

Chem 3BL General Chemistry Lab

Jeremy Barnett
Summer Session-2, 2024
7/29/24-8/30/24

COURSE INFORMATION

Welcome to Chem 3BL. This course, which focuses on science skills building with an emphasis on the general chemistry lab setting, introduces important concepts and practices related to lab safety, fundamental experimental techniques, chemical handling, waste disposal, data collection/analysis, scientific writing/communication, and small-group collaboration. You will work in an in-person lab setting as soon as COVID restrictions are removed. Other work will be done asynchronously online, mainly in Canvas and WebAssign.

INSTRUCTOR INFORMATION

I'm Jeremy Barnett (Jerah), instructor of record for the course. Please use email to contact me at jelabarn@ucsc.edu. Please don't hesitate to reach out to us for help.

Your TA is your primary contact. Please find their information below and in Canvas.

TA	Days/Times	Location	WebAssign Key
Jaden Knight jwknight@ucsc.edu	01A - Tu/Th 9:30-11:30AM #70831 LBS	Nat Sci 2 283	ucsc 1091 6456
Jaden Knight jwknight@ucsc.edu	01B - Tu/Th 12:00-2:00PM #70832 LBS	Nat Sci 2 283	ucsc 0542 8882
Tanya D'Souza taedsouz@ucsc.edu	01C - Tu/Th 2:00-4:00PM #70834 LBS	Nat Sci 2 283	ucsc 5708 2587

Materials:

Purchased access to online WebAssign lab materials and assignments at <http://webassign.net>

[Links to an external site.](#)

(ISBN 978-1-92-855080-8 General Chemistry Labs CHEM 1M and 1N). Please make sure you are registered with your legal name and correct student ID number (#####) before the second section meets. You should be able to access WebAssign through Canvas (and pay directly).

Lab notebook (composition book with grid preferred), scientific calculator; Microsoft Excel® (available for download @ucsc.edu credentials at <https://its.ucsc.edu/software/student-software.html>)

LEARNING OUTCOMES

- Conduct investigations individually and collaboratively following proper lab technique (e.g., correctly handling chemicals, using equipment, disposing of waste, etc.); assess safety considerations and obey safety rules.

- Assess the type, quantity, and accuracy of data needed to produce reliable measurements.
- Collect data, generate and evaluate results, analyze limitations and sources of error, and communicate outcomes.
- Apply mathematical techniques to calculate results based on data, including unit conversions in complex measurement problems with quantities having derived or compound units (e.g., mg/mL, kg/m³, etc.).
- Consider limitations on the precision of the data (e.g., number of trials, risk, time, equipment).
- Use statistical treatments, such as error propagation, to correctly represent the precision associated with derived results.
- Compare and contrast various procedures and data sets to examine consistency, precision, and accuracy of measurements and observations.
- Apply concepts of statistics and probability (such as linear fits using slope and intercept values) to find relationships between dependent and independent variables, using digital tools when feasible.
- Consider limitations of data analysis (e.g., measurement error, sample selection) when analyzing and interpreting data, when reporting results, and when discussing experimental assumptions and claims.
- Based on results, suggest changes to the procedure or its components to optimize precision and accuracy, keeping in mind what can be investigated within the scope of the laboratory with available resources.
- Apply scientific ideas, principles, and/or evidence to provide an explanation of observations and results, incorporating unanticipated effects and sources of experimental error.
- Communicate information, results, claims, and analysis (e.g., about the procedure in relation to the data and results) in multiple formats (e.g., orally, graphically, textually, mathematically).

Attendance:

Safety rules dictate that you attend the section in which you are officially enrolled.* Please arrive on time ready to participate fully in the lab section in the correct attire with your assignments for that class meeting completed. If you get into the course after the first section meets, please contact your TA so that you are ready for the next section meeting.

If you miss the first two sections, we respectfully ask that you drop the course and take it when you can be fully present from the start; you have missed too much important material, including safety rules and regulations (administrative drops may be requested).

Absences:

Please do not miss section.* Participating allows all of us to benefit from insights, assistance, and experience that each person brings. Please contact me and your TA in a timely manner (preferably in advance) regarding attendance or other factors impacting your ability to be successful in the class. Include your name, course, section, TA, and reason for absence or other concern.

*We understand that extenuating circumstances arise that might make it impossible for you to attend. Please email me and your TA (preferably in advance) regarding accommodation.

