**2018-2019 AP Chemistry with Ms. Siller**

Kempner High School - Room 819

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**Course Description:**

AP Chemistry is the equivalent of a two-semester college general chemistry course and a lab credit. The course is designed for college-bound students who either would like to earn college credit (by AP examination) or would like to prepare for college chemistry while in high school. This is accomplished through an intensive, in-depth approach. It is highly recommended that the student take the College Board's Advance Placement test in Chemistry. A score of one to five on the test will be evaluated by the College Board and the scores reported to the colleges of the student's choice. Scores of one and two on the test will generally not qualify the student to receive credit. Scores of three, four, or five will generally allow the student to place out of freshman courses. The amount of credit granted varies by score and by university. **The grade earned in the class is independent of the Advance Placement test**. The laboratory portion of this class is to be the equivalent of a college laboratory experience. Because some colleges require proof of the laboratory portion of the course before granting credit, all students will keep a laboratory notebook.

This class meets five days a week for 50 minutes each day. After school Labs are required as scheduled and you will be required to spend an equivalent amount of time per week on other assignments when lab will be completed during school hours. Because of the required after school lab this class is worth 1.5 credits. Students will earn .5 credits for completing and passing the fall semester, and they will earn 1 full credit for completing and passing the spring semester.

**Classroom Policies:**

**~Class Rule:** Respect everything and everyone at all times. Any disruptions and misbehaviors are all caused by a lack of respect for someone or something, so as long as you respect everything and everyone at all times there will be no classroom problems. Disrespect is never acceptable and will result in disciplinary actions including but not limited to call/email home, detention, referral to counselor or AP, removal from future labs and assigned alternate work, reassigned seats, and discussing behavior privately with the teacher.

**~Schoology:** link to calendar & selected resources will be available in Schoology.

**~Absences:** If you miss class, check the class calendar or a classmate to find missed work and alternate assignments for missed labs and activities. Attend tutorials, speak to me between class, or email me for any help. It is your responsibility to keep up with what is going on in class. You are responsible for doing all pre-class work for the day you return to class. If you are absent on the day prior to a test, you will still be required to take the test when you return. If you are absent on the day of a test you will be required to take the test the day you return to school.

**~Extra Credit, Bathroom Passes, and Excuses:** Upon returning their safety sheet and bringing their class supplies students will receive a Chemistry Extra Credit Page. This page consists of 5 Bathroom Passes and 3 Excuse Passes. Each Bathroom Pass is worth 2 points, for a total 10 points extra credit IF UNUSED. In order to use the restroom for any reason you must use a bathroom pass. Excuse Passes can be used to gain an extra day to complete an assignment, but a detailed explanation must be included of what the excuse is. Each excuse pass is 5 points, for a total of 15 points extra credit IF UNUSED. There will be other opportunities for extra credit throughout the semester and they will be recorded on this extra page as well. Extra credit will not be applied to grades until the end of the semester.

**~Timed Tests and Quizzes:** No extra time will be given to students for quizzes and tests. On the AP test you have 1.5 minutes per multiple choice questions, about 9 minutes for short free-response question, and about 23 minutes for long free-response questions. You will be given similar time constraints on tests and quizzes in this class. If you struggle with the time constraints make sure to practice and focus on the test taking strategies we discuss in class and ask for help.

**~Tutorials:** My tutorial times for AP Chemistry are Tuesday morning and Thursday afternoon as well as Monday, Tuesday & Friday during A1 lunch. I also have limited availability by appointment.

**~Assignment reviewing ALL Chemistry I concepts is REQUIRED.** There will be a test the Monday of the second full week of school covering all information. This is to ensure students enter the class prepared for the rigor of the course and with a firm understanding of Chemistry I concepts

**Grading:**

Tests {Most tests will be in AP format with 50% from Free Response and 50% from Multiple Choice} ..................................................50%

Labs and lab quizzes, Classroom and online quizzes, Classroom activities and Homework ........................................................................................50%

Within a nine-weeks period there will be generally 3-4 major tests. Quizzes are given as appropriate. Most tests will be in AP format and will be graded according to AP standards. The grading procedures for this format will be explained before the students take the exam. Students are required to complete a written lab report for each of the 16 major laboratory investigations. **All lab reports are turned in as a lab group by Friday the same week as the lab.**

**~Late Policy** - Students receive sufficienttime to complete assignments. If a student fails to turn in an assignment they may use an excuse pass to gain one extra day to complete the assignment without penalty (except for online assignments). Without an excuse pass, no late work is accepted.

