

Spring 2024



College of Arts & Sciences
General Chemistry - CHEM 1311-001 Syllabus

Instructor: Dr. Eric Banks

Class Hours: T/TH 2:00 – 3:15 pm

Email: ebanks@tamusa.edu

Class Location: STEM 141

Office: STEM 311

Office Hours: TBD

Course Materials

Textbook: The following textbook is available at brytewave.redshelf.com:

Chemistry, A Molecular Approach by Nivaldo J. Tro (6th 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 first semester of a two-semester sequence, this course introduces many chemical concepts, problems, and calculations. Principles and quantitative relationships in chemistry 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:** MATH 1314 or equivalent. **Corequisite:** CHEM 1111 (Laboratory).

Learning Objectives

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

1. Identify the fundamental units of the SI system, perform dimensional analysis calculations, gain conceptual understanding of the mole, explain how matter is organized and classified as well as distinguish between kinetic and potential energy.
2. Apply the scientific method as a strategy to solve problems through science and creativity.
3. Define and explain Dalton's atomic theory and describe the structure of an atom.
4. Describe and explain the properties of electromagnetic radiation, the photoelectric effect, the Bohr model and use the quantum mechanical model to describe the structure of an atom.

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5. Utilize the periodic table to make predictions as to how elements react to form matter based on their properties. In addition, the student will be able to use the Aufbau principle and Hund's rule to determine the electronic configuration of an atom.
6. Demonstrate their understanding of basic facts, principles, theories, and methods of modern science as well as use general chemistry concepts and theories to solve complex multi-variable chemical problems.
7. Describe the fundamental properties of chemical bonds, perform lattice energy calculations, draw Lewis structures with possible resonance structures and name simple compounds.
8. Utilize the VSEPR model to predict molecular structure the properties of a molecule, identify molecular orbitals according to shape and energy, calculate bond order, predict paramagnetism and use both the molecular orbital and delocalized electron models to describe resonance in molecules.
9. Calculate percent composition, determine molecular and empirical formulas, balance chemical reactions, apply stoichiometry to solve limiting reactant problems and calculate percent yield.
10. Identify weak, strong and nonelectrolytes, calculate the amount of mass product formed in precipitation reactions, determine the amount of titrant required for a neutralization reaction, and specifically describe how to determine the amount of analyte using volumetric analysis and balance redox reactions.
11. Perform enthalpy change calculations for a given reaction, utilize Hess law to determine the enthalpy formation for a compound, define and use heat capacity to perform calorimetry calculations, identify exothermic and endothermic reaction and predict how temperature affects such reactions.
12. Perform calculations using the ideal gas law and describe why chemists modify the ideal gas equation to describe real gas behavior.
13. Identify the types of intermolecular forces and describe how they affect the properties of liquid solutions, describe the structure and types of solids, explain using calculations how different the parameters affect vapor pressure and identify the phase present along with specific (freezing, critical, boiling etc.) points given a phase diagram.
14. Express and calculate solution composition using various methods, calculate the enthalpy of solution and hydration, describe the factors that affect solubility, use Raoult's law to calculate the vapor pressure of a solution and determine the molar mass of a solute using the boiling point, freezing point, or osmotic pressure of a solution. The student will also be able to predict how the colligative properties of electrolyte solution changed based by using the van't Hoff factor.

Student responsibilities

University Email Policy and Course communications: The best way to contact me is through email, 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 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.

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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 may be a great 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 (11 Chapters; 25 pts each)	275 pts
Exams – 3 exams, 100 pts each	300 pts
Final Exam	100 pts
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Total Points:	675 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.

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.

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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.)

	Day	Topic	Exams/Key Dates	Homework
1	Jan 16		Syllabus/Introduction	
	Jan 18	Chapter 1		
2	Jan 23	Chapter 2		
	Jan 25	Chapter 2		
3	Jan 30	Chapter 3		
	Feb 1	Chapter 3		
4	Feb 6	Chapter 3		
	Feb 8	Chapter 4		
5	Feb 13	Chapter 4		
	Feb 15	Chapter 4		
6	Feb 20		Exam I	
	Feb 22	Chapter 5		
7	Feb 27	Chapter 5		
	Feb 29	Chapter 6		
8	Mar 5	Chapter 6		
	Mar 7	Chapter 7		
9	Mar 12		Spring Break	
	Mar 14			
10	Mar 19	Chapter 7		
	Mar 21		Exam II	
11	Mar 26	Chapter 8		
	Mar 28	Chapter 8		
12	Apr 2	Chapter 9		
	Apr 4	Chapter 9		
13	Apr 9	Chapter 9		

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	Apr 11	Chapter 10		
14	Apr 16	Chapter 10		
	Apr 18	Chapter 11		
15	Apr 23	Chapter 11		
	Apr 25		Exam III	
16	Apr 30	No Class	Study Day	
	May 1 - 7	FINAL EXAMS		

Academic Accommodations for Persons with Disabilities: The Americans with Disabilities Act of 1990, as amended, and the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights protection for individuals with disabilities. Title II of the ADA and Section 504 of the Rehabilitation Act require that students with disabilities be guaranteed equal access to the learning environment through the provision of reasonable and appropriate accommodations of their disability. If you have a disability that may require an accommodation, please contact Disability Support Services (DSS) for the coordination of services. The phone number for DSS is (210) 784-1335 and email is dss@tamusa.edu.

