Topics: The final exam will be cumulative. About 1/4 will be devoted to thermodynamics; the remainder will cover the rest of the course. Although an understanding of kinematics (Ch. 1-4) is an essential component of much of the other material, there will be no questions specifically on those chapters.

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. 5–6 Newton’s Laws.
- Ch. 7–8 Work and Energy.
- Ch. 9 Systems of Particles and Momentum.
- Ch. 10–11 Rotational Motion and Angular Momentum.
- Ch. 13 Gravitation.
- Ch. 15–17 Oscillations and Waves.
- Ch. 18–20 Thermodynamics.

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.

Omissions: The following topics will not be on the final.

- Section 6-4 Drag Forces
- Section 9-6 Impulse
- Section 9-12 Rocket Motion
- Section 11-4 Forces of Rolling
- Section 11-12 Gyrosopes
- Section 13-9 Einstein and Gravitation
- Section 17-6 Intensity
- Section 17-10 Shock Waves
- Section 18-12 Heat Transfer
- Section 19-6 Mean Free Path
- Section 19-7 Molecular Speeds
- Section 19-10 A Hint of Quantum Mechanics
- Section 20-7 Real Engines
- Section 20-8 Statistical Interpretation of Entropy

Lab-Specific Questions:

Questions may draw on curve-fitting ideas you used in lab. For example, you might be given
a graph for an experiment and be expected to use the slope and intercept to determine some relevant physical quantity. You should also know how to find and interpret the coefficients (and their uncertainties!) given in Excel charts as you did in lab.

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.

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!