**Laboratory Investigations:** Students will spend a minimum of twenty-five percent of class time involved in laboratory investigation and will record their findings in a lab notebook. It is important for students to maintain their laboratory notebook as many colleges grant credit only with proof of appropriate lab experiences, therefore at the end of the year you must take your lab notebook with you. Students will work in groups in lab and will maintain a laboratory manual with all lab procedures, data, results and conclusions. Data will be communicated within and between groups. All students are required to purchase a carbonless copy lab notebook. It is more cost effective for students to get together and order as a group.

**~Safety:** No open-toed shoes are to be worn during labs. Students may bring a pair of closed-toed shoes with them to class when we have labs. Anyone with hair that can touch their shoulders must put their hair up for labs. Never take off goggles unless explicitly told to!

**~Lab safety consequences:** If a student violates a rule in the laboratory, the student will receive a verbal warning. However, if there are repeated violations/warnings, the student will perform an alternative assignment in lieu of the lab for the next two lab experiments. If the offense is severe, the student will be pulled immediately from the experiment and will be required to complete alternative assignments for the rest of the school year.

~**CHEATING/PLAGIARISM and LAB PARTNERS:** Obviously, lab partners should have identical data. It is acceptable for partners to work on calculations and to discuss the analysis questions together. But answers to questions should be in students’ own words, and not identical to their partner’s. Although partners can discuss their results and key errors, their conclusion must be written completely independently of each other. I grade partners’ lab reports together. It is unacceptable for me to recognize key phrases or wording from one lab report to another. The first instance of this will result in a 50% grade loss for both labs; the second, in a zero on both labs and a referral.

**Out-Of-School Labs:** You are required to attend after school labs as assigned in order to pass your AP lab credit. If you are in an extracurricular activity the lab is still a requirement and it is your responsibility to discuss your schedule with your director/teacher. For some labs, a combination of before school/during class/after school may be utilized. Any time a class period is used for lab, you will have an equivalent amount of time at home in which you will listen to lectures/complete assignments. This means some of the lecture will be done on your own. You are responsible for learning that information and getting your questions answered during tutorials. \*\*We may use the A1 tutorial period during lunch to set up a lab to decrease the length of time required for lab after school. This will be done on a trial basis – if students are not timely or present then I will discontinue this practice.

Out of school labs when required will be on Tuesday from 2:45 – 5:45 PM.   
  
**Formal Lab Report Format:**

**Pre-Lab Work:** ***Due Monday in class***

1. *Heading*: Should include title, date, and a blank space to fill in lab partners. The title should be descriptive. For example, "pH Titration Lab" is a descriptive title and "Experiment 5"is not a descriptive title.
2. *Purpose*: In one or two well-written sentences, the purpose, or rationalization, for performing the investigation
3. *Materials and Equipment*: List all materials and equipment needed for the lab in columns. Often, not all materials and equipment are listed in the handout; you will have to read to find them.   
   Be sure and write the formulas and names of the chemicals used. Ex: Sodium hydroxide, NaOH
4. *Safety*: Safety regarding the procedure, reagents, and materials. Including appropriate safety equipment.
5. *Procedure*: Students need to write a simplified outline of the procedures given to them. They should use numbered steps that are easy to read. If a student is doing a guided inquiry lab, they may be required to write a full procedure that they develop. May include sketches of materials and apparatus.
6. *Pre-lab questions:* Students will be given some questions to answer before doing the lab. They will need to either rewrite the question or incorporate the question in the answer. The idea here is that when someone (like a college professor) looks at a student's lab notebook, they should be able to tell what the question was by merely looking at their lab report. Any calculations should include accurate formulas, units, and significant figures.
7. *Data Tables*: Students will need to create or copy any data tables or charts for data collection during the lab.

