

**ME 430/ECE 451  
Winter 2009**

**SYSTEM DYNAMICS AND CONTROL**

**Kearney 112  
T-TR 10:00-11:50**

	<b>Professor</b>	<b>Graduate Teaching Assistants</b>	
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[PRINTABLE SYLLABUS](#)

[ANNOUNCEMENTS AND HOMEWORK](#)

[SCHEDULE](#)

**Required Text:** Norman S. Nise, Control Systems Engineering, 5th edition, John Wiley and Sons Inc., 2008.

**Grading :**

Select Homework	10%
Quizzes	20%
Midterm	30%
Final	40%

**Learning Objectives:** By the end of the course students will be able to:

- Construct a mathematical model of a dynamic system that includes a control system
- Simplify mathematical models to linear, time-invariant systems through linearization and/or block diagram reduction
- Use time domain performance criteria to design single-input, single-output control systems that achieve specified time response, accuracy and stability requirements
- Construct and use frequency response tools to design single-input, single-output control systems that achieve specified time response and stability requirements
- Use Matlab to design, simulate, and analyze the response of controlled dynamic systems

**Students with Disabilities:** Accommodations are collaborative efforts between students, faculty and Services for Students with Disabilities (SSD). Students with accommodations approved through SSD are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through SSD should contact SSD immediately at 737-4098.

**ME 430 SCHEDULE AND LECTURES:**

Week	Date	Lecture Title	HW Assignments	Due Dates; Quizzes
1	1/6/09	Intro to Control Systems		
	1/8/09	Laplace Transform Review	HW 1 Posted	
2	1/13/09	Transfer Functions		
	1/15/09	Block Diagrams	HW 2 Posted	Quiz 1
3	1/20/09	Block Diagrams		
	1/22/09	State Space Representation	HW 3 Posted	Quiz 2
4	1/27/09	Time Response 1st Order Systems		
	1/29/09	Time Response 2nd Order Systems	HW 4 Posted	Quiz 3
5	2/3/09	Time Response 2nd Order Systems		
	2/5/09	Stability	HW 5 Posted	Quiz 4
6	2/10/09	Basic Control; P, PD, PI, PID		
	2/12/09	<b>MIDTERM EXAM</b>		
7	2/17/09	Midterm Solutions / Basic Control	HW 6 Posted	
	2/19/09	Matlab Review		HW 5 Due; Quiz 5
8	2/24/09	Root Locus Techniques	HW 7 Posted	
	2/26/09	<b>NO CLASS -- MECOP EVENT</b>		HW 6 Due
9	3/3/09	Root Locus Techniques		
	3/5/09	Frequency Domain: Bode Plots	HW 8 Posted	HW 7 Due; Quiz 7
10	3/10/09	Frequency Domain: Bode Plots		
	3/12/09	Observability and Controllability		HW 8 Due
	3/18/09	<b>2 PM: FINAL EXAM</b>		

**HOMEWORK TOPICS:****HW 1:** Laplace Transforms**HW 2:** Transfer Functions**HW 3:** Block Diagrams**HW 4:** State Space Representation and 1st Order Systems**HW 5:** Time Response of 2nd Order Systems**HW 6:** Stability and Basic Control**HW 7:** Root Locus Technique**HW 8:** Bode Plots

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**Academic Dishonesty:** You are permitted, and to a great extent encouraged, to work with others on homework sets. However, there is an obvious difference between constructive discussion of a particular problem and copying. Acts of academic dishonesty will not be tolerated and will be handled according to university policy. (See <http://oregonstate.edu/admin/stucon/achon.htm> for details.)

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