

**Texas A&M International University**  
**Chemistry 1012 1LX**  
**General Chemistry II Laboratory**  
**Spring 2020**

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**Contact Information**

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Tuesday & Friday by appointment  
**Laboratory Schedule:** X TIME-TIME  
**Classroom:** LBV 2XX

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**Laboratory Schedule\***

Week	Date	Experiment #	Subject
1	Jan 20-24	-	Labs do not meet
2	Jan 27-31	<b>7</b>	Safety + Chemicals in Everyday Life
3	Feb 3-7	<b>19</b>	Freezing Point Depression & Molar Mass
4	Feb 10-14	-	Dry Lab
5	Feb 17-21	<b>22</b>	Colorimetric Determination of an Equilibrium Constant
6	Feb 24-28	<b>23</b>	Chemical Equilibrium: Le Chatelier's Principle
7	Mar 2-6	<b>25</b>	Determination of the Dissociation Constant of Weak Acid
8	Mar 9-13	-	Dry Lab
9	Mar 16-20	-	Spring Break – No labs
10	Mar 23-27	<b>27</b>	Determination of the Solubility Product Constant
11	Mar 30-Apr 3	<b>17</b>	Electrochemical Cells & Thermodynamics
12	Apr 6-10	-	Dry lab, Friday lab does not meet
13	Apr 13-17	<b>16</b>	Electrolysis, the Faraday, and Avogadro's Number
14	Apr 20-24	<b>29</b>	Rate of Chemical Reactions: A Clock Reaction
15	Apr 27-29		Finals – No Labs

\*Experiments must only be performed during regularly scheduled laboratory periods.

**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. Placement into Algebra.

## Textbook/Materials

- Laboratory Experiments for Chemistry: The Central Science, John H Nelson, Kenneth C Kemp, 14<sup>th</sup> Edition, Prentice Hall, (ISBN: 9780134566207).
- Scientific Calculator.
- Standard laboratory notebook. (composition notebook)

## Learning Outcomes

- Upon successful completion of this course, students will understand safety, 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.

## 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.

Laboratory reports:	40%	90-100%	A
Laboratory pre-labs/Quizzes:	20%	80-89%	B
Dry Labs:	10%	70-79%	C
Laboratory notebook:	20%	60-69%	D
Laboratory partner evaluation:	<u>10%</u>	0-59%	F
Total:	100%		

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 pre-labs

The pre-lab questions will need to be completed before attending each specified laboratory experiment and/or Dry Lab. To ensure pre-lab questions have been answered there will be pre-lab quizzes over the material before each lab.

## Dry labs

Dry Labs will consist of a problem sets provided by the instructor. These days will also provide students with time to ask about formatting, write-up, result interpretation, etc. for typed lab reports.

## Laboratory reports

Typed lab reports are to be turned in at the beginning of the next laboratory period. The reports generally consist of data, calculations, and post-laboratory questions. Labs need to be turned in both through blackboard dropbox and a paper copy. A lab report template is provided on blackboard.

Typed Lab Reports (100 pts each) must include the following:

1. Title Page (2pts) - Experiment Title, Date, Name, Partner, course and section number

2. Objective (5 pts) - The purpose of the lab, what should be accomplished completing this expt.
3. Background (5 pts) - Provide any background information that is important to the experiment.
4. Procedure (8 pts) – Step by step instructions on how you did the experiment. Note any hazard you should be aware of.
5. Results (20 pts) – Tables, graphs, etc. of the data you collected in the experiment.
6. Calculations (15 pts) – An example of each equation used in the experiment.
7. Discussion (20 pts)- The discussion portion of the lab report should focus on mistakes made during the experiment that may have influenced the outcome, but also any observations or comments on the experiment as a whole.
8. Conclusions (5 pts) – Overall finding of the experiment. For example, the identity of the unknown, the percent yield, the rate of the reaction, etc..
9. Workbook report sheets (20pts) – Completed worksheet and post lab questions should be attached to the lab report and handed in at the beginning of lab.

