Physics 207 Lecture 1

Announcements
- Course has several components:
  - Lecture: (traditional lecture, demos and Active learning)
  - Reading Assignments: From text, Serway and Jewett.
  - Homework Sets: Some "context rich" problems (50 pts)
  - Exams: Three evening midterms (300 pts) and a final (150 pts)
    - Questions on tests will look like those done in the rest of the class (homework, discussion and lectures)
  - Discussion section: (50 pts)
    - Review homework
    - Group exercises
    - Occasional quizzes
  - Labs: (group exploration of physical phenomena, 50 pts)
    - Complete lab notebook (no formal write ups) and quizzes
    - May miss up to one lab (with valid excuse)
- Homework posted on WebAssign
  - First semester is a FREE trial (Next semester will be $25 if used)
  - Go to www.webassign.net and log in
    - username: UW NetID username
    - password: last four digits of your UW ID # (or ask for e-mail)
- Homework assignments are posted on Physics 207 Server at http://romano.physics.wisc.edu/winokur/phys207/index.html
- Homework will be due by Noon on the stated day, usually Tuesday
  1. One problem (blue and underlined) written up neatly and handed in (for content only).
  2. Honors students assigned an additional problem (italicized red).
- Homework is graded automatically. You can have up to 10 attempts per problem.
- Labs
  - Begin on Monday of next week

Announcements cont’d
- Lectures (when in PowerPoint) will be available on the web.
- Honors students one Friday seminar per week (except exam weeks) and eight extra assigned problems (to be handed in)
- Consultation Room at 2131 Chamberlain (shared with Physics 201)

Lecture Organization
- Four main components:
  - Discussion class material
  - Demonstrations/experiments of physical phenomena
  - Interactive exercises with conceptual "Active Learning" problems
    - Physics is an experimental science
  - Interactive Applications
    - To illustrate concepts

Scope of Physics 207
- Classical Mechanics:
  - Mechanics: How and why things work.
    - Motion (dynamics), balance (statics), energy, vibrations
  - Classical:
    - Not too fast ($v < c$), $c$ ≈ speed of light
    - Not too small ($d > \text{atom}$), atoms $\approx 10^{-9}$ m
- Most everyday situations can be described in these terms.
  - Path of baseball
  - Vibrations of an elastic string
  - A roll of the dice (thermodynamics)
Today and Monday’s Topics:

- Precourse assessment (handed out in discussion)
- Measurement and Units (Chapter 1)
  - Fundamental units
  - Systems of units
  - Converting between systems of units
  - Dimensional Analysis
  - Significant digits
- Velocity and Speed (first two sections of Chapter 2)

Standard Quantities

- Basic elements of substances and motion.
- All things in classical mechanics can be expressed in terms of the fundamental quantities:
  - Length \( \text{L} \)
  - Mass \( \text{M} \)
  - Time \( \text{T} \)
- Some examples of more complicated quantities:
  - Speed has the quantity of \( \text{L} / \text{T} \) (i.e. miles per hour).
  - Acceleration has the quantity of \( \text{L} / \text{T}^2 \) (Chapter 2).
  - Force has the quantity of \( \text{ML} / \text{T}^2 \) (Chapter 5).

Units

- SI (Système International) Units:
  - mks: \( \text{L} = \text{meters (m)}, \text{M} = \text{kilograms (kg)}, \text{T} = \text{seconds (s)} \)
- British Units:
  - \( \text{L} = \text{inches, feet, miles}, \text{M} = \text{slugs (pounds)}, \text{T} = \text{seconds} \)
- We will use mostly SI units, but you may run across some problems using British units. You should know how to convert back & forth.
- Why do units matter?

Recap of today’s lecture

- Measurement and units (chapter 1)
  - Systems of units (Text: 1.1)
  - Density (Text: 1.3)
  - Converting between systems of units (Text: 1.5)
  - Dimensional Analysis (Text: 1.4)
- Reading for Monday’s class 9/11/06:
  - Chapter 1, Chapter 2 (through section 2.2)
  - WebAssign
- Reading for Wednesday’s class 9/13/05:
  - All of Chapter 2