

CHEM 1411 – General Chemistry I

Course Syllabus – Fall 2010

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Office Hours: By Appointment

Required Books and Supplies:

Chang, R., **Chemistry**, 10th Ed., Published by McGraw Hill, 2010. **ISBN-13 9780077274313.**
CHEM 1411 Lab Manual, Brazosport College, Published by Signature Labs.
Scientific Calculator.
Safety Goggles – must meet ANSI Z87.1-1989 certification.

Course Description:

This course is a review and extension of basic principles of chemistry, together with a study of the elements and their compounds, bonding theories, kinetic molecular theory, solutions and quantum chemistry.

To pass the course, the student must **successfully complete** the laboratory portion of the course.

Prerequisite:

Grade of C or better in high school chemistry or grade of C or better in CHEM 1405 or approval of the division chair.

Student Resources:

1. Desire2Learn:
Course Name: [101S-CHEM1411-JCHU - 101S-CHEM1411-JCHU](#)
User Name: First initial of first name, last name, and last 4 digits of your Student ID number.
Initial Password: Your initial password will be “bc + your pin number” as given to you by the registrar.
2. Tutorials: [Chemistry Tutorial](#)

Expectation of Students

Students will:

- attend every class.
- show up prepared (text, notebook, pen, assignments completed) and on time.
- seek help at the first sign of learning difficulties.
- fully participate in the class.
- have contributed significantly to all assignments turned in for credit (no copying).
- not cheat on any examination.

Grades:

Final Grades will be determined according to the following system:

Hourly Exams	45%
Homework / ChemSkillBuilder	15%
Lab	20%
Final Exam	20%

Note: a student must successfully **complete** the laboratory portion of the course to obtain any credit for the lecture section Chem. 1411.

Examinations

The examinations will last approximately one hour during class, with the exception of the final, which will last two hours. The exact date of each quiz will be announced in class closer to the actual date.

There will be no make-up exams. However, if the student anticipates a legitimate absence (as judged by the instructor) for an exam, arrangements can be made to take the exam in the Learning Resource Center, LRC. This must be done before the next scheduled class after the exam. A missed exam will be counted as a zero toward the final grade. The final exam grade will replace **one** missed exam grade.

Homework Assignments:

Homework assignments are based on the **Online ChemSkill Builder**. The average of your scores from ChemSkill Builder will count as 15% of your grade. ChemSkillBuilder has the advantage of giving the student immediate feedback concerning the correctness of the student's work. If a student answers incorrectly, the correct answer with an explanation is provided. There is no limit to the number of times a student can complete an exercise. If a student scores higher in a subsequent try the higher grade will be figured into the average.

To receive any credit for the homework, it must be completed on or before the due date listed in the schedule.

Instructions for student self-registration are as follows:

Log on to <http://www.chemskillbuilder.com>. Click on "New Student Registration."

1. Enter your Student Login Number and create a user name. Click on "Submit" when finished.
2. Fill in all of the boxes. Click on the school drop-down menu and select "Brazosport College". Click on instructor drop-down menu and select "Judy Chu". Select CHEM1411 and Section 1.
3. When registration is complete, you will be asked to log back in with your student login number and user name.
4. You are ready to begin ChemSkill Builder. Click on an assigned unit from the left-hand navigation bar and begin.

Class Attendance Policy

- If you are unable to complete this course, you must withdraw by Friday, Nov. 5, 2010. Withdrawal from a course is a formal procedure, which the student must initiate. If you stop attending class and do not withdraw, you will receive a performance grade, usually an "F". If you think you must withdraw from this course, please talk with me about it first.
- Being late for class and leaving class early (without permission) are extremely disruptive to the class. If it becomes habitual, the student will be asked to withdraw from the course.

Academic Code of Conduct

A student, who cheats on an exam or other assignment, will receive a zero for the exam or assignment. Repeat offenses will be discussed with the Dean of Student Services and **will result in a failing grade for**

the course. While studying with fellow students is encouraged, any work turned in for credit must be substantially the work of the student (no copying). Students are advised to read the *Standards of Student Conduct* in the *Student Guide and Calendar* for a complete description of college policies, rules and regulations in this and other areas.

Study Tips

Class attendance and participation will be important to your success. Come to class prepared. This means that you should spend **at least six hours per week outside of class** studying and doing homework assignments. Space out your studies evenly. Your retention and understanding of the material will be enhanced if you follow these simple rules.

Course Objectives:

The course is designed to help the student:

- A. Learn basic terminology and the application of the mathematical skills required to interrelate numbers of atoms and molecules to mass and units of concentration.
- B. Become familiar with the structure of the atom and its corresponding placement on the periodic table, as evidenced by the ability to predict various properties such as size, ionization potential, electronegativity and electron affinity from the position of the element on the periodic table.
- C. Write the electronic configuration of an atom and explain an element's reactivity in terms of its electronic configuration.
- D. Be able to explain in writing both how and why various elements combine to form compounds. This should involve the interrelation of the fundamental concepts of bond theories covered in class into broader abstractions or principles.
- E. Identify and recognize the limitations and differences among competing scientific models of chemical systems; such as covalent bonding and hybridization versus molecular orbital theory, and the various acid-base theories.
- F. Gain a basic understanding of the behavior of elements and compounds in solutions and in chemical reactions.
- G. Be able to predict the behavior and properties of molecules and ions in the gaseous, liquid, and solid states given a set of physical conditions.
- H. Demonstrate knowledge of the physical and chemical properties of solutions of electrolytes and non-electrolytes.
- I. Gain a background in chemical principles sufficient for success in more advanced courses such as Chemistry 1412 or Chemistry 2423.
- J. Acquire basic laboratory skills and carry out quantitative procedures in a laboratory setting.