**Lab Work: *Turned in as a lab group at the end of the week (each person still writes their own!)***Students need to record all their data directly into the data tables. They are NOT to be record data on separate paper. They need to label all data clearly and always include proper units of measurement.

1. *Laboratory Questions:* Should be done using the same method as pre-lab questions. Students include all necessary calculations and graphs here. Students should show how calculations are carried out including accurate formulas, units, and significant figures. Graphs need to be titled, axes need to be labeled, and units need to be shown on the axis.
2. *Conclusion:* A well-developed paragraph that restates the purpose of the investigation, describes the data collected, describes the analysis of quantitative and qualitative summations, and expresses possible sources of error in investigations and the possible effects of the error(s). In inquiry-based investigations there must be discussion of modification of procedure and or analysis methods as appropriate.

When discussing errors be sure to include: What part of the procedure introduced them? Your error must be linked to your data collection/procedure and the effect that error had on the end calculation. In other words, why was the calculated number too high or too low? What step caused the collected data to be off in such a manner that it would make the end calculation off in the manner determined in the lab? How could the lab be improved to either reduce error or simplify the procedure? Use complete sentences and logical discussions.

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| **First Nine Weeks** | |  |  |
| *Unit #, Title, & Chapter(s)* | *Topics Covered* | *Labs* | *OWL assignments* |
| **Unit 1**  Ch. 1 & 2:  Chemical Foundations  Atoms, Molecules, and Ions  FTF: 1 | * The scientific method * Units of measurement and uncertainty * Significant figures * Problem solving methods * Dimensional analysis * Classification of matter * The history of chemistry * Fundamental laws of chemistry * Models of the atom * Molecules and ions * The periodic table * Naming compounds | * Chemical and Physical Change Lab |  |
| Ch. 3:  Stoichiometry  FTF: 8 | * Atomic mass * The mole and molar mass * Percent composition * Empirical and molecular formulas * Combustion Analysis * Chemical equations * Balancing equations * Stoichiometric calculations * Limiting and excess reactants | * Stoichiometry of Chemical Change Lab |  |
| Ch. 4:  Introductory Solutions  Types of Reactions  FTF: 7 | * Water as a solvent * Strong and weak electrolytes * Aqueous Solutions * Molarity * Mass percent * Double replacement reactions and precipitation, gas formation or liquid formation * Single replacement reactions and the activity series * Anhydride reactions * Oxidation-reduction reactions * Acid-base neutralization * Complex ion reactions * Addition and decomposition reactions | * Molarity/Dilution Lab |  |
| **Unit 2**  Ch. 5: Gas Laws  FTF: 4 | * The kinetic molecular theory * Pressure * Gas laws * Gas stoichiometry * Effusion and diffusion * Real Gases * Atmospheric Chemistry | * Gas Demo Day |  |
| **Unit 3**  Ch. 7:  Atomic Structure  and  Periodicity  FTF: 2 | * Electromagnetic spectrum * The nature of matter * The atomic spectrum of hydrogen * The Bohr model * The quantum mechanical model * Quantum numbers * Orbital shapes and energies * Electron spin * Polyelectronic atoms * The history of the periodic table * Periodic trends and properties * Group trends | * Gravimetric Analysis of a Carbonate * Molecular Spectoscopy * Flame Test |  |
| **Second Nine Weeks** | |  |  |
| Ch. 8 & 9:  Bonding  FTF: 3 | * Types of chemical bonds * Electronegativity * Bond polarity and dipole moments * Ions; configuration and size * Localized electron bonding model * Lewis structures * Octet exceptions * VSEPR * Hybridization * Molecular Orbital model * Photoelectron Spectroscopy | * Principles of Chromatography |  |
| **Unit 4**  Ch. 10:  States of Matter and IMF’s  FTF: 5 | * Intermolecular forces * Liquids and solids * Metallic bonding * Network solids * Molecular solids * Ionic solids * Vapor pressure and changes of state | * Types of Chemical Bonds * Spectrophotometric Analysis of Food Dyes |  |
| Ch. 11:  Solutions  FTF: 6 | * Solutions * Factors affecting solutions * Molarity * Molality |  |  |
| **Unit 5**  Ch. 12:  Kinetics  FTF: 10 | * Reaction rates * Rate laws * The integrated rate law * Reaction mechanisms * Catalysis | * Factors Affecting Reaction Rates * Chemical Kinetics |  |
| **Third Nine Weeks** | |  |  |
| **Unit 6**  Ch. 13:  Equilibrium  FTF: 12 | * The equilibrium condition * The equilibrium constant * Equilibrium and pressure * Heterogeneous equilibria * Solving equilibrium problems * Le Châtelier’s principle | * Le Chatelier’s Principle |  |
| Ch. 14 & 15: Acids & Bases  FTF: 13 | * Acids and bases * Acid strength and the pH scale * Calculating pH * Polyprotic acids * Salt hydrolysis * Acids and bases in solution * Buffers * Titration * Indicators | * Conc. of Acetic Acid in Vinegar * Preperation of a Buffered Solution * Evaluating Lemonade as a buffer |  |
| Ch. 16:  Solubility Equilibrium  FTF: 13 | * Solubility equilibria * Precipitation and qualitative analysis * Complex ion equilibrium |  |  |
| **Unit 7**  Ch. 6 & 17:  Thermochemistry &  Thermodynamics  FTF: 11 | * Energy * Enthalpy and calorimetry * Hess’s law * Enthalpies of formation * Energy Sources * Spontaneity * Entropy and free energy * Free energy in chemical reactions * Free energy, equilibrium and work | * Fundamentals of Calorimetry |  |
| **Fourth Nine Weeks** | |  |  |
| **Unit 8**  Ch. 18:  Electrochemistry  FTF: 9 | * Balancing oxidation-reduction reactions * Galvanic cells * Standard reduction potentials * Cell potentials and electrical work * Cell potentials and concentrations * Batteries * Electrolysis | * Vit. C in Fruit Juice Redox Titration |  |
| AP Review of AP exam questions | * All AP topics |  |  |

