Course Description: This is a course that explores the behavior and interaction of matter on the molecular level. Mathematics is an integral part of this course. Successful completion of Chemistry I is a prerequisite. You may not take second semester AP Chemistry if you did not pass first semester.

AP Chemistry exam is scheduled for Monday, May 6 in the morning. Your MANDATORY practice exam will be at the end of April. (The score on the practice exam is your final exam grade for second semester).

Materials: pencil, 3-ring binder, paper, textbook, and a calculator. Please make sure to put your name on the notebook and calculator. Bring your primary textbook to class every day!

Text and References:

Once you are issued these books, you are financially responsible for them.

Rules

Be Prepared – Bring your motivation, enthusiasm for learning and tools for the classroom.

Expect excellence in academic performance, personal interactions, and character development.

Always be on time for class and with your assignments.

Respect everyone.

Show Bear Pride. Take pride in your learning, your character, and in your school.

Grading Policy:

Maximum point values
- Tests - 100 points
- Labs - 25 points -- some are formal lab write ups
- Homework - 10 points
- Free Response Question – up to 10 pts each
- Reactions quizzes - 5 pts each
- Final exam is 10% of your grade and averaged as two test grades.

Approximately 70% of your average will come from tests and quizzes. Course grade will be calculated by adding up the total number of points earned during the semester, dividing it by the total possible points and multiplying by 100. This average counts for 75% of your grade, the final exam determines the other 10 %. Five points will automatically be added to all averages quoted for this course as an advanced placement grade adjustment. Please remember that when checking SmartWeb, these points have not been included in the calculation.

Practice Exam will be the last weekend in April.
- This will count as your final exam for second semester.
- All students must take this exam.
- Final exam exemption is not determined until the end of the semester.
**Reading:** Students are expected to read each chapter thoroughly prior to material being covered in class. Test items may come directly from the reading. Not all information in each chapter will be discussed in class.

**Homework:** Worksheets and free response sheets will be provided. Suggested practice problems will be given for each chapter. Problems are located at the end of each chapter. Answers to odd problems are in the back of the book as a self check. Homework checks are worth 10 points.

**Labs:** Appropriate labs will be assigned throughout the chapter. Extended lab periods will be used for the purpose of hands on data collection and data analysis. A minimum of one formal lab report will be required per semester worth 50 points. Graded labs must be kept in a separate lab notebook. A maximum of 25 points may be earned per lab.

**Free Response Questions:** Each topic will have a set of representative free response questions appropriate for that chapter and previously learned material. Only one point on a ten point problem is earned for the correct answer. The other 9 points are for your work and set up.

**Net ion Equations:** Net ion equations for each of the reaction types will be introduced throughout the year. Net ion quizzes will be given every other day for 5 points each. For each reaction, you will be required to predict the products, eliminate spectator ions, balance the net equation, and answer a question related to the reaction.

**Quizzes:** Given throughout the year on various topics worth a maximum of 50 points.

**Test:** All tests are worth a maximum of 100 points and consist of 2 sections: Multiple Choice and Free Response.

**Make up policy** - Work missed in school is to be made up at a maximum of 5 school days. If you have been informed of a long term assignment or test prior to one day's absence, you are expected to participate in that assignment the day you return. Students who have NI's are not privileged to the 5 day make up rule. They are responsible for work missed before or the immediate day following the NI absence. If you miss a lab, you may obtain the data from your partners and turn in the lab write up or schedule an after school lab session to obtain your own data.

**Late Work** – Complete all work including homework on time. Assignments not turned in on time will result in a zero being entered in the grade book. Students will have 5 days to make up an incomplete assignment for partial credit. If the assignment is made up students will have an automatic deduction of 50%. If the work is not made up in the allowed time frame the zero will remain in the grade book.

**Extra help** – I will be available for extra help as needed before school. I arrive at 7:00 every morning. Due to meetings and other commitments that arise, it is best to let me know in advance that you are coming. I encourage you to come see me as soon as you encounter a problem because chemistry builds on previous information. Once you get lost, misunderstandings only get worse.

