

**General Chemistry I LABORATORY
(CHE1052L)
Fall 2023 Syllabus**

COURSE DESCRIPTION

CHE1052L is the laboratory course that accompanies CHE1052, the first-semester general chemistry course at Point Loma Nazarene University. These two courses are separately graded corequisites designed to be taken during the same semester.

CHE1052 (4 units): Study of the basic principles of modern chemistry. Emphasis on atomic and molecular structure, chemical bonding, gas laws, states of matter, thermochemistry, and solutions. Course includes one 3½ hour laboratory each week. Prerequisite: Satisfactory high school background or CHE 1003. Corequisite: CHE 1052L.

CHE1052L (1 unit): An inquiry-based laboratory accompanying CHE1052 featuring one 3.5-hour laboratory each week. Letter graded. Corequisite: CHE1052.

ALL LABS HELD IN SATOR HALL 209			
LAB MEETING DAYS, INSTRUCTORS, and TIMES:			
Monday	Tuesday	Wednesday	Thursday
	Section 3 (Ponty) Tue 8:00 – 11:30 am		Section 8 (Siegmundt) Thu 8:00 – 11:30 am
Section 1 (Stoneburner) Mon 2:45 – 6:15 pm	Section 4 (Martin) Tue 1:30 – 5:00 pm	Section 6 (Stoneburner) Wed 2:45 – 6:15 pm	Section 9 (Siegmundt) Thu 1:30 – 5:00 pm
Section 2 (Balisi) Mon 6:30 – 10:00 pm	Section 5 (Garland) Tue 6:30 – 10:00 pm	Section 7 (Schumacher) Wed 6:30 – 10:00 pm	
REQUIRED MATERIALS:			
<ol style="list-style-type: none"> 1. Lab Manual (provided documents on Canvas which students must print week by week). 2. Safety Goggles and Lab Coat are available for cash-only purchase in class on first day of lab: <ol style="list-style-type: none"> a. ANSI Z87.1 Safety Glasses, \$6. b. AAMI Level 2 SMS Lab Coat, \$2. <p>You may bring your own coat or goggles if equally protective or better. Goggles, if used, should have indirect venting. For activities that <i>require</i> safety goggles instead of safety glasses, goggles will be available to borrow for the duration of the lab period.</p> 3. Scientific Calculator: Make sure your calculator has sufficient functionality (e.g., natural log functions and readily accessible scientific notation entries). The TI-30X IIS is a good example of an appropriate scientific calculator. Note that graphing or programmable calculators are not permitted in the lecture or lab courses. 4. Course Website: http://canvas.pointloma.edu, course: CHE1052L-1 FA23 (The Canvas sections are all put together for logistical simplicity, so the course will be "1052L-1" regardless of your specific section number. Please refer to Workday for your section number.) 			
LAB COORDINATOR:			
Dr. Sam Stoneburner, stonebu@pointloma.edu , Office: Rohr Science 322 (enter through 330) Open office visits most Mondays, Wednesdays, and Fridays, 1:15-2:00 pm			

LEARNING OUTCOMES

An understanding of chemistry is a necessary part of an education in the basic and applied sciences, engineering, and medical professions. It also provides insight and increased comprehension regarding current events, public policy, consumer safety, and personal nutrition. Specifically, upon completion of CHE1052 and CHE1052L, students will be able to:

- Demonstrate a foundational knowledge of the general principles of chemistry including atomic and molecular structure, chemical bonding, states of matter, solutions, etc.
- Solve problems related to unit conversions, stoichiometry, energy, gas laws, etc.
- Perform basic chemical laboratory techniques related to the topics listed above.

SAFETY

Safety is THE top priority in the lab. You will be required to sign a safety agreement form before you can take part in the lab. The agreement form delineates safety rules set forth by the department. These rules include (but are not limited to) the following:

- Food and drinks are prohibited from entering the laboratory. You may leave them in a designated area outside of the laboratory while in class.
- You must come wearing lab-appropriate clothing, including long pants (i.e., pants that COMPLETELY cover all skin down to the top of your shoes or socks), closed-toed shoes, and shirts that cover the shoulders, back, and stomach.

If you fail to comply with these or *any* of the rules in the safety agreement, you may be excluded from the lab and will not have the opportunity to make up missed assignments.

