

## ME 560 – DIGITAL PROCESS CONTROL – SPRING 03

- COURSE:** ME 560, Section 1: Digital Process Control  
Lecture: T R 11:15A - 12:30P, 202 E E WEST  
Lab: Schedule Attached, 243 Reber
- DESCRIPTION:** M E 560 DIGITAL PROCESS CONTROL (3) Analysis and design of control systems with digital controllers, including PID, finite settling time, state feedback, and minimum variance algorithms. Prerequisite: M E 440 & M E 455
- INSTRUCTOR:** Professor C. D. Rahn  
150A Hammond, 865-6237, [cdr10@psu.edu](mailto:cdr10@psu.edu)  
Office Hours: 4 – 5:30 TR or by appointment
- TA:** Hailu Getachew, [hug103@psu.edu](mailto:hug103@psu.edu)
- WEB PAGE:** <http://www.me.psu.edu/rahn/me560>
- TEXT:** Digital Control of Dynamic Systems, Franklin, Powell, and Workman, Addison Wesley Longman, Inc., Menlo Park, CA, 3<sup>rd</sup> edition, 1997.

**GRADING:** Subject to later revision, the three lab reports, four homeworks, midterm, project, and final exam will contribute to the final grade in the following percentages:

<b>Lab Reports (3)</b>	<b>15%</b>
<b>Homework (4)</b>	<b>20%</b>
<b>Midterm</b>	<b>20%</b>
<b>Project</b>	<b>20%</b>
<b>Final</b>	<b>25%</b>

Homework, lab reports, and projects are due at the beginning of class on the date specified in the attached schedule. Late homework, projects, and lab reports will be accepted only under extenuating circumstances (e.g. illness or death in the family). Please see me **within one week** if you feel you have been graded unfairly. There will be no makeup midterms. If you are unable to attend the midterm due to extenuating circumstances and notify me in advance, I will release you from having to take the midterm and increase the final exam percentage to 45%.

**ACADEMIC HONESTY:** Students are expected to conform to the highest standards of honesty and integrity. Cheating of any kind will not be tolerated and any infraction will be rigorously prosecuted through the appropriate university channels. Students may work together in the preliminary stages of individual homework assignments but the final work must reflect individual efforts. The lab reports and project require group effort and are assigned a group grade. The College of Engineering academic integrity policy includes a statement of behaviors

that are in violation of academic integrity and the review process for violations.  
([www.engr.psu.edu/undergrad/acad\\_int/students](http://www.engr.psu.edu/undergrad/acad_int/students)).

**CLASS ATTENDANCE:** Class attendance is expected but not required. You are responsible, however, for all material discussed and presented in class. A significant portion of the lecture material will not directly follow the text. My notes are not available for copying.

**COMPUTER USAGE:** Some of the homework requires the use of the software package MATLAB and/or SIMULINK.

**LABORATORY WORK:** There will be three informal lab assignments throughout the semester. The lab is available (Combination = ) whenever the Reber building is open. Lab activities will be performed in groups of two. A Torsion experiment and an Industrial Servo Trainer experiment, both built by ECP (<http://www.ecpsystems.com/index.html>), are currently available in the lab for use in ME 560. The software and capabilities of these two experiments are almost identical, so each group will be assigned to an experiment for the entire semester. Each group member is expected to understand all lab activities. The breakdown of responsibilities is up to the partners. A group report must be submitted for each lab that is concise with a brief introduction/background/approach and experimental results with discussion.

**PROJECT:** Each lab group will be required to propose and complete a semester project using the laboratory hardware. Projects should apply some of the advanced techniques introduced in the class and include analysis, design, simulation, and experiments to verify performance. A project report and oral presentation are required.

**LAB POLICIES:**

- NO smoking, eating, or drinking in the lab.
- Only students registered for authorized courses (e.g. ME 560) are permitted to use the lab equipment.
- No removal of manuals, hardware, or software from the lab without explicit permission of the TA.
- Use floppy disks to backup all your work. We assume no responsibility for hard disk failures or viruses.

ME 560 LAB SCHEDULE										
243 REBER										
	5 - 8 AM	8 - 10 AM	10 - 11 AM	11 - 12 PM	12 - 1 PM	1 - 2 PM	2 - 4 PM	4 - 6 PM	6 - 8 PM	8 - 11 PM
Monday			1	2	2	3	3	4	5	
Tuesday			3	4	CLASS		4	5	1	2
Wednesday			1	2	2	3	3	4	5	
Thursday			CLASS					ME 86		
Friday			1	2	2	3	3	4	5	
Open lab time (first come, first served) - includes weekends (if you can get into Reber)										
CLASS	Lab Closed									
<b>Note:</b> Groups 1T - 5T use the Torsion Experiment (#2) and Groups 1S - 5S use the Servo Trainer Experiment (#4)										