2024 Chemistry Study Guide – Semester 1
Chapters 1, 3-6, and 9

Chapter 1:

- Classification and Properties of matter (solids, liquids, gases)
- Physical/Chemical properties/changes
- Energy changes through states of matter
- Measurements; volume by displacement
- Metals, nonmetals, semimetals
- State of matter of elements at room Temperature and temperature conversions
- Diatomic Elements
- Accuracy and Precision
- Metric and English Equalities
- Metric and English Conversions using Dimensional Analysis
- Significant figures
- Scientific Notation

Chapter 3:

- Atomic mass, Atomic number
- Isotopes – Determine number of protons, electrons, neutrons
- Atomic Notation
- Average atomic mass
- Light energy, wavelength and frequency
- Energy, Frequency, Wavelength calculations
- Quantum Numbers
    - Energy levels, sublevels, orbitals
- Aufbau Principle
- Hund's Rule
- Pauli Exclusion Principle
- Electron Configurations
    - anomolies
- Noble Gas Configurations
- Valence Electrons
- Predicting ionic charge – cations and anions
- Mole and Avogadro's Number
- Molar Mass
- Density Calculations
- Converting between grams, moles, particles and volume at STP
- Percent Composition
- Determining empirical formulas
- Determining molecular formulas

Chapter 4:

- The Periodic Table
    - Periods and Groups
- Periodic Trends
    - Atomic radius
    - Ionization energy
    - Electron affinity
    - Electronegativity

Chapter 5:

- Monatomic and polyatomic ions
- Ionic Bonding – Complete Transfer of electrons.
- Predicting ionic compounds
- Dissociation of Ionic salts in water (aq)
- Crystal Lattice
- Nomenclature of ionic compounds

Chapter 6:

- Covalent Bonding – sharing electrons
- Polar, nonpolar bonds
- Electronegativity and polarity of bonds.

2024 Chemistry Study Guide – Semester 1
Chapters 1, 3-6, and 9

- Nomenclature of covalent compounds
- Nomenclature of Acids
- Lewis Dot Structures
- Octet Rule
- Resonance Structures
- Formal Charges
- Expanded Octets
- VSEPR Theory: EDG and Molecular Geometry
- Polar and nonpolar molecules

Chapter 9:

Calculate the following stoichiometry problems with proper mole ratios.

- Mole to mole
- Mass to mole or mole to mass
- Mass to mass
- Mass to volume or volume to mass at STP
- Volume to volume at STP
- Limiting Reagent problems
- Percent yield
- Excess Reagent