Physics 111 Fall 2016 Final Exam Notes

Final: Wednesday, December 14, 2016, 4–7 p.m., Hugel 103

Help: I will run a help session on Tuesday, December 13, from 3:00 – 4:15 pm, in Hugel 142.

Topics: The final exam will be cumulative, incorporating topics covered throughout the semester. The most recent material, namely Chs. 12, 13, and 14, will account for approximately 25% of the total.

The final will be designed to be completed in a 2-hour time period, but you may take the full 3-hour period if you wish. The final exam 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. 1–3 Kinematics
- Ch. 4–6 Newton’s Laws
- Ch. 7 Rotational Motion
- Ch. 9 Linear and Angular Momentum
- Ch. 10 Work and Energy
- Ch. 11–12 Thermodynamics
- Ch. 13 Fluids
- Ch. 14 Oscillations

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

- Sections 9.1 & 9.2 Impulse
- Section 11.2 Energy in the Body
- Section 11.8 Entropy
- Section 12.4 Thermal Expansion
- Section 12.8 Heat Transfer
- Section 13.4 Buoyancy
- Section 13.6 Fluid Dynamics—Bernoulli’s Equation
- Sections 14.6 & 14.7 Damped and Driven Oscillations

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. A copy is available on the course website.

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.

**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 round-off errors. Your final answer should normally be within 1% of the correct answer. Keep additional digits in your intermediate calculations.

Check your arithmetic.

Don’t panic. You should have plenty of time.

Get a good night’s sleep!