Theme Music: John Coltrane

Welcome

Cartoon: Lynn Johnston
For Better or for Worse
Recitations and Labs

- No lab this week or next.
- Go to your recitation section this week to
  - do a pre-test survey
  - get your picture taken
- Regular labs and recitations (tutorials) begin on 9/13.
Buy?

☑ BUY a lab/tutorial manual.
☑ BUY a clicker
  – Bring it to every class.
  – Register it at http://my.umd.edu under the Academics and Testudo tab
☑ BUY Mastering Physics
  – The on-line HW product.
☐ You do not have to buy a text.
  If you want one, you might like
  – Touger,
  – Knight et al.,
  – Cummings et al. (available to this class on-line)
This class is designed to help you develop a deeper understanding of science. Why?

- “Adaptive expertise”
- Self-preservation (both mine and yours)
- Why not? Physics is a good place to do this!
Time Line

- Nuclear physics
- DNA and Genetic Code
- Digital Imaging (CT, MRI)
- Particle physics
- Fractals and chaos
- Quarks and gluons
- New views of bacteria
- Internet
- Anomalous Cosmology
- Genome project
- New view of bacteria
- Socal networking
- Personal Computers
- Cellular phones
- Internet
- TV
- Communications and Medicine


me

my children

you

8/30/10
Adaptive expertise

- The rapid pace of change in science implies that critical skills for scientists (and healthcare professionals) in the next few decades will be
  - the ability to continue to learn
  - the ability to understand the implications of new discoveries
  - the ability to integrate new tools and knowledge into their practice of science.
Why physics?

- Physics is a good place to develop some general scientific skills associated with deeper learning and adaptive expertise.
- It connects with things you know from everyday experience.
- It helps develop tools of general value.
  - Quantification of experience
  - Multiple representations
  - Coherence
  - Mechanism
  - Building physical intuition
Class Info

■ Webpages
  – http://www.physics.umd.edu/courses/Phys121/Redish/

■ Blackboard
  – https://elms.umd.edu/

■ Listserve
  – phys121-02all-fal10@coursemail.umd.edu

Main course info. Lots of good stuff.
For your eyes only.

If you haven’t gotten any emails from me yet, see me!

8/30/10
Homework

■ Three kinds
  – Online – typically a few exercises and online activities + about 4 (of my own) problems in MP. The one due Friday is just familiarizing yourself with the interface (but it’s worth points).
  – Friday lecture – one long problem to write up on paper.

■ Work with others! But…

■ Course Center!
Tutorials

- Discussion sections are run as group-learning sessions with worksheets.
- They will help to build difficult concepts and clarify confusing topics.
- They will focus on helping you understand, evaluate, and refine your intuitions.
- Tutorial HW a quick review of Tutorial ideas. (expect to spend ~15-30 min)
  - Graded 0-1 on ~5 elements.
  - Hand in at tutorial section
Labs

- Labs are required!
  Try very hard not to miss any.
  It will be difficult to make up missed labs.

- Labs will be non-traditional and will run over two weeks (4 hours)

- You will work in groups of 4 and create one lab report per group

- You will design, carry out, analyze, and present your results to the class.

- You will use Excel to analyze your data.
Theme of the Laboratory: Understanding Measurement

- Although we will be using physics concepts learned in lecture, reading, and tutorial in lab, demonstrating their correctness will NOT be the point of the lab.
- The goal of the laboratory will be to have you learn to think about measurement and data.
  - How does your goal affect your experimental design?
  - How does your experimental design affect your data?
  - How trustworthy is your data?
  - Why should someone believe your result?
  - When are two results “close enough” that we can say they agree?
  - When two results differ, how can we decide what is the correct answer?
Exams

- Two midsemester exams and one final.
- Exams will be about thinking, not memorizing.
- Midsemester exams
  - Given on Friday
  - Returned on Monday and gone over in class
- Written regrade requests encouraged
- Makeup exams the following Thursday (out of class) for anyone who wants, but…
Exams will include...

- A multiple-choice or short answer set of questions on translating representations (~25-30%)
- Two problems to work out and explain – typically with symbols, not numbers (~50%)
- An essay question (~10%)
- An estimation problem (~15%).
Grading

- Hour exams (100 pts) 200
- Quizzes (about) 100
- Final exam (200 pts) 200
- Homework (scaled to) 200
- Lab (scaled to) 200
- Participation 100

- Total 1000

Estimate: A ~ (85 ± 3)%, B ~ (75 ± 3)%, C ~ (65 ± 3)%

8/30/10
Small barriers

- In this class there can be lots of small barriers that we need to take down.
- Most are not a big deal – they can be made sense of and cleared up in a couple of hours of work, thinking, and practice.
- But previous experience and phobias can make them hard to remove.
- The presence of a lot of these barriers can cause a lot of trouble. Clean up as many as you can!

*Don’t be afraid to come in and say, “I’m confused about fractions” – or anything else!*