CURRICULUM MAP
CHEMISTRY – 11-12

Week 1-3	Weeks 4-6	Weeks 7-9	Weeks 10-12	Weeks 13-15	Weeks 16-18
Nature of Matter 9-1. Recognize that all atoms of the same element contain the same number of protons, and elements with the same number of protons may or may not have the same mass. Those with different masses (different numbers of neutrons) are called isotopes. **Note:** Calculate atomic mass, molecular weight, and basic conversion. 9-2. Illustrate that atoms with the same number of positively charged protons and negatively charged electrons are electrically neutral. **Note:** Calculate the ions. 9-4. Show that when elements are listed in order according to the number of protons (called the atomic number), the repeating patterns of physical and chemical properties identify families of elements. Recognize that the periodic table was formed as a result of the repeating pattern of electron configurations. **Note:** Periodical trends, transition elements. 9-9. Investigate the properties of pure substances and mixtures (e.g., density, conductivity, hardness, properties of alloys, superconductors and semiconductors). **Note:** Periodical trends, transition elements. 11-1. Explain that elements with the same number of protons may or may not have the same mass and those with different masses (different numbers of neutrons) are called isotopes. Some of these are radioactive. **Credit 1.0** **Prerequisites – Active Physics and Biology** **Double-block** **One Semester**	**Nature of Matter** 9-4. Recognize that the periodic table was formed as a result of the repeating pattern of electron configurations. **Note:** VESPR Theory 9-5. Describe how ions are formed when an atom or a group of atoms acquire an unbalanced charge by gaining or losing one or more electrons. **Note:** Lewis Dot Diagram **Nature of Energy** 12-12. Describe how different atomic energy levels are associated with the electron configurations of atoms and electron configurations (and/or conformations) of molecules. **Historical Perspectives and Scientific Revolutions** 12-15. Describe concepts/ideas in physical sciences that have important, long-lasting effects on science and society (e.g., quantum theory, theory of relativity, age of the universe).	**Nature of Matter** 9-7. Show how atoms may be bonded together by losing, gaining or sharing electrons and that in a chemical reaction, the number, type of atoms and total mass must be the same before and after the reaction (e.g., writing correct chemical formulas and writing balanced chemical equations). **Note:** Naming Chemical Formula, Types of Equations.	**Nature of Matter** 12-1. Explain how atoms join with one another in various combinations in distinct molecules or in repeating crystal patterns. 9-6. Explain that the electric force between the nucleus and the electrons hold an atom together. Relate that on a larger scale, electric forces hold solid and liquid materials together (e.g., salt crystals and water). **Note:** Kinetic Theory of Matter, Stoichiometry, Gas Laws, Types of Solutions **Historical Perspectives and Scientific Revolutions** 12-14. Use historical examples to explain how new ideas are limited by the context in which they are conceived; are often initially rejected by the scientific establishment; sometimes spring from unexpected findings; and usually grow slowly through contributions from many different investigators (e.g., nuclear energy, quantum theory and theory of relativity).	**Nature of Matter** 9-8. Demonstrate that the pH scale (0-14) is used to measure acidity and classify substances or solutions as acidic, basic, or neutral. 12-4. Recognize that at low temperatures some materials become superconducting and offer little or no resistance to the flow of electrons. 9-10. Compare the conductivity of different materials and explain the role of electrons in the ability to conduct electricity. 12-2. Describe how a physical, chemical or ecological system in equilibrium may return to the same state of equilibrium if the disturbances it experiences are small. Large disturbances may cause it to escape that equilibrium and eventually settle into some other state of equilibrium. **Forces and Motion** 11-3. Describe real world examples showing that all energy transformations tend toward disorganized states (e.g., fossil fuel combustion, food pyramids and electrical use).	**Nature of Energy** 12-10. Explain the characteristics of isotopes. The nuclei of radioactive isotopes are unstable and spontaneously decay emitting particles and/or wavelike radiation. It cannot be predicted exactly when, if ever, an unstable nucleus will decay, but a large group of identical nuclei decay at a predictable rate. 12-11. Use the predictability of decay rates and the concept of half-life to explain how radioactive substances can be used in estimating the age of materials. 12-13. Explain how atoms and molecules can gain or lose energy in particular discrete amounts (quanta or packets); therefore they can only absorb or emit light at the wavelengths corresponding to these amounts. **Nature of Matter** 11-2. Explain that humans have used unique bonding of carbon atoms to make a variety of molecules (e.g., plastics). **11/17/2005**