

Texas A&M International University
Chemistry 1111
General Chemistry I Laboratory
Spring 2013

Contact Information

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| Office Location: | LBVSC 259 |
| Office Hours: | Monday 11:30 AM – 12:30 PM Tuesday 12:30 PM – 2:30 PM Wednesday 3:30 PM – 5:30 PM and by appointment. |
| Laboratory Schedule: | Monday 12:30 PM – 3:20 PM |
| Classroom: | LBVSC 281 |

Course description

Chemistry is an experimental science and the laboratory is a vital part of this course. General Chemistry laboratory is a course designed to introduce and expand the basic principles of chemical sciences. Elementary key concepts acquired in general chemistry laboratory include basic laboratory safety techniques and laboratory techniques and synthesis. The focus of this course will be developing the understanding of the basic principles of chemical sciences and providing a foundation for further study in general and analytical chemical science laboratory techniques.

Course pre-requisite

Successful completion of high school chemistry or equivalent.

Textbook/Materials

- Laboratory Experiments for Chemistry: The Central Science, John H Nelson, Kenneth C Kemp, 12th Edition, Prentice Hall, 2011 (ISBN: 9780321705020).
- Chemistry, The Science in Context. Gilbert, Kirss, Foster and Davies, 3rd Edition, W. W. Norton, 2011, (ISBN: 9780393934311) which includes the SmartWork online homework system.
- Scientific Calculator.
- Standard laboratory notebook.
- Safety goggles.

Student Learning Outcomes: Upon the conclusion of the course the students will be able to:

1. Design and conduct experiments, make observations and draw conclusions based on observations or data collected.
2. Solve quantitative problems involving unit conversions, chemical formulas and equations.
3. Display scientific data visually in an effective manner (graphs, figure, tables).
4. Demonstrate a basic understanding of laboratory techniques, safety regulations and waste disposal.
5. Perform the basic laboratory skills including: transfer and measurement of chemicals, filtration, solution preparation, mass percent determination, titrations, redox reactions, enthalpy of reactions, spectrochemical analysis, and gas stoichiometry applications in an undergraduate laboratory.

Core-Curriculum Learning Outcomes:

1. Critical Thinking: includes creative thinking, innovation, inquiry and analysis, evaluation, and synthesis of information. (SLOs: 1, 2)
2. Communication Skills: Students will demonstrate their ability to communicate effectively by using visual communication. (SLOs: 3)
3. Empirical and Quantitative Skills: includes the manipulation and analysis of numerical data or observable facts resulting in informed conclusions. (SLOs: 2, 3, 5)

Laboratory Schedule (Monday)

| Week | Date | Experiment Number | Subject |
|------|--------|-------------------|--|
| 1 | Jan 28 | --- | Laboratory safety, techniques and waste disposal |
| 2 | Feb 04 | 1 | Basic laboratory techniques |
| 3 | Feb 11 | 3 | Separation of the components of a mixture |
| 4 | Feb 18 | 5 | Chemical formulas |
| 5 | Feb 25 | 6 | Chemical reactions of copper and percent yield |
| 6 | Mar 04 | --- | Review (Dry Lab) |
| 7 | Mar 11 | --- | SPRING BREAK --- No Classes |
| 8 | Mar 18 | 21 | Reactions in aqueous solutions |
| 9 | Mar 25 | 20 | Titration of acids and bases |
| 10 | Apr 01 | --- | Review (Dry Lab) |
| 11 | Apr 08 | 28 | Heat of neutralization |
| 12 | Apr 15 | 14 | Determination of R: the gas-law constant |
| 13 | Apr 22 | 35 | Analysis of water for dissolved oxygen |
| 14 | Apr 29 | 11 | Molecular geometry: VSPER model (Dry Lab) |
| 15 | May 06 | --- | NO LABORATORY |

Experiments must be performed only during regularly scheduled laboratory periods unless an alternative arrangement is worked out with the instructor in advance.

Attendance policy

The laboratory is an integral part of all chemistry courses, as it is here that you receive hands on training. Attendance at all lab periods is required. This includes both the pre-laboratory session and the in-lab

period. You are expected to be punctual and ready to perform the scheduled experiment. Being ready means that you have read the experiment before coming to class, you have your lab manual, laboratory notebook, ink-pens, and safety goggles, and that you are dressed properly to do the experiment. There will be NO laboratory make-ups.

