



ALLEN ACADEMY

AP Chemistry Course Description

2019-2020

First Trimester	Second Trimester	Third Trimester
<p>Unit 1 - Atomic Structure and Properties</p> <ul style="list-style-type: none">* Moles and Molar Mass* Mass Spectroscopy of Elements* Elemental Composition of Pure Substances* Composition of Mixtures* Atomic Structure and Electron Configuration* Photoelectron Spectroscopy* Periodic Trends* Valence Electrons and Ionic Compounds <p>Unit 2 - Molecular and Ionic Compound Structure and Properties</p> <ul style="list-style-type: none">* Types of Chemical Bonds* Intramolecular Force and Potential Energy* Structure of Ionic Solids* Structure of Metals and Alloys* Lewis Diagrams* Resonance and Formal Charge* VSEPR and Bond Hybridization <p>Unit 3 - Intermolecular Forces and Properties</p> <ul style="list-style-type: none">* Intermolecular Forces* Properties of Solids* Solids, Liquids, and Gases* Ideal Gas Law* Kinetic Molecular Theory* Deviation from Ideal Gas Law	<p>Unit 5 - Kinetics</p> <ul style="list-style-type: none">* Reaction Rates* Introduction to Rate Law* Concentration Changes Over Time* Elementary Reactions* Collision Model* Reaction Energy Profile* Introduction to Reaction Mechanisms* Reaction Mechanism and Rate Law* Steady-State Approximation* Multi-step Reaction Energy Profile* Catalysis <p>Unit 6 - Thermodynamics</p> <ul style="list-style-type: none">* Endothermic and Exothermic Processes* Energy Diagrams* Heat Transfer and Thermal Equilibrium* Heat Capacity and Calorimetry* Energy of Phase Changes* Introduction to Enthalpy of Reaction* Bond Enthalpies* Enthalpy of Formation* Hess's Law <p>Unit 7 - Equilibrium</p> <ul style="list-style-type: none">* Introduction to Equilibrium* Directions of Reversible Reactions* Reaction Quotient and Equilibrium Constant* Calculating the Equilibrium Constant* Magnitude of the Equilibrium Constant* Properties of the Equilibrium Constant	<p>Unit 9 - Applications of Thermodynamics</p> <ul style="list-style-type: none">* Introduction to Entropy* Absolute Entropy and Entropy Change* Gibbs Free Energy and Thermodynamic Favorability* Thermodynamic and Kinetic Control* Free Energy and Equilibrium* Coupled Reactions* Galvanic (Voltaic) and Electrolytic Cells* Cell Potential and Free Energy* Cell Potential Under Non-standard Conditions* Electrolysis and Faraday's Law



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<ul style="list-style-type: none">* Solutions and Mixtures* Representations of Solutions* Separation of Solutions and Mixtures* Chromatography* Solubility* Spectroscopy and the Electromagnetic Spectrum* Photoelectric Effect* Beer-Lambert Law <p>Unit 4 - Chemical Reactions</p> <ul style="list-style-type: none">* Introduction for Reactions* Net Ionic Equations* Representations of Reactions* Physical and Chemical Changes* Stoichiometry* Introduction to Titration* Types of Chemical Reactions* Introduction to Acid-Base Reactions* Oxidation-Reduction (Redox) Reactions	<ul style="list-style-type: none">* Calculating Equilibrium Concentrations* Representations of Equilibrium* Introduction to Le Chatelier's Principle* Reaction Quotient and Le Chatelier's Principle* Introduction to Solubility Equilibria* Common-Ion Effect* pH and Solubility* Free Energy of Dissolution <p>Unit 8 - Acids and Bases</p> <ul style="list-style-type: none">* Introduction to Acids and Bases* pH and pOH of Strong Acids and Bases* Weak Acid and Base Equilibria* Acid-Base Reactions and Buffers* Acid-Base Titrations* Molecular Structure of Acids and Bases* pH and pKa* Properties of BuffersHenderson-Hasselbalch EquationBuffer Capacity	