

**AOE 4004: Computer Aided Control System Design
Course Syllabus**

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Time & Location: Tuesdays & Thursdays, 12:30 PM to 1:45 PM
Randolph Hall, Room 208

Office Hours: Tuesday, 2:00 PM to 3:30 PM
Thursday, 2:00 PM to 3:30 PM

Course Web Page: <http://scholar.vt.edu>

Recommended Text: Ogata, K. *Modern Control Engineering, Fourth Edition*,
Prentice Hall, Upper Saddle River, NJ, 2002. (ISBN 0-13-060907-2)

References: Bélanger, P. *Control Engineering: A Modern Approach*,
Saunders College Publishing, Philadelphia, PA 1995. (ISBN: 0-03-013489-7)

Franklin, G. F., Powell, J. D., and Emami-Naeini, A.
Feedback Control of Dynamic Systems, Third Edition,
Addison-Wesley, Reading, MA 1994.

Ogata, K. *System Dynamics, Third Edition*,
Prentice Hall, Upper Saddle River, NJ, 1998. (ISBN 0-13-675745-6)

Grade:

20%	Homework
25%	Exam #1: Date TBA
25%	Exam #2: Date TBA
30%	Exam #3: Date TBA

Course Topics:

- I. Modeling and Analysis
 - A. Newton's Laws and Lagrange's Equations
 - B. Linearization
 - C. Frequency/Time Response
 - D. Control Strategies: Open-loop, Feedback, Feedforward
- II. Frequency Domain Topics
 - A. Standard compensator structures (P, PD, PI, & PID control)
 - B. Stability analysis (Routh's criterion, root locus plots, Nyquist plots)
- III. Time Domain Topics
 - A. State Space Systems (state transition, controllability, observability)
 - B. State Feedback (pole placement, LQR)
 - C. State Estimation (Luenberger observer, Kalman filter)