

# PHYS4550 Introduction to Control Systems

## Instructor

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## Course Description

This course deals with the fundamental principles for analysis and design of control systems. Topics include dynamic modelling, dynamic response, basic properties of feedback, root-locus design method, frequency-response design method, and state-space design.

## Course Goal

The goal of this course is to develop the basic understanding of control system theory and its role in engineering design. The students are exposed to many practical problems and their solutions. The laboratory work presents the opportunity to experiment with actual control systems hardware.

## Required Textbook/Materials

- Gene Franklin, J. D. Powell, Abbas Emami-Naeini. *Feedback Control of Dynamic Systems*, 5th edition, Prentice Hall, 2006, ISBN-10: 0131499300 Reserved at STEACIE Library
- *Lectures Notes* (will be available online before the class)

## Recommended References

- Norman S. Nise. *Control Systems Engineering*, 4th edition, Wiley, 2003, ISBN-10: 0471445770 Reserved at STEACIE Library
- Richard C. Dorf, Robert H Bishop. *Modern Control Systems*, 10th edition, Prentice Hall, 2004, ISBN-10: 0131457330 Reserved at STEACIE Library
- Benjamin C. Kuo, Farid Golnaraghi. *Automatic Control Systems*, 8th edition, Wiley, 2002, ISBN-10: 0471134767

## Class Time/Location

September 9 ~ December 8, 2009  
Tuesday and Thursday, 10:00am - 11:30am @ CC 318

## Office Hours

3:00pm - 5:00pm, Tuesday (or by appointment)

## Prerequisites

AS/SC/MATH 2015 3.00; AK/AS/SC/MATH 2271 3.00.

## Course Website

<http://www.yorku.ca/jjshan/phys4550>

## Homework Policy

- There will be homework assignments approximately once per week, and the assignment will specify the due date. Homework must be turned in to me at the beginning of the lecture hour on the due date. Late homework will not normally be accepted. Students are encouraged to use MATLAB in problem solving. However, you should keep in mind that MATLAB is ONLY a tool.
- You are encouraged to discuss homework assignments with your instructor, teaching assistant (if any), and classmates. However, all work submitted for a grade must reflect your own understanding of the material. You may not copy answers to homework problems and you may not assist others or seek assistance on exams. Line-by-line copying of someone else's homework is cheating, and will result in a grade of zero for that assignment. A repeated instance of cheating will result in an F for the course.

## Course Grading Policy

Homework (UG)	30%	~ one/week
Homework(Graduates)	20%	~ one/week
Midterm (UG)	25%	~ Oct 20th
Final Exam	45%	TBD
Project (Graduates)	35%	TBD
Total:	100%	

## Course Outline (approximate number of lectures, subject to change)

- I Overview and Introduction (~1 lecture)**
- II Review of Laplace Transforms (~2 lectures)**
- III Dynamic Models (~3 lectures)**
- IV Dynamic Response (~3 lectures)**
- Midterm on October 20th, 2009**
- V Feedback Properties (~3 lectures)**
- VI The Root-Locus Design Method (~5 lectures)**
- I The Frequency-Response Design Method (~6 lectures)**