Tentative Syllabus: Fall '10
Automated Controls I
Prof. Rhoades

Sequence	Topic	Text Chapter	Chapter Sections	Comments
I.	Introduction and Concepts	1	All	Open-loop vs. closed-loop, process vs. motion
II.	Op-Amps: Proportional Gain	3	1	Inverting, non-inverting, sum, difference, etc.
III.	Op-Amps: Integration and Differentiation.	3	1	Application to closed-loop controllers
IV.	Frequency and Transient Response	3	1, notes	Rise time, settle time, bandwidth, etc. *Test 1*.
V.	Signal Transmission	3	2-3	Current loops, cabling, etc.
VI.	Mechanical Systems	5	1-3	Response of linear and rotational systems
VII.	Mech. Power Transmission	5	4-6	Gears compared to transformers, belts, etc.
VIII.	Basic Sensors	6	1-2	Position, angular velocity
IX.	Basic Motors	7 8	1-3 1-3	Overview of DC motors, AC induction motors, etc. *Test 2*.
X.	Feedback Control	11	1-6	Overview: More in the next course.
XI.	Laplace Transform Analysis	–	–	Handouts – Transfer functions, "cookbook" approach to 1st-order and 2nd-order responses, closed-loop issues. *Test 3*.

Text: Kilian, *Electronic Devices and Circuits*, 3rd edition.

Class: Room D122, MW 3:30-4:45 p.m. No class 9/6, optional makeup day 11/24 (12/20 if needed).

Office: Room C232 (office hours MW 2:00-3:20).

Tentative Syllabus: Fall 2010
Automated Controls I Lab
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Week	Date	Title
L1	8/26/10	Inverting and Non-Inverting Amplifier
L2	9/2/10	Sum and Difference Amplifier
L3	9/9/10	Position Sensor, Error, and Feedback Loop
L4	9/16/10	Integrator and Differentiator
L5	9/23/10	Passive Filters: Low-Pass, High-Pass, Band-Pass
L6	9/30/10	Bandwidth vs. Time Constant
L7	10/7/10	Introduction to Active Filters
L8	10/14/10	DC Motor-Tachometer Set
L9	10/21/10	Simulation of First-Order Electrical Systems
L10	10/28/10	Simulation of First-Order Mechanical Systems
L11	11/4/10	Characteristics of Second-Order Systems
L12	11/18/10	Simulation of Second-Order Systems
L13	12/2/10	Introduction to MATLAB
L14	12/9/10	Control System Step Response Using MATLAB
L15	12/16/10	Only if needed for makeup

Office: Room C232 (office hours MW 2:00-3:20).

Note: Lab meets in Room B213, Thurs. 2:30-4:10 p.m. No lab on 11/11/10 or 11/25/10.