*Please do not attend if you are sick. Please email me and your TA (preferably in advance) regarding accommodation.

All absences will be reviewed on a case-by-case basis, and please understand that deductions may be applied or may be waived. Due to safety, space, and capacity constraints, we are not able to provide make-up opportunities (e.g., we cannot permit you to attend a different section, nor can we keep equipment/reagents/etc. available).

We want you to do well. If we do not hear from you, you may not be able to complete the tasks associated with course requirements, and this can result in a non-passing course grade. If you miss two or more sections, we may request that you drop or withdraw so that you can take the course when you are able to be fully present. Thank you.

COMMUNICATION

I will hold office hours with the schedule based on your feedback on good days and times. TAs will also hold office hours open to all students in the course. Please email me and your TA with specific questions or requests so that we can respond as quickly as possible. We try to respond in a timely way, generally by evening if not sooner for daytime messages and by morning for late night messages. Please email me and TAs with help requests.

Your TA is your first and primary contact. Make sure you have his/her/their contact information. Please email all of us (TAs and Randa) so that we can get you the help you need as soon as possible, and we will happily set up office hours for you!

STUDENT HOURS FOR CLASS

This is a 2-unit lab course. In addition to the two-hour bi-weekly lab sections, you should plan to spend twice as long per week on homework. This may vary person-to-person. Please do not hesitate to contact us for help if you need it.

Assignments and Assessments:

- We use WebAssign, Canvas, and written paper submissions for course assignments.
- Pre-lab written procedure + data tables (WP+DT) are to be written in your lab notebook before the lab starts. A complete description and rubric are available on Canvas.
- Pre-lab videos for certain experiments, viewable on Canvas.
- WebAssign Inlabs, 10 submissions per answer blank, no deductions.
- WebAssign reviews, 5 submissions per answer blank, no deductions.
- Abstracts (or scientific writing assignments), submitted on Canvas. A complete description and rubric are available on Canvas.
- Scholarship points will reflect your preparation, participation, collaboration and technique during the lab.

GRADING POLICY

*Lab is a hands-on experience where you get the opportunity to link experiments with concepts and calculations. Please attend all lab sections and turn in all assignments fully complete to pass the course. Your assignments should also contain reasonable values; up to 50% may be deducted if not (we can help if you see this). For most assignments, you have a week to finish them. If you have any questions during that time, please do not hesitate to ask. It's very important to keep up. Generally, a minimum of 25% off per day is applied for late work, and you must complete all assignments for credit. We review all reasons for late work on a case-by-case basis. We want you to succeed!

Grading (subject to updates)

Written prelab/procedures + data tables (lab notebook)	10%
Inlabs (WebAssign)	35%
Reviews (WebAssign)	10%
Written abstracts (Canvas)	20%
Canvas Videos	5%

Final activity (during last section)	5%
Scholarship points (arrival time, preparedness, in-lab actions)	15%

It is your responsibility to keep track of due dates and times.

Some assignments may take a little longer to complete. You should have section time to work together on calculations and discussion. If it's taking you much longer to do this work than seems reasonable, please talk to your TA or to me. It may be that there's some misunderstanding between us about the assignment. Talk to us and let's figure it out!

We would like to see how you are able to understand and apply the material, so we ask that you submit original work. According to university policy, plagiarism/cheating may result in a failing grade in the course and possible disciplinary action.

COURSE SCHEDULE

Date	Exp #	Reading and Activities	Deliverables
Tu 7/29	--	TA training + enrollment period	Please confirm your enrollment and section information.
Th 8/1	0	Course requirements; safety; locker assignments and equipment review; WebAssign; data collection, significant figures, error propagation; activity	WebAssign: introduction and tutorial. Canvas: Lab Room and Lab Locker videos In-class activity
Tu 8/6	16	Equilibrium and Le Châtelier's Principle	Notebook: prelab #16 (+Canvas)
Th 8/8	10	Determination of K_{sp} for Calcium Hydroxide	WebAssign: Inlab #16 and Review #16 Notebook: prelab #10 (+Canvas) Canvas: Burets and Volumetric Pipets and Limewater videos
Tu 8/13	5	Characterization of an Unknown Acid	WebAssign: Inlab #10 and review #10 Notebook: prelab #5 (+Canvas) Canvas: writing assignment #10 and pH meter and Buret video
Th 8/15	8	Acids, Bases, Salts, and Buffers	WebAssign: Inlab #5 and review #5 Notebook: prelab #8 (+Canvas)
Tu 8/20	4	Acid Neutralized by an Antacid Tablet by Back Titration	WebAssign: Inlab #8 and review #8 Notebook: prelab #4 (+Canvas)
Th 8/22	9	Determination of the Concentration of Allura Red in Mouthwash	WebAssign: Inlab #4 and review #4 Notebook: prelab #9 (+Canvas) Canvas: Intro to Spec 20 videos