The pre-laboratory session will be used to discuss various aspects of the experiment and to answer questions you may have about the experiment. Attendance at the pre-lab session is required in order to go into the laboratory to collect data.

Students who have two or more un-excused absences will receive an “F” in the course. I do not take attendance, but obviously in a class of this size your absence will be noted. Although no mark is assigned for attendance, it is highly likely that continual skipping of laboratories will lead to a low grade. It is the responsibility of each student to promptly notify the instructor if there is an absence for the laboratory sessions. If a student is unable to make a lab session then the average of the existing labs will be used as a substitute for the missing laboratory grade. All unexcused assignments and examinations will be given a grade of ZERO!

Class courtesy is also an important aspect of the course and the use of cellular phones, unrelated discussions and interruption of the questions of fellow students is discouraged.

Grade distribution

The majority of your laboratory grade will come from the quality of your data and your lab reports. Minor contributions will come from your safety record, quizzes and attendance.

For lab reports, all students must do their own calculations, though students may and should compare their final numbers to catch mistakes prior to turning in the laboratory report.

Each category will be weighted as stated below.

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|-----------------------------------|------------------|
| Laboratory reports 10@10pts each: | 100 points |
| Laboratory notebook: | 100 points |
| Laboratory Safety: | <u>50 points</u> |
| Total: | 250 points |

If you feel that an error was made in the grading of reports or quizzes, you may request a re-grade by notifying the instructor within **one week** of receiving it.

Laboratory reports

For most experiments, the laboratory textbook provides a skeleton report that has to be filled with the data, calculations, and post-laboratory questions. Unless otherwise indicated, the reports are to be turned in at the beginning of the next laboratory period.

Laboratory reports must include:

- all data collected in lab with units and uncertainties
- all calculations that were done by hand (for example - the calculation of the molarity of a solution you made)

Laboratory notebook

The objective of the laboratory notebook is to assist the student in developing the written communication skills needed to develop scientific recognition and recording in a laboratory environment. Additional guidelines will be provided on Angel to assist the student in developing these writing skills.

You are responsible for keeping a detailed and complete laboratory notebook of the work you do in lab. You are also responsible for bringing your laboratory notebook to each lab period. The laboratory notebook will be checked at the beginning of each experiment.

Your lab notebook must be completed before each experiment and must include:

- dates on every entry
- objective of the experiment to be performed
- experimental procedures summarized and numbered in the order they will be performed
- additional notes (safety, observations, etc.)

Safety rules

The safety rules and policies are for your (and everyone else's) safety. Any chemistry lab can be potentially dangerous.

FAILURE TO FOLLOW THE SAFETY RULES WILL RESULT IN EXPULSION FROM THE LABORATORY AND A GRADE OF ZERO FOR ALL COMPONENTS OF THE DAY'S WORK.

Safety will be thoroughly discussed at the first lab meeting. Additionally, a copy of the safety rules is provided in your laboratory manual.

You are expected to provide your own safety glasses or goggles to work in the chemistry lab. Eye Protection must be worn at all times when in the chemistry laboratory. There will be no exceptions to this rule.

Laboratory rules

The most important component of completing a laboratory successfully is your pre-lab preparation. You will make fewer mistakes if you have read and understood the lab write-up. In many cases you will need to figure out how to make up the necessary solutions before coming to the lab; there isn't enough time for these calculations during the lab. A half-hour of time spent before the lab may save you hours. Short quizzes at the start of some of the labs will help you to remember to prepare. You may use your lab notebook for these quizzes, but not the lab write-up.

Preparation

1. Read carefully and understand the lab write-up before coming to lab.
2. If you don't understand something--ask. Labs are a lot of fun, if you are prepared.
3. Look up all of the substances in the experiment in the **Merck Index** (or other suitable source) to determine if there are any health or safety hazards.
4. Plan out your solution preparation scheme before coming to lab.
5. Write everything down in your lab book.
6. Laboratory notebook must be completed for a given experiment before being allowed to perform the experiment.

In-the lab

1. Wear eye protection (goggles or glasses with side shields).
2. Note the location of safety equipment, fire alarms, and exits.
3. Be conscious of what others are doing around you.
4. Clean up chemical spills immediately, especially in and around balances.

