GENERAL INFORMATION

General Description (3 credits):

The course will cover material introduced in beginning undergraduate level control courses but at a much faster pace, in an attempt to present in-depth coverage of graduate level material. The course will consist of four major parts; basic concepts from signals and related sampling concepts, modeling, linearization, dynamic system analysis and feedback control. The last part will include basic issues relevant to the design of feedback control systems and application of feedback control principles to engineering design. Single-input and single-output (SISO) control system design for engineering systems using frequency domain techniques will be addressed. Covered topics will also include concepts of equilibrium and stability, state-space approaches to control system design, observers and a brief introduction to digital control systems. Extensive use of the MATLAB and Simulink software should be expected.

Computational advances have greatly enhanced our ability to automate many functions of dynamic systems and enable certain functions that were previously not possible. In particular, it is possible to greatly enhance the performance of a physical system by dynamically coordinating several control inputs. In this course students will learn how to design such controllers for the case of SISO systems. In attempting to learn what performance can be accomplished by the use of feedback, students will discover the limitations of feedback control and what performance levels cannot be accomplished through the use of linear feedback control.

Prerequisites:

MEEN 411 or equivalent.

Instructor:

Dr. Alexander G. Parlos
Dept. of Mechanical Engineering
116 Engineering/Physics Building
Ph. 862-2060
E-mail: a-parlos@tamu.edu
Time and Place:

Lectures:
Tuesday & Thursday 11:10 AM - 12:25 PM
ENPH 205

Office Hours:
A. G. Parlos - Tuesday and Thursday 10:00 AM - 11:00 AM

Additional help is available by scheduling an appointment with me via e-mail.

Textbook:
The course textbook is


Additionally, some material regarding modeling of dynamic systems will be presented from


Additional reference books on control system design that should be consulted during the semester include


On-line Course Material:
A course web page is being set at the following URL:

http://www.mengr.tamu.edu/research/parlos/index.html

Please, follow the link to MEEN651 for Fall 04 and will be at the course web page. Course-related material, e.g. notes, solutions, etc., will be placed on-line in PDF format for you to download and print. Please, check the site frequently, e.g. at least weekly.

Use of Computer Software:
This course will make extensive use of MATLAB and SIMULINK. These tools should be extensively used for solving the homework problems, and for completing your term project. YOU ARE RESPONSIBLE FOR LEARNING HOW TO USE THESE TOOLS, SHOULD YOU NOT BE FAMILIAR WITH THEM.

**IMPORTANT NOTE:** The software tools you will be introduced to in this course are intended to help you solve the various numerical problems you encounter in this course. Such problems would otherwise require extensive number crunching. Even though one could perform symbolic calculations with some of these tools, I highly recommend against it. You could use the symbolic calculators of MATLAB to check some of the mathematics you perform by hand. However, I expect you to know how to do mathematics by hand and you will have to show your skills in the tests. Review notes on various aspects of mathematics needed in this course will be made available on the course web page.

**Student Evaluation:**

Student grades will be computed as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid-term Exam</td>
<td>40 %</td>
</tr>
<tr>
<td>Final Exam - Comprehensive</td>
<td>45 %</td>
</tr>
<tr>
<td>Homework</td>
<td>15 %</td>
</tr>
</tbody>
</table>

Total: 100 %

**Policy on Make-up Exams:**

Make-up exams will be given only for those with excused absences from the regular exams. Contact the instructor as soon as you are aware of the absence so that a make-up exam can be scheduled before the actual exam takes place. Make-up exams will be scheduled by the instructor.

**Final Exam:**

The final exam will be given as scheduled in the Fall 2004 schedule of classes as follows:

Friday, December 10, 2004 @ 3:00 PM - 5:00 PM in ENPH 205.

The final will be a comprehensive exam.

**Homework Assignments:**

Homework will be usually posted on the course Web page on Friday and it will be due at 5:00 PM on the following Friday. No late homework will be accepted. All written work must be clear and professionally done with the necessary steps leading to the solution clearly marked. Homework solutions will be made available on the course web site. Homework submissions with solutions to all assigned problems will receive a checkmark and **full credit**. Submissions with solutions to a subset of the assigned problems will receive **no credit**.
Homework is intended to show your individual work. Each student is required to turn-in his or her solutions to the homework assignments. However, you are allowed to form groups or join each other on discussions regarding the problems. **Please, read the section on plagiarism below.**

**Use of e-mail:**

You are required to check your e-mail regularly (at least daily) and stay in touch with the announcements that appear on the class web site. You must make available to the instructor the most reliable e-mail address you have, and/or any changes to it, as soon as possible.

**Policy on Grading Complaints:**

If you feel a mistake was made in grading any material involving (1) points not added or not recorded properly, (2) points taken-off for an answer that is not 100% correct, or (3) for giving partial credit, please, first talk to person doing the grading. If you are not satisfied with the resolution of the matter then talk to me. Please, make your complaint to me is in writing and via e-mail. Please, be specific about your complaints.

In general, I will be grading the tests and the final exam, whereas the lectures teaching assistant will be grading the homework and the lab teaching assistant will be grading the pre-labs and lab reports.

**Plagiarism:**

Plagiarism consists of passing off as yours the work that belongs to someone else. As such, you will be committing plagiarism if you present someone else's work as your own, even with the other person's consent. Be aware that such conduct is against University rules and could have serious consequences. If you have questions about this subject, please consult the *Texas A&M University* Student Rules, under the section "Scholastic Dishonesty."