Chapter 1
1. Elements, compounds; solutions
2. States of matter
3. Physical and chemical properties
4. Law of conservation of mass

Chapter 2
5. Atoms; protons, neutrons, and electrons
6. Atomic number, mass number, isotopes; atomic symbols including atomic and mass numbers and charges
7. Molecules and ions, cations, anions; charges on atomic ions; names, formulas, and charges of polyatomic ions
8. Formulas and names of ionic compounds and binary molecular compounds

Chapter 3
9. Atomic and molecular masses
10. Avogadro's number; mole, molar mass; gram to mole conversions
11. Percent composition; empirical formula from percent composition
12. Stoichiometry, mole method \((g \rightarrow mol \rightarrow mol \rightarrow g)\)
13. Limiting reagent; theoretical, actual, and percent yield

Chapter 4
14. Solute concentrations; molar concentration (molarity; \(M = \frac{mol}{L}\))
15. Solubility of ionic compounds in water
16. Predicting products of precipitation and acid-base reactions
17. Molecular, ionic, and net ionic equations (precipitation and acid-base)
18. Oxidation and reduction; redox reactions
19. Oxidation numbers
20. Solution stoichiometry (precipitation, acid-base, and redox reactions; \((M, V) \rightarrow mol \rightarrow mol \rightarrow (M, V)\))

Chapter 5
21. Ideal gas law; pressure, volume, temperature, or amount of gas (moles or grams)
22. Change in pressure, volume, or temperature (initial and final states)
23. Calculating molar mass or density of a gas
Chapter 7
24. Bohr model of the atom
25. Quantum numbers (n, l, m_l, m_s); allowed values of quantum numbers
26. Pauli exclusion principle
27. Hund’s rule
28. Electron configurations

Chapter 8
29. Periodic table
30. Periodic properties; atomic radius, ionic radius, ionization energy, electronegativity

Chapter 9
31. Lewis symbols and Lewis structures
32. Octet rule
33. Formal charge
34. Resonance
35. Octet rule exceptions

Chapter 10
36. Electron domains; electron arrangement
37. Molecular shape; VSEPR model