STRATEGIES for SUCCESS in CHE1053L

- Come prepared to lab. Lab does not start when you walk through the door; it starts the previous week as you make yourself ready to do the experiment properly and safely.
 - Print the lab manual and report form, read them, and envision what you'll be doing in the lab. Anticipate what data will be collected and what calculations will be needed. Bring the printed materials with you to lab.
 - Take the pre-lab preparation quiz (Quiz A) on Canvas BEFORE coming in to lab.
 - Continue to study the lab materials. You will have a closed-book quiz in lab (Quiz B) at the beginning of each lab period.
 - The PLNU Credit Hour Policy states that 2 hours of preparation per 3 hours of lab time is "normal", meaning almost **2.5 hours per week outside of the lab** would be reasonable for the CHE1052L lab course for a well-prepared student. Students with reduced high-school preparation (e.g., students who had high-school chemistry as a remote class due to COVID-19) may require additional time.
- Get help when you don't understand something. The instructors and TAs are here for you!
- Pay attention in lab. Know what you're doing, what chemicals you're using, and what positive or negative results you should be observing during the lab procedure.
- Take the lab seriously from the very beginning. Review labs directly after class, and prior to the following week.

GRADING and ASSESSMENT

The following graded items will contribute to your overall grade in CHE1052L:

Lab Reports: 80% Pre-Lab Quizzes (Quiz A): 10% In-Lab Quizzes (Quiz B): 10%

There is no final exam for CHE1052L.

The lowest grade in *each* of these categories will be dropped automatically by Canvas. Do not expect your grade to suddenly improve at the end of the semester due to the dropped grades, as the score you see at any point in the semester will already reflect the dropped grades.

Letter grades will be assigned according to the following scheme:

A-range	B-range	C-range	D-range	F-range
A: Any grade of 93.00% or above.	B+: 87.00-89.99 %	C+: 77.00-79.99 %	D+: 67.00-69.99 %	F: Any grade below 60.00% <i>or 3 absences if after Nov. 3</i>
	B: 83.00-86.99 %	C: 73.00-76.99 %	D: 63.00-66.99 %	
A-: 90.00-92.99 %	B-: 80.00-82.99 %	C-: 70.00-72.99 %	D-: 60.00-62.99 %	

Pre-lab preparation quiz (Quiz A)

Each lab will have a pre-lab preparation quiz (Quiz A) that is due on Canvas BEFORE the beginning of lab. These quizzes are designed to check each individual student's understanding of the current and previous week's experiments. There will be 5 questions (usually multiple choice), some of which will require you to critically think about the meaning or purpose behind the concepts or procedural steps in that week's experiment. This is not just a reading quiz; do not expect the answers to all be explicitly stated in the provided material.

You are permitted to use your lab manual and report form (but not classmates or other outside help) while you take each Quiz A. You may take the quiz any time in the week leading up your lab time, but once you begin the quiz you will have 15 minutes to complete it. Your quiz grades will be posted after the last section of the week has completed the lab and the lab coordinator has reviewed the results.

In-lab preparation quiz (Quiz B)

Each lab will also have an in-lab quiz (Quiz B) that will be take on Canvas immediately at the start of the lab period. The quiz will automatically close 15 minutes after the start of the lab period. You will need a phone, laptop, or some other Canvas-compatible device to take Quiz B each week.

These quizzes are designed to check each individual student's understanding of any safety precautions and waste protocols. There will be 5 questions (usually multiple choice). You are

NOT permitted to use your lab manual, report form, or any other materials while taking Quiz B (i.e., it is a closed-book quiz). Your quiz grades will be posted after the last section of the week has completed the lab and the lab coordinator has reviewed the results.

Note that the 15-minute window to take Quiz B is NOT an invitation to arrive 15 minutes late. Being late by any amount of time puts you at risk of getting logged as absent, which means a “0” on that week’s lab report. (See the Attendance policies below for more detail.)

Lab reports

You are responsible for all the material covered in lab, even if you did not attend. Experiments may be done individually or in pairs. Your lab instructor and/or lab manual will specify when you work in pairs. In either case, individual lab reports will be submitted at the end of each period unless noted otherwise. Lab reports will be submitted electronically on Canvas (see “Scanning PDFs” below), but you will also turn in the hard copy at the end of lab.

Lab safety, participation, and post-lab cleanup will be monitored and may affect a student’s grade if they are at a substandard level, particularly if there are repeated and/or egregious violations. Factors include your preparedness for each experiment as you arrive in lab; your participation in each part of the experiment, whether working individually or with a partner; your attention to lab safety and neatness during lab; and cleanup of your lab space and public lab spaces, as needed. Leaving out equipment or chemicals when you leave the lab for the day are especially effective ways to lower your grade, as is disposing of leftover chemicals or waste in the wrong way. *Make sure your instructor or TA examines your station and signs your lab report before you leave.*

Your lab report will be graded in Canvas according to the rubrics that will be visible in Canvas. Your grades will be posted after the lab coordinator has reviewed the results.

