MA (OR) 531

Time: 10:15 - 11:30 TH
Place: HA 368
Instructor: Ralph Smith
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Text: *Linear Systems* by Panos J. Antsaklis and Anthony N. Michel

Computing: We will use Matlab.

Grades: The gradescale is: 90-100 A-,A; 80-89 B-,B,B+; 70-79 C-,C,C+; 60-69 D-,D,D+; below 60: F. The grades are based on the following coursework:

Homework and Projects (Matlab):	40 %
Exams (2-3):	35 %
Final Exam (December 16, 2008):	25 %

Course Topics:

- Mathematical Models for Systems
  - Models for physical processes
  - Initial value problems (existence, uniqueness and continuous dependence of solutions on initial conditions and parameters)
  - State-space modeling of continuous and discrete time systems
- Linear Systems Theory
  - Representation of linear systems in state space and frequency domains
  - Input-output descriptions of discrete time systems
  - Realization theory and algorithms
- Linear Control Theory
  - Controllability and observability
  - Kalman canonical forms
  - State feedback (pole placement and LQR)
  - State observers including full and reduced order observers, Kalman-Bucy filters
  - Stability theory including linear theory, linearizations and Lyapunov stability

Academic Integrity and Disabilities Information: This information is provided at the following web sites:

`http://www.ncsu.edu/provost/academic_regulations/integrity/reg.htm`
`http://www2.ncsu.edu/ncsu/stud_affairs/counseling_center/dss/`