Outline for Final Examination of ChE 573 in 2005

April 16, 2007

The final examination will be mainly based on the lecture notes. You can find them from our course webpage. The main focuses of the final examination will be on Chapters 5, 7,8,9. However, this does not mean that our final exam includes nothing related to the other chapters (chapters before mid-term). This is because the chapters after the midterm are closely related to the chapters before the midterm.

The exam is closed book and closed notes. Only unprogramable calculator is permitted. You can prepare for a formula sheet by yourself-ONE page of two-sided letter size.

The exam will be held at 9:00am on Thursday, April 26, 2007. I will let you know the location (should be our classroom, however, I will make this sure later).

For the convenience of students to prepare for the final examination, the contents to possibly appear in the exam are summarized as follows.

Chapter 5. Understand the definitions of auto-correlation, cross-correlation, and their properties. Make clear the relationship between the correlation and convolution sum. Know how to use auto-correlation and cross-correlation to identify the period of a signal and the delay in a static system.

Chapter 7. Understand the definitions of Fourier series and Fourier transforms for different kinds of signals (CT and DT, periodic and aperiodic). Be able to calculate Power or Energy Density Spectrum, and know how to use Parseval's relations. Know how to apply power spectrum in sampling signals. Be familiar with the properties of the Fourier transform of the DT signal. Understand the concept of Discrete Fourier Transform (DFT) and its relationship to Fourier transform. Know how to calculate DFT by hand and using Matlab.

Chapter 8. For a given LTI system, know how to calculate its frequency response. Know how the magnitude response and the phase response affect the output signals. With the input signal (exponential function, sinusoidal signal, periodic and aperiodic signal) and the frequency response given, know how to express the corresponding output signal. Understand the concept of transient and steady-state responses. Know the relationship between

the transfer function $H(z)$ and the frequency response $H(\omega)$.

Chapter 9. Understand the classifications of filters. Know how to design an implemental FIR filter based on different window functions.

To prepare for the exam, first, you need to read the related lecture notes, understand the examples, be able to finish the questions given in the assignments and seminars. All assignment solutions can be downloaded from the course webpage (the solution to the last assignment will be given soon), and I will also put the solutions to some of seminars on the webpage. Ensure that you can finish the questions without the solutions. Solutions are only used to verify if you have got correct results. Students are encouraged to find extra excises for practice.

If you have questions, you can come to see me at the following times:

2:00pm-3:00pm Wednesday April 18;
2:00pm-3:00pm Tuesday April 24;
2:00pm-4:00pm Wednesday April 25.