



College of Sciences
Department Chemistry and Biochemistry
Laboratory for Chemistry 4211- Instrumental methods for Analytical Chemistry

Course name:	Laboratory for Chemistry 4211
Course no.:	CHEM 4212
Course CRN:	20921 and 29498
Semester/year	Spring 2022
Undergraduate credit hours:	2
Class location:	PreLab: LART 122- Lab: CCSB G.0714
Class meeting time:	PreLab: Monday, 12:30pm to 1:20pm - Lab: Monday/Wednesday, 1:30pm to 4:20 pm
Class instructors:	Instructor: Dr. Jose Angel Hernandez-Viezcas TA: Kazi Saima Banu Lab Coordinator: Brittany L. Ruch
Contact methods:	Email, Blackboard messages, conference through Blackboard Collaborate Ultra, or ask the instructor to schedule a meeting through Zoom (Meeting ID: 5069035828).
Email:	<i>jahernandez19@utep.edu</i> <i>kbanu@miners.utep.edu</i>
Office:	Office hours Tuesday from 1:00 pm to 2:00 pm, or by appointment. Office CCSB 3.0502
Preferred contact method:	Email

Course description:	This is the laboratory of class CHEM 4211, you will be exposed to several different types of instrumental techniques. You will be investigating the characteristics and capabilities of instruments and using them to make a measurement.
Course pre-requisites:	To enroll for this course, you will need to meet the following pre-requisites: CHEM 3110 Minimum Grade of C May be taken concurrently. Must be enrolled in main campus (no online programs). Prerequisites for CHEM 4212 listed in the course description.
Required textbooks:	No textbook is required. In an effort to reduce the economic burden of acquiring a text book, the instructors will create and provide instrument material and lab practices through blackboard and/or hard copies.
Required and Supplemental readings:	Students will be required to complete reading the assigned materials before the lab practice. Material will be posted one week before the lab practice. Invest in good preparation BEFORE coming to class by reading the labs, doing the prelab exercises (if any), and writing your own outlined procedure for each lab. Anticipate problems and timing issues.
Course requirements:	Time commitment is essential to complete the laboratory requirements. DO NOT SCHEDULE OTHER APPOINTMENTS/commitments during this lab time, as your grade will suffer, if you are not in the lab at the scheduled times. The labs are long and you will need to use your time wisely. If you feel that your experiment was too much out of control, please see me or the TA. Try to resolve any problems within the allotted lab time. Attendance to the lecture portion of the lab is mandatory. Reports <ul style="list-style-type: none">• A laboratory report is required for each experiment. These reports are due one week after completing the lab. Reports are due at the beginning (during the first 15 minutes of the class) of the lab period.• You are encouraged to work with your team to analyze data. However all written reports are individual efforts. Your report must be written in your own words with your own

calculations and conclusions. Plagiarized reports will result in academic dishonesty and reported to the Office of Student Conduct & Conflict Resolution (OSCCR) as per UTEP's handbook of operating procedures.

- If you miss a lab practice you will not be able to submit the corresponding lab report. No make up labs. To accommodate any personal emergencies, you can drop one lab report.
- We will mainly work in groups of three to four for all of the labs (unless specified otherwise by the instructors).
- Be sure to include clear sample calculations. Handwritten calculations are acceptable
- When fitting data to a line (e.g. a calibration curve), Report the equation for the line and the correlation coefficient (r or r^2).

Lab report

Lab reports should contain and will be graded based on the following elements

1. Title of the report, Name and date
2. Introduction that explains the technique employed
3. Objective of the experiment
4. Materials
5. Procedure
6. Results (data obtained, graphs etc.)
7. Conclusion (a summary statement about all the results and any conclusion about the experiment)

Pre-Labs

- Review the material (if Any) for the upcoming laboratory and create your own procedure (e.g. in your own words). Pre-lab can be tested with quizzes before the lab.

Post-Labs

- After every lab, a set of questions will be uploaded in blackboard. You have one week to complete them. The questions will be about topics explained during the pre-lab and lab.

Attendance: Student must comply with a **minimum of 80% attendance**. Attendance involves assistance to Pre-lab and lab. Attendance in itself is not a part of your final grade but remember that an absence will have an impact in your Lab-report/quiz/post-lab

Final Exam: Final Comprehensive Examination will be given for the Spring's 2022 Semester. Examinations will consist of combination of multiple-choice, true/false, open questions. The final exam will be the last week of April during the pre-lab time at Liberal Arts room 122

Quizzes: They will evaluate Pre-Lab material. Quizzes will consist of multiple choice and open questions. You will be given a limited time (e.g. 10 min) to complete them depending on the number and type of questions.

