

FIRST MEETING OF THIS CLASS IS TUESDAY 9/19/2006
Ford Building B100 (lower level; by the shop)

10699 / MECH_ENG / 433-0 / 01
Advanced Mechatronics 12:30PM – 1:50PM Tuesdays
Labs will be scheduled (probably Thursday evenings)

Advanced Mechatronics

Fall 2006 - Prof. Michael Peshkin

a projects-based course

This course extends ME 333 Introduction to Mechatronics. It will provide hands-on familiarization with a professional toolset, useful in research or industry, including software, electronics, sensors and actuators.

Open to qualified graduate and undergraduate students in all disciplines
ME333 is a recommended (not required) prior course. **Enrollment limit: 12**

Photos of previous years' projects: AdvancedMechatronics.com

For more information contact peshkin@northwestern.edu (Tech B227; 847-491-4630)

The course will meet on Tuesdays in lecture format and on Thursdays for labs and projects

Probable lecture topics:

- Electronics: digital & analog refresher (chips and discrete devices), construction techniques: protoboard, solderboard, wire wrap, printed circuit layout
- Motor types, controllers; motor selection: inertia matching and other criteria
- Sensor types and sensor selection; sensor interfacing
- Processing platforms: handyboards/basic stamp, digital signal processors (DSP), singleboard x86 CPUs, programmable gate arrays, discrete digital chips, analog computation
- Software platforms: Real time operating systems, Matlab xPC, QNX, threads, timing issues, interrupts, interprocess communication
- Communication protocols: analog, serial RS232 and similar, USB, Ethernet TCP & UDP

Labs (in teams of two):

- Instrumentation amps / op-amps / filters / analog computation
- Real time programming (Matlab xPC or C/QNX real-time OS)
- Sensor interfacing (amplifiers, signal processing, ADCs)
- Encoders and motors.
- Design a digital circuit (referring to datasheets), prototype, printed circuit layout

Projects (in teams of two):

- Students will pick their own multi-week projects, using electronics, software, sensors and actuators, and usually requiring some mechanical construction.