



College of Arts & Sciences  
**CHEM 4131: Instrumental Analysis Laboratory**

**Instructor:** Dr. Eric Banks

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**Office:** STEM Suite 311

**Office Hours:** TBD and by appointment

**Class Hours:** W 3:30-6:15 PM

**Class Location:** SciTech 327

### Course Description

This is the accompanying laboratory for CHEM 4331: Instrumental Chemical Analysis. This laboratory introduces chemical concepts, problems, and calculations discussed in CHEM 4331. Topics include the theory and application of analytical instruments like spectrophotometers, spectrometers, GCMS, LC and NMR. Instruments subject to availability.

**Prerequisite:** CHEM 3331

**Corequisite:** CHEM 4331

### Course Materials

**Laboratory handouts.** You must print off a copy of all handouts from Blackboard before each lab session. All data should be collected with BLUE or BLACK NON-ERASABLE PEN. FIVE POINTS WILL BE DEDUCTED FOR DATA RECORDED IN PENCIL. Refer to attached schedule for the sequential list of labs. Reports are due at the beginning of class one week after completion.

**Calculator.** Any calculator is acceptable.

**Proper Clothing for Lab.** Close-toed shoes that cover your foot in its entirety, NO shorts or short skirts, NO mid-riff shirts. NO tank tops. NO  $\frac{3}{4}$  length pants. NO pants with large holes. **THIS POLICY WILL BE STRICTLY ENFORCED AND STUDENT IN NONCOMPLIANCE MAY BE DISMISSED FROM THE LABORATORY AND WILL A RECEIVE NO CREDIT FOR THAT WEEK'S EXPERIMENT.** We take YOUR safety in the laboratory very seriously and we expect the same from you.

**Goggles.** Goggles **MUST** be worn properly in the laboratory **AT ALL TIMES**. If you are in the laboratory, you must wear goggles. **NO EXCEPTIONS!** For the first three violations, 2 points will be deducted for that week's experiment. On the third violation, the student will be dismissed, and no credit will be received for that week's experiment. Students must bring their own goggles. No rentals will be provided this semester. Students who do not bring their 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 **MUST** bring their own lab coats. No rental coats will be provided this semester. Students who do not bring their lab coats 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!

## Learning Objectives

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

1. Demonstrate their understanding of safe laboratory practices, such as responsible disposal techniques and proper use of personal protective equipment (PPE) while performing experiments.
2. Identify the categories of hazards associated with chemicals and use Safety Data Sheets (SDS) as well as reference materials.
3. Apply the chemistry concepts learned in CHEM 4331 to the design and analysis of chemical experiments.
4. Develop critical thinking skills, develop empirical and quantitative reasoning skills, develop scientific communication skills, develop teamwork skills.

## Student Responsibilities

**Communication.** The best way to contact instructors is via email. All correspondence between professors and students must occur via University email accounts. All students have a Jaguar email account ready and working. If it is not working, contact the help desk at [sahelp@tamusa.tamus.edu](mailto:sahelp@tamusa.tamus.edu) or at 210-784-4357. 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 ask questions. Discussions concerning grading/grades will not be addressed through email and will only be discussed during office hours or scheduled appointments.

**Attendance Policy:** All students are expected to attend all laboratories and be fully and actively engaged in class discussion and activities. Attendance will be monitored and can be used to make decisions on cases of borderline grades. Absences will be excused if due to illness (with 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. Please get prior approval from your instructor for planned absences due to official University activities. Excessive tardiness and unexcused absences will result in grade penalties as determined by the instructor. Three unexcused absences result in failure for the course.

**Late Work Policy:** Students will be informed about due dates and times for laboratory reports. Work is required to be turned in on time. Late work is not accepted without prior approval.