Tu 8/27	12	Rate Properties and Rate Law of an Iodide Oxidation Reaction	WebAssign: Inlab #9 and review #9 Notebook: prelab #12 (+Canvas) Canvas: writing assignment #9
Th 8/29	Final	Finish assignments and grading	WebAssign: Inlab #12 and review #12

Prelabs:

Please complete each **prelab** before section for that experiment and submit a copy as an Assignment in Canvas as a .doc, .docx, or .pdf (convert images to a pdf file before submission). See Canvas for a description and instructions. You should be able to perform the experiment safely and efficiently based on your pre-section assignment. Copies of the procedure and electronics such as phones or laptops are not allowed at your lab bench.

You should be prepared to conduct all parts of the procedure; however, in section you may be informed of modifications to the procedure. Small groups may be assigned. For collaboration to be successful, it is important that you take responsibility for yourself and for your team members. You must make sure that everyone in your group has complete and correct data before leaving the lab room; your scores on assignments will reflect your group's dynamic.

Inlabs:

Please complete the **online Inlab assignments in WebAssign** by the specified due date/time. This assignment includes data, data analysis, results, and brief concept assessment questions. Significant figures are graded. Your TA will grade the free-response questions after the assignment closes. *Incomplete assignments will result in at least 50% off the assignment. If values are nonsensical and/or incorrect (and it is not due to experimental issues), you will lose at least 50% of the points.* You have **10 submissions in WebAssign**, no deductions.

Reviews:

Please complete the **online review assignments in WebAssign** by the specified due date/time. You must complete these questions by the specified due date/time. You **have 5 submissions in WebAssign, -10% after the first submission (per question)**.

Abstracts:

You will write two **abstracts** for specified experiments and submit your work in Canvas (unless otherwise instructed) by the start of the next lab section. An abstract is a brief statement discussing procedure, results, and error analysis. Please see the guidelines and rubrics in Canvas and consult your TA on the format and content.

FINAL ACTIVITY

During your final lab section, you will perform a final activity that draws on the knowledge you have gained during the quarter. The TA will perform an in-class assessment.

Videos:

The videos are in Canvas. We appreciate your preparation because it helps the lab go smoothly and safely. Please watch the assigned video(s) before the associated section so that you are familiar with certain techniques and procedural steps before performing the experiment.

Scholarship points:

Lab settings are dynamic where Principles of Community are critical. Everyone has a better lab experience if you act according to rules and regulations that keep you safe, that allow for effective learning, and that show respect for your lab mates, TA, instructor, and staff as well as chemicals/reagents, equipment, glassware, instrumentation, facilities, and waste. If your actions are not compatible with effective and safe lab work, you may lose scholarship points (and may be asked to leave the lab). No scholarship points will be awarded for labs missed.

Late submissions:

Please keep track of due dates and times. If you miss a due date in Canvas/WebAssign, please email your TA and Melissa. Please include your full name, class, and section, and please indicate if you have relevant DRC accommodations. Also please explain the reason for the late work so that we can assess if any deductions should be applied. Your assignment will be extended for a reasonable time; any deduction would be applied manually after you submit the completed assignment.

If you are absent for an unapproved reason, deductions for late assignments are a minimum of 25% per day; this includes turning work in at the end of the lab period.

Grading:

A+ 97-100%

A 93-96.99%

A- 90-92.99%

B+ 87-89.99%

B 83-86.99%

B- 80-82.99%

C+ 77-79.99%

C 73-76.99%

C- 70-72.99%

D+ 67-69.99%

D 63-66.99%

D- 60-62.99%

F < 60%

TA/INSTRUCTOR FEEDBACK

WebAssign grades some of the work submitted through that platform; your TA assesses the portions of your Inlab that involve free-response discussion. Your TA will also score your written prelabs and your scientific writing (abstracts). There are guidelines and rubrics available in Canvas for assignments such as your prelab and your abstracts, and each week in section you will have an opportunity to review your past and present work with your TA and classmates.