### **Laboratory notebook**

The lab notebook will be graded at the beginning of each laboratory experiment. 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 and an example will be provided on Blackboard 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
- experimental procedures as you performed them
- 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)

A more detailed description and an *example* of the laboratory notebook can be found in your Lab Manual **Appendix A**.

### **Lab 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. 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. Written

objectives and procedures in your laboratory notebook will be checked at the start of each lab to help you to prepare.

### 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.

### 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.

### 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. 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 beginning of the laboratory session will be used to discuss various aspects of the experiment and to answer questions you may have about the experiment. Therefore, attendance at beginning the session is *required* in order to perform the laboratory to collect data, and students will not be allowed to attend lab if they arrive late.

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 course 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 (due to a university designated excused absence) 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!

### Technology:

All cell phones and computers are to be put away unless otherwise instructed. These devices create unwanted distractions in the laboratory where we need to be attentive and aware of our surroundings. Students who have cell phones or other electronics out will have points deducted from the day's lab and may be asked to leave the lab.

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# **Policies of the College of Arts and Sciences**

**(Required on all COAS Syllabi / Last Revised: December 13, 2019)**

## **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.

## **Student Absences**

Students are expected to attend class and to complete all assignments. It is the student's responsibility to communicate absences with his/her professor.

According to University policy, acceptable reasons for an absence, which cannot affect a student's grade, include:

- Participation in an authorized University activity.
- Death or major illness in a student's immediate family.
- Illness of a dependent family member.
- Participation in legal proceedings or administrative procedures that require a student's presence.
- Religious holy day.
- Illness that is too severe or contagious for the student to attend class.
- Required participation in military duties.
- Mandatory admission interviews for professional or graduate school which cannot be rescheduled.

The student is responsible for providing satisfactory evidence (i.e., physician note, medical release, etc.) to the faculty member within seven calendar days of his/her absence and return to class. He/she must substantiate the reason for absence. If the absence is excused, the faculty member must either provide the student with the opportunity to make up the exam or other work missed or provide a satisfactory alternative to complete the exam or other work missed within 30 calendar days from the date of absence.

Students who miss class due to a University-sponsored activity are responsible for identifying their absences to their faculty member(s) with as much advance notice as possible. If an off-campus licensed physician provides evidence of a student's illness, the written excuse, orders or documentation must contain the date and time of the doctor's appointment, the prognosis of illness, doctor's opinion and recommendations for the individual student. In addition, the notice should outline whether or not the student is able to attend class. If a physician determines that the student is not ill, he or she will not receive an excused absence. If absence is not an excused absence, the faculty member will decide whether makeup work will be allowed. In some courses, attendance and in-class participation are ongoing requirements and an integral part of the work of the course. In other courses, occasional in-class assessments may occur, sometimes without advance notice. It is the responsibility of the faculty member to inform each class at the beginning of the semester of the in-class participation expected and the effect that absences will have on the student's evaluation of work in the course.

### **Plagiarism and Cheating**

Plagiarism is the presentation of someone else's work as your own. It occurs when you:

- 1) **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) **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) **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 should 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, may elect 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 should not be 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 should receive a “zero” for the assignment and not be allowed to make the assignment up. The incident should 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 TAMU 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 TAMU Honor Council of their intent to appeal as long as the notification of appeal comes within 10 business days of the faculty member’s e-mail message to the student. The *Student Handbook* provides more details.

### **Use of Work in Two or More Courses**

You may not submit work completed in one course for a grade in a second course unless you receive explicit permission to do so by the instructor of the second course.

### **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 no 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](http://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.

*Copyright laws do not allow students and professors to make photocopies of copyrighted materials, but you may copy a limited portion of a work, such as an article from a journal or a chapter from a book for your own personal academic use or, in the case of a professor, for personal, limited classroom use. In general, the extent of your copying should not suggest that the purpose or the effect of your copying is to avoid paying for the materials. And, of course, you may not sell these copies for a profit. Thus, students who copy textbooks to avoid buying them or professors who provide photocopies of textbooks to enable students to save money are violating the law.*

### **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.

### **Student Attendance and Leave of Absence (LOA) Policy**



As part of our efforts to assist and encourage all students towards graduation, TAMIU provides LOA's for students, including pregnant/parenting students, in accordance with the Attendance Rule (Section 3.24) and the Student LOA Rule (Section 3.25), which includes the "Leave of Absence Request" form. Both rules can be found in the TAMIU Student Handbook ([URL: http://www.tamiau.edu/studentaffairs/StudentHandbook1.shtml](http://www.tamiau.edu/studentaffairs/StudentHandbook1.shtml)).

