



# TEXAS A&M UNIVERSITY SAN ANTONIO

College of Arts & Sciences

## Physical Chemistry I laboratory - CHEM 4101 Syllabus

### Instructor and class information

**Instructor:** Yulun Han, Ph.D.

**Email:** yhan@tamusa.edu

**Office:** STEM 311J

**Class Hours:** T 3:30 pm – 6:15 pm

**Class location:** Science and Technology Building, Room 327

**Office hours:** W 1:00 pm – 2:30 pm and by appointment

### Course Description

This is the co-requisite laboratory for CHEM 4301: Physical Chemistry I. The laboratory investigations complement the theory introduced in the lectures. Prerequisites: CHEM 2325, PHYS 2326, MATH 2314 with a C or better. Corequisites: CHEM 4301. TSI Restriction(s): Reading, Writing, and Math Restrictions: Graduate level students may not enroll.

### Learning Objectives

By the end of the course, students will be able to:

1. Design and conduct physical chemistry experiments safely and collaboratively.
2. Use laboratory instruments to collect, model, and analyze data.
3. Apply thermodynamics, statistical mechanics, and molecular modeling to experimental systems.
4. Quantify uncertainty and evaluate results using statistical methods.
5. Compare experimental, computational, and published results critically.
6. Maintain a professional laboratory notebook and write clear scientific reports.

## Course Materials

**Laboratory handouts:** Handouts will be available from Blackboard before each lab session. All data should be collected with BLUE or BLACK NON-ERASABLE PEN. Refer to attached schedule for the sequential list of labs.

**Calculator:** Any calculator is acceptable.

**Proper Clothing for lab:** Closed-toe shoes that covers your foot in its entirety, NO shorts or short skirts, NO mid-riff shirts. NO tank tops. NO ¾ length pants. NO pants with holes.

**Goggles:** Goggles must be always worn properly in the laboratory. If you are in the laboratory, you must wear goggles. Goggle loaners are available while supplies last. Students who do not have goggles will not be allowed to work on that week's lab and will receive no credit for that lab.

**Lab coats:** Lab coats must also be worn properly during all laboratory activities. Students who do not have a lab coat will not be allowed to work on that week's lab and will receive no credit for that lab. Prior to leaving the lab classroom, students must remove their lab coats. PPE worn in the lab is not to be worn outside the lab classroom.

**Masks:** Masks may be worn while in the lab, but it is not mandatory.

## Grading

All written assignments must be worked on individually. All student term papers and other written assignments are subject to analysis by anti-plagiarism software. Plagiarism will result in a grade of a zero for the assignment.

Lab reports: 400 points

Presentation: 100 points

TOTAL: 500 points

Your grade:  $\left(\frac{\text{Total points earned}}{500}\right) * 100$

There will be NO extra work given. Laboratory worksheets/reports are the only opportunities students have to earn points in this course.

All laboratory report/worksheet grades will be posted to Blackboard. However, course percentages, letter grades, etc. are not to be considered as official and students should use caution when using those to evaluate overall course grades. To calculate your grade use the equation above. Using that equation, letter grades will be determined as:

A: 90.0-100%;

B: 80.00-89.99%,

C: 70.00-79.99%;

D: 60.00-69.99%;

F: <60.0%

**Data Sheets and Excel files:** Data sheets are due on Friday by 11:59pm. Data sheets must be uploaded on blackboard as **pdf files**. If an Excel file is required, it should also be uploaded in blackboard in the original **Excel** format.

**Late Work Policy:** 20% deduction for every day late. No work will be accepted 3 days after the due date.

#### **Tentative Schedule\***

| <b>Week #</b> | <b>Week of</b> | <b>Experiment</b>                                                             |
|---------------|----------------|-------------------------------------------------------------------------------|
| 1             | Aug 24-27      | Introduction, Syllabus, Safety training                                       |
| 2             | Aug 31-Sep 3   | Propagation of Uncertainty                                                    |
| 3             | Sep 7-10       | <b>No lab</b>                                                                 |
| 4             | Sep 14-17      | Maxwell–Boltzmann distribution function                                       |
| 5             | Sep 21-24      | Linux and Python basics                                                       |
| 6             | Sep 28-Oct 1   | Carnot Cycle                                                                  |
| 7             | Oct 5-8        | Building atomic models                                                        |
| 8             | Oct 12-15      | Heats of Combustion Formation Determined by Electronic Structure Calculations |
| 9             | Oct 19-22      | Bomb Calorimetry                                                              |
| 10            | Oct 26-29      | Bomb Calorimetry                                                              |
| 11            | Nov 2-5        | Viscometer                                                                    |
| 12            | Nov 9-12       | Thermodynamic Functions of an Electrochemical Cell                            |
| 13            | Nov 16-19      | Polarimetry                                                                   |
| 14            | Nov 23-26      | <b>Thanksgiving-No lab</b>                                                    |
| 15            | Nov 30-Dec 3   | Student presentation                                                          |
| 16            | Dec 7-10       | <b>Final week- No labs</b>                                                    |

\*These are the tentative topics. Instructor reserves the right to make changes as deemed necessary.

