

# KAP Chemistry Syllabus—2010-2011

**Major themes** include *structure of matter* (atomic theory and structure, chemical bonding), *states of matter* (gases, liquids and solids, solutions), *reactions* (reaction types, stoichiometry, equilibrium, acids and bases, kinetics), *descriptive chemistry* (relationships in the periodic table), and *laboratory* (physical manipulation; processes and procedures; observations and data manipulation; communication, group collaboration, and the laboratory report.)



Students should be able to

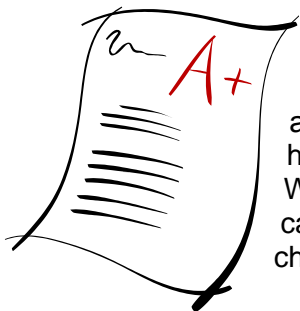
- Apply first-year chemistry Essential Outcomes to new situations.
- Use safe chemical practices when working in the laboratory.
- Display proficiency with a variety of laboratory skills and a variety of laboratory equipment.
- Use technology when appropriate to solve chemical problems (both written and in the laboratory.)
- Predict products of word equations by understanding classification schemes of reactions and write the reaction using correct chemical formulas.
- Use stoichiometry as a tool to make quantitative predictions about a variety of chemical reactions.
- Use a variety of methods (such as titrations, freezing point depression, percent composition, empirical formulas, vapor density, and others) to determine the molar mass and molecular formula of an unknown compound.
- Understand the nature of gases and use gas laws to make quantitative calculations.
- Understand that atomic structure is the basis of the chemical and physical behavior of matter including radioactivity.
- Apply their knowledge of atomic structure to determine chemical structures and to explain chemical and physical observations and trends in the periodic table.
- Understand the nature of equilibrium, both quantitatively and qualitatively, in terms of gas-phase reactions, acid-base reactions, complex-ion formation, solubility, solubility, and electrochemistry.
- Understand how free energy ( $\Delta G$ ) drives chemical reactions and understand its relationships to enthalpy ( $\Delta H$ ), entropy ( $\Delta S$ ), and equilibrium.
- Use kinetics to evaluate whether a mechanism is possible.
- Explain how reduction-oxidation reactions generate electric current and make predictions about the chemical energy produced by or required for a chemical change.
- Differentiate between ionic, covalent, network covalent, and metallic bonding and describe characteristics of each.
- Understand intermolecular forces and their effects.
- Understand the nature of solids, liquids, and solutions both quantitatively and qualitatively.

## Required Texts:

Hill, John. W, Petrucci, Ralph H, et. al., *General Chemistry*, 4<sup>th</sup> ed., Upper Saddle River, NJ: Pearson Education, Inc., 2005.

AP Chemistry Free Response Practice Book designed for KAP Chemistry classes in our school district

**Other Supplies:** Bound lab record book (provided as part of class fees), **approved safety goggles** (note—safety glasses are *not* an acceptable substitute for goggles), graphing calculator, notebook with separated sections for notes and homework, pens, pencils, highlighters



### Academic honesty:

Students often work together in advanced science classes. This is valuable and I encourage working together. HOWEVER, copying another person's homework, lab report, or answers to any other sort of assessment is CHEATING. While you and your lab partner will share data, you need to do your OWN calculations and your OWN analysis. Using unapproved outside resources is also cheating. You will not receive credit for an assignment or assessment if you cheat.

*Example:* You do not know how to approach solving an old AP Test question that you have for homework. What should you do?

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|--|--|
| a) Search the internet for the answer  | NO—that is CHEATING  |
| b) Search the internet for another explanation of the topic  | YES—good idea!   |
| c) Copy the answer from your friend or older sister  | NO—that is CHEATING  |
| d) Tell your friend you could do a, b, and c but are stuck on d.<br>Ask your friend to point you in the right direction. | YES—good idea!   |
| e) Steal the answer key from your teacher  | NO—that is CHEATING  |
| f) Ask your teacher for help a day or two before the due date  | YES—good idea!   |
| h) Ask your teacher for help a day or two after the due date   | OK—Better late than never,<br>but your teacher might get<br>annoyed<br>Okay for the short term, but you<br>still need to figure out the<br>answer! |
| i) Cry   |  |
| j) Ignore it and hope it goes away.  | NO—it won't go away, and<br>neither will your teacher  |

**More background...** This is a **college-level** chemistry course. It is a *second-year course*—students should have successfully completed Chemistry in their sophomore or junior years of high school. It emphasizes chemical understanding, both quantitatively and qualitatively, in a laboratory setting. Students should have three credits in Math, credit in Biology, and Chemistry with a “B” or better average.



