

CHEMISTRY 1B Lab/Seminar  
Continuation of Chem 1B Syllabus

Spring 2023

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Office hours – TBD

***Books/Supplies***

**Required**

- 1) **Lab Manual/Handouts for Chemistry 1B** - Chem Club – DH 20 - \$25 cash only
- 2) Hand-held scientific calculator - **Must be non-programmable** and should have  $\log x$ ,  $10^x$ ,  $\ln x$ ,  $e^x$  and  $x^y$  keys. - **You will not be allowed to use your programmable calculator during a lab exam or quiz!**

Not Required (But useful)

1) **Suggested items to purchase for lab:** small notebook to keep in your drawer (you can staple together 15 sheets of lined paper?), safety glasses (side and top shields) and a china marker (sold at bookstore). The notebook is to keep a set of data in your locker in case you lose your lab manual. The safety glasses are in case you don't want to use the goggles provided in your locker and the china marker writes on glass to label things quickly. Note though the china marker will not label things that go in the oven!

***Things you must do the first week of school (Jan 25 – Jan 27)***

- 1) **Attend your seminar on Jan 27.** Before coming to seminar view the videos below  
Safety - <https://youtu.be/mMUgpxXUcU> <https://youtu.be/sInkkTner1k>
- 2) **Attend your first lab meeting. Labs start on Jan 25.**
- 3) **Read this syllabus thoroughly.** It is the rules of the game. Best to know the rules before you start. There is a syllabus and ethic quiz through Canvas for your seminar that you must complete. Don't forget to get it done by the due date.
- 4) If you decide to drop the course, you need to do it on MySJSU.
- 5) Do the calculator practice in your lab manual. It is your responsibility to know how to use your calculator. Instructors will not assist you during an exam or quiz!
- 6) Start working on Exp. 13 problems on concentration and stoichiometry found at the end of the experiment in your lab manual.

***Attendance/Workload***

**Regular attendance to lab is required. Absences to lab can and will result in an F grade for the FULL course** (two unexcused absences from lab are sufficient for me to drop or fail you!!). Please remember this is a 5 unit course, it will require a great deal of your time. Seldom does a student who works and carries a full course load succeed in this class. Make arrangements now, don't wait until you are behind. SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum effort of forty-five hours for each unit of credit for the semester so minimum of three hours per unit per week, including preparing for class, participating in course activities, completing assignments, and so on. More details about student workload can be found in [University Policy S12-3](http://www.sjsu.edu/senate/docs/S12-3.pdf) at <http://www.sjsu.edu/senate/docs/S12-3.pdf>.

To attend another lab section so as to complete work, you will need the consent of the section's lab instructor. They are not required to accept you in their lab, particularly if their lab is full or if we have COVID restrictions in place! I strongly encourage you to not be absent from lab.

### ***Misconduct***

Students are to do only those laboratory experiments assigned. Certain chemicals when improperly used are very dangerous. You are responsible for disposing chemical wastes safely; the lab instructor will inform you on particular waste disposal issues for each experiment. If they forget to inform you, ASK THEM!! Any student found preparing anything that may in any way endanger her/his safety or the safety of others will be immediately dropped from the course with an F grade. Any student found disposing of wastes incorrectly is also in danger of being dropped from the course or failed. Students are expected to behave maturely and honorably in the lab and lecture course.

### ***Laboratory***

It is your responsibility to complete the experiment on time, particularly if you don't come prepared! Chem. 1B experiments require that you come to class with a clear idea of what you have to do and in what order. Also they often require that you process more than one run at a time or you won't have enough lab time to complete the experiment. You must pay attention to the lab instructor when they say "Start cleaning up". This will usually be said 15 minutes before the end of lab. There will be times when the instructor might say that you cannot start X part of the experiment because there isn't enough time to complete it. Follow those instructions or you will damage experimental runs and you will get to start over!

