PHY1025 - Review Topics for Exam 3

Be sure to look at the "Summary of Terms" at the end of each chapter and to really understand
what each of those terms means. Also, try to answer as many of the chapter questions as possible.
Finally, make sure you can convert units for any given quantity.
Here are some of the main topics you should be familiar with:

Chapter 11
Make sure to know the definitions of and distinctions between the terms we studied.
Distinguish between atom and molecule, element, compound and mixture. Give examples.
Atomic number, atomic mass, isotope
Structure of the atom: nucleus, proton, neutron, electron, ion
Simple calculations about number of protons, neutrons, electrons.
What are valence electrons and what do they determine?
How are positive and negative ions is formed?
Brownian motion – What is it? How can we "see" it?
How is density related to atomic mass?
Why are the atomic masses on the periodic table not whole numbers?
What is a mole? Avogadro's Number? How does this relate to atomic mass?
Just how big is an atom, anyway? About how many atoms are in one cm^3 of hamburger?

Chapter 12
Difference between crystalline and amorphous solids. Examples of each?
What is density? What are the units? How do you convert from kg/m^3 to g/cm^3? Is density a unique identifier?
What is elasticity? Give examples of substances that are elastic and inelastic.
Hooke's Law for springs. Spring constant – What is it? What are the units? (F = -kx)
Tension and compression in beams. Where does each occur? Why do we use I-beams in construction?
Scaling – Relationship between length, surface area, volume, mass and weight. Why do larger
animals have thicker legs relative to their body size? Why do larger animals have a harder time keeping cool?
Why is a 3 story building more energy efficient than a 1 story building?

Chapter 13
Pressure – Units (there are several). What is the difference between force and pressure?
How can you have a large force and a small pressure? A small force and a large pressure?
What actually causes the pressure in a liquid or gas (Brownian Motion, collisions).
How does pressure change with depth in a liquid? In water, add 1 ATM for every 10 m or 33 ft.
What is gauge pressure? Does a tire pressure gauge or a water pressure gauge actually give the correct
measurement?
Buoyancy. Archimedes' Principle. What makes something sink or float? Why does an iron boat float?
What makes a hot air balloon rise?
Pascal's Principle – How this makes the hydraulic lever work (like in your brakes or in heavy duty machinery).
 Force gets multiplied while distance gets divided.

Chapter 14
Earth's atmosphere. What is its composition and how does pressure change with altitude?
How does a mercury barometer work? Why do we use mercury instead of some other liquid?
Bernoulli's Principle. What is the relationship between velocity and pressure in a gas or liquid?
How does Bernoulli's Principle provide lift for an airplane? How can it cause the roof of a house to blow off in
high winds?
Ideal Gas Law. What is the relationship between Pressure, Volume and Temperature of a gas?
What is a plasma? How are plasmas formed? What is actually in a plasma? (A fully ionized gas – a soup of
nuclei and electrons)

$P = F/A$

$P_{ABS} = P_{Gauge} + P_{ATM}$ (What does this formula mean?)

1 ATM = 14.7 PSI = 101.3 kPa = 760 mm Hg

PV=nRT (Be able to do simple calculations using the Ideal Gas Law, similar to what we did in class.

$P = P_0 + \rho g h$ (What does this formula mean?)