Students will earn one and one-half credits of advanced laboratory science. The course is taught as a “1 ½ block” course—students will alternate between single period and double period. The double

period on alternate days will allow us to complete the more rigorous laboratory activities required by the AP curriculum. Classes will either be 50 minutes or 104 minutes in length, with an average of 375 minutes of class time each week. The classes are arranged so that students may take 2 AP Sciences in 3 class.

Students will be able to earn college credit through Kenyon College by participating in the KAP program



### About KAP...

Students who will have junior or senior status will have the opportunity to apply for admission to the KAP (Kenyon Academic Partnership) program. The program allows students to get college credit while still in high school. Students will have an official transcript from Kenyon College. Students who wish to enroll in KAP courses must be strongly motivated and should have demonstrated success in the subject areas they wish to pursue. Since KAP courses are demanding, readiness and willingness to work hard are essential for success. When students register for their courses, they must complete a separate application for the KAP program. The application includes a teacher recommendations and a transcript. There is an additional fee for KAP and additional coursework may be required. Students participating in the KAP program will receive credit for the **four** following Kenyon courses:

Chemistry 121 Introductory Chemistry Lecture (0.5 Kenyon units; 4 semester hours)

Chemistry 123 Introductory Chemistry Laboratory (0.25 Kenyon units; 2 semester hours)

Chemistry 124 Biophysical and Medicinal Chemistry (0.5 Kenyon units; 4 semester hours)

Chemistry 125 Biophysical and Medicinal Chemistry (0.25 Kenyon units; 2 semester hours)

### NOTES:

- a. Although there is a biological focus to the second semester Kenyon courses, the major chemical topics (equilibrium, atomic structure and bonding, kinetics) are the same as a traditional second-semester chemistry course. Students enrolled in KAP will have the same chemistry content as those enrolled only in AP Chemistry.
- b. Students may earn a maximum of 3.0 Kenyon units while in high school.
- c. I will submit **four separate grades** to Kenyon College. Students receive separate lecture and lab grades for each semester. These grades are **not** figured into the Davidson GPA and may be different than the grade on the student's Davidson report card.

### Assessment...

The class is graded on a weighted scale. Tests and quizzes are 55% of the grade, labs and projects 35%, and Free Response and homework are 10% of the grade. For students who receive a C or higher, AP courses at Hilliard Davidson High School receive an extra quality point when calculating grade point average. (A = 5.0, B = 4.0, C = 3.0, D = 1.0, F = 0.0)

**Homework** Students should be doing homework daily. Homework is graded on a sliding scale—students with higher test grades need to turn in less homework.

**Free Response Questions** are questions from old AP tests. All students must turn in Free Response questions.

**Labs** are done frequently. Since most occur on double-block days, students should try not to miss lab days. All labs must be completed to receive credit for the course. Some universities require students

to submit a lab notebook or portfolio to receive college credit.

**Quizzes** are given frequently. The primary purpose of the quizzes is to make sure everyone is keeping up with the material.

**Tests** are given at the end of each unit. Tests will include both multiple choice and open-ended questions. Lab questions will be included on tests. **All** students take an in-class college-level test. The grade is part of the fourth quarter.

**Semester and final exams** are both lab-based. The semester exam is more like a traditional lab while the final exam is an opportunity for students to demonstrate their chemical skills for others.

### **More about tests and quizzes...**

- Tests and quizzes serve several purposes: they are typically viewed as a way for me to evaluate your progress, but they are also learning experiences for students.
- Tests will always be announced at least two days prior. Quizzes will almost always be announced. They may be written or lab-based.
- To receive full credit on tests and quizzes, show all calculations. Explain your answers completely and concisely—explanations help me to understand your thoughts.
- Each new test will include material from previously studied chapters as well as the summer review. Quizzes over earlier material will appear throughout the year.
- Tests may include sample free response questions from old AP Chemistry tests