



GREAT NECK PUBLIC SCHOOLS

"Where Discovery Leads to Greatness"

#DiscoverGreatness

Phipps Administration Building
Office of Instruction
345 Lakeville Road
Great Neck, New York 11020

516.441.4009
516.441.4010
Fax 516.441.4992

Course Profile: Chemistry AP

<u>Department</u>	Science		
<u>Course Name</u>	AP Chemistry		
<u>Course Length</u>	1 year		
<u>High School Credits</u>	1 unit		
<u>Description</u>	This course is the equivalent of a first-year college chemistry course. Successful achievement in Regents Chemistry is strongly recommended. This course stresses problem-solving and the use of mathematics as a thought tool. In May, the students will take the College Board Advanced Placement Test in Chemistry. Class daily plus lab is on alternate days.		
<u>Target/eligible students</u>	Students from grades 11 and 12		
<u>State Learning Objectives Link(s)</u>	AP Chemistry Course and Exam Description Link		
<u>Primary texts and materials</u>	Zumdahl, Steven. S and Zumdahl, Susan. A. (2014). Chemistry (9th AP ed, Chapters 1-18). Brooks Cole, Cengage Learning		
<u>Scope/Sequence</u>			
Unit 1: Atomic Structure and Properties	SPQ-1 and 2 SAP-1 and 2	• 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	Pg. 34
Unit 2: Molecular and Ionic Compound Structure and Properties	SAP-3 and 4	• 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	Pg. 48
Unit 3: Intermolecular Forces and Properties	SAP-5, 6 and 7 SPQ-3	• Intermolecular forces • Properties of solids • Solids, liquids and gases • Ideal gas law • Kinetic Molecular Theory • Deviation from Ideal Gas Law • Solutions and Mixtures • Representation of Solutions • Separation of Solutions and Mixtures • Chromatography • Solubility • Spectroscopy and the Electromagnetic Spectrum • Photoelectric Effect	Pg. 62

		• Beer-Lambert Law	
Unit 4: Chemical Reactions	TRA-1 SPQ-4 TRA-2	• Introduction for Reactions • Net Ionic Equations • Representation of reactions • Physical and chemical changes • Stoichiometry • Introduction to Titration • Types of Chemical Reactions • Introduction to Acid-Base Reactions • Oxidation-Reduction Reactions	Pg. 84
Unit 5: Kinetics	TRA-3,4 and 5 ENE-1	• Reaction rates • Introduction to rate law • Concentration changes over time • Elementary reactions • Collision model • Reaction energy profile • Introduction to reaction mechanisms • Steady-state approximation • Multistep reaction energy profile • Catalysis	Pg. 100
Unit 6: Thermodynamics	ENE-2 and 3	• 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	Pg. 118
Unit 7: Equilibrium	TRA-6, 7 and 8	• Introduction to equilibrium • Direction of reversible reactions • Reaction quotient and equilibrium constant • Calculating the equilibrium constant • Magnitude of the equilibrium constant • Properties of the equilibrium constant • Calculating equilibrium concentrations • Representations of equilibrium • Introduction to LeChatelier's Principle • Reaction quotient and LeChatelier's Principle • Introduction to Solubility Equilibria • Common-Ion Effect • pH and Solubility • Free Energy of Dissolution	Pg. 134
Unit 8 :Acids and Bases	SAP-9 and 10	• 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 buffers • Henderson-Hasselbalch • Buffer capacity	Pg.156
Unit 9: Application of Thermodynamics	ENE-4,5 and 6	• Introduction to entropy • Absolute entropy and entropy change	Pg. 174

		• 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 nonstandard conditions • Electrolysis and Faraday's law	
<u>Additional Notes</u>	From the AP Chemistry CED (Effective Fall 2019), College Board. The order of topics may vary from year to year and school to school.		