

## **Prerequisite Knowledge:**

**General Chemistry I** - periodic table, ions and ionic compounds, stoichiometry, formula weights, interconverting masses and moles, thermochemistry, enthalpy, wave behavior of matter, quantum mechanics and atomic orbitals, representations of orbitals (s,p,d,f), electron spin and Pauli exclusion principle, electron configurations, effective nuclear charge, sizes of atoms and ions (trends), electron affinity, electronegativity, group trends, Lewis symbols, ionic bonding and energetics, covalent bonding, molecular geometry and bonding theories, VSEPR, covalent bonding and orbital overlap, molecular orbitals for simple diatomic molecules.

**General Chemistry II** – Phase changes, phase diagrams, structures of solids, unit cells, close packing of spheres, bonding in solids (molecular, covalent network, ionic, metallic), chemical kinetics, Le Chatelier's Principle, classical thermodynamics, entropy, Gibbs Free energy, oxidation states, balancing oxidation-reduction reactions, crystal field theory, electron configuration in complexes.