

AP Chemistry Unit 1 Outline: Basic Chemistry

Chapter 1: Chemical Foundations

Classes	Topics	Suggested Reading	✓	Assignments	✓
1	Course Outline, Lab Writeup, SI Units, Scientific (Exponential) Notations, Exact Numbers, Uncertainty, Significant Digits	1.1 Chemistry: An Overview (pg. 1 – 6) 1.2 The Scientific Method (pg. 6 – 8) 1.3 Units of Measurement (pg. 8 – 10) 1.4 Uncertainty in Measurement (pg. 11 – 14) 1.5 Significant Figures and Calculations (pg. 15 – 18)		pg. 32 #19, 20 pg. 33 #23, 25 to 32	
2	Unit Factor (Analysis) Method Temperature Scales, Density, Classification of Matter, Density, Classification of Matter	1.6 Dimensional Analysis (pg. 18 – 21) 1.7 Temperature (pg. 22 – 25) 1.8 Density (pg. 25 – 26) 1.9 Classification of Mater (pg. 26 – 31)		pg. 33–34 #33, 35 (refer to Table 1.4 on pg. 18), 41, 42, 43, 45; pg. 34–35 # 47, 49, 51 pg. 35 #55, 57, 59, 61, 63 pg. 35–36 #65, 67, 69	
3	Chapter 1 Quiz (August 30, Thu)				

Chapter 2: Atoms, Molecules and Ions

Classes	Topics	Suggested Reading	✓	Assignments	✓
1	History of Chemistry, Law of Conservation of Mass, Law of Definite Proportion, Atomic Theories (Dalton, J.J Thomson, Nuclear, Quantum), Millikan Oil drop Experiment, Atomic Structures and Subatomic Particles, Isotopes, Atomic Number and Mass Number, Valence Electrons, Atomic Orbitals	2.1 The Early History of Chemistry (pg. 41 – 42) 2.2 Fundamental Chemical Laws (pg. 43 – 46) 2.3 Dalton’s Atomic Theory (pg. 46 – 48) 2.4 Early Experiments to Characterize the Atom (pg. 49 – 53) 2.5 The Modern View of Atomic Structure: An Introduction (pg. 53 – 56)		pg. 75–76 #25, 27, 29 pg. 75–76 #19, 21, 23, 33 pg. 76 #35 to 46	
2	Molecules, Ions (Cations and Anions), Metals, Non-Metals, Ionic and Covalent Compounds, Groups, Families (Periods), Binary and Polyatomic Elements, Nomenclature of Ionic Compounds, Complex Ions and Oxyanions Nomenclature of Hydrates, Nomenclature of Molecular Compounds, Names and Formulas of some Common Molecular Compounds, Nomenclature of Acids	2.6 Molecules and Ions (pg. 56 – 58) 2.7 An Introduction to the Periodic Table (pg. 58 – 61) 2.8 Naming Simple Compounds (pg. 62 – 72)		pg. 76 #47, 49 pg. 76–77 #51, 53 to 55, 57, 58 Memorize Figure 2.3 (Common Cations and Anions) on pg. 62 Memorize Figure 2.4 (Common Type II Cations) on pg. 63 pg. 77–78 #59 to 72 Memorize Table 2.5 (Common Polyatomic Ions) on pg. 67 Memorize Table 2.6 (Prefixes) on pg. 68 Memorize Names of Common Molecular Compounds (Handout)	
3	Lab Safety	Lab Safety Rules			
4	Chapter 2 Quiz (August 31, Fri)				

Chapter 3: Stoichiometry & Types of Chemical Reactions and Solution Stoichiometry

Classes	Topics	Suggested Reading	✓	Assignments	✓
1	Atomic Mass., Atomic Mass Unit (amu) and Relative Abundance, Mass Spectrum, Mole, Avogadro's Number, Molar Mass, Conversions between Mass, Mole, and Molar Mass $\left(n = \frac{m}{M}\right)$	3.1 Atomic Masses (pg. 81 – 85) 3.2 The Mole (pg. 86 – 90) 3.3 Molar Mass (pg. 90 – 93)		pg. 123 #21, 23, 25 pg. 123 #27, 29 pg. 123 –124 #27, 29, 31, 33, 34 to 51	
2	Mass Percent Composition, Empirical and Molecular Formulas, Chemical Reactions, Reactants, Products, Coefficients, Classifying and Balancing Different Types of Chemical Reactions (Composition, Decomposition, Single and Double Replacements, Hydrocarbon Combustion)	3.4 Percent Composition of Compounds (pg. 93 – 95) 3.5 Determining the Formulas of a Compounds (pg. 96 – 102) 3.6 Chemical Equations (pg. 102 – 104) 3.7 Balancing Chemical Equations (pg. 104 – 108)		pg. 124 #54 to 56 pg. 123 #19; pg. 125 #61 to 65, 67 to 72 pg. 126 #75 to 84	
3	Stoichiometry, Mole Ratio, Gravimetric Stoichiometry, Limiting Reagents	3.8 Stoichiometric Calculations: Amounts of Reactants and Products (pg. 108 – 112) 3.9 Calculations Involving a Limiting Reagent (pg. 113 – 121)		pg. 126 #85 to 90 pg. 127 #93 to 102	
4	Lab #1: Lab Safety, Measuring Techniques & Diagnostic Tests for H₂, O₂, and CO₂ (September 4, Tues)	Lab #1 Procedure		Lab #1 Report (Due September 10, Mon)	
5	Chapter 3 Quiz (September 4, Tues)				

Chapter 4: Types of Chemical Reactions and Solution Stoichiometry

Classes	Topics	Suggested Reading	✓	Assignments	✓
1	Aqueous Solutions, Hydration, Solubility, Solute, Solvent, Strong and Weak Electrolytes, Nonelectrolytes, Strong and Weak Acids and Bases, Molarity or Molar Concentration $\left(C = \frac{n}{V} \right)$, Dilution ($C_1V_1 = C_2V_2$) and Dilution Technique, Pipet, Volumetric Flask	4.1 Water the Common Solvent (pg. 133 – 136) 4.2 The Nature of Strong and Weak Electrolytes (pg. 136 – 140) 4.3 Molarity and Dilution (pg. 140 – 148)		pg. 180–181 #9, 11 to 14 pg. 181 #15 to 28	
2	Lab #2: Solution Preparation (September 7, Fri)	Lab #2 Procedure		Lab #2 Report (Due September 21, Fri) *Due with Lab #3 Report	
3	General Rules for Solubility, Precipitation, Molecular Equations, Complete Ionic Equations, Net-Ionic Equations	4.5 Precipitation Reactions in Solution (pg. 148 – 154) 4.6 Describing Reactions in Solution (pg. 154 – 155)		pg. 182 #29, 30 pg. 182 #31 to 37 Memorize Table 4.1 (Solubility Rules) on pg. 152	
4	Predicting Amounts of Precipitate Produced or Minimum Limiting Reagent Needed, Neutralization, Volumetric Analysis, Indicator, Equivalence (Stoichiometric) Point, Endpoint, Titration Technique, Titrant, Analyzed Buret	4.7 Stoichiometry of Precipitation Reactions (pg. 156 – 158) 4.8 Acid-Base Reactions and Titrations (pg. 158 – 164)		pg. 182–183 #39 to 44 pg. 183 #45 to 56	
6	Lab #3: Gravimetric and Solution Stoichiometry (September 12, Wed)	Lab #3 Procedure		Lab #3 Report (Due September 21, Fri)	
7	Unit 1 Test (September 17, Monday) (covers Chapters 1 to 4)				