

Course Information Sheet
General Chemistry for Engineers
Chem 1410.A2

Blinn College
Fall 2009

Instructor: Dr. Elizabeth Bell Office Room: H252 Office Hours: MW 1215-115pm
E-mail: elizabeth.bell@blinn.edu Class Times: MW 125-405pm TR 910-1010am
S113/S228 TR 140-240pm

Course Description: CHEM 1410 is a course designed for engineering majors which will incorporate the major concepts and principles of both CHEM 1411 and CHEM 1412. Applications of these principles will be emphasized. The major areas which will be covered are: Matter and energy relationships, structure of matter, chemical bonding, gases, liquids and solids, solutions, acids and bases, oxidation-reduction, electrochemistry, thermodynamics, kinetics, and chemical equilibrium.

Prerequisites: Math 1314 with a grade of "C" or better; or SAT math score of 550; or ACT math score of 22.

Core Curriculum Course: This is a course in the 42-hour Core Curriculum of Blinn College. As such, students will develop proficiency in appropriate intellectual competencies, exemplary educational objectives and general perspectives. The URL of the Blinn College core curriculum website is www.blinn.edu/corecurriculum.htm

Course Objectives and Student Learning Outcomes: Upon completing the course students should have a grasp of the listed concepts be able to solve problems related to them. They should grasp the relationships among them as well. Students should be able to safely perform basic laboratory operations such as titrations, filtrations, and syntheses.

1. Classify atoms, molecules and compounds
2. Describe the characteristics of matter, measurements, and calculations in chemistry.
3. Understand the atomic nature of matter: electrons and nuclei, the elements, ions.
4. Demonstrate the representation and naming ionic and molecular compounds
5. Demonstrate the mole concept of matter, mass-mole conversions, determining chemical formulas, aqueous solutions.
6. Interpret chemical equations to determine yields of chemical reactions, percent yields, the limiting reactant, excess reactants, and reactions involving solutions.
7. Discuss the behavior of both ideal and real gases and reactions involving gases.
8. Understand the properties of electrons, quantum theory and quantum numbers, shapes of atomic orbitals, and chemical periodicity.
9. Discuss ionic and covalent bonding, electronegativity and polarity.
10. Draw Lewis structures and use VSEPR theory and Valence Bond theory to describe molecules.
11. Summarize the properties and behavior of solids and liquids.
12. Describe the energy changes of chemical reactions.
13. Illustrate how energy, entropy and free energy affect the spontaneity of chemical processes.
14. Understand the field of chemical kinetics applied to reaction mechanisms and rates of reaction.
15. Demonstrate the principles of chemical equilibrium.
16. Describe the different types of electrochemical cells.

BLINN COLLEGE CLASS POLICIES:

Dropping: If a student chooses to drop the course, it is that student's responsibility to complete a drop order at the Office of Enrollment Services in the administration building. Failure to do so could result in a grade of F in the course. The last day to withdraw with a "W" can be found on your class syllabus, online, and in the course schedule bulletin.

Eating and drinking are not allowed during class or laboratory work.

Dishonesty Statement: Blinn College does not tolerate cheating, plagiarism or other acts of dishonesty. Definitions of these acts and procedures for dealing with them are described in "Scholastic Dishonesty" in the Blinn College Student Handbook, copies of which are available at the information desk in the administration building or online at the Blinn College website, <http://www.blinn.edu>.

Civility Statement: Members of the Blinn College community, which includes faculty, staff and students, are expected to act honestly and responsibly in all aspects of campus life. Blinn College holds all members accountable for their actions and words. Therefore, all members should commit themselves to behave in a manner that recognizes personal respect and demonstrates concern for the personal dignity, rights, and freedoms of every member of the College community, including respect for College property and the physical and intellectual property of others. Civility applies to attire as well as language and behavior. Please dress appropriately for the academic classroom and laboratory.

