

## Advanced Chemistry Objectives

I. Atomic Structure	State Standards
<b>Core Objective:</b> The student will be able to develop a comprehensive understanding of atomic structure which may include the following optional objectives:	12.1.2 12.3.1
1. understand the relationship between quantum theory and electron configuration within the electron cloud	12.3.2 12.3.6
2. apply electron configuration concepts to periodicity	12.8.3*
3. correlate radioactivity to nuclear stability	
4. utilize spectral data to discern atomic electron structure	

II. Chemical Bonding	State Standards
<b>Core Objective:</b> The student will be able to develop a comprehensive understanding of chemical bonding which may include the following optional objectives:	12.1.2 12.3.3
1. employ Molecular Orbital theory to describe molecular structures	12.3.2
2. employ VSEPR Theory & hybridization to describe molecular structures	
3. apply polarity and dipole moments in molecules to describe intermolecular attractions	

III. Chemical Reactions	State Standards
<b>Core Objective:</b> The student will be able to develop a comprehensive understanding of chemical reactions which may include the following optional objectives:	12.1.2 12.3.2
1. utilize the concepts of kinetics describe the rates of chemical reactions	12.3.3
2. apply stoichiometric practices to solve advanced problems involving a mixture of variables	12.3.5 12.3.6
3. describe product formation of chemical reactions by implementing reaction mechanisms	
4. utilize fundamental concepts of reactions types predict products of chemical reactions	
5. correctly write chemical equations using oxidation/reduction and acid/base principles	
6. understand the key role of energy in chemical reactions	

IV. Acid/Base	State Standards
<b>Core Objective:</b> The student will be able to develop a comprehensive understanding of acid/base chemistry which may include the following optional objectives:	12.1.2 12.1.5
1. apply equilibrium principles to acid/base reactions	12.3.2
2. collect & analyze titration data	12.3.3
3. describe the role of buffers in acid/base systems	

\*These state standards apply to optional objectives.

V. Organic Chemistry	State Standards
<b>Core Objective:</b> The student will be able to develop a comprehensive understanding of organic chemistry which may include the following optional objectives:	12.1.2 12.1.4
1. apply nomenclature rules/strategies for naming organic compounds	12.3.2
2. identify common functional groups found within families of organic compounds	12.6.2*
3. describe common chemical reactions associated with common functional groups	12.7.3*
4. extend organic chemistry concepts to biological compounds & reactions	12.7.5*
5. differentiate structures of hydrocarbons & families of organic compounds	12.8.3*
6. describe the structures of polymers and the importance of polymer chemistry	
7. describe physical and chemical properties of organic families	

\*These state standards apply to optional objectives.