

Phone: 724-646-5700 x737

Email: [jcoburn@reynolds.k12.pa.us](mailto:jcoburn@reynolds.k12.pa.us)Edmodo: [www.edmodo.com](http://www.edmodo.com) Group Code:Website: [http://www.reynolds.k12.pa.us/Coburn\\_Jane.aspx](http://www.reynolds.k12.pa.us/Coburn_Jane.aspx)**General Course Information**

**Course Description from Program of Studies:** The AP Chemistry course is designed to be the equivalent of two semesters of freshman college chemistry for students planning to pursue further studies in the natural and applied sciences. Students are encouraged to take the AP Chemistry examination given by the College Board in May. Many colleges and universities award up to ten credits of lecture and laboratory with high exam scores and completed lab notebooks. The textbook used is a college-level text. Emphasis is placed on inorganic chemistry with a strong focus on reaction processes and products, chemical calculations, and mathematical formulation of principles; extensive college-level laboratory work is integrated throughout the course. Strong mathematical skills are essential. Students are expected to complete frequent reading and homework assignments outside of normal class time. A packet containing work for the first four chapters must be completed independently prior to the first day of class. This summer assignment only reviews topics that are covered in first year chemistry.

If the student intends to use the AP Chemistry score for college credit it is then his or her responsibility to research if the college of their choice will accept it. Colleges have widely differing policies to this matter ranging from complete acceptance to total disregard.

**Textbook:** Zumdahl, Steven S. Chemistry, 8th Edition. Cengage Learning.

**Suggested Text:** While not a requirement, it is strongly recommended that students invest in one of the AP Chemistry course preparation books currently on the market. There are several available and each student should peruse the titles and select one based upon personal preference. Some examples of suitable books are listed below. Since the course has underwent major revisions, please be sure that the version you use is meant for the 2015 test!

Cracking the AP: Chemistry Exam by Paul Foglino. Paperback Princeton Review; ISBN: 0307946207

Barron's AP Chemistry: Advanced Placement Examination by Neil D. Jespersen. Barrons Educational Series; New Edition Not Yet Available

5 Steps to a 5 AP Chemistry, 2014-2015 Edition by Richard Langley & John Moore. McGraw Hall; ISBN: 0071803734

AP<sup>®</sup> Chemistry Crash Course Book, 2014 edition by Adrian Dingle, ISBN-10: 0738611549

**Course Outline** \*\*DATES ARE SUBJECT TO CHANGE

The syllabus published at the start of the course should be viewed as provisional and as such is subject to minor alteration from time to time.

**I. Chemical Foundations and Summer Assignment Review – 3 weeks** Aug 28 – Sept 2

- A. Atomic Theory and Structure
- B. Molecules & Ions
- C. Nomenclature
- D. Empirical and Molecular Formulas
- E. Writing and Balancing Equations
- F. Stoichiometric Calculations
- G. Pressure Measurements
- H. Laboratory Safety/Procedures/Process

## **II. Chemical Stoichiometry & Mole Concept – 4 weeks**

Sept 8 – Sept 25

- A. Nature of Solutions
- B. Solution Concentrations
- C. Precipitation and Solution Stoichiometry
- D. Spectroscopy and Beer's Law
- E. Oxidation-Reduction Reactions

Labs to include: Iron in Water, **Inquiry Lab**: Analysis of Food Dyes in Beverages, What Makes Water Hard?

## **III. Gases – 2 weeks**

Sept 28 – Oct 9

- A. Gas Laws
- B. Gas Stoichiometry
- B. Dalton's Law of Partial Pressure
- C. Kinetic-Molecular Theory and Real Gases

Labs to include: Determining the Molar Volume of a Gas

## **IV. Thermochemistry – 2 weeks**

Oct 13 – Oct 30

- A. Energy and Reactions
- B. Calorimetry
- C. Enthalpy and Hess's Law
- D. Enthalpies of Formation

Labs to include: **Inquiry Lab**: Designing a Hand warmer

## **V. Atomic Structure and Periodicity – 2 weeks**

Nov 2 – Nov 13

- A. Quantum Model of the Atom
- B. Periodic Trends

## **VI. Chemical Bonding – 2 weeks**

Nov 16 – Nov 25

- A. Types of Bonds
- B. Ionic Bonds and Lattice Energy
- C. Covalent Bonds, VSEPR, sigma & pi bonds
- D. Hybridization
- E. Bond polarity

Labs to include: Qualitative Analysis & Chemical Bonding ; **Inquiry Lab**: Separation of a Dye Mixture Using Chromatography

## **VII. Liquids, Solids & Solutions – 1 week**

Dec 1 – Dec 9

- A. Intermolecular Forces and Kinetic Theory
- B. The Liquid State
- C. The Solid State and Crystal Structure
- D. Changes of State
- E. Energy and Solution Formation
- F. Factors Affecting Solubility

Labs to include: **Inquiry Lab**: Rate of Decomposition of Calcium Carbonate

## **IX. Chemical Kinetics – 2 weeks**

Dec 10 – Dec 23

- A. Reaction Rates
- B. Rate Laws
- C. Reaction Mechanisms
- D. Catalysis

Labs to include: A DIFFERENT LOOK AT KINETICS with Vernier WSIM, Crystal Violet Lab

## **X. Chemical Equilibrium – 2 weeks**

Jan 4 – Jan 20

- A. Characteristics of Equilibrium
- B. The Equilibrium Constant

- C. Gas Equilibrium and Pressure
- D. Equilibrium Calculations
- E. LeChatlier's Principle