STUDENT FEEDBACK

Please do not hesitate to send us feedback about your experience. Please try to include constructive suggestions to help us address your comments. Here is [CITL's Guide to Giving Useful Feedback to Instructors and TAs](#)

At the end of the quarter, you will be asked to complete a Student Experience of Teaching survey for this course. SETs give an opportunity for you to give valuable feedback on your learning that is honest and constructive. This anonymous feedback will help me consider modifications to the course that will help future students learn more effectively.

ACADEMIC INTEGRITY

All members of the UCSC community benefit from an environment of trust, honesty, fairness, respect, and responsibility. You are expected to present your own work and acknowledge the work of others to preserve the integrity of scholarship.

Academic integrity includes:

- Following class rules
- Using only permitted materials and resources
- Viewing course materials only when permitted by your instructor
- Incorporating proper citation of all sources of information
- Submitting your own original work

Academic misconduct includes, but is not limited to, the following:

- Accessing course materials without permission
- Copying/purchasing any material from another student, or from another source, which is submitted for grading as your own
- Plagiarism, including use of Internet material without proper citation
- Using cell phones or other electronics to obtain outside information without explicit permission from the instructor
- Submitting your own work in one class that was completed for another class (self-plagiarism) without prior permission from the instructor.
- Violations of the Academic Integrity policy can result in dismissal from the university and a permanent notation on a student's transcript. For the full policy and disciplinary procedures on academic dishonesty, students and instructors should refer to the [Academic Misconduct page](#) at the [Division of Undergraduate Education](#).

ACCESSIBILITY

UC Santa Cruz is committed to creating an academic environment that supports its diverse student body. If you are a student with a disability who requires accommodations to achieve equal access in this course, please submit your Accommodation Authorization Letter from the Disability Resource Center (DRC) to me privately during my office hours or by email, preferably within the first two

weeks of the quarter. At this time, I would like us to discuss ways we can ensure your full participation in the course. I encourage all students who may benefit from learning more about DRC services to contact the DRC by phone at 831-459-2089 or by email at drc@ucsc.edu.

Service animals:

Please notify us as soon as possible if you have a service animal who will be coming to lab with you. Please include details (e.g., species, breed/size, physical proximity needs, etc.). We want to keep you and your companion safe.

RELIGIOUS ACCOMMODATION

UC Santa Cruz welcomes diversity of religious beliefs and practices, recognizing the contributions differing experiences and viewpoints can bring to the community. There may be times when an academic requirement conflicts with religious observances and practices. If that happens, students may request reasonable accommodations for religious practices. The instructor will review the situation to provide reasonable accommodations without penalty. You should first discuss the conflict and your requested accommodation with your instructor early in the term. You or your instructor may also seek assistance from the [Dean of Students office](#).

PRINCIPLES OF COMMUNITY

Instructors may want to involve students in the preparation of principles of community for your course. This allows students to be partners in deciding what guidelines you will collectively follow to ensure free, open, and respectful discussions. A sample of such principles appears below:

The University of California, Santa Cruz expressly prohibits students from engaging in conduct constituting unlawful discrimination, harassment or bias... [More here](#). I am committed to providing an atmosphere for learning that respects diversity and supports inclusivity. We need to work together to build this community of learning. I ask all members of this class to:

- be open to and interested in the views of others
- consider the possibility that your views may change over the course of the term
- be aware that this course asks you to reconsider some “common sense” notions you may hold
- honor the unique life experiences of your colleagues
- appreciate the opportunity that we have to learn from each other
- listen to each other’s opinions and communicate in a respectful manner
- keep confidential discussions that the community has of a personal (or professional) nature
- ground your comments in the texts we are studying. Refer to the texts frequently and make them the focus of your questions, comments, and arguments. This is the single most effective way to ensure respectful discussion and to create a space where we are all learning together.

TITLE IX/CARE ADVISORY

This statement was created in collaboration with the UC Santa Cruz Title IX Office and leadership at CARE.

