Background Assessment
1/11/2011
(ungraded)
Due at the beginning of next class (1/13/11) or before to MEB2136

Do not spend any time calculating or looking up anything for this survey. I just want to know what you know off the top of your head. If you would know immediately if you just had a book in front of you, just state this next to the associated question.

Personal Information
Last Name: First Name:

Preferred Name/Nickname: Email:

Highest Degree Held and field of that degree:

Current Department and degree currently sought:

To get 24 hour access to the lab (MEB 2172) please provide info on your student ID and card reader please include here and email Dr. Provancher your full name, UID # in the form u0xxxxxx, and card# in the form xxxx xxxx xxxx xxxx).

Why are you interested in taking this course and what do you hope to learn?

Experience

1. What other courses have you taken in virtual reality, human-computer interaction, computer graphics, or controls?

2. How familiar are you using with haptic displays? __________
   [rate from 0 to 5: 0 = never touched one, 5 = used extensively]

Mechatronic Hardware

3. List 3 ways for sensing position, proximity or force (e.g., sonar/proximity). State which parameter each method senses.

   A. method: ________________________ parameter: ________________
B. method: _______________________ parameter: _______________

C. method: _______________________ parameter: _______________

4. Are you familiar with basic electrical circuit analysis?

What is Ohm’s law?

What are the laws of ideal op. amps?

**Programming**

5. What programming languages and operating systems are you proficient in?

6. Have you ever used an I/O board (e.g. analog-to-digital converter or digital I/O) to make the computer communicate with the outside world? Describe very briefly (< 20 words).

**Design and Fabrication**

7. Describe briefly the most complicated thing you ever made or fixed. (Examples: rebuilt automobile engine, sewed a tailored jacket, made a lego robot.)

8. What is your level of skill in using the following tools?

   [rate from 0 to 5: 0 = never touched one, 5 = highly skilled]

   lathe or milling machine (CNC?) __________ soldering iron __________

   Rapid Prototyping: water jet _______ 3D printer _______ other _______

   router __________ hot-melt glue gun __________

   band saw __________ drill press __________
Controls

9. What are the Laplace Transforms of the following, where $K$ is a constant and $x$ is a function of time, $t$?
\[ \frac{d(Kx)}{dt} \]
A. __________ 

\[ \int Kx \, dt \]
B. __________ 

C. $Kx$ __________ 

10. Describe the effect and/or form of the following types of control (in words, or with signal or flow chart diagrams):

A. proportional ________________________________

B. derivative ________________________________

C. integral ________________________________

Statistics

12. Briefly describe the point of doing a t-test.

13. Briefly describe the point of doing an ANOVA.