ENME 403 (Fall 96)

AUTOMATIC CONTROLS

Section 0201

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Course Objective: Feedback control is an indespensible component in almost any modern engineering system. This course will introduce seniors in mechanical engineering to fundamentals of analysis and design of linear control systems. MATLAB will be used to practice computer-aided design techniques.

Topics: ODEs and Laplace transform, models of electromechanical system components, transfer functions; time response specifications of performance, PID controllers and Ziegler-Nichols tuning procedure, automatic tuning, stability via Routh-Hurwitz; frequency response—Bode and Nyquist diagrams, root locus, design of dynamic compensators; state space models, controllability, observability, canonical forms, pole placement; time permitting: discrete-time models and analysis/design techniques, appreciation of nonlinearities.

Textbook: Anand and Zmood, *Introduction to Control Systems*, 3rd ed., 1995

Prerequisite: ENME 360 or ENEE 300

Time and Place: MonWedFri 12–12:50, Room EGR 3108

Office Hours: MonFri 1–2, Tue 5–6

Grading: Homework 10%
Laboratory 15%
Midterms (two) 40% (October 2 and November 13)
Final 35%

Web Page: Class handouts will also be available at the course home page
http://www.engr.umd.edu/~krstic/enme403.html.