If a student is asked to leave the classroom because of uncivil behavior, the student may not return to that class until he or she arranges a conference with the instructor. It is the student's responsibility to arrange for this conference.

Attendance: The College District believes that class attendance is essential for student success; therefore, students are required to promptly and regularly attend all their classes. Each class meeting builds the foundation for subsequent class meetings. Without full participation and regular class attendance, students shall find themselves at a severe disadvantage for achieving success in college. Class participation shall constitute at least ten percent of the final course grade. It is the responsibility of each faculty member, in consultation with the division chair, to determine how participation is achieved in his or her class. Faculty will require students to regularly attend class and will keep a record of attendance from the first day of class and/or the first day the student's name appears on the roster through final examinations.

If a student has one week's worth of unexcused absences during the semester, he/she will be sent an e-mail by the College requiring the student to contact his/her instructor and schedule a conference immediately to discuss his/her attendance issues. If the student subsequently accumulates two weeks worth of unexcused absences, he/she will be administratively withdrawn from class.

There are three forms of excused absence officially designated by Blinn College:

- (1) Observance of religious holy days: The student should notify his/her instructor(s) not later than the 15th day of the semester concerning the specific date(s) that the student will be absent for any religious holy day(s); and
- (2) Representing Blinn College or TAMU at an official institutional function and
- (3) Official involvement in a high school activity for "dual credit" students.

Other excuses will be considered and may be considered excused at the instructor's discretion, with documentation.

Student E-Mails: Students are assigned an E-mail address that must be checked regularly for official Blinn communications and course information. The address is of the form: Firstname.LastnameLast2digitsBlinnID@buc.blinn.edu . Information about accessing this account can be found at: www.blinn.edu/acadtech/studentemail/

ADA Policy: Students needing special accommodation due to a disability must obtain authorization from the Disabilities Counseling Office in room 157 of the Blinn science building. (Please do this as soon as possible, as disability accommodation is not retroactive.)

The above requirements and policies are discussed more fully in the Blinn College Student Handbook which, by reference, is incorporated into this information. Please obtain one or access it online and read it.

POLICIES OF THE CHEMISTRY DEPARTMENT AND/OR DR. BELL:

Cheating: Students are expected to work together on experiment and online assignments. Students are expected to work alone on lab quizzes and exams. Many versions of lab quizzes and exams are handed out. If a student writes a number from the paper of the person next to him or her on a quiz or exam, cheating will be discovered. If a student is caught cheating, a written report will be filed with the division chairperson and the academic dean. The student will receive a zero for assignment in question and could be given an F in this course.

Class and Lab Behavior Rules:

1. Cell phones are to be neither seen nor heard. Cell phones should be set to silent or off before entering the classroom or lab room. Do not answer, talk on, text message with, take a picture or video with, or have out a cell phone in the classroom or lab room.
2. The use of tobacco products is strictly prohibited at all times inside all Blinn College buildings.
3. If a student is late, he or she should enter the classroom in such a way that does not disrupt class.
4. If a student has a question, he or she should raise their hand and wait to be called on to ask it.
5. Students should never begin an experiment until they are told to do so.
6. Students should never remove their goggles from their eyes in the lab room from the time they are told to don them until the time they are told they may remove them.

7.
Failure to adhere to these rules could result in the student being asked to leave the classroom or laboratory room due to uncivil behavior, as per the civility protocol. Failure to leave the classroom after being asked to leave will result in the student being physically removed by the Blinn College PD.

Absences: Missing any part, no matter how small, of either lecture or lab or both in one day will count as one absence. This means if a student is late and misses roll call, the student is absent. Students are expected to attend both lecture and lab and to punctually arrive at both. Attendance will be checked daily in both lecture and lab. It is the student's responsibility to contact their instructor regarding anticipated absences and to obtain any materials given out or discussed during their absence.