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 is an appointment-based center where appointments are made through the Navigate platform. Students access Navigate through Jagwire in the Student Services tab. The Center is active on campus outreaching to students to highlight services offered. You can contact the Academic Learning Center by emailing tutoring@tamusa.edu or calling (210)-784-1332. Appointments can also be made through JagWire under the services tab.

Counseling Resources: As a college student, there may be times when personal stressors interfere with your academic performance and/or negatively impact your daily functioning. If you or someone you know is experiencing life stressors, emotional difficulties, or mental health concerns at Texas A&M University – San Antonio, please contact the Student Counseling Center (SCC) located in Modular C, Room 166 (Rear entrance) or call 210-784-1331 between the hours of 8 a.m. and 5 p.m., Monday – Friday. After-hours crisis support is available by calling 210-784-1331. Please contact UPD at 911 if harm to self or harm to others is imminent.

All mental health services provided by the SCC are free, confidential (to the extent permitted by law), and are not part of a student’s academic or university record. SCC provides brief individual and group therapy, crisis intervention, consultation, case management, and prevention services. For more information, please visit www.tamusa.edu/studentcounseling.

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 in JagE Alert, will have the option to receive a text message, email, and/or phone call with instructions and updates. To register or update your information visit: <https://tamusa.bbcportal.com/>.

More information about Emergency Preparedness and the Emergency Response Guide can be found here: <https://www.tamusa.edu/upd/index.html>.

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. The 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

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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.

Jaguar Writing Center: The Jaguar Writing Center provides writing support to graduate and undergraduate students in all three colleges. Writing tutors work with students to develop reading skills, prepare oral presentations, and plan, draft, and revise their written assignments. Students can schedule appointments with the Writing Center in JagWire under the student services tab. More information about what services we offer, how to make an appointment, and how to arrange your appointment can be found on our website at www.tamusa.edu/Writing-Center. The Writing Center can also be reached by emailing writingcenter@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 contact the Dean of Students (DOS@tamusa.edu) for support. In addition, you may notify the instructor if you are comfortable doing so.

Military Affairs: Veterans and active-duty military personnel are welcomed and encouraged to communicate, in advance, if possible, about special circumstances (e.g., upcoming deployment, drill requirements, disability accommodations). You are also encouraged to visit the Patriots' Casa in-person, Room 202, or to contact the Office of Military Affairs with any questions at military@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 A&M System policy, students are provided an opportunity to make up any examination, study, or 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, equality of 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, diversity, pluralism, 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, based on race, color, sex, religion, national origin, age, disability, genetic information, veteran status, sexual orientation, gender identity, or gender expression. 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 helping create a safe learning environment for all students and for the university. 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 has staff members trained to support survivors 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 university. Please be aware that all A&M-San Antonio employees (other than those designated as confidential resources such as counselors and other healthcare providers) are required to report information about such discrimination and harassment to the university. This means that if you tell a faculty member about an incident of sexual harassment or sexual violence, or other related misconduct, the faculty member must share that information with the university's Title IX Coordinator. If you wish to speak to a confidential employee who does not have this reporting responsibility, you can contact the Student Counseling Center at (210) 784-1331, Modular C.

Students' Rights and Responsibilities: The purpose of the following statement is to enumerate the essential provisions of students' freedoms and responsibilities to learn at Texas A&M University-San Antonio. All students are

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required to follow all policies and regulations as set forth by The Texas A&M University System, including the A&M-San Antonio Student Code of Conduct.

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 procedure 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, genetic information, 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 staff, and the administration.
2. A student has the responsibility to be fully acquainted with and compliant with the University Student Rules found in the Student Handbook, Student Code of Conduct, on our website, and in the University Catalog.
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.
6. 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. Behaviors that infringe on the rights of another individual will not be tolerated.

Using AI CHEM: 1311 assumes that all work submitted by students will be generated by the students themselves, working individually or in groups. Students should not have another person/entity do the writing of any portion of an assignment for them, which includes hiring a person or a company to write assignments and/or using artificial intelligence (AI) tools like ChatGPT. Use of any AI-generated content in this course qualifies as academic dishonesty and violates Texas A&M-San Antonio's standards of academic integrity.