**Tentative Schedule**

Week	Week	Laboratory
1	Jan 17	No Class
2	Jan 24	Introduction, Syllabus, Safety and Laboratory Report Format
3	Jan 31	Spectrophotometric Determination of Iron in Vitamin Tablets
4	Feb 7	Spectrophotometric Analysis of Caffeine/Benzoic Acid in Soda
5	Feb 14	Spectrophotometric Analysis of an Analgesic Tablet
6	Feb 21	Spectrophotometric Determination of Copper in Brass
7	Feb 28	Atomic Absorption Determination of Copper in Brass
8	Mar 6	Atomic Absorption Determination of Fe and Zn in Pet Food
9	<b>Mar 11-15</b>	<b>Spring break-No classes</b>
10	Mar 20	DNA Composition by LC
11	Mar 27	LC/HPLC TBD
12	Apr 3	GC/MS TBD
13	Apr 10	NMR TBD
14	TBD	

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

**Assignments:** The assignments are due at the beginning of the next laboratory period, unless instructed otherwise. These will be graded for correctness, accuracy, not just completion,

**Grading:**

12 laboratory assignments x 50 points each = 600 points

There will be NO extra credit will be given. Laboratory worksheets/reports are the only opportunities students have to earn points in this course. Worksheets will be graded based on completeness, accuracy, and correctness.

$$\text{Your grade: } \left( \frac{\text{Total points earned}}{700} \right) * 100$$

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:

**Letter Grades:** Letter grades will be assigned as follows:

<b>Letter Grade:</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>F</b>
% of Total Points:	<b>90.0 - 100%</b>	<b>80.0 - 89.9%</b>	<b>70.0 - 79.9%</b>	<b>60.0 - 69.9%</b>	<b>0 - 59.9%</b>

## IMPORTANT POLICIES AND RESOURCES

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 accommodation of their disability. If you have a disability that may require 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](mailto: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](mailto: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 stress interferes with your academic performance and/or negatively impacts 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 8:00AM and 5:00PM, Monday – Friday. After-hours crisis support is available by calling 210-784-1331 (select option “2”). 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 (as the law allows), 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](http://www.tamusa.edu/studentcounseling)

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 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. 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.

Meeting Basic Needs. If you face challenges securing food, housing or other basic needs, you are not alone, and A&M-San Antonio can help during this time of crisis. We invite you to learn about the many resources available to support you by visiting the [Dean of Student's website](#) or by reaching out via [dos@tamusa.edu](mailto:dos@tamusa.edu). Additionally, it is not unusual for students to encounter temporary illness or injuries that may interfere with your academic success. Students may request temporary illness/disability assistance by reaching out to the [Dean of Student's Office](#) (210) 784-1354. If you are comfortable doing so, please notify the professor of any issues so that they may provide additional resources.

Military Affairs. Veterans and active-duty military personnel are welcomed and encouraged to communicate, in advance if possible, and in 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.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 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.

Respect for Diversity. We understand that our students represent diverse backgrounds and perspectives. When we are equity-minded, we are aware of differences and inequalities and are willing to discuss them so we can act to resolve them. The University is committed to building cultural competencies, or the attitudes, skills, and knowledge that enable individuals and organizations to acknowledge cultural differences and incorporate these differences in working with people from diverse cultures. Respecting and accepting people different than you is vital to your success in the class, on campus, and as a future professional in the global community. While working together to build this community we ask all members to:

- Share their unique experiences, values, and beliefs.
- Be open to the views of others.
- Honor the uniqueness of their colleagues.
- Value each other's opinions and communicate respectfully.
- Keep confidential discussions that the community has of a personal (or professional) nature.
- Use this opportunity together to discuss ways in which we can create an inclusive environment in this course and across the A&M-San Antonio community.

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, on the basis of 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 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 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 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. 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 for the student freedom and responsibility to learn at Texas A&M University-San Antonio. All students are required to follow all policies and regulations as set forth by The Texas A&M University System. This includes 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, genetic information, veteran status, gender identity, or gender expression 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 the 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, University Catalog and students must comply with them and the laws of the land.
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 an environment for learning.
5. A student has the responsibility to check their university email for any updates or official university notification.

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.

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://bit.ly/WLDCCenter>.