If an absence is due to illness, the student must provide a verifiable medical doctor's note. The doctor's note must state that the student was too sick to attend class for each day missed; the student will only be

allowed to make up work from days that their doctor's note covers. If an absence is due to a death in the family, the student must provide a copy of the obituary. If an absence is due to an official college or high school function, the student must provide proper documentation from the college stating this.

Under rare circumstances and only with proper documentation, a lab quiz or an exam may be made up at the Learning Center in the second floor of the library building. The student should contact the instructor via email to arrange for this. There are no make up labs for any reason at any time. Under rare circumstances and only with proper documentation, a missed lab may be completed for 50% credit with a provided data set.

Late work: Hard copy (not online) work is considered late if it is not turned in with all other work at the beginning of the lecture period. Late work for hard copy work will not be accepted unless it is late due to an excused absence. The late policy for online assignments can be found online.

Required Textbook and Other Materials*:

- CIS: Download this document from Blinn's website, print it out and bring it to class each day.
- Textbook: Chemistry for Engineering Students, Lawrence S. Brown & Thomas A. Holme, Thomson Brooks/Cole (2006)
- Laboratory Manual: Download free from your eCampus page for this course (<http://ecampus.blinn.edu>) or from my department webpage (<http://www.blinn.edu/brazos/natscience/Chem-Faculty/bell/index.htm>).
- Lab Notebook: Laboratory notebook containing carbonless duplicating consecutively numbered pages.
- Homework: OWL (Online Web-based Learning) Homework Password, available at Blinn Bookstore and elsewhere.
- Lab Safety: Safety goggles (required for contact lenses) or OSHA approved safety glasses with side shields.
- Simple scientific calculator: Students may not use a calculator that has a multi-line screen or extensive memory. Students may not use a cell phone as a calculator. If a student forgets the correct calculator on an exam day or lab quiz day, the student will be doing math by hand. Bring an approved calculator to class each day.

Optional Material:

- Student Solution Manual and Study Guide by Steve Rathbone.
- CHEM 1410 Course Pack for lecture notes: available at Blinn Copy Center.

***Bring a print out of the CIS, your textbook, lab notebook, lab manual, and approved calculator to every class.**

Lab Safety: Students are responsible for purchasing appropriate eye protection and wearing eye protection during lab. Appropriate eye protection will be

1. Safety goggles (required for contact lenses)
2. OSHA approved safety glasses with side shields

Students must wear approved eye protection and closed toe shoes any time chemicals or equipment are being moved by anyone in the laboratory. Failure to bring and wear goggles or appropriate footwear will result in expulsion from the laboratory for the experiment involved and 0 points for the postlab report form and post lab questions. Appropriate lab attire consists of closed face goggles or OSHA approved safety glasses, long pants or a long skirt, and no open-toed shoes, clogs, or cloth shoes.

Course Requirements and Criteria for Grading:

- A) Reading is a requirement. Pop quizzes may be given to insure that reading is completed before the lecture has been given. Students should read over material in their book prior attending lecture over that material for each lecture given. The score on pop quizzes will be for extra credit points.
- B) Homework will be weighted by a total of 120 points out of 1000 possible points for the semester. Homework collection and grading will be handled by the online system, Mastering Chemistry. An access code must be purchased in order to access this system. The score on the online homework will constitute 12% of the final course grade.
- C) Exams will be weighted by a total of 400 points out of 1000 possible points for the semester. Your score on exams will constitute 40% of the final course grade.
- D) The final exam is comprehensive, all multiple-choice and worth 200 points. The student will be responsible for turning in one blank scantron for use on the final exam. This scantron should be turned in on the day of the fourth in-class exam. The score on the final exam will constitute 20% of the final course grade.
- E) Laboratory quizzes are a requirement. There will 2 lab quizzes based on laboratory material given during the lab period on the days indicated in the attached schedule. The laboratory quizzes are worth 50 points each for a total of 100 pts to be counted toward your final grade (this is 10% of your final grade).
- F) Laboratory experiments are a requirement. The laboratory experiment portion of this course counts for 18% of the total course grade. For each experiment or worksheet you will receive a total score between 0 and 15. Download and print out the two documents for each experiment from the Blinn website (see links above under "Required Textbook and Other Materials" and at the top of the first page of this document. (Worksheets will be provided for you in class.) The first document for each experiment contains the prelab discussion, experimental procedure and safety guidelines. The second document for each experiment contains the prelab questions, in-lab guidelines, postlab report and postlab questions.