Chem. 1411* – MW Lecture Schedule Fall 2010

Week	Date	Topic	Chap. - Unit	ChemSkill Builder Unit - Section	Due Date
1	Aug. 30	Orientation, Classification of Matter, Physical and Chemical Properties	1.1 - 1.6	1-1,1-2, 1-3, 1-4	9/6
1	Sept. 1	Measurement, Scientific Notation, Significant Figs, Conversions	1.7 - 1.9	1-6, 2-1, 2-2, 2-3, 2-4, 2-5, 2-6	9/8
2	Sept. 6	Labor Day Holiday			
2	Sept. 8	Atomic Theory, Periodic Table,	2.1 - 2.4	9-1, 3-1, 3-2	9/13
3	Sept. 13	Formulas, Nomenclature	2.5 - 2.7	3-3, 3-4 Nomenclature Worksheet	9/15
3	Sept. 15	Acids, hydrates, and review	2.7	3-5	9/20
4	Sept. 20	Exam 1			
4	Sept 22	Molar Mass, % Composition, Empirical Formula	3.1 - 3.6	4-1, 4-2, 4-5, 4-6	9/27
5	Sept. 27	Chemical Equations, Reaction Stoichiometry	3.7 - 3.8	5-4, 4-3	9/29
5	Sept. 29	Limiting Reactant, Yields,	3.9 - 3.10	4-4	10/4
6	Oct. 4	Aqueous Soln's, Electrolytes, types of reactions, Oxidation No.	4.1 - 4.4	5-1, 5-3, 5-6	10/6
6	Oct. 6	Redox Rxn's	4.4	10-1, 10-2	10/11
7	Oct. 11	Exam 2			
7	Oct. 13	Types of Solutions, Concentration Units, Acid-Base Titrations	12.1 - 12.3 4.5, 4.7	6-1, 6-2, 15-1, 15-2	10/18
8	Oct. 18	Effects on Solubility of T and P, Colligative Properties	12.4 - 12.5 12.6 - 12.8	15-5	10/20
8	Oct. 20	Gas Laws	5.1 - 5.3	7-1, 7-2	10/25
9	Oct. 25	Ideal Gas Equation, Stoichiometry	5.4 - 5.5	7-3	10/27
9	Oct. 27	Mixtures, Kinetic-Molecular Theory	5.6 - 5.8	7-4, 7-5	11/1
10	Nov. 1	Types of Energy, Energy Changes in Chemical Reactions	6.1 - 6.3	8-1,8-3	11/3
10	Nov. 3	ΔH Rxn, Formation, & Combustion,	6.4 - 6.7	8-4, 8-5, 8-6	11/8
		Nov. 5 - Last Day to Withdraw			
11	Nov. 8	Exam 3			
11	Nov. 10	Bohr Atom, Quantum Atom	7.1 - 7.5	9-2	11/15
12	Nov. 15	Electronic Configurations, Aufbau Principle	7.6 - 7.9	9-3, 9-5	11/17
12	Nov. 17	Periodic Properties	8.1 - 8.6	11-1, 11-2	11/22
13	Nov. 22	Ionic Bonding, Covalent Bonding	9.1 - 9.5	11-3, 11-4	11/29
13	Nov. 24	Thanksgiving Holiday			
14	Nov. 29	Lewis Structures, Bond Energies	9.6 - 9.10	12-1, 12-2, 12-4	12/1
14	Dec. 1	VSEPR	10.1 - 10.2	12-3	12/6
15	Dec. 6	Valence Bond Theory	10.3 - 10.5	13-1, 13-2	12/8
15	Dec. 8	Exam 4			
16	Dec. 15	Final Exam Dec. 15 10:30 - 12:30			

*This schedule is subject to change.

*Online ChemSkillBuilder homework is due at 8 AM on the indicated date.