Grading scale & criteria:

Grading Scale:

- >90 % = A
- 80-89% = B
- 70-79% = C
- 60-69% = D
- <60% = F

Grading Components:

Coursework & Examinations:	Weighted Value
Pre-lab, quizzes and Post-lab	30%
Lab Reports	50%
Final	20%
Extra Credit	2.5%

Dropping & Grading policies for dropping the course, withdrawals, and incomplete:

Students may drop individual courses or completely withdraw from the university and grades are based on when the actions are taken. Refer to the online Academic Calendar at www.utep.edu/calendar or the “Important Dates” section to be aware of the specific deadline dates.

- a) **Student-initiated Drops:** It is the student’s responsibility to officially drop a course that she/he no longer wishes to take. Failure to do so may result in a grade of “F” on the student’s academic record. Athletes must receive permission from the Miner Athletic Advising Center before dropping a course. International students with F or J visas must receive permission from the Office of International Programs before dropping a course.
- b) **Administration Drops:** During registration periods for upcoming semesters, students will be dropped from registered courses for failure to meet prerequisites or co-requisites after final grades have been posted for the current semester and before the beginning of late registration for next semester. A student may petition the department chair of the course in question for a prerequisite or co-requisite waiver.
At the discretion of the instructor, a student may be dropped from a course because of excessive absences (i.e., 4 or more) or lack of effort. Students may also be administratively withdrawn from a course during the semester for other reasons, with the concurrence of the academic dean or department chair. A grade of “W” will be assigned before the course drop deadline and a grade of “F” after the course drop deadline. A grade of “F” received due to disciplinary action imposed by the University overrides a grade of “W” received through a student-initiated or faculty drop. Students will be notified of their drop through their UTEP e-mail account.
- c) **Grade Assignment for Drops and Withdrawals:** Grades will be assigned as follows when a student drops a course or completely withdraws from the University:
 1. If a student drops a course before the official census date of a semester, neither the course nor a grade will appear on the student’s academic record.
 2. If a student drops from a course after the census date but before the student-initiated course drop deadline listed in the Class Schedule, a grade of “W” will be assigned.
 3. If the student drops after the student-initiated course drop deadline, instructors will determine a grade of “W” or “F” for each course. A grade of “W” is considered only under exceptional circumstances and must be approved by the instructor and department chair for the course. A student may petition for a grade of “W” in writing with the necessary supporting documentation.

Incomplete course work: An “I” (incomplete grade) can only be considered only if requested by the student in advance of the conclusion of the course and only for legitimate, documented exceptional circumstances/emergencies after you have completed at least half of the course requirements. Failure to request and negotiate the terms of an “Incomplete” grade before the conclusion of the course will result in a denial except in the most extraordinary circumstances.

Course/Instructor & Institutional Policies

Attendance:

The University requires that students comply with at a minimum of 80% attendance. Lower than 80% attendance means that there is the risk of being dropped from the course at any time and regardless of your current performance, even if it occurs in the final week of class. Exceptions will be made in the case of University excused absences (sponsored activities approved by the Dean of students). You will only be able to make up for activities, exams, or assignments (scheduled or unscheduled) in the case of University excused absences (sponsored activities approved by the Dean of students).

Accommodations for individuals with disability:

The University is committed to providing reasonable accommodations and auxiliary services to students, staff, faculty, job applicants, applicants for admissions, and other beneficiaries of University programs, services and activities with documented disabilities in order to provide them with equal opportunities to participate in programs, services, and activities in compliance with sections 503 and 504 of the Rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act (ADA) of 1990 and the Americans with Disabilities Act Amendments Act (ADAAA) of 2008. Reasonable accommodations will be made unless it is determined that doing so would cause undue hardship on the University. Students requesting an accommodation based on a disability must register with the [UTEP Center for](#)