**Violation of lab rules** – Violation of lab rules will result in immediate removal from the lab area. You will be assigned an alternate activity and will receive a zero in lab. Other punishment may be necessary depending on the seriousness of the violation. If you show up for a lab with the inappropriate lab wear, you will not be allowed to participate in the lab and you will receive a zero.

**Extended Labs:** Due to the time required to complete many of the chemistry labs, 1st period students will be expected to show for labs at 7:00 a.m. Students with transportation problems or zero period classes will need to make sure a member of their lab group can show up at 7:00 to get the lab started. Fourth period students will use extended period day on Tuesday to complete the labs. Lab dates will be announced with plenty of notice.

**Night Classes:** As we approach the date for the AP exam, I will offer the opportunity for night classes. They are not required. The purpose of the night class is to review old AP exams and material that will be tested on the AP exam. Classes will start in February and will run from 6:00 to 8:00 PM.
**Academic Integrity**

Cheating on assignments, quizzes or tests will not be tolerated in this class. The school cheating policy for a test is as follows:

When a student is caught cheating on a test, they are required retest. The office referral will be counted as cumulative all classes, not isolated for each individual class.

1st time – Office Referral – Warning and opportunity to take test
2nd time – Office Referral – 3 days ISS and opportunity to take test
3rd time and beyond – Office Referral and 0 on the test

Remember to retest, you must complete all of the requirements
- Three days of morning tutoring from 7:15 to 7:45
- Corrections completed on the original test
- Completion of additional practice problems
- Retake must be completed within 5 days of receipt of the graded original test
- All retakes must be completed in the morning from 7:00 – 7:45

Although all definitions of cheating cannot be covered in this syllabus, the following situations are a few examples that are considered cheating:

- Copying homework from another student or allowing someone to copy your homework.
- Programming calculators with notes, formulas, or other material to use on a test without permission of the instructor.
- Writing on the desk or on your person or creating any other sort of cheat sheet for a test.
- Use of a cell phone or laptop at any time during a quiz or exam.
- Plagiarism.
- Looking on another student’s paper or getting help from another student during a quiz or test.
- Discussing contents of a test or quiz with other classes before they have taken the exam.
- Using notes, quizzes, tests, projects, and lab write ups from other students both current and past.
- Changing answers on a test after you have seen the tests others students have turned in.
- Using the teacher’s edition or test bank for the text book currently in use.
AP chemistry syllabus

First Semester

- **Chemical Foundation; Atoms, Molecules, and Ions; and Stoichiometry** - Chapters 1 – 3  (½ week)
  - Important concepts –
    - Metric, Significant Figures, & Dimensional Analysis
    - Modern Atomic Structure
    - Nomenclature – binary, tertiary, transition metals, acids
    - Stoichiometry
      - Limiting Reactants
      - % yield and % error
    - Percent Composition
    - Writing and Balancing Equations
    - Calculations for empirical and molecular formulas

- **Aqueous reactions and Solution Stoichiometry** - Chapter 4 (2 weeks)
  - Extremely Important Chapter – has its own special section on the AP Exam
  - Important concepts
    - Electrolytes
    - Types of reactions
    - Precipitation Reactions
    - Solubility Rules
    - Acid Base Reactions
    - Redox reactions
    - Net ion equations (throughout entire year)

- **Periodic Properties of the Elements** - Chapter 7 (1 ½ weeks)
  - Very Important Chapter
  - Important Concepts –
    - Quantum Numbers
    - Orbital Shapes and Energies
    - Ionization Energy
    - Atomic and Ionic Radius
    - Electron Affinity
    - Isoelectronic species

- **Chemical Equilibrium** - Chapter 15 (2 weeks)
  - ONE OF THE BIG SIX TOPICS FOR AP CHEMISTRY
  - Important Concepts
    - Visualizing equilibrium
    - Writing the equilibrium constant
    - Kc, Kp, Ksp
    - LeChatelier’s Principle
    - Common Ion Effect

