PHYSICS 1020 – Spring 1997

THINGS TO KNOW FOR FIRST EXAM

(15 January 1997)

- material covered in chapters 1 and 2 of the textbook
- material covered in lectures 1,2,3
- material covered in homework sets 1 and 2

Specific items to know:

- what distinguishes science from pseudoscience and from religion? (falsifiability, absolute truth, certainty,....)
- planetary motion: theories of Aristarchus, Ptolemy, Copernicus, Kepler
  what are their differences, what do they have in common
- what is a sphere? what is a circle? what is an ellipse?
- what is a deferent? what is an epicycle?
- what is retrograde motion of the planets, and how is it explained in the models of Ptolemy and Copernicus
- shape and approximate size of the Earth
- powers of 10, scientific notation
- meaning of prefixes M (mega), k (kilo), m (milli), μ (micro)
- how many centimeters in an inch?
- how many meters/kilometers in a mile?
- how many feet in a meter?
- what is a chemical element?
- what is a chemical compound?
- distinguish elements, compounds and mixtures
- atoms and molecules
- approximate size of an atom
- thermal energy and random motion
- models of the atom:
  Demokritos – structureless point – Thomson (raisin cake) – Rutherford (planetary model) – quantum theory

- periodic table; similarity of elements in same column
- chemical reactions
- oxidation
- combustion, burning
- respiration
- photosynthesis