AP Chemistry Syllabus

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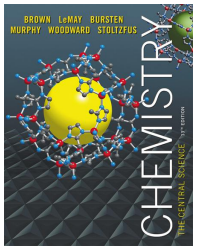
Overview of AP Chemistry

Welcome to AP Chemistry! This is a rigorous course in that it will be taught at a level comparable to a college course. The AP exam is scheduled for Friday May 7th, 2021. This means that we do not have a full school year to complete a lot of work. I am available during 8th period options to help in any way.

Grouping and Groupwork

Within the first couple weeks of the course students are grouped in pairs. These groupings constitute lab partners, but are also used during classroom instruction. Partners are allowed to help each other during many class activities (obviously excluding formal assessments). Further, when activities will benefit from a larger group two pairs will work together. Throughout all of this work these pairs are held accountable as a team with pair assessments and labs being used to link grades to provide motivation for mutual support. First among these group assignments is a problem of the day, which are generally drawn from past AP multiple choice questions.

Textbook and Instructional Materials

Material	Description/Comments
1. One 3 Ring Binder	• For handouts, notes, etc
2. Notebook Paper	• 8.5" x 11" • No jagged tear-outs from spiral notebooks
3. Pencil and Pen	• Standard or mechanical pencil • Dark color pens only! No pink, yellow, etc.
4. **Graphing** Calculator	
Textbook 	Title: Chemistry: The Central Science, 13th Edition • Aside from the textbook, numerous web resources and workbooks are used to provide preparation, variety, and supplemental instruction or aid as necessary

Grading

Grades are based on class work, homework, laboratory work and reports, quizzes and tests based on the following percentages:

Tests and Quizzes	40%
Class work	20%
Homework	10%
Labs/ Projects	30%

Tests and Quizzes include a variety of assessments, most based directly on previously released AP test items. Others, such as quizzes of memorization of materials such as solubility rules are designed to support basic knowledge and/or skills required for mastery of content and excellent performance on the AP exam

Classwork and homework consists of a wide variety of assessments include online work, notes and questions from our text, authentic AP free response questions, pre- lab work, and small research projects.

Labs consists of pre-labs work including questions designed to prepare students to understand their work in the lab as well as make them aware of the safety considerations specifics to the particular lab. During the lab students are assessed on their ability to follow the provided procedure, execute the required techniques and answer questions informally posed by the instructor. Post lab data analysis and lab reports are intended to enhance students' mastery of lab materials and prepare students to write college-level reports.

Units of Study

UNIT 0: AP CHEMISTRY PREAMBLE

TOPIC 0A: Chemistry, Scientific Method and Chemical & Physical Change

TOPIC 0B: Measurement

TOPIC 0C: Atomic Theory

TOPIC 0D: Nomenclature

UNIT 1: ATOMS, ELEMENTS AND PERIODICITY

BIG IDEA 1

The chemical elements are fundamental building materials of matter, and all matter can be understood in terms of arrangements of atoms. These atoms retain their identity in chemical reactions.

TOPIC 1A: Atoms and The Elements

TOPIC 1B: Electrons

TOPIC 1C: The Periodic Table & Periodicity

TOPIC 1D: Mass Spectrometry and Spectroscopy

TOPIC 1E: Conservation of Atoms

UNIT 2: CHEMICAL BONDING

BIG IDEA 2

Chemical and physical properties of materials can be explained by the structure and the arrangement of atoms, ions, or molecules and the forces between them.

TOPIC 2A: States of Matter and Solutions

TOPIC 2B: Intermolecular Forces

TOPIC 2C: Intra Bonding

TOPIC 2D: Bonding and Properties of Solids

UNIT 3: CHEMICAL REACTIONS AND ENERGY CHANGES

BIG IDEA 3

Changes in matter involve the rearrangement and/or reorganization of atoms and/or the transfer of electrons.

TOPIC 3A: Chemical Reactions

TOPIC 3B: Types of Chemical Reaction

TOPIC 3C: Energy Changes & Electrochemistry

UNIT 4: CHEMICAL KINETICS

BIG IDEA 4

Rates of chemical reactions are determined by details of the molecular collisions.

TOPIC 4A: Factors Affecting Rates

TOPIC 4B: Collision Theory

TOPIC 4C: Reaction Mechanisms

TOPIC 4D: Catalysts

UNIT 5: CHEMICAL THERMODYNAMICS

BIG IDEA 5

The laws of thermodynamics describe the essential role of energy and explain and predict the direction of changes in matter.

TOPIC 5A: Heat, Temperature and Kinetic Energy

TOPIC 5B: Work, Calorimetry and Conservation of Energy

TOPIC 5C: Breaking and Making Chemical Bonds

TOPIC 5D: Physical and Chemical Changes and Bonding

TOPIC 5E: Enthalpy, Entropy and Free Energy

UNIT 6: CHEMICAL EQUILIBRIUM

BIG IDEA 6

Any bond or intermolecular attraction that can be formed can be broken. These two processes are in a dynamic competition, sensitive to initial conditions and external perturbations.

TOPIC 6A: Equilibrium

TOPIC 6B: Le Châtelier's Principle

TOPIC 6C: Acid-Base Equilibria

TOPIC 6D: Free Energy and Equilibrium