5. Check with the instructor for disposal information on all chemicals and solutions. Unless stated otherwise collect all waste in labeled waste containers. Keep aqueous and non-aqueous waste separate.
6. Check with the instructor for the proper procedure for washing spectrophotometer cuvettes and cells. Never wipe cell windows with paper towels.
7. Work with concentrated acids or bases in the hoods only.
8. Make up solutions in the wet lab, not in the instrument lab.
9. Weigh out chemicals by difference or into small beakers. Don't use paper for weighing.
10. Never place a pipet directly into a solvent or solution bottle. Pour just what you need into a small beaker and pipet from the beaker.
11. Never return reagents to the bottle.
12. Record everything in your lab notebooks.
13. If you work in pairs, both members of the pair must be present throughout the course of the experiment.

Classroom Behavior

The College of Arts and Sciences encourages classroom discussion and academic debate as an essential intellectual activity. It is essential that students learn to express and defend their beliefs, but it is also essential that they learn to listen and respond respectfully to others whose beliefs they may not share. The College will always tolerate diverse, unorthodox, and unpopular points of view, but it will not tolerate condescending or insulting remarks. When students verbally abuse or ridicule and intimidate others whose views they do not agree with, they subvert the free exchange of ideas that should characterize a university classroom. If their actions are deemed by the professor to be disruptive, they will be subject to appropriate disciplinary action, which may include being involuntarily withdrawn from the class.

Plagiarism and Cheating

Plagiarism is the presentation of someone else's work as your own. **1)** When you borrow someone else's facts, ideas, or opinions and put them entirely in your own words, you must acknowledge that these thoughts are not your own by immediately citing the source in your paper. Failure to do this is plagiarism. **2)** When you also borrow someone else's words (short phrases, clauses, or sentences), you must enclose the copied words in quotation marks as well as citing the source. Failure to do this is plagiarism. **3)** When you present someone else's paper or exam (stolen, borrowed, or bought) as your own, you have committed a clearly intentional form of intellectual theft and have put your academic future in jeopardy. This is the worst form of plagiarism.

Here is another explanation from the 2010, sixth edition of the *Manual of The American Psychological Association* (APA):

Plagiarism: Researchers do not claim the words and ideas of another as their own; they give credit where credit is due. Quotations marks should be used to indicate the exact words of another. *Each* time you paraphrase another author (i.e., summarize a passage or rearrange the order of a sentence and change some of the words), you need to credit the source in the text.

The key element of this principle is that authors do not present the work of another as if it were their own words. This can extend to ideas as well as written words. If authors model a study after one done by someone else, the originating author should be given credit. If the rationale for a study was suggested in the Discussion section of someone else's article, the person should be given credit. Given the free exchange of ideas, which is very important for the health of intellectual discourse, authors may not know where an idea for a study originated. If authors do know, however, they should acknowledge the source; this includes personal communications. (pp. 15-16)

Consult the Writing Center or a recommended guide to documentation and research such as the *Manual of the APA* or the *MLA Handbook for Writers of Research Papers* for guidance on proper documentation. If you still have doubts concerning proper documentation, seek advice from your instructor prior to submitting a final draft.

Penalties for Plagiarism: Should a faculty member discover that a student has committed plagiarism, the student will receive a grade of 'F' in that course and the matter will be referred to the Honor Council for possible disciplinary action. The faculty member, however, has the right to give freshmen and sophomore students a “zero” for the assignment and to allow them to revise the assignment up to a grade of “F” (50%) if they believe that the student plagiarized out of ignorance or carelessness and not out of an attempt to deceive in order to earn an unmerited grade. This option is not available to juniors, seniors, or graduate students, who cannot reasonably claim ignorance of documentation rules as an excuse.

Caution: Be very careful what you upload to Turnitin or send to your professor for evaluation. Whatever you upload for evaluation will be considered your final, approved draft. If it is plagiarized, you will be held responsible. The excuse that “it was only a draft” will not be accepted.

Caution: Also, do not share your electronic files with others. If you do, you are responsible for the possible consequences. If another student takes your file of a paper and changes the name to his or her name and submits it and you also submit the paper, we will hold both of you responsible for plagiarism. It is impossible for us to know with certainty who wrote the paper and who stole it. And, of course, we cannot know if there was collusion between you and the other student in the matter.

Penalties for Cheating: Should a faculty member discover a student cheating on an exam or quiz or other class project, the student will receive a “zero” for the assignment and not be allowed to make the assignment up. The incident must be reported to the chair of the department and to the Honor Council. If the cheating is extensive, however, or if the assignment constitutes a major grade for the course (e.g., a final exam), or if the student has cheated in the past, the student should receive an “F” in the course, and the matter should be referred to the Honor Council. Under no circumstances should a student who deserves an “F” in the course be allowed to withdraw from the course with a “W.”

