

Honour Chemistry Unit 1 Outline: Basic Chemistry

Chapter 1: Introduction

| Classes | Topics | Suggested Reading | ✓ | Assignments | ✓ |
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| 1 | Course Outline, Lab Write-up, Lab Safety, Common Laboratory Equipment & Apparatus, Common Lab Techniques (Meniscus, Lighting Bunsen Burner, Electronic Balance, Pipetting) | Lab Safety Contract and Video Lab Safety, Equipment and Techniques Handout | | Read & Sign Lab Safety Contract | |
| 2 | Lab Safety Quiz (August 22, Monday) Scientific Method, Theory, Scientific Law, Accuracy, Reliability, Classification of Matter (Pure Substance and Mixture, Elements and Compounds), Three States of Matter, Physical, Chemical, Extensive and Intensive Properties, Mass, Volume, Density | 1.1 The Study of Chemistry (pg. 2) 1.2 The Scientific Method (pg. 2 – 3) 1.3 Classification of Matter (pg. 4 – 7) 1.4 Physical and Chemical Properties of Matter (pg. 7 – 8) | | pg. 23 #2 to 12 (even) | |
| 3 | Microscopic and Macroscopic Properties, SI Units, Scientific (Exponential) Notations, Precision, Percent Error and Percent Yield, Exact Numbers, Uncertainty, Significant Digits, Mass vs. Weight, Temperature Scales, Density Calculations, Unit Factor (Analysis) Method | 1.5 Measurement (pg. 8 – 12) 1.6 Handling Numbers (pg. 13 – 18) 1.7 Dimensional Analysis in Solving Problems (pg. 18 – 22) | | pg. 23–24 #14, 16, 18 to 20, 22, 24 to 26, 28 to 30 pg. 24 #32 to 34, 36, 38, 40 | |
| 4 | Chapter 1 Quiz and (August 30, Tuesday) | | | | |

Chapter 2: Atoms, Molecules and Ions

| Classes | Topics | Suggested Reading | ✓ | Assignments | ✓ |
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| 1 & 2 | History of Chemistry, Law of Conservation of Mass, Law of Definite and Multiple Proportions, Atomic Theories (Dalton, J.J Thomson, Nuclear, Quantum), Millikan Oil drop Experiment, Atomic Structures and Subatomic Particles, Radioactivity and Particles, Isotopes, Atomic Number and Mass Number, Valence Electrons, Atomic Orbitals, Periodic Table of Elements (Mendeleev), Molecules, Ions (Cations and Anions), Metals, Non-Metals, Ionic and Covalent Compounds, Groups (Families), Periods, Binary and Polyatomic Elements and Molecules | 2.1 The Atomic Theory (pg. 29 – 30) 2.2 The Structure of Atom (pg. 30 – 35) 2.3 Atomic Number, Mass Number and Isotopes (pg. 35 – 36) 2.5 Molecules and Ions (pg. 38 – 39) 2.4 The Periodic Table (pg. 36 – 38) | | pg. 53 #4, 8 pg. 54 #10 to 16 (even) pg. 54–55 #26 to 34 (even) pg. 54 #18 to 24 (even) | |
| 3 & 4 | Chemical and Molecular Formulas, Allotrope, Structural Formula, Empirical Formulas, Nomenclature of Ionic Compounds, Polyatomic Ions and Oxoanions, Nomenclature of Hydrates, Nomenclature of Molecular Compounds, Names and Formulas of some Common Molecular Compounds, Nomenclature of Acids | 2.6 Chemical Formulas (pg. 39 – 43) 2.7 Naming Compounds (pg. 43 – 51) 2.8 Introduction to Organic Compounds (pg. 51 – 52) <i>(Read only: won't be tested until Unit 5)</i> | | pg. 55 #36, 38, 42, 44, 46 pg. 55 #47 to 50 | |
| 5 | Lab #1: Lab Safety, Measuring Techniques & Diagnostic Tests for H₂, O₂, and CO₂ (September 8, Thursday) | Lab #1 Procedure | | Lab #1 Report Due (September 15, Thurs) | |
| 6 | Chapter 2 Quiz (September 12, Mon) | | | | |

Chapter 3: Stoichiometry

| Classes | Topics | Suggested Reading | ✓ | Assignments | ✓ |
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| 1 | Atomic Mass., Atomic Mass Unit (amu), Average Atomic Mass and Relative Abundance, Mole, Avogadro's Number, Molar Mass, Conversions between Mass, Mole, and Molar Mass $\left(n = \frac{m}{M}\right)$, Mass Spectrometer | 3.1 Atomic Masses (pg. 59 – 60) 3.2 Avogadro's Number and Molar Mass of an Element (pg. 60 – 64) 3.3 Molecular Mass (pg. 64 – 66) 3.4 The Mass Spectrometer (pg. 66 – 67) | | pg. 86 #4, 6, 8 pg. 86–87 #10, 13 to 16, 18 to 20, 22 pg. 87 #24 to 30 (even) | |
| 2 & 3 | Mass Percent, Determination of Empirical Formulas and Molecular Formulas and Hydrates, Chemical Reactions, Reactants, Products, Coefficients, Classifying and Balancing Different Types of Chemical Reactions (Composition, Decomposition, Single and Double Replacements, Hydrocarbon Combustion) | 3.5 Percent Composition of Compounds (pg. 67 – 70) 3.6 Experimental Determination of Empirical Formulas (pg. 70 – 73) 3.7 Chemical Reactions and Chemical Equations (pg. 73 – 77) | | pg. 87–88 #40 to 54 (even) pg. 88 #59, 60 | |
| 4 & 5 | Stoichiometry, Mole Ratio, Gravimetric Stoichiometry, Excess and Limiting Reagents Calculations, Reaction Yield | 3.8 Amounts of Reactants and Products (pg. 77 – 81) 3.9 Limiting Reagent (pg. 81 – 83) 3.10 Reaction Yield (pg. 83 – 85) | | pg. 89–90 #64 to 78 (even) pg. 90 #82, 84, 86 pg. 91 #90, 92 | |
| 6 | Unit 1 Review | | | Unit 1 Practice Test | |
| 7 | Unit 1 Test (September 26, Monday) | | | | |