Course Information

Course Number:	CHEM 117
Course Title:	General Chemistry for Engineers Lab
Section:	501-620
Time:	Labs are scheduled to meet for 2 hours and 50 minutes one day a week
Location:	HELD 405, 409, 410, or 414
Credit Hours:	1

Instructor Details

Laboratory Instructor:	Alicia Altemose
Office:	HELD 213A
Phone:	845-5398
E-Mail:	aaltemose@tamu.edu
Office Hours:	10:00 AM – 12:00 PM on M – HELD 411 1:00 PM – 3:00 PM on R – HELD 411

Course Description

Introduction to important concepts and principles of chemistry in the laboratory; emphasis on areas considered most relevant in an engineering context; practical applications of chemical principles in engineering and technology.

Course Prerequisites

Prerequisites: None
Co-requisites: CHEM 107

Special Course Designation

This is a core curriculum (CORE) course

CHEM 117 in conjunction with the co-requisite CHEM 107 lecture meet the state requirements for Core Curriculum in Life and Physical Science. Courses in this category focus on describing, explaining, and predicting natural phenomena using the scientific method. Courses involve the understanding of interactions among natural phenomena and the implications of scientific principles on the physical world and on human experiences.

Core objectives for the Life and Physical Sciences Foundational Component Area:

Critical Thinking: Includes creative thinking, innovation, inquiry, and analysis using evaluation and synthesis of information. Students will meet this core objective through free response questions on exams, problems presented during lecture, and the analysis and evaluation of data from laboratory experiments.

Communication: Includes effective development, interpretation, and expression of ideas through written, oral, and visual communication. Students will meet this core objective through in-class pair discussions,

the creation of succinct tables and graphs using experimental data, well-written result and conclusion summaries of laboratory experiments.

Empirical and Quantitative Skills: Includes the manipulation and analysis of numerical data or observable facts resulting in informed conclusions. Students will meet this core objective by applying theoretical and quantitative concepts presented in lecture to "real-world" problems as well as the interpretation of experimental data from laboratory experiments.

Teamwork: Includes the ability to consider different points of view and to work effectively with others to support a shared purpose or goal. Students will meet this core objective by working in pairs or small groups to solve problems in lecture as well as setup and execute laboratory experiments.

Course Learning Outcomes

Many of the learning objectives for this course are related to specific topics that will be introduced in each experiment. However, the learning objectives below are more general in nature and will be stressed throughout the entire semester.

- Acquiring Factual Knowledge: Achieving basic chemical literacy requires familiarity with chemical terms, structures and symbols.
- Developing a Conceptual Understanding: Learning to visualize, explain and predict the behavior and properties of matter on the molecular scale is the basis of a conceptual understanding of chemistry.
- Applying Knowledge to Solving Problems: Developing problem-solving skills in chemistry typically involves employing quantitative calculations within the context of a particular concept.
- Analyzing Results: Learning to compare and contrast one set of results to another is the first step in being able to evaluate the results.

Textbook and/or Resource Materials

- Macmillan Learning Achieve and Gradescope. Instructions provided in first lab session.
- Basic composition or spiral-bound notebook for recording laboratory data.
- Non-web accessing calculator. Allowed brands and models include: TI-30X Series, 36X Series models, TI-83 Series, TI-84 Series. Calculators that are able to access the internet in any fashion (e.g., TI-nspire with WiFi attachment) are NOT allowed.
    - Other electronic devices, such as cell phones, smartwatches, etc., are not acceptable to be used as a calculator.
- Chemical splash goggles (fully enclosing goggles with four indirect vents) are required. These are the ONLY approved form of eye protection. No other goggles will be allowed.

Grading Policy

Final Grade Distribution (subject to change, determined at the section level)

A ≥ 90.0%
B ≥ 80.0%
C ≥ 70.0%
D ≥ 60.0%
F < 60.0%

Determination of Final Grades:

- Student scores from the assignments described above will be summed and grades will be determined using grade dividing lines (cutoffs) that will vary to some extent from section to section.
- The grade cutoffs will be determined after consultation between your Teaching Assistant and the Laboratory Coordinator. Then in each laboratory section, letter grades will be assigned based upon relative performance within the section, and while distribution of letter grades will be similar in different sections, they will not be identical.
- Overall section grade averages will be allowed to vary somewhat since every group of students is different, but the Laboratory Coordinator's policy will attempt to compensate as much as possible for differences in the grading habits of TAs.
- Grade cutoffs are not determined by any adherence to a 90/80/70/60 rule – students need to be aware that such a rule is not applied.
- In many cases, the cutoffs will be lower than these numbers, but it is also possible that they will be higher than these numbers.
- Please refrain from contacting your TA, IAs, the FYP office or the lab coordinator with specific questions regarding letter grade cutoffs in this course; these questions cannot and WILL NOT be answered.