Credit for doing a lab comes from attending the lab, physically doing the lab and then handing in the necessary reports/worksheets. These report sheets get graded for accuracy and precision. Thus doing the experiment will not get you through the course. You have to do it WELL. Without the reports, you will not get any credit for the lab. If you hand in a report without having attended the lab, you will be reported to the University's Disciplinary Committee and will obtain a zero for the report sheet.

Extra time in lab will be used to either work out data and the report sheet, or to practice doing problems. You have an instructor in the room who can help you study! Don't waste the opportunity.

### ***Friday Seminar***

This is when we discuss the following week's lab, do the lab quizzes and lab exam. No make-ups for absences to seminar. If a strong, compelling and documented absence is informed to Dr. Singmaster 24 hours before the seminar she MIGHT be able to accommodate doing a quiz through Canvas at the same time as classmates are doing it in seminar but note it will NOT be the same quiz. It will require lockdown browser as well as you will be limited to seeing one question at a time and cannot go back to correct. Also partial credit is not possible for numerical answers through Canvas.

### ***Lockers***

You will not be sharing lockers with a student from another lab section. You will have a checkbook to check out items from the stockroom. Return those items at the end of the lab or you will be billed for them at the end of the semester by the Bursar.

### ***Grading***

The total lab grade constitutes 40% of the final grade. **Failing lab (55.0% or less) or lack of attendance to lab will result in an F grade for the FULL COURSE, irrelevant of how well you are doing in lecture. Do not miss labs!! PLEASE note we do NOT provide extra credit work at the end of the semester for students who are doing poorly.**

The grade for lab is forwarded to your lecture professor. He/She will combine that with your lecture grade to give a grade for the full course. The grading is based on quizzes, lab exams, lab reports and evaluations points. **These points do not have the same weight!** Quiz and lab exam point weigh more than lab report points!

## Quizzes

We expect that you will have about 9 or 10 lab quizzes which includes a Canvas quiz on the greensheet. Most will be 10 points. You must get 80% or better in the safety quiz to remain enrolled in the course. You will have a maximum of two chances to pass the safety quiz. We will NOT be deleting quiz scores. Rather we will add all your quiz scores and divide by the sum of the quizzes MINUS 10 points. This would be equivalent to deleting one quiz score.

## Lab Reports/Unknowns/Worksheets

Typically you must submit a lab report at the end of every experiment. Some of the experiments have unknowns. Point value for the reports varies greatly depending on the nature of the experiment. **Report sheets have due dates that are listed in the schedule for lab and seminar.** You are strongly encouraged to hand in the report sheets well before the due date and prior to the quiz on the experiment. **Report sheets handed in after the due date will have points deducted from the score at a rate of 20% per week late!** This hopefully forces students to keep up with the workload and minimizes last minute grading by the lab instructors.

## Exams

One 100-point exam will be given during the last Friday of the semester.

**Total Lab score is made up by 25% lab exam, 40% lab quizzes and 35% lab reports. You must complete the lab with a 55% or you will fail the FULL course irrelevant of how well you did in lecture!**

**Students' biggest mistakes in Chem 1B lab/seminar - Very honest comments from Dr. Singmaster, in case you are interested**

- 1) **Not taking the time to do and understand all the problems in Study Assignment 13.** Those problems will *haunt* you all semester because all semester you are doing concentration and stoichiometry.
- 2) **Being desperate to leave lab early.** You have 4.25 hours to get it done right, to get help with the report sheet, to work out problems/worksheets/study assignments with classmates. Don't waste points because you were cutting corners, not checking your calculations, etc. For experiment 16 we often have as many as 50% of the students handing in calculations that are wrong. Take advantage of the fact that the lab instructor is there to see if you are doing the calculations correctly, etc.
- 3) **Not being ready for lab.** Read the experiment, attend seminar and create a summary (recipe) so that you know what to do. Do not expect others to have this for you. They might be lost and you do the wrong thing, wasting time, etc. Sometime many mess up because they followed the mistakes one person made.
- 4) **Expecting others to do the work for you when working in groups.** Those doing all the work will complain to the lab instructor and to me, and they will ask to have your name removed from the project!
- 5) Not taking advantage of the FREE Sci 1 workshops and of office hours with instructors.
- 6) **Waiting for magic to fix it all...** If you are lost, don't wait for your score in Lecture Exam I to prove it to you. By that time, you might not have the time to fix it and the material just gets harder.
- 7) **Forgetting material learned in Chem 1A.** For example, you learned how to draw a graph in Chem 1A. Use that knowledge in Chem 1B or we just take the points away and wonder why we passed you in Chem 1A.

