

AP CHEMISTRY DETAILED SYLLABUS

- ★ The assigned textbook reading is *due by the **Monday** of the next week.*
- ★ ONLINE HOMEWORK Assignments are *due by the **Tuesday** of the next week.* ONLINE HOMEWORK assignment numbers are indicated by parenthesis.
- ★ Textbook problem assignments are *due by the **Wednesday** of the next week.* Textbook problem assignments are indicated by page number and are printed in red. In most cases, textbook problem assignments are odd-numbered problems with the answer in the back of your textbook. However, you are expected to show all your work and be able to show/explain your solutions in class.
- ★ Friday will usually be reserved for laboratory activities. You should prepare your lab notebook and read the procedure carefully before each lab day. Lab notebook preparation is *due by the **Friday of the lab.*** Lab writeups are *due by the **Thursday** of the next week.* The theme of the lab may or may not match the concepts presented during the week.
- ★ ***Quizzes will usually be administered on Monday,*** covering the previous week's topics.
- ★ You may use the student computer in my classroom AFTER school to complete ONLINE HOMEWORK assignments.
- ★ You may submit both ONLINE HOMEWORK and textbook problem assignments before due date if you want to work ahead.
- ★ You may work as a group to complete these problems, however, each student must complete and submit their own set of assignments. You will be expected to show/explain your solutions in class.
- ★ All weeks run from Monday - Friday and may or may not include 5 full class days.
- ★ DO NOT GET INTO THE HABIT OF LEAVING ALL YOUR ASSIGNMENTS UNTIL THE LAST MINUTE - MANY OF THESE WILL TAKE MORE TIME THAN YOU EXPECT. BE PREPARED; PLAN AHEAD.

WEEK	TOPIC	ASSIGNMENTS
1 (5 days)	Review: Chapter 1: Conversions, Significant Figures, Density Chapter 2: Atomic Structure, Periodic Table, Naming Compounds & Writing Formulas Chapter 3: Mole-Gram Conversions, Empirical Formulas (simple), Percent Composition, Balancing Equations, Stoichiometry (simple) Chapter 4: Solution Concentration (simple), Types of Chemical Reactions Chapter 5: Gas Laws Labs: 1) Chromatography 2) Precipitation Reactions	<p style="text-align: center;"><i>Do 3 problems from each assignment. 70 points</i></p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> Chapter 1: (0)Significant Figures (1)Exponents (4)Scientific Notation (7)Mass, density and volume (9)Mass, density and volume (21)Converting Volumes (22)Converting Mass (23)Converting Distance Chapter 2: (30)Protons,electrons and neutrons (160)Naming Chemical Compounds (161)Names to formulas (162)Stock Notation </div> <div style="width: 45%;"> Chapter 3: (31)Elements,moles and mass (110)Calculating gfw (111)Mass, moles and gfw (114)Percent Composition (130)Balancing chemical equations Chapter 4: (52)Molarity, moles and volume Chapter 5: (40)Boyle's Law (41)Charles' Law (42)Avogadro's Law (43)Combined Gas Law (44)The Ideal Gas Equation </div> </div>