- **Acid-Base Theory** - Chapter 16 (3 weeks)
  - Important – Although most of the information is review, it feeds directly to the next chapter, which is one of the big six topics for AP Chemistry.
  - Important Concepts
    - Characteristics of acids and bases
    - Arrhenius, Bronsted-Lowry, Lewis definition of acid and base
    - Identification of the strong acids and bases
    - Calculation of pH for strong acid/bases and weak acid/bases
    - Polyprotic acids
    - pH of salts
    - Acid anhydrides/base anhydrides
• **Aqueous Equilibria** - Chapter 17 (3 ½ weeks)

  **ONE OF THE BIG SIX TOPICS FOR AP CHEMISTRY**

  **Important Concepts**
  - Common Ions
  - Buffers
  - Titrations
  - Acid/base indicators
  - Solubility product
  - Selective Precipitation
  - Qualitative analysis

• **Chemical bonding** - Chapter 8 (1 ½ week)

  **Important Concepts**
  - Types of bonds
  - Electronegativity
  - Bond Polarity and dipole moment
  - Bond energies
  - Lewis Structures
  - Resonance
  - Exceptions to octet
  - VSEPR
  - Bond Order

• **Molecular Geometry** Chapter 9 (½ week)

  **Important Concepts**
  - Hybridization
  - Molecular Orbital Model

• **Chemistry of Non metals and metals** – Chapter 22 & 23 (1 week)

  **Important**
  **To be completed over Thanksgiving holidays** - Test when you return

  **Important Concepts**
  - Characteristics of each group
  - Group trends and exceptions

• **Organic Chemistry** - Chapter 25 (1 ½ week)

  **Important**
  **Important Concepts**
  - Organic Nomenclature
  - Saturated and unsaturated hydrocarbons
  - Aromatics
  - Alcohols
  - Esters
  - Ethers
  - Ketones
  - Aldehydes
  - Polymers

**END OF FIRST SEMESTER** – Final exam will include information from all of the chapters listed above. It will be in the format of a real AP chemistry exam with a multiple choice section, reactions section and free response section. You will only be allowed to use the calculator and formulas sheet on the first part of the free response section.
Second Semester

- **Gases** – Chapter 5 (½ week)
  - Important chapter. **To be completed over Christmas holidays** - Test when you return
  - Important Concepts
    - Pressure
    - Major Gas Laws
    - Ideal Gas Law
    - Effusion
    - Kinetic Molecular Theory of Gases
    - Velocity of gas molecules

- **Thermodynamics** - Chapter 5 & 19- (2 ½ weeks)
  - **ONE OF THE BIG SIX CHAPTERS**
  - Important Concepts
    - Calorimetry
    - Enthalpy
    - Hess’s Law
    - Enthalpy of reactions
    - Entropy
    - Free Energy
    - Work
    - Spontaneity

- **Chemical Kinetics** - Chapter 14 (3 weeks)
  - **ONE OF THE BIG SIX CHAPTERS**
  - Important Concepts
    - Reaction Rates
    - Determining rate laws from lab data
    - Reaction mechanisms
    - Model for chemical kinetics
    - Catalysis and inhibitors
    - Half-life

- **Intermolecular Forces, Liquids and Solids** Chapter 11 (1 week)
  - Fairly important chapter
  - Important Concepts
    - Intermolecular forces
    - Hydrogen bonding particularly
    - Types of crystal structures
    - Vapor pressure
    - Phase change diagrams

- **Electrochemistry** - Chapter 20 (2 weeks)
  - **ONE OF THE BIG SIX CHAPTERS**
  - Important Concepts
    - Redox
    - Galvanic cells
    - Cell potential
    - Work
    - Free energy
    - Batteries
    - Electrolysis
• **Transition Metals and Coordination Chemistry – Chapter 24 (1 week)**
  To be completed over spring holidays - Test when you return

  **Important Concepts**
  - Characteristics of each group
  - Group trends and exceptions
  - Coordination compounds
  - Isomerism

• **Properties of Solutions Chapter 13 (1 ½ week)**
  Fairly important chapter

  **Important Concepts**
  - Solution formation
  - Energy of solutions
  - Factors affecting solubility
  - Raoult’s Law
  - Boiling point elevation/freezing point depression
  - Osmotic pressure
  - Colloids