Final grade assignments will not be released to students by the TAs or the FYP office. Students will learn their final grades in the course after they are released by the University Registrar on Howdy.

Late Work Policy

A flat 50% deduction will be applied to any late laboratory assignments. To submit late laboratory assignments, students must request an extension by emailing makeup@chem.tamu.edu within 24 hours of the deadline. This email must include your name, course and section number, and the name of the assignment(s) for which you want an extension. If you do not provide the required information, the late assignment(s) may not be accepted.

Course Schedule

See next page.

Laboratory Schedule for Fall 2022

Week of		Experiment	Pts	Pre-Lab Quizzes	Safety & Performance (S&P)	Post-Lab Assignment	Total Lab Points
Odd	Even			10	10	40	
8/29	8/29	Safety*/Lab Notebooks	20				
8/29	8/29	Data and Graphics**	25	**Due week of 9/12**			
9/12	9/12	Scientific Measurement (due week of 9/26)	40			**(20)**	
9/12	9/12	Significant Figures**	20	**Due week of 9/26**			
9/19	9/26	Quantitative Reactions & Analysis	60				
9/19	9/26	Introduction to Statistics of Laboratory Data**	35	**Due week of 10/3 (odd), 10/17 (even)**			
10/3	10/17	Gas Laws	60				
10/3	10/17	Scientific Literature and Safety**	20	**Due week of 10/24 (odd), 10/31 (even)**			
10/24	10/31	Nanoparticles	60				
10/24	10/31	Nanoparticles Literature Project**	30	**Due week of 11/7 (odd), 11/14 (even)**			
11/7	11/14	Calorimetry	60				
11/7	11/14	Scientific Writing**	30	**Due week of 11/28 (all)**			
11/28	11/28	Group Evaluations	20				
		Laboratory Notebooks	15				
		Total	495				

* Students who miss the safety orientation must make this up BEFORE their next lab meeting.

** These are out-of-class exercises, not in-class experiments.

Laboratory Policies

Course Structure:

Laboratory meetings will occur on your scheduled laboratory day/time either face-to-face or you will be expected to work outside of the laboratory on online and/or group assignments. Lab video material will supplement the meetings. There will also be pre- and post-lab videos to watch each week. The videos consist of course content material necessary for the lab activities/assignments. The expectation is that students will watch those videos prior to completing the associated assignments/activities.

Lab Safety: Student safety is a top priority in the Texas A&M Department of Chemistry.

- Protective eyewear, appropriate clothing and shoes that completely cover your feet must be worn at all times in the laboratory. Appropriate clothing includes pants or long skirts which come all the way down to the ankles so that no parts of the legs or feet are exposed and a shirt or top with sleeves, which fully covers the chest and midriff.
- All CHEM 117 students accept a Lab Safety Acknowledgement (LSA) in Howdy upon registration.
- Furthermore, students must view a safety video and pass a safety quiz during the first lab meeting.
- ***Any student who does not view the safety video and pass the safety quiz will not be permitted to continue in CHEM 117, until they have done so.***
- The safety guidelines associated with individual experiments are explained in the lab manual and will be presented at the beginning of each experiment.
- Prelab quiz questions regarding safety aspects specific to each experiment should be expected.
- Failure to adhere to any safety regulation while in the laboratory will result in expulsion from the laboratory.
- Eating, drinking, and smoking are prohibited in the lab at all times. Chewing gum or tobacco is also prohibited.
- Long hair must be held in place to the back of your head. You are responsible for bringing the bands or clips to hold back your hair.
- If you do not comply with the attire rules, you will be asked to leave the lab to get appropriate clothing. If you do not make it back to complete the lab, you will need to request an unexcused makeup lab, which may or may not be permitted.
- All personal belongings must be placed in the back of the room and any food/drink should be inside a backpack.

