Chemistry 101
Unit 11 – Outcomes

The student will be able to:

1) Describe the extranuclear structure of the atom.

2) Give the qualitative relationship between:
a) wavelength and frequency
b) wavelength and energy
c) frequency and energy

3) Given an example, differentiate between continuous and quantized.

4) Distinguish between the ground state and the excited state of an atom.

5) Identify the principal energy levels in an atom.

6) State the energy trend among the principal energy levels in an atom.

7) For each principal energy level, state the number of sublevels and identify them.

8) State the relative energy trend among sublevels.

9) Describe what is meant by orbital.

10) Describe the shapes of s and p orbitals.

11) Recognize that the Pauli exclusion principle limits the number of electrons that can occupy an orbital and describe the restriction.

12) Recognize that chemical properties of an element depend on its electron configuration.

13) Write ground state electron configuration for elements with atomic #'s 1 – 36.

14) Using n for the highest occupied energy level, write valence electron configurations of any representative element.

15) Write the Lewis (electron dot) symbol for an atom of any representative element.

16) Given the symbol for a representative element, select other elements that would be expected to have similar chemical properties and conversely, elements that would be expected to have different chemical properties.

17) Identify monatomic ions that are isoelectronic with a given noble gas and write the electron configuration of those ions.

18) Distinguish between ionic and covalent bonds.

19) Differentiate between properties of ionic and covalent (molecular) compounds.

20) Distinguish between polar and nonpolar covalent bonds.

21) Given the electronegativities of all elements involved, rank bonds in order of increasing or decreasing polarity.

22) Given the electronegativities of two elements, classify the bond between them as non-polar covalent, polar covalent, or primarily ionic. If the bond is polar, state which end is positive and which end is negative.

23) Identify and describe or explain dipole forces, dispersion forces, and hydrogen bonds.

24) Given the structure of a molecule, or information from which it may be determined, identify the significant intermolecular forces present.

25) Given the molecular structure of two substances, or information from which they may be obtained, compare or predict relative values of physical properties that are related to them.