There are several requirements for each experiment:

- 1)The prelab questions are due at the beginning of the lecture period on the day of the experiment. You should complete these directly on the print out from the experiment's documents in your lab manual.
- 2)The experimental procedure write up and its carbonless copy are due at the beginning of the lab period on the day of the experiment. The experimental procedure should be transcribed onto a new page in your lab notebook and consists of a numbered list of each step in the procedure. The experimental procedure may be found in the first of the two experiment documents. Begin transcribing where it reads, "Experimental Procedure" and go all the way through (and include) the "Safety" section at the end of the first experiment document. You will NOT be allowed to participate in lab without the completed experimental procedure write up in your lab notebook and you will receive 0 points for the postlab report and postlab questions.
- 3)The in-lab guidelines and their carbonless copy are due at the beginning of the lab period on the day of the experiment. The in-lab guidelines should be done on a new page in your lab notebook. Directions for the in-lab guidelines can be found in the second of the two experiment documents. You will NOT be allowed to participate in lab without the completed in-lab guidelines and you will receive 0 points for the postlab report and postlab questions.

- 4) You must wear appropriate lab attire to be allowed to conduct any wet experiment. Appropriate lab attire consists of approved goggles or safety glasses, long shorts or a long skirt, and closed toe shoes (no clogs or cloth shoes allowed.) Your clothing must cover from your neck to below your knees, without adjusting your clothes to make them appear longer. Your shirt must have sleeves; no spaghetti straps, tank tops or tube tops allowed. You may also buy and wear your own lab coat (buttoned up), which should extend to below your knees. You will NOT be allowed to participate in lab if you do not wear proper lab attire and you will receive 0 points for the postlab report and postlab questions. If you remove your goggles or safety glasses from your eyes at any time during the experiment, you will be asked to leave immediately and you will receive 0 points for the postlab report and postlab questions.
- 5) Each lab period during which we will conduct a wet experiment will begin with a lecture on the procedure and safety briefing. **DO NOT BE LATE TO LAB.** If you miss any part of the safety briefing and procedure lecture, you will NOT be allowed to participate in lab and will receive 0 points for the postlab report and postlab questions.
- 6) Postlab report forms and postlab questions are due the day of the next class at the beginning of the lecture period. You should complete these directly on the print out from the experiment's documents from your lab manual. Report forms and postlab questions will not be accepted for credit unless the carbonless copy of your lab data (in-lab guidelines) from your lab notebook is signed by the instructor at the end of the preceding lab period and is turned in stapled to the postlabs. The student is responsible for obtaining the instructor's signature on the copy of the data sheet at the end of each lab period. The postlab report form must reflect information obtained and recorded in the lab notebook by the student while in the laboratory. If the student does not staple the signed copy of the data sheet with the postlab report and post lab questions, he or she will receive 0 points for the postlab report and postlab questions.
- 7) A student should never begin an experiment until they are told to do so. A student will know it is time to begin when the instructor asks everyone to put on his or her goggles and then says, "Go." If a student is found beginning an experiment without the instructor's verbal consent, they will be asked to leave and will receive 0 points for the postlab report and postlab questions.

Prelab questions (worth 3 pts), postlab report forms (worth 10 pts), and postlab questions (worth 2 pts) must be turned in individually (i.e., each student must turn in an assignment). Neatness and completeness of the data sheets, pre-labs, and reports may be considered when points are assigned (i.e., if I cannot read it, I cannot grade it.) Experiments and in-lab worksheets count for 18% of your final course grade (180 pts. maximum).