#### **Class policies**

**Communication:** The best way to contact me is through email. Students are expected to access Blackboard for updates on the course, announcements and other course materials. All students are strongly encouraged to come to office hours or make appointments at other times to discuss course material and answer questions.

\*\*Emails should be professional (I am happy to explain this, but professional emails are NOT text messages), clear, and preferably sent within working hours (8 am-6 pm). If you do not hear back in 48 hours, please reach back again.\*\*

**Attendance Policy:** All students are expected to attend all laboratories and be fully and actively engaged in lab activities. Attendance will be monitored. Absences will be excused if due to illness (medical excuse), death of a close family member, religious holiday (please inform instructor), official university activity, cancellation of classes/closure of the University, military duties, pregnancy & related conditions, or participation in legal proceedings. Only **one** laboratory will be excused for the above reasons.

**Late Arrivals:** Punctuality is essential to maintaining a safe and efficient laboratory environment. Timely arrival ensures that you are present for important safety instructions and lab procedures. A point from your experiment grade will be deducted for every minute you are late, up to 10 minutes. **If a student arrives more than 10 minutes late, they will not be permitted to participate in the lab for that day.** This will result in a grade of "0" for that week's lab report. Please plan your schedule accordingly to ensure prompt attendance at every lab session.

**Conduct and Behavior:** As an instructor my goal is to create a safe and engaging learning environment for ALL. Class disruptions are unacceptable, asking questions to clarify material during class does not qualify as a disruption and is encouraged. Disruption of the learning environment means creating a situation where other students cannot learn and if such situations arise, the instructor reserves the right to ask the disruptive party to leave the classroom. This includes but is not limited to talking loudly about things not discussed in the class, physical or verbal hostility, texting, use of headphone/listening to music during the class, actively disrupting others or the instructor from learning/teaching.

Use of electronic devices during the class session is not allowed unless instructed by the instructor. During the exams all electronic and transmitting devices **MUST** be placed in the silent mode and stored in the bag.

Academic misconduct and attempts to cheat during the exam will be pursued according to Texas A&M-San Antonio code of conduct policy. If you need to use the restroom, ask and leave all electronic devices with the instructor.

**Visitors:** Only students enrolled in the course are allowed in the classroom. No visitors are allowed.

**IMPORTANT:** Each student receives this information during the first lecture. It is your responsibility to read this material and be familiar with the course content, procedures, and grading.

**Recording (audio/video) lectures:** If a student wishes to record (audio or video) the lectures, they must take written permission from the instructor prior to start recording.

## IMPORTANT POLICIES AND RESOURCES

**University Email Policy and Course Communications:** All correspondence between professors and students must occur via university email accounts. You must have your Jaguar email account ready and working. If it is not working, contact the help desk at [helpdesk@tamusa.edu](mailto:helpdesk@tamusa.edu) or at 210-784-HELP (4357). If you don't hear back within 48 hours, contact them again. They have many requests during the first part of the semester, so you may need to follow up with them.

**Academic Accommodations for Individuals with Disabilities:** Texas A&M University-San Antonio is committed to providing all students with reasonable access to learning opportunities and accommodations in accordance with The Americans with Disabilities Act, as amended, and Section 504 of the Rehabilitation Act. If you experience barriers to your education due to a disability or think you may have a disability, Disability Support Services is located in the Central Academic Building, Suite 210. You can also contact us via phone at (210) 784-1335, visit us at the [website](#) or email us at [dss@tamusa.edu](mailto:dss@tamusa.edu). All students are encouraged to discuss their academic accommodation with Disability Support Services and their instructors as soon as possible.

**Academic Learning Center:** All currently enrolled students at Texas A&M University-San Antonio can utilize the Academic Learning Center for subject-area tutoring. The Academic Learning Center provides free course-based tutoring to all currently enrolled students at Texas A&M University-San Antonio. Students wishing to work with a tutor can make appointments through the Brainfuse online tutoring platform. Brainfuse can be accessed in the *Tools* section of Blackboard. You can contact the Academic Learning Center by emailing [tutoring@tamusa.edu](mailto:tutoring@tamusa.edu), calling (210) 784-1307, or visiting the Central Academic Building, room 202. Online tutoring is also available for after hours and weekend assistance.

