Course Objectives for CH 1010  
Fall 2017

Chapter 1: Matter and Energy: An Atomic Perspective

Big Ideas

- We can view matter at three levels, symbolic (H₂O), particulate and macroscopic (a beaker of water).
- The properties of matter are related to its molecular level structure.
- Scientific theories and models are the result of observations and experiments; theories evolve over time as the more evidence becomes available.
- Chemistry is an experimental science and as such results depend on accurate, precise, reproducible measurements.

After your study of this chapter you should be able to:

1. Distinguish solids, liquids and gases at all three levels of representation.
2. Distinguish between the classifications of matter and how they differ at the molecular level.
3. Discuss how scientific theories and models change over time and why.
4. Correctly use SI units and prefixes and convert between SI units.
5. Correctly interpret numbers written in scientific notation, convert between scientific and decimal notation, and use numbers written in scientific notation in calculations.
6. Express mass, length, and volume in appropriate units.
7. Utilize the Celsius and Kelvin temperature scales. Convert between the two scales.
8. Distinguish between accuracy and precision.
9. Determine the number of significant figures in a measurement.
10. Report answers to calculations to the appropriate number of significant figures.
11. Determine density from mass and volume, and distinguish density from mass. Recognize how changes in mass and/or volume affect density.
12. Use unit conversions in calculations to change from one set of units to another.

Things you should know from this chapter:

- Definitions of atoms, molecules, compounds, elements and density.
- Standard Units of measurement for: mass, temperature, time, length, amount of substance, volume and density.
- Prefix multipliers: mega, kilo, deci, centi, milli, micro and nano.