

Spring 2025



College of Arts & Sciences  
**General Chemistry - CHEM 1312-012 Syllabus**

**Instructor:** Dr. Eric Banks

**Class Hours:** MWF 2:00 – 2:50 pm

**Email:** [ebanks@tamusa.edu](mailto:ebanks@tamusa.edu)

**Class Location:** STEC 141

**Office:** STEM 311Y

**Office Hours:** TBD and appointment

### Course Materials

**Textbook:** The following textbook is available at [brytewave.redshelf.com](http://brytewave.redshelf.com):

Chemistry, A Molecular Approach by Nivaldo J. Tro (6<sup>th</sup> ed)

**Homework:** Mastering Chemistry (see Instructions on Blackboard)

**Calculator:** **Scientific calculators are required for this course.** Only the use of models without data storage capabilities are approved for exams. Some good calculator examples are TI-30Xa (about \$9 in Amazon and Walmart), TI-30X (about \$13), Casio fx-300ES Plus (about \$13) or casio FX-300MS (about \$11). Rental calculators will be available for tests. They will cost \$1 to rent.

### Course Description

The second semester of a two-semester sequence, this course introduces many chemical concepts, problems, and calculations. Principles and quantitative relationships in chemistry that will be introduced include stoichiometry, chemical equilibrium, acid-base chemistry, thermochemistry, rates and mechanisms of reactions, changes of state, solution behavior, atomic structure, periodic relationships, and chemical bonding. Prerequisite: CHEM 1311 and CHEM 1111 with a grade of “C” or better Corequisite: CHEM 1112 (Laboratory).

### Learning Objectives

1. Identify different types of intermolecular forces present in a molecule and rank them by strength.
2. Understand phase changes, phase diagrams and heat of vaporization and apply those concepts to predict states of matter at different environmental conditions.
3. Calculate concentrations of solutions, convert between concentration units and determine how concentration affects boiling point, freezing point, vapor pressure and osmotic pressure.

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4. Write solubility equilibrium expressions and calculate solubility product constants and explain how different parameters affect solubility.
5. Demonstrate their understanding of chemical kinetics by determining and analyzing reaction rate laws, identifying order of reaction and determining what factors affect reaction rates.
6. Write equilibrium constant expressions for chemical reactions as well as calculate the value of the equilibrium constant and the concentration of reactants and products at equilibrium.
7. Define and identify strong and weak acids and bases as well as make dissociation predictions based on their structure.
8. Solve acid-base problems, calculate pH and explain acid-base properties of oxides.
9. Develop a procedure to make a buffer given a specific pH.
10. Construct a titration curve for an acid-base couple and determine the chemical species present during various points of the titration.
11. Express the three laws of thermodynamics and interrelate the enthalpy, free energy and equilibrium constant for the reaction
12. Balance redox reactions, calculate cell potentials and make quantitative calculations based on electrolysis.
13. Identify modes of radioactive decay, balance nuclear reactions, calculate energy changes associated with nuclear reactions and explain, based on the kinetics of nuclear processes, how quantities of radioactive elements relate with time.

### Course Responsibilities

**University Email Policy and Course communications:** The best way to contact me is through email, [ebanks@tamusa.edu](mailto:ebanks@tamusa.edu). 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 [sahelp@tamus.edu](mailto:sahelp@tamus.edu) or at 210-784-HELP (4357). If you don't hear back within 48 hours, contact them again. They have a lot of requests during the first part of the semester, so you may need to follow up with them. All students are strongly encouraged to come to office hours or make appointments at other times to discuss course material and answer questions.

**Attendance Policy.** All students are expected to attend lectures and actively engage in class discussion, activities and online assignments. If you are absent, you are responsible for the material covered and are expected to get notes, announcements, and any other material from another student in the class. Absences will be excused if due to illness (medical excuse), death of a close family member, religious holiday (please inform instructor), official university activity or cancellation of classes, military duties, pregnancy & related conditions, and participation in legal proceedings.

**Conduct and Behavior.** As an instructor my goal is to create a safe and engaging learning environment. Class disruptions are unacceptable, asking questions to clarify material during class does not qualify as a disruption and is encouraged. If you disrupt the class, you will be asked to leave for the day. Technology in the classroom

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may be a great a resource but it can also hinder the learning process. Therefore, students are not allowed to wear ear buds and headphones and/or use cellphones during class. All cellphones must be on vibrate or turned off for the entirety of the class/lab period. In case of an emergency call, leave the room before answering the call.

Texting during class is absolutely prohibited. The use of laptops, tablets or other devices for non-class related activities is not allowed. **Electronic Devices during Exams.** All electronic devices must be completely stored during exams and quizzes; this do not include approved scientific calculators (see course materials). Academic misconduct and attempts to cheat during the exam will be pursued according to Texas A&M-San Antonio code of conduct policy. You are discouraged from leaving the room during an exam. If you need to use the restroom, ask and leave all electronic devices with the instructor. **Aggressive Behavior.** The academic environment is meant for discussing ideas in a respectful manner. Tolerance, empathy, respect and courtesy help us create a safe environment. Abusive and aggressive behavior will result in contacting the University Police Department and immediate removal of the student from the classroom. **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.