Even for Exp. 23 final report I get graphs that are so wrong in terms of axis choices, correct plotting that it is depressing for me to grade.

8) **Doing poorly on the Safety Quiz and Syllabus/Ethics Quiz on Canvas.** You should get at least 90% in both of these so that you start with two GOOD quiz scores.

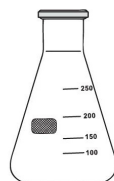
9) **Not paying attention to Prelab Quizzes for Exp. 16 and 23.** Both are giving you significant hints for the experiments!

10) **Not taking advantage of the resources YOU PAY FOR**, like: Counseling Services for test anxiety; Career Center to plan your future; Accessible Education Center if you have accessibility issues; Peer Connection for workshops and tutoring; Sci 1 and CoSAC for tutoring.

11) **Glassware Names** – Use them correctly. Figure out what they do. Measuring a volume is NOT the same as delivering a volume. A pipet delivers 10.00 mL to a flask, it does not contain 10.00 mL. The pipet sucked up a little more than 10.00 mL because it stays wet.



Volumetric flask  
(narrow neck)



Conical or  
Erlenmeyer flask

## Lab Schedule will be a separate document.

This will allow us to update it based on possible campus closures due to COVID restrictions and/or for bad weather days.

### **Beginner Course on Ethics in the Sciences and Engineering for Chem 1A/B Students**

These are some of the codes of ethics scientists, engineers, health professionals, etc. are expected to follow. There are courses (Phil 133) and textbooks on the subject of ethics that can cover much more material and expand on these topics. Not following these codes can: get you fired from a job, generate criminal/civil charges leveled against you and will definitely cause your colleagues to not respect your work. At SJSU not following these codes gets you reported to the Office of Student Conduct and Ethical development. Both colleges, Engineering and Science, report many students every year. You, as budding scientists, engineers, health professionals, need to start applying these codes in your work. Be aware that “Does the applicant behave ethically?” is a question faculty and former employers have to answer when serving as a reference for you.

1) **Never, ever make up data.** You cannot fabricate data to fit the final answer, even if you know the final answer. I understand that you want to please the professor and give her the right answer but this is not the way science is done. As an example as to why fabricating data is the wrong thing to do, think of medical researcher who made-up positive results on the testing of a new drug for diabetes just because he thinks it should work. Not a drug you would want to take! Or consider a civil engineer, whose calculation leads to answers he does

not like so he changes the value to something he thinks it should be. You might not want to use that bridge or building he built. We are often biased towards wanting a certain result but we can't let that bias cloud our judgement. Ultimately it is data correctly obtained and analyzed that will determine whether you have succeeded in proving your hypothesis.

2) **Never alter or delete your data.** If you have a data point that you feel is not valid because you are aware that you spilled some of the solution, or you clearly went past the end point in a titration, etc., you lightly cross out the information in your notebook or report sheet, not erase it, and then write an explanation as to what happened. You can also not incorporate that data point into the calculation of the average value, since you have written evidence of a fault in your technique which invalidated the run. In more advanced courses, you can submit your data to statistical scrutiny (least squares fit, T test, Q test, etc.) which will give you guidance on whether that data point can be removed from consideration. Again, think of a medical researcher who decides to ignore the one patient out of 20 that developed cancer while under the drug he was testing. You would not be pleased if this side effect is not reported to you when you are deciding on whether to use that drug. This is why those drug commercials often end with someone rapidly reading every side effect observed so far (which freaks most of us out!). They can't ignore one data point. Or consider the civil engineer who is testing 15 supporting beams and decides to ignore the one that is not meeting specs by a little bit because it is just one beam so the beam gets used in the construction.