<p>2 (4 days)</p>	<p>MLK Holiday Chapter 3: Empirical Formulas (difficult), Stoichiometry (difficult) Chapter 4: Solution Concentration, Precipitation Reactions, Acid-Base Titration, REDOX reactions Labs: 1) Empirical formula 2) Solution Concentration / Dilutions 3) Stoichiometry 4) Acid-Base titration</p>	<p>Chapter 3: (112)Mass Relations from chemical formulas (113)General Treatment of relations from chemical formulas (115)Empirical formulas (116)Combustion Analysis (131)Mass Relationships in Chemical Reactions (132)Mole Relationships in Chemical Reactions (134)Limiting Reagents (135)Calculations based on percent yields (136)Using the Limiting Reagent</p>	<p>Chapter 4: (53)Molarity, mass and volume (57)Dilution (76)Acids/Base Titrations (140)Balancing Oxidation Reduction Reactions (146)Writing Redox Equations <i>Do 3 problems from each assignment. 45 points</i> Page 181-183: 29, 33, 39, 45, 53, 57, 61, 63 c&d, 65 a&b Read Chapter 12 before Monday</p>
<p>3 (5 days)</p>	<p>Chapter 12: Reaction Rates, Rate Laws, Reaction Mechanisms, Catalysis (topic may extend into next week) Lab: Acid-Catalyzed Iodination of Acetone</p>	<p><i>Do 5 problems from each assignment. 20 points</i> (120)Determining Orders and Rate Constants (121)Using the Rate Law</p>	<p>(122)First Order Processes (123)The Arrhenius Equation Page 602-605: 19, 22, 29, 30, 45 Read Chapter 13 Before Monday</p>
<p>4 (5 days)</p>	<p>Chapter 13: Equilibrium Lab: Determination of the Equilibrium Constant for the Formation of FeSCN²⁺</p>	<p><i>Do 4 problems from each assignment. 30 points</i> (150)Calculating K (151)Calculating K-advanced (152)Calculating an Equilibrium Concentration (153)Q vs K</p>	<p>(154)The LeChatelier Effect (155)Combining Equilibria (156)Kc and Kp Page 651-652: 27, 29, 31, 45, 47, 49, 51 Read Chapter 14 Before Monday</p>
<p>5 (5 days)</p>	<p>Chapter 14: Acids & Bases, pH, pOH Lab: Determination of pH and Indicators for Titration</p>	<p><i>Do 5 problems from each assignment. 20 points</i> (70)Identifying acids and bases (71)pH, pOH, [H⁺], [OH⁻]</p>	<p>(72)Basic relations(pH,pOH,etc) (73)Solutions of Weak Acids Page 714-716: 75, 81, 83, 89, 107, 109, 115, 117, 119, 123, 125 Read Chapter 15 Before Monday</p>
<p>6 (5 days)</p>	<p>Chapter 15: Aqueous Equilibria, Acid-Base Equilibrium, Solubility Equilibria, Complex Ion Equilibria Lab: Determination of the Hardness of Water</p>	<p><i>Do 5 problems from each assignment. 40 points</i> (74)Solutions of Acids and Bases-complete treatments (75)Acid-base reactions-calculation of K (77)The Composition of Buffers (78)Properties of Buffers</p>	<p>(79)Hydrolysis of acids and bases (80)Proton Transfer Reactions (81)Solutions of Weak Bases (82)The Weak Acid Approximation Page 782: 23d, 24d</p>
<p>7 (4 days)</p>	<p>Presidents' Day, Continuing Chapter 15 Labs: 1) Identifying Elements Using Flame Tests 2) Qualitative Analysis</p>	<p><i>Do 5 problems from each assignment. 20 points</i> (90)Slightly Soluble Salts (91)Predicting Precipitation</p>	<p>(92)Solubility and the common ion effect (93)Using Solubility to Separate Ions</p>
<p>8 (5 days)</p>	<p>Equilibrium: Tying it all Together (Chapters 13-15) Lab: Determining the Formula of a Hydrate</p>		<p>Read Chapter 6 Before Monday</p>