Lab Prep SUMMARY

In order to participate in and get credit for each experiment:

1. Make sure you are dressed properly.*
2. Bring and wear safety goggles/glasses.*
3. Complete lab notebook preparation.*
4. Get instructor signature before leaving.
5. Turn in prelab on time.
6. Turn in postlabs with signed data sheet on time.

*Without these items, you will be asked to leave the laboratory and you will lose credit for the experiment postlabs.

How to succeed: To be successful in college chemistry, a student should expect to spend at least 3 hours studying outside of class for every hour of time spent in class. A student should also seek help with difficult concepts early and often to succeed. Here are some ways to get help in chemistry class:

- Understand all laboratory responsibilities so points are not lost unnecessarily.
- Come to office hours with any questions.
- Email the instructor at elizabeth.bell@blinn.edu with questions.
- Go to the Learning Center in the second floor of the library building on Blinn campus for free tutoring. Hours can be found at the Blinn College Learning Center website.
- Form a study group with your classmates and meet regularly in a quiet location conducive to productive studying.
- Private tutoring can be sought at the student's own expense. Group rates are available from most local tutors.

Final Grade Calculation: Grades will be calculated in the following manner:

Exams (4 exams @ 100 pts. ea.)	400 pts.
Comprehensive Final	200 pts.
Online Homework	120 pts.
Experiments/Worksheets (12 best @ 15 pts. ea.)	180 pts.
Laboratory Exams (2 exams at 50 pts. ea.)	100 pts.
Total Course Points	1000 pts.

The range of each letter grade is strictly as follows:

Total Course Points \geq 900 = A
Total Course Points \geq 800 = B
Total Course Points \geq 700 = C
Total Course Points \geq 600 = D
Total Course Points $<$ 600 = F

Course lecture and laboratory schedule: See attached syllabus with important dates listed.

Reading Assignments:

Read Ch 1 before Wednesday, September 2, 2009
 Read Ch 2 before Monday, September 7, 2009
 Read Ch 3 before Monday, September 14, 2009
 Read Ch 4 before Monday, September 21, 2009
 Read Ch 5 before Monday, September 28, 2009
 Read Ch 6 before Wednesday, September 30, 2009
 Read Ch 7 before Wednesday, October 7, 2009
 Read Ch 8 before Wednesday, October 21, 2009
 Read Ch 9 before Wednesday, October 28, 2009
 Read Ch 10 before Wednesday, November 4, 2009
 Read Ch 11 before Monday, November 16, 2009
 Read Ch 12 before Monday, November 23, 2009
 Read Ch 13 before Monday, December 7, 2009

Important dates:

9/4/09 Last day to change classes
 11/20/09 Last day to drop with a "W"
 12/14/09 Final Exam 12:45-2:45pm

Important notes:

- It is your responsibility to obtain, read, and become familiar with our class Course Information Sheet.
- You will not be permitted to participate in any wet experiments until you have been cleared for safety.
- **You must wear proper lab attire and bring goggles to participate in lab for all experiments.**
- Postlabs consist of postlab questions, postlab report, & signed data sheet carbonless copy. Due at beginning of lecture.
- Prelabs consist of prelab questions, in-lab guidelines and experimental procedure written out in notebook with carbonless copies. Prelab questions due at beginning of lecture; in-lab guidelines and procedure due at beginning of lab.