3) **Never take someone else's data and claim it as your own (i.e. plagiarism).** This is what a subset of Chem 1A students are currently doing, looking at old report sheets. You signed a document indicating you would not do that! Occasionally in Chem 1A you will do experiments with a partner. That is fine, you collecting data for both of you. Or maybe you were out sick and provide documentation of the issue, then the instructor might give you a fake data set to work out a report sheet or instruct you to obtain a data set from another student. That is OK. But "stealing" data from a classmate in lab because you don't want to do the work or want to get out of lab early, or using data from an old report sheet is plagiarism and will be reported to SJSU. Aside from the sporadic permission from an instructor to obtain data from another student, you are not allowed to use data collected by another student, even if the student gives you permission to use it!

4) **Give credit to others that were involved in collecting the data.** This is why your report sheets often ask you to include the names of your partners, if the data was collected together. You should never work with other collaborators and then submit the data as only your work. That is one way to really upset your colleagues, get alienated from the group and possibly even sued if you make money from it. In the same manner, contribute your fair share if you expect to get credit for the work. A researcher that watches his colleagues do the work and does not contribute assistance physically, intellectually and, occasionally, even financially should not be included as a co-author.

This one is often an issue throughout your college education and at work. Whether it is an experiment in lab, your senior project or a report in a class, working in groups can be tough. All members have to contribute in some way if they want their name included in the report. The problem often is that one student wants to have an A paper and the other one just wants to pass the class with a C so she does not want to put in as strong an effort. The student who wants an A, Sally, does a lot of extra work to produce that A paper but then has to write the other student's name, Jill, on the paper. Sally will be angry that Jill is getting credit for her hard work, but she still has to write Jill's name because she contributed some effort, even if it was only 10%. Whenever possible try to form a group with people who have similar goals so that the work is better distributed and the commitment to the project is similar.

Since you are not generating new knowledge for the world when doing your Chem 1B experiment, we won't go into the rules for intellectual property. But that is also an issue that you need to learn about when you go work for a company in research and development. They own your ideas because they are paying for your time,

training and access to things (equipment, chemicals, journals, experts, etc.) that allow you to come up with the new idea.

### Self-test

1) Karen sees that Michael was assigned the same unknown as she was assigned. The lab is almost ending and Karen is one data run short. Without consulting with the instructor, Karen asks Michael whether she can copy one of his runs to her report sheet.

Karen behaved in an ethical manner.            True            False

2) Bill is doing the hydrate experiment, Exp. 2. He notices that his calculation leads to an average number of moles of water per molecule of hydrate of 192. This seems very illogical to him so he writes 2 as his final answer because he was able to look up the formula of the hydrate online.

Bill behaved in an ethical manner.    True            False

3) Jane and Lee have to do Exp. 12 as partners. They have to do three data runs to find the heat when Mg reacts with acid. The report sheet and the instructor indicate that the groups do two runs and then the third data set should be obtained from another group. Jane and Lee complete two runs and then copy their third run from Jack and Bill. On the sheet they write that they took their data for run 3 from Jack and Bill.

Jane and Lee behaved in an ethical manner.            True            False

4) Morgan finishes an experiment and goes home to do the report sheet. While at home he realizes that he did not collect all the needed data. Morgan texts a friend, Alexis, multiple times to share his data with him. He says please but Alexis says no. He continues to harass Alexis by text to provide the data.

Morgan is behaving in an ethical manner.    True            False

5) Sam does three runs for the titration in Exp. 6. While doing run 3 he notices that there are air bubbles in the tip of his pipet. He is also very certain that for run 3 he went over the end point by multiple drops because he had problems controlling the buret. He writes all three data runs on his report sheet but lightly crosses out run 3. He only averages the data for his first two runs. At the bottom of the report sheet he writes a note to his instructor indicating that he noticed air bubbles in the buret and had an issue with the buret releasing too much base at the end of the titration so this is why he did not include that run 3 in his calculations.

Sam behaved in an ethical manner.    True            False