## CHEM1111 - General Chemistry I

Credits:	5 (4/1/0)
Description:	Meets MnTC Goal Areas 2 and 3. This course is the first of a two-course series (CHEM1111 and CHEM1112) intended for science majors. Students will learn the general chemistry principles: problem solving, nomenclature, atomic structure, electronic structure, stoichiometry, titration, reaction types, molecular structure, thermochemistry, electronic structure, and properties and laws of gases. The course includes a lab. Students completing the two-semester sequence will be competent in all areas listed in General Chemistry I & II of the Minnesota State Chemistry Transfer Pathway.
Prerequisites:	• MATH1020
Corequisites:	
Pre/Corequisites <sup>*</sup> :	



i	
Competencies:	<ol> <li>Apply dimensional analysis with proper attention to units and significant figures.</li> <li>Describe and apply the scientific method used by scientists in solving problems.</li> <li>For ionic compounds (including those containing polyatomic ions) and simple inorganic molecular compounds, given a chemical formula, give the correct name, and vice-versa.</li> <li>Describe atom components, general structure of the atom and isotope. Determine the atomic number, mass number and number of neutrons for a specified isotope.</li> <li>Calculate the average atomic mass of an element from isotopic abundances and isotopic masses.</li> <li>Carleite the average atomic mass of an element from isotopic abundances and isotopic masses.</li> <li>Apply wave-particle duality and the uncertainty principle to describe properties of electrons.</li> <li>Apply he results of the Schrödinger quantum mechanical model of the atom to assign quantum numbers to electrons, and write electron configurations of multi-electron atoms and ions.</li> <li>I dentify valence vs. core electrons and predict trends in atomic size, ionization energy, electron affinity and charges on main-group ions.</li> <li>Calculate quantities associated with stoichiometry and using stoichiometric relationships including molar mass, number of particles, mass of reactant or product, limiting reagents and percent yields</li> <li>Destrime the empirical formula of an unknown compound using composition by mass or combustion analysis data.</li> <li>Apply the First and Second Laws of Thermodynamics and thermochemical equations to relate heat energy, quantity of substance reacted, temperature measurements and/or heat capacity.</li> <li>Calculate reaction enthalpies using two methods: calorimetry data and Hess's Law with enthalpies of formation.</li> <li>Apply the First and Second Laws of Thermodynamics and thermochemical equations to relate heat energy, quantity of substance reacted, temperature measurements and/or he</li></ol>
MnTC goal areas:	2. Critical Thinking 3. Natural Sciences



<sup>\*</sup>*Can be taking as a Prerequisite or Corequisite.* 