Labs to include: Determination of an Equilibrium Constant; **Inquiry Lab**: Applications of LeChatelier's Principle

#### **XI. Acids, Bases and Aqueous Equilibria – 4 weeks**

Jan 21 – Feb 19

- A. Acids and Calculations Involving pH
- B. Salts and Their Properties
- C. Solving Acid/Base Problems
- D. Acid/Base Equilibria and Precipitation
- E. Complex Ions and Their Equilibria

Labs to include: Standardization of Sodium Hydroxide, Determination of Acid in Vinegar and Muriatic Acids,  
**Inquiry Lab**: Buffers in Household Products, Properties of Buffer Solutions

#### **XII. Spontaneity, Entropy and Free Energy – 1 week**

Feb 22 – Feb 26

- A. Entropy and Second Law
- B. Free Energy and Chemical Reactions
- C. Free Energy and Equilibrium

#### **XIII. Redox and Electrochemistry – 4 weeks**

Mar 1 – Mar 31

- A. Galvanic Cells
- B. Reduction Potentials
- C. Cell Potential and Concentration: The Nernst Equation
- D. Commercial Electrolytic Processes

Labs to include: Electrochemical Series

#### **XIV. AP Exam Practice and Review**

Apr 1 – Apr 28

#### **AP CHEMISTRY TEST DATE:**

Monday, May 7 8:00 am

#### **Standards/Anchors/Objectives:**

These can be found by accessing the AP Chemistry Course and Description written by College Board:

[http://media.collegeboard.com/digitalServices/pdf/ap/IN120085263\\_ChemistryCED\\_Effective\\_Fall\\_2013\\_lkd.pdf](http://media.collegeboard.com/digitalServices/pdf/ap/IN120085263_ChemistryCED_Effective_Fall_2013_lkd.pdf)

#### **Course Procedures**

Grading policy: The midterm will mirror the format of the AP exam. It will be counted as a test grade during the second nine weeks. Students will be taking the AP test and will not have a final exam as long as they meet the minimum requirement of attending the majority of review sessions and/or completing review materials. The nine-weeks grades will be averaged and used as the final exam grade for students. Each nine-weeks grade is determined from the percentage of possible points you earn on tests, quizzes, and labs. The total is weighted as follows:

Tests	60%
Weekly Assessments	15%
Lab Reports /Assignments	20%
Homework	5%

**Laboratory work:** During each experiment students will work pairs or trios. They will use the lab equipment and chemicals to make observations and to obtain data. Often Vernier LabPro interfaces along with computers will be utilized for data collection. At least 16 labs will be conducted based on topics required by College Board, and six of these labs will be inquiry based. Upon completion of each experiment students will communicate their findings, conclusions,

and resulting hypotheses in a lab report, presentation or informal write up. In addition, students will occasionally present their findings to the rest of the class and/or local scientists. Students are required to keep a lab notebook of all of their lab work. The notebook may be evaluated by university personnel to determine student placement in college laboratory courses.

**Course Website:** Some materials for the course can be accessed from the edmodo website. It is your responsibility to visit the site to get materials as and when they are needed. In addition to the course material you will find a large amount of other helpful information there. You are required to visit regularly.

**Student obligations:** I hope it goes without saying that attendance, punctuality, courtesy and good behavior of the highest levels are expected at all times. On the occasions when it is unavoidable that a class is missed it remains the responsibility of the student to catch up with any material missed. Laboratory safety is always of paramount importance. Exemplary behavior and observance of safety procedures is required at all times.

The very nature of the AP Chemistry program, attempting as it does to mimic a college chemistry course, requires students to learn and apply some college style learning skills. More specifically taking the initiative for one's own learning and being prepared to think around problems to find solutions. Please seek help if you are having difficulties.

**Late Work, Make-up Exams & Incomplete Grades:** Late work is not accepted. When students are legally absent from classes, it is his/her responsibility to arrange with his/her teachers to make up work missed in each class. This is to be done during homeroom or afterschool. NOT during Classroom time! The amount of time given to make up this work depends on the amount of time that the student was absent and the circumstances surrounding the absence. For instance, if the student is legally absent for two school days, the student shall receive two school days to makeup the work, if necessary. If this work is not completed within the given time period, a student may receive a zero for a grade. Students will not receive credit for any class work that takes place during unexcused class absences. Students are required to make up any missed assignments. If a student is missing due to a pre-approved vacation/field trip they must see me in advance and make sure they have their assignments so that you can keep up with the class. Students are to use Edmodo to keep connected with the course and assigned materials. Failure to do so, will result in a zero for the missed assignments.

**Student Conduct, Discipline, and Behavior Management:**

1. Be prompt. Students are expected to arrive at class prepared for the day's activities. Students who fail to bring the required materials to class or arrive without assignments will be penalized.
2. We all make mistakes! However, repeated errors in behavior, lack of self-control, refusal to follow directions, and so forth, will not be tolerated.
3. Laboratory supplies and computers are tools, not toys. Students found tampering with or intentionally harming laboratory equipment will be given alternative assignments and will be subject to other penalties
4. Never bring food or drink into the chemistry lab.
5. Academic Dishonesty: Plagiarism is defined as taking or imitating the ideas, thoughts or language of another to represent them as one's original work. It is imperative that all work submitted by a student be representative of his/her own ideas, thoughts and especially language capability. Therefore, plagiarism is strictly prohibited in all work pertaining to school. A grade of "F" or zero will be awarded for any submitted work which is found to be the work of another (student, author, encyclopedia, internet, etc.) and subsequent offenses will be dealt with accordingly.

I looking forward to a wonderful and successful school year !!  
Mrs. Coburn