Student Right of Appeal: Faculty will notify students immediately via the student’s TAMIU e-mail account that they have submitted plagiarized work. Students have the right to appeal a faculty member’s charge of academic dishonesty by notifying the TAMIU Honor Council of their intent to appeal as long as the notification of appeal comes within 3 business days of the faculty member’s e-mail message to the student. The *Student Handbook* provides details.

UConnect, TAMIU E-Mail, and Dusty Alert

Personal Announcements sent to students through TAMIU’s UConnect Portal and TAMIU E-mail are the official means of communicating course and university business with students and faculty – not the U.S. Mail and not other e-mail addresses. Students and faculty must check UConnect and their TAMIU e-mail accounts regularly, if not daily. Not having seen an important TAMIU e-mail or UConnect message from a faculty member, chair, or dean is not accepted as an excuse for failure to take important action. Students, faculty, and staff are encouraged to sign-up for *Dusty Alert* (see www.tamtu.edu). *Dusty Alert* is an instant cell phone text-messaging system allowing the university to communicate immediately with you if there is an on-campus emergency, something of immediate danger to you, or a campus closing.

Copyright Restrictions

The Copyright Act of 1976 grants to copyright owners the exclusive right to reproduce their works and distribute copies of their work. Works that receive copyright protection include published works such as a textbook. Copying a textbook without permission from the owner of the copyright may constitute

copyright infringement. Civil and criminal penalties may be assessed for copyright infringement. Civil penalties include damages up to \$100,000; criminal penalties include a fine up to \$250,000 and imprisonment.

Students with Disabilities

Texas A&M International University seeks to provide reasonable accommodations for all qualified persons with disabilities. This University will adhere to all applicable federal, state, and local laws, regulations and guidelines with respect to providing reasonable accommodations as required to afford equal education opportunity. It is the student's responsibility to register with the Director of Student Counseling and to contact the faculty member in a timely fashion to arrange for suitable accommodations.

Incompletes

Students who are unable to complete a course should withdraw from the course before the final date for withdrawal and receive a "W." To qualify for an "incomplete" and thus have the opportunity to complete the course at a later date, a student must meet the following criteria:

1. The student must have completed 90% of the course work assigned before the final date for withdrawing from a course with a "W", and the student must be passing the course;
2. The student cannot complete the course because an accident, an illness, or a traumatic personal or family event occurred after the final date for withdrawal from a course;
3. The student must sign an "Incomplete Grade Contract" and secure signatures of approval from the professor and the college dean.
4. The student must agree to complete the missing course work before the end of the next long semester; failure to meet this deadline will cause the "I" to automatically be converted to a "F"; extensions to this deadline may be granted by the dean of the college.

This is the general policy regarding the circumstances under which an "incomplete" may be granted, but under exceptional circumstances, a student may receive an incomplete who does not meet all of the criteria above if the faculty member, department chair, and dean recommend it.

Student Responsibility for Dropping a Course

It is the responsibility of the STUDENT to drop the course before the final date for withdrawal from a course. Faculty members, in fact, may not drop a student from a course.

Independent Study Course

Independent Study (IS) courses are offered only under exceptional circumstances. Required courses intended to build academic skills may not be taken as IS (e.g., clinical supervision and internships). No student will take more than one IS course per semester. Moreover, IS courses are limited to seniors and graduate students. Summer IS course must continue through both summer sessions.

Grade Changes & Appeals

Faculty are authorized to change final grades only when they have committed a computational error, and they must receive the approval of their department chairs and the dean to change the grade. As part of that approval, they must attach a detailed explanation of the reason for the mistake. Only in rare cases would another reason be entertained as legitimate for a grade change. A student who is unhappy with his or her grade on an assignment must discuss the situation with the faculty member teaching the course. If students believe that they have been graded unfairly, they have the right to appeal the grade using a grade appeal process in the *Student Handbook* and the *Faculty Handbook*.

Final Examination

Final Examination must be comprehensive and must contain a written component. The written component should comprise 20% of the final exam grade. Exceptions to this policy must receive the approval of the department chair and the dean at the beginning of the semester.

For matters not covered in this syllabus, please consult the professor, or the college catalog/student handbook. This syllabus is not intended to be all inclusive of classroom and college policies and procedures.