### Grading

Your final grade will be assigned based on your performance in the following areas:

Mastering Chemistry Problem Sets (9 Chapters; 25 pts each)	225 pts *
Exams – 4 exams, 100 pts each	400 pts**
Final Exam	100 pts
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Total Points:	700 pts

Letter Grade:	A	B	C	D	F
Total Points	100-89.5%	89.4-79.5%	79.4-69.5%	69.4-59.5%	<59.4%

Homework sets for each Chapter are assigned as on-line homework through Pearson Mastering Chemistry. Chapters are grouped into sets according to the scheduled exams. Due dates are listed on Pearson Mastering Chemistry for each set. In addition, due dates may change according to the instructor. Instructions for accessing Pearson materials posted on Blackboard.

The \* designates the lowest score is dropped from the set. The \*\* designates the final exam score will replace your lowest exam score if it is higher.

**Exams.** There are **no makeup examinations** without prior approval from the instructor.

**Homework.** All homework will be assigned via Mastering chemistry which is available through Blackboard. In general, homework is posted near the completion of associated lectures and due within one week. Late work not accepted without prior approval of the instructor.

**Tentative lecture schedule.** Subject to change (Dates, topics and exam coverage are tentative. The instructor reserves the right to make changes as deemed necessary.)

**Syllabus.** Subject to change (Dates, topics and exam coverage are tentative. The instructor reserves the right to make changes as deemed necessary.)

Week	Day	Topic(s)	Exams	Key Dates
1	Jan 20	<b>NO CLASSES</b>		<b>MLK HOLIDAY</b>
	22	Introduction/Syllabus		
	24	CH 12		

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2	Jan 27	CH 12		
	29	12		
	31	CH 12		
3	Feb 3	CH 14		
	5	14		
	7	14		
4	Feb 10	14		
	12	CH 15		
	14	15		
5	Feb 17		<b>Exam I</b>	
	19	CH 15		
	21	16		
6	Feb 24	CH 16		
	26	16		
	28	16		
7	Mar 3	CH 17		
	5	17		
	7		<b>Exam II</b>	
8	Mar 10	<b>NO CLASSES 10- 15 MAR</b>		<b>SPRING BREAK</b>
	12			
	14			
9	Mar 17	CH 17		
	19	17		
	21	CH 18		
10	Mar 24	CH 18		
	26	18		
	28	18		
11	Mar 31	CH 19		
	Apr 2	19		
	4		<b>Exam III</b>	
12	Apr 7	CH 19		
	9	19		
	11	CH 20		
13	Apr 14	20		
	16	20		
	18	<b>NO CLASSES</b>		<b>STUDY DAY</b>
14	Apr 21	CH 20		<b>LAST DROP DAY</b>
	23	CH 21		
	25	21		
15	Apr 28	21		
	30	21		
	May 2		<b>Exam IV</b>	
16	May 5			<b>LAST CLASS DAY</b>
	7- 13			<b>FINAL EXAMS</b>

## TAMUSA IMPORTANT POLICIES AND RESOURCES

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 <https://www.tamusa.edu/Disability-Support-Services/index.html> or email us at [dss@tamusa.edu](mailto:dss@tamusa.edu). 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 Support Services and their instructors as soon as possible.

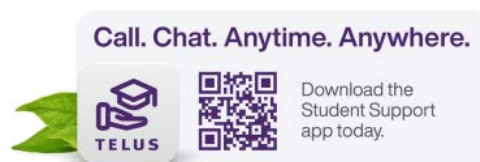
Academic Learning Center: The Academic Learning Center provides free course-based tutoring to all currently enrolled students at Texas A&M University-San Antonio. Students wishing to work with a tutor can make appointments through the Brainfuse online tutoring platform. Brainfuse can be accessed in the *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.

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, call 210-784-1331 or visit Madla 120.

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. For more information on SCC services visit [tamusa.edu/student-counseling](https://tamusa.edu/student-counseling)

*Crisis support is available 24/7 by calling the SCC at 210-784-1331 (after-hours select option '2').*

Additionally, the TELUS Student Support App provides a variety of mental health resources to including support for in the moment distress, 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. 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/>.

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More information about Emergency Operations Plan and the Emergency Action Plan can be found here:

<https://www.tamusa.edu/about-us/emergency-management/>.

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 the first week of class. Any student receiving federal financial aid who does not attend 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.

Writing, Language, and Digital Composing Center: The Writing, Language, and Digital Composing Center supports graduate and undergraduate students in all three colleges as well as faculty and staff. 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. Students can schedule appointments through JagWire under the Student Services tab. Click on “Writing, Language, and Digital Composing Center” to make your appointment. The Center offers face-to-face, synchronous online, and asynchronous digital appointments. More information about what services we offer, how to make an appointment, and how to access your appointment can be found on our website at <https://www.tamusa.edu/academics/>.

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 referral (<https://www.tamusa.edu/university-policies/Student-Rights-and-Responsibilities/file-a-report.html>) for support. Furthermore, please notify the professor if you are comfortable in doing so. This will enable them to direct you to available resources.

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 diversity 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.

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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 within our state, nation, and world. All decisions and actions involving students and employees should 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, gender identity, gender expression, or pregnancy/parenting status. Individuals who believe they have experienced harassment or discrimination prohibited by this statement are encouraged to contact the appropriate offices within their respective units.

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- or gender-based discrimination or harassment, including sexual assault, sexual harassment, domestic or dating violence, or stalking, 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 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.

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, sexual orientation, gender identity, gender expression, 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, sexual orientation, 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



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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

(<https://www.tamusa.edu/university-policies/student-rights-and-responsibilities/documents/Student-Handbook-2022-23.pdf>) or visit the resources available in the OSRR website (<https://www.tamusa.edu/university-policies/student-rights-and-responsibilities/academic-integrity.html>).

### **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.