Physics 133 Fall 2011 Final Exam Notes

Final: Tuesday, December 13, 2011, 4–7 p.m., HSC 103

Help: I expect to be available most of the day on Monday, December 12, 2011, except during Senior Thesis presentations, which will likely be around noon and early afternoon.

Topics: The final exam will be cumulative. There will be more emphasis on oscillations and waves, and particularly on material covered since the third hour test. Thermodynamics will be included, but with an emphasis on the fundamental principles.

It will be very similar to individual hour exams in style and format. 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. Consult the syllabus for the specific list of topics.

The following general areas may be covered:

- Ch. 14 Pressure
- Ch. 17–20 Thermodynamics
- Ch. 13 Periodic Motion
- Ch. 15–16 Waves
- Ch. 25–26 DC Circuits
- Ch. 33–36 Light Waves

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

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

- Ch. 14.3–6 Fluid Dynamics
- Ch. 17.7 Mechanisms of Heat Transfer
- Ch. 18.2 Molecular Properties of Matter
- Ch. 18.6 Phases of Matter
- Ch. 20.3 Internal Combustion Engines
- Ch. 20.8 Microscopic Interpretation of Entropy
- Ch. 26.4 RC Circuits
- Ch. 33.4 Dispersion

Lab-Inspired Questions:

There may be lab-inspired questions on the final. For example, there may be questions which are similar to physical situations you encountered in lab. There could also be problems in which you are presented with graphical information (similar to what you have encountered in lab) and asked to use the graph to solve a problem.

You will not be responsible for calculating or propagating uncertainties, but, I hope that you do find those topics useful in your future endeavors. 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 LoggerPro 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!