Help Sessions: Friday, December 14, 2007, time and room to be arranged.

Topics: The final exam will be cumulative. It will contain a mix of problems of varying degrees of difficulty. Some problems might include qualitative as well as quantitative questions. Some problems may focus on a single topic or chapter, while others may include topics from several different chapters. Only topics covered in all sections will be included. Consult the syllabus for the specific list of topics.

The following general areas may be covered:

Ch. 1–4 Kinematics.
Ch. 5–6 Newton’s Laws.
Ch. 7–8 Work and Energy.
Ch. 9 Momentum.
Ch. 10–11 Rotational Motion.
Ch. 13 Gravitation.
Ch. 21 Electric Force and Energy.

Problems will typically focus on the underlying fundamental physics rather than obscure applications or complex mathematical manipulations.

You will be provided with an equation sheet similar to those from previous hour tests.

Copies of hour tests from all sections will be placed on reserve in the library.

Additions: The following sections not in the original syllabus may be on the final:

Ch. 21 Electric Charge
Ch. 24.2 Electric Potential Energy
Ch. 39.8 The Bohr Model of the Hydrogen Atom

Omissions: The following sections will not be on the final:

Ch. 2.10 Graphical Integration
Ch. 6.4 Drag Forces and Terminal Speed
Ch. 9.12 Rocket Motion
Ch. 11.12 Gyroscopes
Ch. 13.9 Einstein and Gravitation

Lab-Inspired Questions:

Questions may draw on curve-fitting ideas you used in lab. For example, you might be given the position as a function of time, \( x = 0.34 + 2.2t + 1.4t^2 \), and be expected to find the initial position and velocity as well as the acceleration from that equation.

You will not be responsible for calculating or propagating uncertainties, but you should know how to interpret uncertainties such as you obtained in fits in lab. For example, if you predict \( a = 1.5 \) and you experimentally measure \( a = 1.47 \pm 0.05 \), you should know how to draw conclusions based on those numbers.
You should also know how to find and interpret the coefficients (and their uncertainties!)
given in Excel charts as you did in lab.

**Hints:** Some questions may apply concepts from several chapters to a single problem.

Do not attempt to memorize specific examples. Instead, be sure you understand the basic
physical principles.

Review the equation sheet carefully so that you know what the symbols mean and when
each equation applies.

Start each problem with a general principle or equation. If you start your solution with
a specialized equation that is not on the equation sheet, you may lose substantial credit.
Then, if numerical values are needed, substitute them for the appropriate symbols. This
shows that you know what the relevant physics is and what the symbols mean.

If you are unable to obtain a result for some part of a problem and a subsequent part uses
that result, use a symbol for the unknown result. For example, write “where $a$ (in m/s$^2$) is
the acceleration from part b.”

Work clearly and carefully so that your work can be read and understood.

Avoid reckless rounding.

Check your arithmetic.

Get a good night’s sleep!