Further details on appropriate lab attire and other safety regulations will be explained during the first lab meeting. If you are pregnant or become pregnant during this semester, it is important to speak to a Lab Coordinator so that safety concerns can be discussed.

Accidents and Other Incidents: Any illness or injury incurred in the laboratory must be brought to the attention of your Teaching Assistant or Laboratory Coordinator. In the event of serious injury, 9-1-1 will be contacted by the Lab Coordinator or Instructor and the situation will be assessed by the responding EMT team. Because students are not eligible for worker's compensation, the cost of any care not provided by the Beutel Health Center must be covered by the student's personal health insurance plan.

Laboratory Assignments: Assignments associated with 5 laboratory experiments comprise the majority of the lab grade, although a significant number of points are also derived from out-of-class assignments. The points for each experiment are divided into several categories, including: prelab quizzes, laboratory notebooks, safety and performance, and post-lab assignments (DRAs, Smart Worksheets, post-lab

questions, or lab reports). The out-of-class assignments generally mimic the format of a post-lab assignment. A brief description of each of the course components is given below. A schedule of experiments and a point breakdown for all assignments is listed in this syllabus. These assignments are to be completed independently; all rules and policies regarding the Aggie Honor Code apply to these assignments.

Prelab Quizzes: A prelab assessment will be administered for each experiment in the course. All of the quizzes for the course are electronic, and will be found on Macmillan Learning Achieve via Canvas links. The prelab quiz(zes) for each experiment will be due ***at 1 am on the day of the lab meeting*** in which the experiment is scheduled to be performed.

Although use of the laboratory manual and other printed or electronic resources cannot be restricted, **you are required to complete the quizzes individually**. Students should also be aware that successful completion of the quizzes will require adequate preparation.

The prelab quizzes are designed to test a student's preparedness for the upcoming experiment ***and*** their understanding of basic chemical concepts relevant to each experiment. Quiz questions may cover but are not limited to the following topics: basic calculations; experimental aim; ecological/environmental issues; analytical techniques; basic chemical concepts; experimental procedure; data manipulation, and equipment and reagents. At least one general safety question will be included in each quiz.

Laboratory Notebooks: A basic notebook (composition, spiral-bound, etc.) will be required for students to write experimental procedures, data and observations. The format of the lab notebook will be discussed during the first lab meeting. These lab notebooks will be checked at the end of each experiment before you leave. If you arrive to your lab session without a complete prelab notebook for the experiment, you will need to request an unexcused makeup lab, which may or may not be permitted.

Safety and Performance (S&P): Your attendance is required for each experiment, for the entirety of the lab meeting:

- The safety and performance grade includes adhering to safety guidelines (including wearing appropriate goggles and attire), maintaining a clean workspace, and being organized and prepared for the day's activities.
- Safety violations will result in lost points and can lead to dismissal from the laboratory. The performance form asks whether each student a) wore goggles throughout the entire exercise; b) was appropriately dressed; c) maintained a clean environment; d) was prepared; e) was on time; and f) followed directions.
- Each violation costs the student 2-3 points. The TAs must strictly follow the rules and are not allowed to exercise discretion in any of these criteria.

Post-Lab Assignments: The lab Canvas page will list the post-lab assignments that are required for each experiment. Some experiments will have worksheets called DRAs, some will have electronic Smart Worksheets, some will have post-lab questions, and some will have lab reports. A brief description of these assignment types is given below.

Data Reduction and Analysis (DRA): Worksheets called DRAs provide a series of directions, calculations and questions after each experiment. These exercises are designed to guide students through the analysis of their experimental data. All calculations and questions will be completed on a provided worksheet. Any additional plots or data tables should be completed using an electronic software package such as Microsoft Excel and should be submitted alongside the DRA.

Smart Worksheets: In place of DRAs for certain experiments, you will complete Smart Worksheets on Macmillan Learning Achieve. These Smart Worksheets provide hints for significant figures, magnitudes of values, etc. as you enter in your data and calculated values and entries are graded as you submit your responses.

Post-Lab Questions: For certain experiments, post-lab questions will be also be assigned. Students should write their responses in paragraph form, including tables, graphs, equations and calculations when appropriate.