CHEM 1411onors LAB SCHEDULE – Fall 2010

Monday 1 – 3:50PM

Week	Week of	Experiment
1	8/30	TECH 380 Lab Safety and Drawer Check in MISC 486 Dimensional Analysis
2	9/6	No Lab – Labor Day Holiday
3	9/13	PROP 484 - Density
4	9/20	REAC 482 - Copper
5	9/27	ANAL 503 – Nine Bottles – Equations - handout
6	10/4	ANAL 503 – Nine Bottles – Reactions – handout grids for knowns and unknowns
7	10/11	ANAL 424 - NaOH standardization
8	10/18	ANAL 427 - Acid Content of Fruit Juices
9	10/25	PROP 332 - Gas Law Constant R
10	11/1	PROP 481 – Molar Mass by Dumas Method
11	11/8	Specific Heat Determination - handout for experiment
12	11/15	THER 368 - Heat of Neutralization
13	11/22	No Lab – Thanksgiving Holiday
14	11/29	PROP 500 – Molecular mass – Freezing Pt Depression
15	12/6	Clean-up and Check out

Important Semester Dates:

Thanksgiving Holiday –Nov. 24-26

Last Day to Withdraw from Classes– Nov. 5

CHEM 1411 – Fall 2010

Dr. J. Chu

General Chemistry I Lab

Safety:

1. Safety goggles must be worn at all times in the laboratory.
2. Know the locations of eyewashes, showers, fire extinguishers and exits.
3. Use common sense.
4. Never point the open end of a test tube at someone.
5. Bare feet are NOT allowed into the laboratory. Open sandals and shoes are discouraged.
6. All broken glass goes in the glass boxes located on the ledges above the benches.

Laboratory Housekeeping:

1. Arrange apparatus neatly and compactly. Keep all books except the laboratory manual off the laboratory workbench.
2. Do not throw filter paper or solid materials into the water troughs or sinks.
3. Keep all reagent bottles clean (especially acids and bases).
4. Keep the reagent-dispensing area clean. Pay particular attention to keeping the balances clean and in order. If you spill chemicals, clean them up immediately. Put caps back on reagent containers.
5. At the end of the laboratory period, clean off your workspace with a sponge or wet paper towel. Check to see that the gas and water have been turned off. You are responsible for keeping the area neat. Repeated failure to do so may result in loss of credit.

CLEAN UP STARTS 10 MINUTES BEFORE THE OFFICIAL END OF THE CLASS PERIOD.

When the time is up, you are supposed to be out of the laboratory. Failure to properly budget your time is presumptive of poor planning and your grade may suffer.

Grading:

1. Most experiments include a Pre-lab (25 points) which must be turned in at the beginning of the lab period. You are expected to come to the lab prepared to perform the assigned experiment.
2. The Data Sheets and Observations (50 points) and the Post-lab exercises (25 points) will be due at the end of the period following the completion of the experiment.
3. The Data Sheets and Observations must be completely filled out in ink. When you make an error, cross it out with a single line. Do not use liquid paper or obliterate the error. For example: ~~error~~ error

References:

Occasionally reference data may be required on some of the compounds used in lab. Consult the CRC Handbook of Chemistry and Physics. A copy of the **CRC** can be found in the lab.

Working With Your Lab Partner

Lab Partner's Name _____

Best way to contact (phone, email...) _____

To become a productive lab partner, develop and fine-tune the following skills and abilities:

1. **RESPONSIBILITY.** Before leaving the lab, make sure both you and your lab partner have completely filled out both your and your partner's data sheets. This is your insurance policy.
2. **LISTENING SKILLS.** You must be able to put your own thoughts aside and listen without interrupting or interpreting what your partner is saying. Try it - it's not easy.
3. **SELF-CONFIDENCE.** You must believe in yourself and in the worth of your contributions. Speak up!
4. **OPEN-MINDEDNESS.** Welcome change, and listen to the ideas others bring.
5. **CREATIVITY.** Try stretching yourself outside of your routines. Try a different method. It might work better than your current method.
6. **THOUGHT.** Keep your goal in sight. Instead of following the lab manual like a recipe, consider the instructions to be a guide. When you make an error, how can you adapt the manual's procedure to still reach your goal? Which type of balance will give you enough significant digits?
7. **RELIABILITY.** Do what you say you're going to do.
8. **OBJECTIVITY.** Assess ideas, thoughts, and opinions from all sides, not just yours.
9. **OPTIMISM.** Look at problems as opportunities. Knocking over the beaker containing your product can lead to learning about purification techniques.
10. **COOPERATION.** You must be able to accept team decisions and work just as hard on other people's ideas as you do on your own.

Adapted from Ern, B. L. and Lawley, C. M. (1992). The office professional as a team player. Office Hours, 229, 1.

Chemistry 1411 Honor's Project

Optional Honors Contract:

- Students who sign an honor's contract will receive an "Honors" designation on their transcript.
- Honor's contract students must submit and present an "Honor's Project" before the end of the semester.

The rules for the Honor's Project are as follows:

- **Topic** – The topic range is quite broad. The criterion is some aspect of chemistry as it relates to society, an average person's life. The topic should be narrow enough that it can be covered in at least some depth in a 10 minute presentation. Topic should be approved by the instructor.
- **Individual or Team** – Students may elect to form two person teams. Team members would then be responsible for a 20 minute presentation and would receive the same grade.
- **Components** –
 - Bibliography – A written list of references in some acceptable format.
 - Outline –Written, to be turned in along with the bibliography at least one week prior to the presentation.
 - Presentation – The presentation would be oral and may be supplemented by use of the whiteboard, flipcharts, transparencies or PowerPoint. The presentation will be scheduled during the last portion of a regular class period on any non-test day before December 1.