends. That friendship may be the most valuable part of your college education.

My philosophy of using design as a major approach to learning science was developed over the years. In the past, students listen to lectures, read textbooks, do exercises, take exams and pass courses with only a vague idea that what is learned is useful. You have done enough of that. Now, in thinking about a design project, you may find that your success depends on certain knowledge about science and humanity. Therefore, you search for knowledge actively.

The reading material accompanying each lecture is a sample of good papers. Each paper talks about a topic of engineering science. These papers are not design reports, but usually they are the results of many successful designs.

On the following three pages are the assignments I gave the class when I was teaching. Your instructor may give you a different set.

Y. C. Fung
Editor