	<p>Accommodations and Support Services (CASS). Contact the Center for Accommodations and Support Services at 915-747-5148, or email them at cass@utep.edu, or apply for accommodations online via the CASS portal.</p>
Copyright statement for course materials:	<p>All materials used in this course are protected by copyright law. The course materials are only for the use of students currently enrolled in this course and only for the purpose of this course. They may not be further disseminated.</p>
Copyright and fair use requirements:	<p>The University requires all members of its community to follow copyright and fair use requirements. You are individually and solely responsible for violations of copyright and fair use laws. The University will neither protect nor defend you on or assume any responsibility for a student violations of fair use laws. Violations of copyright laws could subject you to federal and state civil penalties and criminal liability, as well as disciplinary action under University policies.</p>
Student conduct and scholastic integrity:	<p>Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures. Students are expected to be above reproach in all scholastic activities. Students who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and dismissal from the university. “Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another student, possessing unauthorized materials during a test, or falsifying research data on laboratory reports, and any act designed to give unfair advantage to a student or the attempt to commit such acts.” <u>Regent’s Rules and Regulations</u>, Part One, Chapter VI, Section 3.2, Subdivision 3.22. Since scholastic dishonesty harms the individual, all students, and the integrity of the University, policies on scholastic dishonesty will be strictly enforced. From the UTEP Dean of Student Affairs (http://studentaffairs.utep.edu/Default.aspx?tabid=4386).</p> <p>Examples of “cheating” include:</p> <ul style="list-style-type: none"> ▪ Copying from the homework, in-class work or exam paper of another student, engaging in written, oral, or any other means of communication with another student during an exam or homework assignment, or giving aid to or seeking aid from another student during a test; ▪ Possession and/or use during an exam or home test of materials which are not authorized by the person giving the test, such as class notes, books, or specifically designed “crib notes”; ▪ Using, obtaining, or attempting to obtain by any means the whole or any part of non-administered test, test key, homework solution, or computer program; using a test that has been administered in prior classes or semesters but which will be used again either in whole or in part without permission of the instructor; or accessing a test bank without instructor permission; ▪ Collaborating with or seeking aid from another student for an assignment without authority; ▪ Substituting for another person, or permitting another person to substitute for one's self, to take a test; ▪ Falsifying research data, laboratory reports, and/or other records or academic work offered for credit. <p>“Plagiarism” means the appropriation, buying, receiving as a gift, or obtaining by any means another's work and the unacknowledged submission or incorporation of it in one's own academic work offered for credit, or using work in a paper or assignment for which the student had received credit in another course without direct permission of all involved instructors. NOTE: This includes cutting-and-pasting and photocopying from on-line and other material.</p> <p>“Collusion” means the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any provision of the rules on scholastic dishonesty.</p>

<p>Student resources:</p>	<p>UTEP provides a variety of student services and support. Familiarize yourself with the bookmarks on the right-hand side of the Blackboard student portal (visible before entering into a course) as well as the resources below.</p> <p>Academic Resources</p> <ul style="list-style-type: none"> ▪ UTEP Library: Access a wide range of resources including online, full-text access to thousands of journals and eBooks plus reference service and librarian assistance for enrolled students. ▪ University Writing Center (UWC): Submit papers here for assistance with writing style and formatting, ask a tutor for help and explore other writing resources. ▪ Math Tutoring Center (MaRCS): Ask a tutor for help and explore other available math resources. ▪ History Tutoring Center (HTC): Receive assistance with writing history papers, get help from a tutor and explore other history resources. ▪ RefWorks: A bibliographic citation tool; check out the RefWorks tutorial and Fact Sheet and Quick-Start Guide. <p>Individual Resources</p> <ul style="list-style-type: none"> ▪ Military Student Success Center: Assists personnel in any branch of service to reach their educational goals. ▪ Center for Accommodations and Support Services: Assists students with ADA-related accommodations for coursework, housing, and internships. ▪ Counseling and Psychological Services: Provides a variety of counseling services including individual, couples, and group sessions as well as career and disability assessments. <p>Technology Resources</p> <ul style="list-style-type: none"> • Help Desk: Students experiencing technological challenges (email, Blackboard, software, etc.) can submit a ticket to the UTEP Help desk for assistance. Contact the Helpdesk via phone, email, chat, website, or in person if on campus. Phone: 915-747-4357 (HELP) Email: helpdesk@utep.edu 																								
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<p>COVID-19 Precautions:</p>	<p>Please stay home if you have been diagnosed with COVID-19 or are experiencing COVID-19 symptoms. If you are feeling unwell, please let me know as soon as possible, so that we can work on appropriate accommodations. If you have tested positive for COVID-19, you are encouraged to report your results to covidaction@utep.edu, so that the Dean of Students Office can provide you with support and help with communication with your professors. The Student Health Center is equipped to provide COVID-19 testing.</p> <p>The Center for Disease Control and Prevention recommends that people in areas of substantial or high COVID-19 transmission wear face masks when indoors in groups of people. The best way that Miners can take care of Miners is to get the vaccine. If you still need the vaccine, it is widely available in the El Paso area, and will be available at no charge on campus during the first week of classes. For more information about the current rates, testing, and vaccinations, please visit epstrong.org.</p>																								