While tutoring hours may change based on tutor schedules and availability, the current tutoring hours for MATH in the ALC are as follows:

### Appointments available MATH Walk in Tutoring – No appointment needed

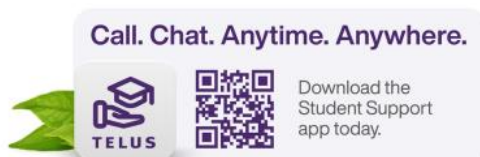
|           | Appointments available | Walk in Tutoring – No appointment needed |
|-----------|------------------------|------------------------------------------|
| MONDAY    | 8 am – 6 pm            | 9 am – 5 pm                              |
| TUESDAY   | 8 am – 6 pm            | 9 am – 5 pm                              |
| WEDNESDAY | 8 am – 6 pm            | 9 am – 5 pm                              |
| THURSDAY  | 8 am – 6 pm            | 9 am – 5 pm                              |
| FRIDAY    | 8 am – 5 pm            | 11 am – 4 pm                             |

**Counseling/Mental Health Resources:** As a college student, there may be times when personal stressors interfere with your academic performance and negatively impact your daily functioning. If you are experiencing emotional difficulties or mental health concerns, support is available to you through the Student Counseling Center (SCC). To schedule an appointment, visit our website, call 210-784-1331 or visit Madla 120 between the hours of 8:00 AM and 5:00 PM.

All mental health services provided by the SCC are free and confidential (as the law allows). The Student Counseling Center provides brief individual and group therapy, crisis intervention, consultation, case

management, and prevention services. *Crisis support is available 24/7/365 by calling the SCC at 210-784-1331 or through the TELUS student support App.*

The TELUS Student Support App provides a variety of mental health resources to including 24/7/365 support for in the moment distress, crisis support, an anonymous peer-to-peer support network, mental health screenings, podcasts, and articles to improve your mental wellbeing.



**Emergency Preparedness:** JagE Alert is Texas A&M University-San Antonio's mass notification system. In the event of an emergency, such as inclement weather, students, staff and faculty, who are registered, will have the option to receive a text message, email with instructions and updates. To register or update your information visit: <https://tamusa.bbcportal.com/>. More information on emergency response may be found at: [Emergency Operations Plan](#) and the [Emergency Action Plan](#). Download the SafeZone App (<https://safezoneapp.com/>) for emergencies or call (210) 784-1911. Non-Emergency (210) 784-1900.

**Financial Aid and Verification of Attendance:** According to the following federal regulation, 34 CFR 668.21: U.S. Department of Education (DoE) Title IV regulation, a student can only receive Title IV funds based on Title IV eligibility criteria which include class attendance. If Title IV funds are disbursed to ineligible students (including students who fail to begin attendance), the institution must return these funds to the U.S. DoE within 30 days of becoming aware that the student will not or has not begun attendance. Faculty will provide the Office of Financial Aid with an electronic notification if a student has not attended by the published Census Date (the first week of class). Any student receiving federal financial aid who does not attend prior to the published Census Date (the first week of class) will have their aid terminated and returned to the DoE. Please note that any student who stops attending at any time during the semester may also need to return a portion of their federal aid.

**Jaguar Writing, Language, and Digital Composing Center (WLDCC):** The WLDCC provides support to graduate and undergraduate students in all three colleges as well as faculty and staff. Writing tutors work with students to develop reading skills, prepare oral presentations, and plan, draft, and revise their written assignments. Our language tutors support students enrolled in Spanish courses and students composing in Spanish for any assignment. Our digital studio tutors support students working on digital projects such as eportfolios, class presentations, or other digital multimedia projects. The WLDCC offers face-to-face, synchronous online, and asynchronous digital appointments. Students can schedule appointments with the WLDCC in JagWire under the Student Services tab. Click on "Writing, Language, and Digital Composing Center" to make your appointment. Students wanting to work in realtime with a tutor can schedule an "Online Appointment." Students wishing to receive asynchronous, written feedback from a tutor can schedule an "eTutoring" appointment. More information about what services we offer, how to make an appointment, and how to access your appointment can be found on our [website](#) . The WLDCC can also be reached by emailing [wldcc@tamusa.edu](mailto:wldcc@tamusa.edu).