UC Santa Cruz is committed to providing a safe learning environment that is free of all forms of gender discrimination and sexual harassment, which are explicitly prohibited under Title IX. If you have experienced any form of sexual harassment, sexual assault, domestic violence, dating violence, or stalking, know that you are not alone. The Title IX Office, the Campus Advocacy, Resources & Education (CARE) office, and Counseling & Psychological Services (CAPS) are all resources that you can rely on for support.

Please be aware that if you tell me about a situation involving Title IX misconduct, I am required to share this information with the Title IX Coordinator. This reporting responsibility also applies to

course TAs and tutors (as well as to all UCSC employees who are not designated as “confidential” employees, which is a special designation granted to counselors and CARE advocates). Although I must make that notification, you will control how your case will be handled, including whether or not you wish to pursue a formal complaint. The goal is to make sure that you are aware of the range of options available to you and that you have access to the resources you need.

Confidential resources are available through [CARE](#). Confidentiality means CARE advocates will not share any information with Title IX, the police, parents, or anyone else without explicit permission. CARE advocates are trained to support you in understanding your rights and options, accessing health and counseling services, providing academic and housing accommodations, helping with legal protective orders, and more. You can contact CARE at (831) 502-2273 or care@ucsc.edu.

In addition to CARE, these resources are available to you:

- If you need help figuring out what resources you or someone else might need, visit the [Sexual Violence Prevention & Response \(SAFE\) website](#), which provides information and resources for different situations.
- [Counseling & Psychological Services \(CAPS\)](#) can provide confidential counseling support. Call them at (831) 459-2628.
- You can also report gender discrimination and sexual harassment and violence directly to the University’s [Title IX Office](#), by calling (831) 459-2462 or by using their [online reporting tool](#).
- Reports to law enforcement can be made to the UC Police Department, (831) 459-2231 ext. 1.
- For emergencies, call 911.

DIFFICULT CONVERSATIONS

In our in-class and online discussions and dialogues, we may explore challenging, high-stakes scientific issues. We sometimes make mistakes in our speaking and our listening. We may need patience or courage or imagination or any number of qualities in combination. We always need respect for others. This effort will ultimately deepen our understanding and allow us to make the most of being in a community with people of many backgrounds, experiences, and positions.

REPORT AN INCIDENT OF HATE OR BIAS

The University of California, Santa Cruz is committed to maintaining an objective, civil, diverse and supportive community, free of coercion, bias, hate, intimidation, dehumanization or exploitation. The Hate/Bias Response Team is a group of administrators who support and guide students seeking assistance in determining how to handle a bias incident involving another student, a staff member, or a faculty member. To report an incident of hate or bias, please use the following form: [Hate/Bias Report Form](#).

STUDENT SERVICES

[Counseling and Psychological Services](#)

Many students at UCSC face personal challenges or have psychological needs that may interfere with their academic progress, social development, or emotional wellbeing. The university offers a variety of confidential services to help you through difficult times, including individual and group counseling, crisis intervention, consultations, online chats, and mental health screenings. These services are provided by staff who welcome all students and embrace a philosophy respectful of clients’ cultural and religious backgrounds, and sensitive to differences in race, ability, gender identity and sexual orientation.

[Student Success and Engagement Hub](#)

The Division of Student Success provides campus-wide coordination and leadership for student success programs and activities across departments, divisions, the colleges, and administrative units.

[Tutoring](#) and Learning Support

At Learning Support Services (LSS), undergraduate students build a strong foundation for success and cultivate a sense of belonging in our Community of Learners. LSS partners with faculty and staff to advance educational equity by designing inclusive learning environments in Modified Supplemental Instruction, Small Group Tutoring, and Writing Support. When students fully engage in our programs, they gain transformative experiences that empower them at the university and beyond.

[Slug Support Program](#)

College can be a challenging time for students and during times of stress it is not always easy to find the help you need. Slug Support can give help with everything from basic needs (housing, food, or financial insecurity) to getting the technology you need during remote instruction.

To get started with SLUG Support, please contact the [Dean of Students](#) Office at 831-459-4446 or you may send us an email at deanofstudents@ucsc.edu.

Slug Help/[Technology](#)

The ITS Support Center is your single point of contact for all issues, problems or questions related to technology services and computing at UC Santa Cruz. To get technological help, simply email help@ucsc.edu.

On-Campus Emergency Contacts

Slug Help/[Emergency Services](#). For all other help and support, including the health center and emergency services, start [here](#). Always dial 9-1-1 in the case of an emergency.