**Required Materials**

1. **Duplicate Lab Notebook** at least 50 pages **–** carbonless self-copying pages (each page has a self-duplicating page). These can be found in some Walmart’s, bookstores, and in many places online. PLEASE ORDER IMMEDIATELY!

**2.** Pencil bag (must be brought to class every day, but can be   
 used in other classes)

* + Set of fine tip colored pens (at least 5 colors)
  + Pencils or mechanical pencils (with extra leads)
  + Pencil sharpener with cover, if they write with a standard pencils
  + 4 colors of highlighters

**3.** 1.5 inch binder with 8 dividers

**4. A graphing calculator of your own is recommended**

**5. Turn the following supplies into your teacher.   
 Due September 4th.**

* + **bring 2 rolls of paper towels & 1 box of gloves**

**How much time should you spend outside of class working on Chemistry?**

To answer this question consider the amount of time you will be spending on school when you are in college and use that amount of time to set a goal to begin preparing yourself for that level of time commitment:

In College: Usually about 18 credit hours per semester = 18 hours in class each week

Study 2-3 hours per credit per week (18\*2.5) = + 45 hours studying each week

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63 total “school” hours each week

In High School: 6.5 hours in class a day X 5 days a week = 32 hours in class each week

Study 2.5 hours x 7 days in a week = + 18 hours studying each week

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50 total “school” hours each week

In High School you should be preparing yourself for the level of commitment required in order to do well in college, when you are taking pre-AP and AP classes you should be spending about 50 hours a week on school, which would mean 18 total hours of studying each week or 2.5 hours a day 7 days a week.

**For my class I expect you to spend 30-45 minutes every school night** x 5 = 2.5- 3.75 hours per week **preparing** for class