9 (5 days)	Chapter 6: Thermodynamics (AHSGE for underclassmen) Labs: 1) Heat Capacity of a Calorimeter 2) Heat of Reaction for the Combustion of Magnesium	<u>Do 5 problems from each assignment. 25 points</u> (60)Heat and Temperature Changes for water (61)Heat Transfer-water (62)Heat Transfer-water,word problems	(63)Heat Transfer-water and another substance (64)The Thermochemical Equation Read Chapter 16 Before Monday
10 (4 days + midterm)	Midterm Exam (Monday) Chapter 16: Spontaneity, Entropy, and Free Energy Lab: Analysis of a Commercial Bleach	<u>Do 5 problems from each assignment. 15 points</u> (66)The Second Law	(67)Energy, heat and work (68)Energy, heat and work-word problems Pages 828-831: 17, 21, 23, 25, 26, 27, 29, 31, 33, 35, 37, 45, 49, 55, 56
11	SPRING BREAK		Read Chapter 17 Before Monday
12 (5 days)	Chapter 17: Electrochemistry Labs: 1) Energizer Battery 2) Electrochemical Cells	<u>Do 5 problems from each assignment. 25 points</u> (141)Calculating Eo (142)Relating E,K and G (143)Faraday's Laws	(144)The Nernst Equation (145)Using the Electrochemical Series Pages 879-80: 14, 16a, 25, 27 Read Chapters 18, 19 & 20 Before Monday
13 (5 days)	Chapter 18 & 19: Representative Elements Chapter 20: Coordination Chemistry Lab: Synthesis of Alum		Reread Chapters 7 & 8 and Read Chapter 9 Before Monday
14 (5 days)	Chapter 7: Atomic Structure & Periodic Table Chapter 8: Bonding, VSEPR Theory Chapter 9: Orbitals Labs: 1) Atomic Mass 2) The Periodic Law	<u>Do 5 problems from each assignment. 25 points</u> (8)Wavelength, frequency and energy (33)The Quantum Numbers (34)Electronic Structures of Atoms and Ions	(35)Atomic Spectrum of Hydrogen (36)The de Broglie Wave Equation Page 406-407: 19, 21, 25, 33, 37, 39, 47, 48, 49, 53 Reread Chapter 5 and Read Chapters 10 & 11 Before Monday
15 (4 days)	Chapter 5: Ideal Gas Law & Stoichiometry, Real Gases Chapter 10: Liquids & Solids Lab: Molar Mass of a Volatile Liquid Friday Weather Day	<u>Do 10 problems from each assignment. 30 points</u> (45)Graham's Law	(46)Dalton's Law (165)Lattice Energies-Born Haber Cycles Page 234-236: 53, 54, 85, 86 Page 503-508: 32, 34, 91, 92
16 (5 days)	Chapter 11: Properties of Solutions Lab: It's Getting Colder (Freezing Point Depression)	<u>Do 5 problems from each assignment. 25 points</u> (50)Raoult's Law-one volatile component (51)Raoult's Law-two volatile components (54)Osmotic Pressure	(55)Freezing and Boiling Points-Aqueous Solutions (56)Molecular Weight and FP Depression Page 553-554: 27, 28, 35, 36(a&b), 41 Read Chapters 21 & 22 Before Monday
17 (5 days)	Chapter 21: Nuclear Chemistry Chapter 22: Organic Chemistry Lab: Ester Synthesis	<u>Do 5 problems from each assignment. 20 points</u> (163)Basic Organic Nomenclature (37)Nuclear Decay	Page 1052-1055: 9, 11, 21,23, 25, 27

18 (5 days)	Exam Prep Week Lab: Laboratory Final Exam	Study for AP Exam Prep lab notebook for Lab Final Exam
19 (5 days)	AP Exam - Tuesday May 15, 2007, Laboratory Final Exam	(Senior Exam on Thursday)
20 (4 days)	Final Exam week	

Bonus Points: You can do the following ONLINE HOMEWORK Assignments as bonus points to be added to your test grades. Maximum of 5 points per assignment.

- (2)Direct and Inverse Relationships
- (3)Direct and Inverse Relationships-Calculations
- (5)Smaller, larger or the same?
- (6)Percentage
- (10)Exercises in Comparison
- (11)Further Exercises in Comparison
- (12)Which is it?
- (13)Mass, moles and volume-relating two elements
- (24)Converting Densities
- (25)Converting Temperatures
- (32)Using Molar Volume