• **Nuclear Chemistry - Chapter 21 (1 week)**
  **ONE OF THE BIG SIX CHAPTERS**

  **Important Concepts**
  - Types of decay
  - Kinetics of decay
  - Transformations
  - Uses of radioactivity
  - Fission and fusion

Test Review

**AP exam is Monday, May 6 in the morning.**
Dear Parent:

I would like to take this opportunity to welcome you and your child to the exciting world of Chemistry. AP Chemistry is a fascinating and very applicable field of science; however, it is at times also very challenging and frustrating for students. I will do my best to ensure that your child learns about AP Chemistry through problem solving, writing, and hands-on activities. You can help your child be successful in AP Chemistry by helping him/her stay caught up with daily assignments, teaching good study skills, and encouraging him/her to come and ask me questions when they do not understand something. It is not unusual for me to have students in my room before school working on assignments or reviewing concepts. Please encourage your child to join us if he/she is having difficulty. I look forward to a great year.

I strongly recommend that a notebook be kept. I expect each student to take the AP Exam. It is a gamble that can save you THOUSANDS of dollars in the future!! A well-kept notebook may be the proof to the college of the level of difficulty of this course and may help to obtain college credit.

Please read the policies and procedures handout that your child received in class. The policies and procedures I have outlined are designed to make this AP Chemistry class run smoothly, safely, and efficiently. I ask that you and your child read this handout and sign this form below acknowledging that you are aware of what I expect in my class. If there are any questions, please do not hesitate to call or email.

Thank you,

Laura Byrd

988-6340 (HCHS)
laura.byrd@hcbe.net

Student:  

I have read these policies and procedures for AP Chemistry class and I understand what is expected of me and the results if I fail to comply.

(Student) ________________________________ (date) ________________

Parent:

I have read these policies and procedures for AP Chemistry class and I understand what is expected of my child and the results if he/she fails to comply.

_____________________________ ____________________ __________
Parent signature               Date

_____________________________ 
Parent’s email address
LABORATORY SAFETY CONTRACT
HCHS CHEMISTRY DEPARTMENT

At all times when I am working or visiting the chemistry laboratory, I will use good laboratory safety practices. While in the laboratory, I will always think about the following safety precautions:

1. Wear departmentally approved eye-protection glasses at all times.
2. Never put anything into my mouth or eat or drink while in the lab.
3. Know the exact location of the safety equipment.
4. Never work alone.
5. Do only assigned experiments and follow the designated procedures. If I do not understand the procedure, I will find out the correct procedure from my instructor.
6. Wear sensible clothing. (Shoes - not sandals or bare feet, long hair tied back, rubber laboratory apron.)
7. Keep the lab bench free of items not related to the experiment. Keep the lab bench and chemical supply areas clean at all times and wipe up all spills.
8. Dispose of waste materials and excess chemicals as indicated by my laboratory instructor.
9. Use the fume hood when instructed to do so.
10. Avoid touching hot objects.
11. Insert glass objects into rubber stoppers or corks following proper procedures including lubricating the glass and using a towel around the object.
12. Read the label on the bottle or container to make sure that it contains the correct material and be sure to put the cover back on the bottle as soon as I am finished.
13. REPORT TO THE LABORATORY INSTRUCTOR IMMEDIATELY ANY ACCIDENTS WHICH CAUSE INJURY, NO MATTER HOW MINOR.

I have read carefully the discussion of good laboratory safety practices and the above written safety precautions and understand their importance for the safety and welfare of myself and of all the people in the laboratory.

I recognize my responsibility to observe these practices and precautions while present in a chemistry laboratory and agree that if I fail to follow these procedures, I may be asked to discontinue the lab and receive a zero on the lab.

Signature ___________________________ Date ________________

Parent's Signature ___________________________ Date ________________

Please list any health problems or allergies that may affect your performance in the laboratory (i.e. sensitivity to ammonia, colorblindness, hearing problems, etc.)

_________________________________________________________________________________

Do you wear contact lenses? _________ If yes, are they soft or hard? ____________________