Lab Reports: For at least one experiment, a lab report will be assigned. Further instructions will be given at that time on the requirements for the lab report.

Please Note: If you experience a technical issue with a Macmillan Learning Achieve assignment, contact the Support Team (https://macmillan.force.com/macmillanlearning/s/) immediately. Technical difficulties will not be considered an excuse for non-completion, so we encourage you to begin and complete the assignment well before the deadline.

Please Note: DRAs, lab notebook pages, and post-lab questions must be submitted electronically to Gradescope. Physical submissions will not be accepted, nor will they be graded. ***Successful submission of assignments will be confirmed via email. If you do not receive a confirmation email, you should assume your assignment was not successfully submitted and you should try again.***

Assignment Due Dates and Late Policy:
Unless a University-excused absence applies,

- All pre-lab quizzes will be due at 1 am the night before the corresponding lab meeting.
- All post-lab assignments will be due one week after, at 1 am the night before your next lab meeting.
- If any portion of a post-lab assignment is accepted as a late submission, a flat 50% deduction will be applied to all associated post-lab work.

To submit late laboratory assignments, students must request an extension by emailing makeup@chem.tamu.edu within 24 hours of the deadline. This email must include your name, course and section number, and the name of the assignment(s) for which you want an extension. If you do not provide the required information, the late assignment(s) may not be accepted.

Other Course Information Items

Questions:
For questions regarding the laboratory or specific experiments, e-mail your TA. General questions regarding other non-technical issues can be sent to chemfyp@chem.tamu.edu.

Communication and Conduct:
All electronic communication with your Instructor, TA, IAs, and the FYP office must be conducted from a ***tamu.edu*** **email account**. Emails sent to university email addresses are a permanent document of communication. Therefore, be sure that your emails are polite, professional and well-prepared before you send them. All emails should include the student's first and last name, UIN, and the course and section number. Students are responsible for checking their ***tamu.edu*** **email** on a regular basis to receive messages regarding the course. Please allow up to 48 hours for a response to emails. Responses will normally occur between 8 am and 4 pm, Monday through Friday. Inappropriate language and/or disruptive behavior can result in loss of credit and/or reported to the Student Conduct Office.

Canvas:
Course grades will be posted on Canvas (https://canvas.tamu.edu/), along with various announcements, supplemental information, etc. All Gradescope assignments and Macmillan Learning Achieve assignments and prelab quizzes can also be accessed through the Canvas page.

Disclaimer:
Any communications or handouts from your TA, IAs, the FYP office, or Instructor take precedence over the contents of this syllabus.

University Policies

Attendance Policy
Attendance in the laboratory is expected and required. **All absences from lab** must be reported to and processed by your instructor or the First Year Program office in HELD 411 (8am-5pm, M-F) in order to request a make-up lab, within 2 business days of the end of the absence. Make-up requests will not be considered via email. Your TA does not have the authority to approve a request for a make-up lab or to schedule a make-up experiment.

An absence for a non-acute medical service, such as a routine doctor's appointment, does not constitute an excused absence. We are under no obligation to allow make-up opportunities for unexcused absences. All students with University-approved excused absences may request to schedule a make-up. The student is responsible for providing documentation substantiating the reason for the absence. See Student Rule #7 (http://student-rules.tamu.edu/rule07) for further guidance.

Punctuality:
Arrive to class on time. For the lab, you will begin the experiment promptly at the start of the lab sessions. If you arrive late to your lab session, you will need to request an unexcused makeup lab, which may or may not be permitted.

Makeup Work Policy
Students will be excused from attending class on the day of a graded activity or when attendance contributes to a student's grade, for the reasons stated in Student Rule 7, or other reason deemed appropriate by the instructor.

Please refer to Student Rule 7 in its entirety for information about makeup work, including definitions, and related documentation and timelines.
Absences related to Title IX of the Education Amendments of 1972 may necessitate a period of more than 30 days for make-up work, and the timeframe for make-up work should be agreed upon by the student and instructor" (Student Rule 7, Section 7.4.1).

"The instructor is under no obligation to provide an opportunity for the student to make up work missed because of an unexcused absence" (Student Rule 7, Section 7.4.2).

Students who request an excused absence are expected to uphold the Aggie Honor Code and Student Conduct Code. (See Student Rule 24.)