### **Pregnant and Parenting Students**

Under Title IX of the Education Amendments of 1972, harassment based on sex, including harassment because of pregnancy or related conditions, is prohibited. A pregnant/parenting student must be granted an absence for as long as the student's physician deems the absence medically necessary. It is a violation of Title IX to ask for documentation relative to the pregnant/parenting student's status beyond what would be required for other medical conditions. If a student would like to file a complaint for discrimination due to his or her pregnant/parenting status, please contact the TAMIU Title IX Coordinator (Lorissa M. Cortez, 5201 University Boulevard, KLM 159B, Laredo, TX 78041, [TitleIX@tamiau.edu](mailto:TitleIX@tamiau.edu), 956.326.2857) and/or the Office of Civil Rights (Dallas Office, U.S. Department of Education, 1999 Bryan Street, Suite 1620, Dallas, TX 75201-6810, 214.661.9600). You can also report it on TAMIU's anonymous electronic reporting site: [www.tamiau.edu/reportit](http://www.tamiau.edu/reportit).

TAMIU advises a pregnant/parenting student to notify their professor once the student is aware that accommodations for such will be necessary. It is recommended that the student and professor develop a reasonable plan for the student's completion of missed coursework or assignments. The Office of Equal Opportunity and Diversity (Lorissa M. Cortez, [lorissam.cortez@tamiau.edu](mailto:lorissam.cortez@tamiau.edu)) can assist the student and professor in working out the reasonable accommodations. For other questions or concerns regarding Title IX compliance related to pregnant/parenting students at the University, contact the Title IX Coordinator. In the event that a student will need a leave of absence for a substantial period of time, TAMIU University urges the student to consider a Leave of Absence (LOA) as outlined in the TAMIU *Student Handbook*. As part of our efforts to assist and encourage all students towards graduation, TAMIU provides LOA's for students, including pregnant/parenting students, in accordance with the Attendance Rule and the Student LOA Rule. Both rules can be found in the TAMIU Student Handbook (<https://www.tamiau.edu/scce/studenthandbook.shtml>).

### **Anti-Discrimination/Title IX**

TAMIU does not discriminate or permit harassment against any individual on the basis of race, color, sex, religion, national origin, age, disability, genetic information, veteran status, sexual orientation or gender identity in admissions, educational programs, or employment. If you would like to file a complaint relative to Title IX or any civil rights violation, please contact the TAMIU Director of Equal Opportunity and Diversity/Title IX Coordinator, Lorissa M. Cortez, 5201 University Boulevard, Killam Library 159B, Laredo, TX 78041, [TitleIX@tamiau.edu](mailto:TitleIX@tamiau.edu), 956.326.2857, via the anonymous electronic reporting website, ReportIt, at [www.tamiau.edu/reportit](http://www.tamiau.edu/reportit), and/or the Office of Civil Rights (Dallas Office), U.S. Department of Education, 1999 Bryan Street, Suite 1620, Dallas, TX 75201-6810, 214.661.9600.

### **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 an “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.

### **WIN Contracts**

WIN Contracts are offered only under exceptional circumstances and are **limited to seniors**. Only courses offered by full-time TAMIU faculty or TAMIU instructors are eligible to be contracted for the WIN requirement. However, a WIN contract for a course taught by an adjunct may be approved, with special permission from the department chair and dean. Students must seek approval before beginning any work for the WIN Contract. No student will contract more than one course per semester. Summer WIN Contracts must continue through both summer sessions.

### **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 without getting the approval of their department chair and dean.

### **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 or an error in recording a grade, 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 at least 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.