

Atoms to Galaxies PHY 102
Exam #2 Study Guide
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Use this as a study guide for the material we covered in class, what was in the textbooks, on the homework, and what concepts you should expect to see on the first exam. Topics in **BOLD type** are ones I consider important, and may emphasize over others.

The topics below are from Chapters 3-17 (skipping Chapters 11 and 16) in the book The Cartoon Guide to Physics. You can see exactly which sections we covered in class from the schedule in the course syllabus.

The exam will be multiple choice, and it will be closed book and closed notes. If you can answer the questions here in a general conceptual sense, you should have little trouble picking the right answers out of a multiple-choice list on the exam itself.

You should also consider using the end-of-chapter features and sample problems in the textbook, as well as any of the textbook's online resources to help you study.

Statics and Dynamics (Be ready for a descriptive problem: Identifying forces in a diagram of some system. Also, be ready for some 'what if' scenarios).

What is Newton's 3rd Law? How is it applied to static situations?

What is meant by the 'total force' in one direction or dimension?

How do Normal, Frictional, Tension forces, and Weight work?

How can Newton's laws be used to predict the motion of a system?

Momentum, Impulse, Collisions, and Conservation of Momentum

What is the definition of momentum? How is it related to Force? What is impulse?

What happens to momentum in a collision?

What is conservation of momentum?

What is a perfectly elastic collision? Perfectly inelastic?

Work and Energy, and Conservation of Energy (Be ready for a descriptive problem where you have to identify energy in a diagram of some system).

How are work and energy related to each other?

How is work related to Force?

What is kinetic energy?

What is gravitational potential energy?

What other kinds of energy are there?

What does the Law of Conservation of Energy state?

How can Conservation of Energy be used to solve a problem?

Electricity

What is electric charge? Where is it found?

What are some real-life natural examples of static electricity?

What causes electric fields?

What is Coulomb's Law of Electric Force? What direction does it act?

What is electric potential energy?

What does a capacitor do? What does a battery do?

What is electric current? How is it related to charge?

What is electric potential (Voltage)?

What is electrical resistance? What does a resistor do?

What is Ohm's Law? Where is it used?

What is Power? How is it related to energy?

Magnetism

What causes magnetic fields?

What causes magnetic forces? What direction do magnetic forces act?

What is Faraday induction? What does it tell us about the relationship between electricity and magnetism?

What are some real-life natural examples of magnetism?