AP Chemistry Syllabus

Schoology Course Code: RHNZ-BV84-J2S25

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Required Materials

Textbook: Zumdahl, Steven S., and Susan A. Zumdahl. Chemistry, 7th ed. Brooks/Cole, Cengage Learning, 2007.
Lab Book (provided): AP Chemistry Guided Inquiry Experiments: Applying the Science Practices
Lab notebook: Student Lab Notebook from Hayden McNeil with 100 carbonless page sets (or similar)
Scientific or Graphing Calculator

Course Overview

AP Chemistry is one-year class equivalent to that of a freshman-level college chemistry course. It will be extremely rigorous, requiring a strong and successful background in first-year chemistry, plus a high level of confidence and skills in mathematics. AP Chemistry involves applying logic and critical thinking to show a depth of understanding. The goal of AP Chemistry is to provide the student a foundation in which to understand the structure, properties, and transformation of chemical substances and to make predictions in regards to energy movement. By nature, this course is lab-based with special emphasis on inquiry-based quantitative and qualitative methods of analysis over content such as: atomic structure, intermolecular forces and bonding, chemical reactions, kinetics, thermodynamics, and equilibrium. Students are expected to complete all of their assigned readings and homework prior to coming to class so they are prepared to participate in class discussions and problem-solving activities. This is a very easy course to fall behind in quickly if students are not prepared and do not keep up with the pace of the course.

Grading

Grade determination:

- 50% Summative Assessments (tests and projects)
- 30% Labs
- 5% Practice (homework and classwork)
- 15% Semester Exam

Late Policy: Late work will not be accepted without previous arrangements with Mr. Fuller.

Class Format

The class will meet during fourth period according to the remote, hybrid, or in-person schedules. Approximately 25% of class time will be dedicated to lab experiences and/or simulations that relate to the topics that are being covered in class. You need to be *in class or online, on time, every class day* in order to perform well in this course. **RESPECT**, **RESPONSIBILITY** and **MATURITY** will guide all classroom behavior. The intensity of this course and the associated labs will require a higher level of maturity and seriousness than a typical high school class. Disruptions and immature behavior may result in your removal from this course.

Attendance

Attendance is **critical**. Your success in this course as well as on the AP exam hinges on your learning the material and it is very difficult to learn when you aren't in class. It will also be very difficult to make up missed labs if you are absent. You are expected to be on time to class with your notebook and calculator, ready to learn. If you are absent, it is your responsibility to make arrangements within one week with Mr. Fuller to make up any missed material including tests, labs, and quizzes. You will have 2 days per day of absence to make up your work as per the student handbook. Tutoring and extra help is available from Mr. Fuller during online office hours from 1:30 pm – 2:30 pm M-Th.

Lab Safety

Lab safety is of the utmost importance since many of the labs in this course will be student-directed inquiry-based labs involving potentially dangerous chemicals. Close-toed shoes should be worn on lab days. No food or gum is allowed in class. Water and coffee (it's early!) can be consumed only in the lecture area and must be in a sealed container. Goggles must always be worn in the lab area.

Lab Notebook

Each student must keep up with the labs performed throughout the year. Lab write ups must be your own work even if the lab was performed and discussed as a group. The format of lab reports will be given to you on another handout. You will keep the original work in your notebook and turn in the copy. Do not get behind in your lab work! Colleges may request to see your AP labs or notebook prior to granting college credit.

Wrap Up

In this class, the process is more important than the final answer. You **must show all work to receive credit** for the answers. This may not appear as explicit directions on a test, quiz, or homework assignment, but it will **always** be graded this way. The work is worth more than the answer. This is how the AP exam is graded. This means that you can make A's on everything and get all the answers wrong! It also means that you can get all the answers correct and never make an A!

Please ask me for help any time you need it. I will do everything I can to help you succeed in this course *if* you make an effort to succeed. You will be challenged…I promise. But when you finish this course, you will be a better student, far more prepared for college than most of your peers. *And* you will have a strong foundation in the fundamentals of chemistry.

Course Content

The AP Chemistry course is organized into 9 units. This class will cover these units with a summative assessment at the end of each unit. The rough timeline for each unit is given below.

	Unit	Approximate % of AP Test	Time*	Labs**
Semester 1	1. Atomic Structure and Properties	7-9%	3 weeks	1. Gravimetric Analysis of an Unknown Metal Carbonate 2. Determination of the Formula for a Hydrate
	2. Molecular and Ionic Compound Structure and Properties	7-9%	3 weeks	3. Qualitative Analysis and Chemical Bonding (GI) 4. Modelling VSEPR
	3. Intermolecular Forces and Properties	18-22%	4 weeks	5. Liquid Chromatography 6. What Is the Relationship Between the Concentration of a Solution and the Amount of Transmitted Light Through the Solution (GI)
	4. Chemical Reactions	7-9%	4 weeks	7. How Can We Determine the Actual Percentage of H_2O_2 in a Drugstore Bottle of Hydrogen Peroxide? (GI) 8. How Can Color Be Used to Determine the Mass Percent of Copper in Brass? (GI)
	5. Kinetics	7-9%	3 weeks	9. Rates of Chemical Reactions: The Iodination of Acetone 10. How Long Will That Marble Statue Last (GI)
Semester 2	6. Thermodynamics	7-9%	3 weeks	11. Designing a Hand Warmer (GI)
	7 Equilibrium	7-9%	4 weeks	12. Determination of the Equilibrium Constant for a Chemical Reaction (GI) 13. Applications of Le Châtelier's Principle (GI)
	8. Acids and Bases	11-15%	4 weeks	14. How Much Acid Is in Fruit Juice and Soft Drinks? (GI) 15. Determination of the Equivalent Mass and pKa of an Unknown Acid
	9. Applications of Thermodynamics	7-9%	3 weeks	16. Entropy and Enthalpy Changes 17. Electrochemical Cells

*All timelines in this table are subject to change.
**All labs marked with (GI) are student-directed, guided inquiry-based labs.

The units cumulatively cover 4 big ideas in chemistry as well as 6 scientific practices in which every scientist should engage. These ideas and practices are as follows:

Big Ideas:

1. Scale, Proportion, and Quantity: Quantities in chemistry are expressed at both the macroscopic and atomic scale.
2. Structure and Properties: Properties of substances observable at the macroscopic scale emerge from the structures of atoms and molecules and the interactions between them.
3. Transformations: At its heart, chemistry is about the rearrangement of matter. Understanding the details of these transformations requires reasoning at many levels as one must quantify what is occurring both macroscopically and at the atomic level during the process.
4. Energy: Energy has is important in characterizing and controlling chemical systems, both in accounting for the distribution of energy in a system and in considering the enthalpic and entropic driving forces for a chemical process.

Scientific Practices:

1. Models and Representations: Describe models and representations, including across scales.
2. Question and Method: Determine scientific questions and methods.
3. Representing Data and Phenomena: Create representations or models of chemical phenomena.
4. Model Analysis: Analyze and interpret models and representations on a single scale or across multiple scales.
5. Mathematical Routines: Solve problems using mathematical relationships.
6. Argumentation: Develop an explanation or scientific argument.

These Big Ideas and Scientific Practices will continuously be included in each unit as they encompass the core principles and theories of chemistry as well as the skills that will help you think and act like a chemist.