	<p>On-Campus COVID-19 Walk-Up Testing Free COVID-19 testing is available for employees and students from 9 a.m. to 2 p.m. Monday through Thursday in the University's former Honors House, 2090 Hawthorne St., located behind the Academic Advising Center. The main entrance for testing will be from the building's back patio area. Individuals who use wheelchairs may enter through the other door on the side closest to the Liberal Arts Building. Rapid antigen tests and lower nasal PCR tests will be administered. Nasal swabs from the walls of both nostrils will be collected. Results from the rapid antigen test will be available via text or email within two hours. Results from the PCR test will be shared via text within 48 hours. The text message will direct you to a link where you can access your results. No appointment is necessary. Participants must register each time they go for a test at this site because each visit generates a unique test number. UTEP employees and students must bring their Miner Gold Card to gain entry to the clinic. Face coverings are required in the testing area.</p>
	<p>Syllabus is subject to change. Any change will be announced in class or posted in blackboard during the semester.</p>
<p>Laboratory experiments</p>	<ol style="list-style-type: none"> 1. Laboratory safety 2. UV-vis 3. FAAS 4. GAAS 5. FTIR 6. ICP-OES 7. Analytical Electrochemistry 8. ICP-MS 9. Hyperspectral analysis 10. Gas-Chromatography 11. Ion Chromatography 12. X-Ray Fluorescence 13. Photothermal IR/Raman ?
<p>Lab Safety</p>	<p>The instrumental techniques that you will be learning are used in many areas of science, not only chemistry (e.g. pharmacy, medicine, forensic science, environmental science, material science etc). You will have the opportunity to have "hands on" experience on many of the instrumental techniques. Therefore, much of the responsibility for your education rests with you. You will also have the responsibility at times for the use and care of expensive equipment. In order for everyone to get the most out of this course and to protect you and the instrumentation we must agree to abide by some rules. Please read the following statements about expectations and use of facilities. Failure to follow these rules will result in a failing grade in the course.</p> <ol style="list-style-type: none"> 1. I will follow safe working procedures in lab. If the proper practice is unclear, or questionable in my opinion, I will ask the instructor about it. 2. I agree not to eat or drink in the lab, nor to bring open beverages or containers of food into the lab. 3. I agree to clean up around the computers, lab benches and instruments whenever I work in the lab. If I bring reagents, equipment or materials into the lab for my work, I will remove them when I leave for the day. 4. I will see that the instrument or computer that I use is left in the appropriate idle (or off) condition when I am done (unless the next user is present to take over). 5. I will sign the operator's log book (if provided) after using an instrument and report any problems or special needs (such as a low gas level) in the logbook or directly to the instructor. 6. Since equipment and supplies are intended for members of this class and other chemistry courses, I will not remove any materials or equipment from the lab that I did not bring there without express

permission from a faculty member. (Obviously, such things as my data, print-outs and used reagents are exceptions.)

7. I will not misuse any instruments or equipment in the lab.
8. I will not operate any equipment for which I have not been given instruction in operating.
9. I will be responsible for anyone that I let into the lab and will see that they abide by our class guidelines for use of any equipment or facilities.
10. I will work through all of the reading assignments and tutorials.
11. I will cooperate with my lab partner. If the group becomes dysfunctional, it is part of my responsibility to work things out. If that cannot be done satisfactorily in a short period of time, I will talk to the instructor about the matter.

Safety in the lab

- Always wear safety shoes, laboratory coats and safety glasses
- Don't work alone in the laboratory
- Eating, drinking and smoking is prohibited in the laboratory
- Keep hot plate and hot glassware in a designated place that has a display so that other members will not touch them.
- Label your glassware/disposable material
- Used liquids/chemicals should be disposed off in a proper way as per EH&S procedure
- Check analytical procedures thoroughly before starting the work with organic liquids which may be dangerous.
- Be careful with power supply, gas cylinders and heating equipments
- Work as much as possible in a fume hood and always add acid/base to water. Slowly add strong acids and bases to water to avoid sputtering.
- If there is an accidental skin contact, thoroughly flush the contaminated area with water and seek medical attention.
- Use auto pipettes and avoid mouth pipetting.
- Never use glassware for hydrofluoric acid treatment
- If you are unsure about a procedure or have questions or concerns about a chemical discuss with the instructors.
- Clean your glassware at the end of the experiment.
- Report any dangerous observation made in the lab.