Date	Lecture	Lab	Due online at 12:01 am	Due in Lecture & Lab
Mon, Aug 31, 2009	Course Information Sheet	OWL, Pretest		
Wed, Sep 2, 2009	Ch 1 Introduction to Chemistry	Safety Training/Clearance		
Mon, Sep 7, 2009	Ch 2 Atoms and Molecules	Exp 1 (Math Review)		
Wed, Sep 9, 2009	Ch 2 Atoms and Molecules	Exp 2 (Density)	Intro to OWL	Exp 1, Exp 2 Prelab
Mon, Sep 14, 2009	Ch 3 Molecules, Moles, and Chemical Equations	Exp 2 (Density)		
Wed, Sep 16, 2009	Ch 3 Molecules, Moles, and Chemical Equations	Nomenclature Worksheet		Exp 2 Postlab
Mon, Sep 21, 2009	Ch 4 Stoichiometry	Lecture Runover Day		
Wed, Sep 23, 2009	Exam 1 (Pt. 1)	Exam 1 (Pt. 2)	HW for Ch 1, 2, 3, 4	
Mon, Sep 28, 2009	Ch 5 Gases	Exp 3 (Epsom Salt)		Exp 3 Prelab
Wed, Sep 30, 2009	Ch 6 The Periodic Table and Atomic Structure	Exp 4 (Cu Compds.)		Exp 3 Postlab, Exp 4 Prelab
Mon, Oct 5, 2009	Ch 6 The Periodic Table and Atomic Structure	Exp 4 (Cu Compds.)		
Wed, Oct 7, 2009	Ch 6/Ch 7	Electron Configuration Worksheet		Exp 4 Postlab
Mon, Oct 12, 2009	Ch 7 Chemical Bonding and Molecular Structure	Exp 7 (Alum)		Exp 7 Prelab
Wed, Oct 14, 2009	Ch 7 Chemical Bonding and Molecular Structure	Lecture Runover Day		
Mon, Oct 19, 2009	Exam 2 (Pt. 1)	Exam 2 (Pt. 2)	HW for Ch 5, 6, 7	
Wed, Oct 21, 2009	Ch 8 Molecules and Materials	Exp 7 (Alum)		
Mon, Oct 26, 2009	Ch 8 Molecules and Materials	Molecular Models Worksheet		Exp 7 Postlab
Wed, Oct 28, 2009	Ch 9 Energy and Chemistry	Lab Midterm		
Mon, Nov 2, 2009	Ch 9 Energy and Chemistry	Exp 8 (Acid/Base)		Exp 8 Prelab
Wed, Nov 4, 2009	Ch 10 Entropy and the Second Law of Thermodynamics	Exp 11 (Hess' Law)		Exp 8 Postlab, Exp 11 Prelab
Mon, Nov 9, 2009	Ch 10 Entropy and the Second Law of Thermodynamics	Lecture Runover Day		Exp 11 Postlab
Wed, Nov 11, 2009	Exam 3 (Pt. 1)	Exam 3 (Pt. 2)	HW for Ch 8, 9, 10	
Mon, Nov 16, 2009	Ch 11 Chemical Kinetics	Exp 12 (Mass Mg)		Exp 12 Prelab
Wed, Nov 18, 2009	Ch 11 Chemical Kinetics	Exp. 22 (Iodine Clock Reaction)		Exp 12 Postlab, Exp 22 Prelab
Mon, Nov 23, 2009	Ch 12 Chemical Equilibrium	Exp. 25 (Ka of a Weak Acid)		Exp 22 Postlab, Exp 25 Prelab
Wed, Nov 25, 2009	<i>Thanksgiving Holiday</i>	<i>Thanksgiving Holiday</i>		
Mon, Nov 30, 2009	Ch 12 Chemical Equilibrium	Lecture Runover Day		
Wed, Dec 2, 2009	Exam 4 (Pt. 1)	Exam 4 (Pt. 2)	HW for Ch 11, 12	Exp 25 Postlab
Mon, Dec 7, 2009	Ch 13 Electrochemistry	Lab Final		
Wed, Dec 9, 2009	Ch 13 Electrochemistry	Lecture Runover Day		
Mon, Dec 14, 2009	Final Exam in lecture room from 12:45 to 2:25pm		HW for Ch 13	