**Meeting Basic Needs:** Any student who has difficulty affording groceries or accessing sufficient food to eat every day or who lacks a safe and stable place to live, and believes this may affect their performance

in the course, is urged to submit a [CARE report](#) for support. Furthermore, please notify the professor if you are comfortable in doing so. This will enable them to direct you to available resources. A food pantry is available on campus; click [here](#) for hours and contact information.

**Military Affairs:** Veterans and active-duty military personnel are welcomed and encouraged to visit the Office of Military Affairs for any question involving federal or state VA Education Benefits. Visit the Patriots' Casa building, room 202, or to contact the Office of Military Affairs with any questions at [military.va@tamusa.edu](mailto:military.va@tamusa.edu) or (210)784-1397.

**Religious Observances:** Texas A&M University-San Antonio recognizes the wide variety of faiths represented among the campus community and protects the rights of students, faculty, and staff to observe religious holidays according to their tradition. Under the policy, students are provided an opportunity to make up any examination, study, or course work requirements that may be missed due to a religious observance provided they notify their instructors before the end of the second week of classes for regular session classes.

**The Six-Drop Rule:** Students are subject to the requirements of Senate Bill (SB) 1231 passed by the Texas Legislature in 2007. SB 1231 limits students to a maximum of six (6) non-punitive course drops (i.e., courses a student chooses to drop) during their undergraduate careers. A non-punitive drop does not affect the student's GPA. However, course drops that exceed the maximum allowed by SB 1231 will be treated as "F" grades and will impact the student's GPA.

**Statement of Harassment and Discrimination:** Texas A&M University-San Antonio is committed to the fundamental principles of academic freedom, equal opportunity, and human dignity. To fulfill its multiple missions as an institution of higher learning, A&M-San Antonio encourages a climate that values and nurtures collegiality and the uniqueness of the individual on our campus and within our state, nation, and world. All decisions and actions involving students and employees are to be based on applicable law and individual merit. Texas A&M University-San Antonio, in accordance with applicable federal and state law, prohibits discrimination, including harassment, on the basis of race, color, sex, religion, national origin, age, disability, genetic information, veteran status, sexual orientation, or pregnancy/parenting status. Individuals who believe they have experienced harassment or discrimination prohibited by this statement are encouraged to contact the University's Civil Rights Officer at 210-784-2061 or [titleix@tamusa.edu](mailto:titleix@tamusa.edu).

Texas A&M University-San Antonio faculty are committed to providing a safe learning environment for all students and for the university as a whole. If you have experienced any form of sex discrimination or harassment, including sexual assault, sexual harassment, domestic or dating violence, or stalking based on sex, know that help and support are available. A&M-San Antonio's Title IX Coordinator can support those impacted by such conduct in navigating campus life, accessing health and counseling services, providing academic and housing accommodations, and more. The university strongly encourages all students to report any such incidents to the Title IX Coordinator. Please be aware that all A&M-San Antonio employees (other than those designated as confidential resources such as counselors and trained victim advocates) are required to report information about such discrimination and harassment to the university. This means that if you tell a faculty member about a situation of sexual harassment, sexual violence, or other related sex-based misconduct, the faculty member must share that information with the university's Title IX Coordinator ([titleix@tamusa.edu](mailto:titleix@tamusa.edu), 210-784-2061, CAB 439K). If you wish to

Speak to a confidential employee who does not have this reporting requirement, you can contact the Student Counseling Center at (210) 784-1331 or visit them in Madla 120.

**Pregnant/Parenting Students:** Texas A&M-San Antonio does not require a pregnant or parenting student, solely because of that status or issues related to that status, to (1) take a leave of absence or withdraw from their degree or certificate program; (2) limit the student's studies; (3) participate in an alternative program; (4) change the student's major, degree, or certificate program; or (5) refrain from joining or cease participating in any course, activity, or program at the University. The university will provide such reasonable accommodations to pregnant students as would be provided to a student with a temporary medical condition that are related to the health and safety of the student and the student's unborn child. These could include maintaining a safe distance from substances, areas, and activities known to be hazardous to pregnant individuals and their unborn child; excused absences because of illness or medical appointments; modified due dates for assignments; rescheduled tests/exams; taking a leave of absence; and being provided access to instructional materials and video recordings of lectures for excused absences, if these would be provided to any other student with an excused absence. Pregnant/parenting students are encouraged to contact the Title IX Coordinator with any questions or concerns related to their status ([titleix@tamusa.edu](mailto:titleix@tamusa.edu); 210-784-2061; CAB 439K).

Texas A&M-San Antonio has also designated the Title IX Coordinator as the liaison officer for current or incoming students who are the parent or guardian of a child younger than 18 years of age. The Title IX Coordinator can provide students with information regarding support services and other resources.