Unless a University-excused absence applies,

- All pre-lab quizzes will be due at 1 am the night before the corresponding lab meeting.
- All post-lab assignments will be due one week after, at 1 am the night before your next lab meeting.

Academic Integrity Statement and Policy

"An Aggie does not lie, cheat or steal, or tolerate those who do."

"Texas A&M University students are responsible for authenticating all work submitted to an instructor. If asked, students must be able to produce proof that the item submitted is indeed the work of that student. Students must keep appropriate records at all times. The inability to authenticate one's work, should the instructor request it, may be sufficient grounds to initiate an academic misconduct case" (Section 20.1.2.3, Student Rule 20).

All submitted work (prelab quizzes, post-lab assignments, etc.) must be completed individually. Copying and sharing answers instead of completing and turning in your own original work is considered cheating. Allowing others to view your work is also cheating. Using experimental data you did not obtain in lab or were not given by your own TA is also a violation of the honor code. Unauthorized collaboration via text messages, social media (Facebook, GroupMe, etc.), or any other means of passing or receiving information about exams or any other graded material are all considered honor violations. All honor violations will be reported to the Aggie Honor System Office.

You can learn more about the Aggie Honor System Office Rules and Procedures, academic integrity, and your rights and responsibilities at aggiehonor.tamu.edu.

Americans with Disabilities Act (ADA) Policy

Texas A&M University is committed to providing equitable access to learning opportunities for all students. If you experience barriers to your education due to a disability or think you may have a disability, please contact the Disability Resources office on your campus (resources listed below) Disabilities may include, but are not limited to attentional, learning, mental health, sensory, physical, or chronic health conditions.

All students are encouraged to discuss their disability related needs with Disability Resources and their instructors as soon as possible. Disability Resources is located in the Student Services Building or at (979) 845-1637 or visit disability.tamu.edu.

Title IX and Statement on Limits to Confidentiality

Texas A&M University is committed to fostering a learning environment that is safe and productive for all. University policies and federal and state laws prohibit gender-based discrimination and sexual harassment, including sexual assault, sexual exploitation, domestic violence, dating violence, and stalking.

With the exception of some medical and mental health providers, all university employees (including full and part-time faculty, staff, paid graduate assistants, student workers, etc.) are Mandatory Reporters and must report to the Title IX Office if the employee experiences, observes, or becomes aware of an incident that meets the following conditions (see University Rule 08.01.01.M1):

- The incident is reasonably believed to be discrimination or harassment.
- The incident is alleged to have been committed by or against a person who, at the time of the incident, was (1) a student enrolled at the University or (2) an employee of the University.

Mandatory Reporters must file a report regardless of how the information comes to their attention – including but not limited to face-to-face conversations, a written class assignment or paper, class discussion, email, text, or social media post. Although Mandatory Reporters must file a report, in most instances, a person who is subjected to the alleged conduct will be able to control how the report is handled, including whether or not to pursue a formal investigation. The University's goal is to make sure you are aware of the range of options available to you and to ensure access to the resources you need.

Students wishing to discuss concerns in a confidential setting are encouraged to make an appointment with Counseling and Psychological Services (CAPS).

Students can learn more about filing a report, accessing supportive resources, and navigating the Title IX investigation and resolution process on the University's Title IX webpage.

Statement on Mental Health and Wellness

Texas A&M University recognizes that mental health and wellness are critical factors that influence a student's academic success and overall wellbeing. Students are encouraged to engage in healthy self-care by utilizing available resources and services on your campus.

Students who need someone to talk to can contact Counseling & Psychological Services (CAPS) or call the TAMU Helpline (979-845-2700) from 4:00 p.m. to 8:00 a.m. weekdays and 24 hours on weekends. 24-hour emergency help is also available through the National Suicide Prevention Hotline (800-273-8255) or at suicidepreventionlifeline.org.

COVID Statement for Fall 2022

To help protect Aggieland and stop the spread of COVID-19, Texas A&M University urges students to be vaccinated and to wear masks in classrooms and all other academic facilities on campus, including labs. Doing so exemplifies the Aggie Core Values of respect, leadership, integrity, and selfless service by putting community concerns above individual preferences. COVID-19 vaccines and masking — regardless of vaccination status — have been shown to be safe and effective at reducing spread to others, infection, hospitalization, and death.