**Young Jaguars** can support parenting students with daycare if students meet this criteria: (1) must be enrolled in classes at Texas A&M-San Antonio in the current semester, (2) must be Pell eligible or a single parent, (3) child(ren) must be aged 3 to 12-years-old, and (4) child(ren) must be enrolled in Pre-K-3 through 6th grade. Hours of operation is Monday-Thursday 3:30pm-9:00pm. For more information, please contact Young Jaguars at [youngjaguars@tamusa.edu](mailto:youngjaguars@tamusa.edu) or call (210) 784-2636.

**Students' Rights and Responsibilities:** The following statement of students' rights and responsibilities is intended to reflect the philosophical base upon which University Student Rules are built. This philosophy acknowledges the existence of both rights and responsibilities, which is inherent to an individual not only as a student at Texas A&M University-San Antonio but also as a citizen of this country.

#### Students' Rights

1. A student shall have the right to participate in a free exchange of ideas, and there shall be no University rule or administrative rule that in any way abridges the rights of freedom of speech, expression, petition and peaceful assembly as set forth in the U.S. Constitution.
2. Each student shall have the right to participate in all areas and activities of the University, free from any form of discrimination, including harassment, on the basis of race, color, national or ethnic origin, religion, sex, disability, age, and pregnancy/parenting or veteran status in accordance with applicable federal and state laws.
3. A student has the right to personal privacy except as otherwise provided by law, and this will be observed by students and University authorities alike.
4. Each student subject to disciplinary action arising from violations of university student rules shall be assured a fundamentally fair process.



## Students' Responsibilities

1. A student has the responsibility to respect the rights and property of others, including other students, the faculty, and administration.
2. A student has the responsibility to be fully acquainted with the published University Student Rules found in the Student Handbook, [Student Code of Conduct](#), on our website, and University Catalog, and to comply with them, as well as with federal, state, and local laws.
3. A student has the responsibility to recognize that student actions reflect upon the individuals involved and upon the entire University community.
4. A student has the responsibility to recognize the University's obligation to provide a safe environment for learning.
5. A student has the responsibility to check their university email for any updates or official university notifications.

We expect that students will behave in a manner that is dignified, respectful, and courteous to all people, regardless of sex, ethnic/racial origin, religious background, or disability. Conduct that infringes on the rights of another individual will not be tolerated.

Students are expected to exhibit a high level of honesty and integrity in their pursuit of higher education. Students engaging in an act that violates the standards of academic integrity will find themselves facing academic and/or disciplinary sanctions. Academic misconduct is any act, or attempt, which gives an unfair advantage to the student. Additionally, any behavior specifically prohibited by a faculty member in the course syllabus or class discussion may be considered as academic misconduct. For more information on academic misconduct policies and procedures please review the [Student Code of Conduct](#) or visit the resources available in the [OSRR website](#)

## Broader Use of Generative AI Permitted Within Guidelines

Use of artificial intelligence (AI) tools, including ChatGPT, is permitted in this course for students who wish to use them. To adhere to our scholarly values, students must cite any AI-generated material that informed their work (this includes in-text citations and/or use of quotations, and in your reference list). Using an AI tool to generate content without proper attribution qualifies as academic dishonesty and violates Texas A&M-San Antonio's standards of academic integrity.

NOTE: Guidance for how to cite AI-generators, like ChatGPT, can be found here <https://apastyle.apa.org/blog/how-to-cite-chatgpt>

Important Fall 2026 Dates:

| Dates                    | Event                                                                                                                 |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------|
| August 20                | Tuition & Fee Payments deadline                                                                                       |
| August 24                | First day of class                                                                                                    |
| September 7              | Labor Day Holiday – No Classes /<br>University Closed                                                                 |
| September 9              | Census Date – Students not paid in full or<br>enrolled in a payment plan by 4:59 pm<br>may be dropped for non-payment |
| October 5 – October 16   | Midterm grading period                                                                                                |
| November 13              | Last day to drop with an automatic “W”                                                                                |
| November 25              | Study Day – No classes                                                                                                |
| November 26-November 28  | Thanksgiving Holiday – No Classes /<br>University Closed                                                              |
| November 30              | Last day to drop a course or withdraw<br>from the University                                                          |
| December 4               | Last day of classes                                                                                                   |
| December 5 – December 11 | Final exams                                                                                                           |
| December 15              | Commencement                                                                                                          |
|                          |                                                                                                                       |

The complete [academic calendar](#) is available online