Scanning PDFs

You will have to scan in your handwritten lab report forms before you submit them on Canvas. You can do this with campus copiers in the library across the street, but most often the more convenient choice will be to use a smartphone (e.g., with the Notes app for iPhones or the Adobe Scan app for Android).

Whatever method you choose, make sure that you have all pages of the assignment in one PDF file rather than a separate file for each page. Multiple-file submissions may be rejected as incomplete. Additionally, make sure that the pages are legible in the scanned file. View your submission on Canvas before you leave the lab. You are responsible for making sure that your submission is complete and legible *in Canvas*.

Grading disputes and corrections

Any questions, disputes, or appeals regarding grades should be [directed to the lab coordinator](#). If you believe any part of your lab report was not graded properly according to the rubric, you may ask the lab coordinator to re-grade it. By asking for a re-grade, you acknowledge and accept that any and all grading errors will be corrected, and so your grade may go up *or down*. Note that FERPA (federal privacy laws) prevents us from discussing comparisons with other students' grades, even if another student has revealed their grades to you directly.

Your grade is unlikely to change unless there is evidence that a rubric was improperly applied or the policies described in this syllabus were not followed. Personal circumstances outside of lab are not taken into consideration when assigning or re-evaluating grades. In cases of extreme personal hardship it may be possible to take an Incomplete and finish the lab in the following semester (see the Attendance policy below for more details).

“Extra credit”, “curving”, “rounding up” of the final grade, or dropping of *additional* assignment scores will generally not be offered and should not be expected or requested. Grades are ultimately the responsibility of the lab coordinator, and all questions relating to grades should be [directed to them](#).

ATTENDANCE

Regular and punctual attendance at all classes is essential for learning, and lab classes are participation-based. Being late for lab will cause significant issues for students as they will miss any pre-lab lectures which cover safety and procedures in detail. Laboratory sections will meet on a weekly basis unless specified otherwise. (See schedule at the end of the syllabus. Note that the Monday sections are meeting on Friday, September 8th, due to the Monday of that week being Labor Day.)

If you are absent for 2 lab periods (more than 10 percent of class sessions), the lab coordinator will issue a written warning of de-enrollment. If the absences exceed 20 percent (3 lab periods), the student may be de-enrolled without notice until the course withdrawal date (Nov. 3) or, after that date, receive an “F” grade. Note that ALL absences are counted toward this total, even if one of them is your “dropped” lab report score.

If you have unavoidable circumstances that necessitate missing multiple labs, you may need to consider withdrawing from the course (if before the withdrawal date) or requesting an Incomplete from the lab coordinator and finishing the course the following semester. Incompletes will be given only in cases of extraordinary hardship, such as an ongoing medical crisis. If you are considering asking for an Incomplete, please [discuss your situation with the lab coordinator](#) as soon as possible.

Lateness and absences:

Instructors are not required to allow you to participate if you arrive after the start of lab time. Your instructor may choose to prohibit you from participating in lab at any time after the start of the lab period. For instance, your instructor may have already communicated vital safety information, or they may have found that there has been a troubling pattern of tardiness. However, these are just examples. If you are late, by any amount of time, your instructor does NOT need to give you a specific justification for telling you to leave.

You will be considered “absent” and get a zero on the lab report if *any* of the following take place. Remember, having 3 absences automatically means an “F”.

- You do not attend your regularly scheduled section (unless you have made *prior* arrangements with the lab coordinator to attend a different section that same week)
- You arrive after 15 minutes past the start time
 - This is a firm policy, and your instructor does NOT have the authority to permit you to participate if you arrive late by 15 minutes or more
- You arrive late (by any amount of time) and your instructor tells you to leave
- Your instructor tells you to leave due to disregard for safety, a lack of participation, or other violations of the lab rules
 - If you arrive in clothing that does not comply with lab safety rules, you may still participate in lab IF and ONLY IF you are back in lab in compliant clothing within the first 15 minutes of the lab period. If you arrive after the 15-minute mark, it is still an absence and a zero, even if you were present earlier (but not correctly attired).

You will also get a zero on the lab report for any of the following, but they will not count as absences:

- You do not turn in your lab report by the end of the lab period
 - Any technical difficulties with scanning or Canvas should be reported immediately to the instructor or the TA. You will not receive a zero for “late” submissions if your instructor or TA confirms that you had a completed lab report and you were unable to turn it in by the cutoff time.
- You leave without having completed all necessary cleanup (as determined by the instructor or TA)
 - The best way to avoid losing points due to cleanup is to make sure your instructor or TA examines your station and signs your lab report before you leave.

Any zero scores on lab reports due to any of the above reasons will not be reversed unless a student can provide compelling evidence that a course or university policy was not properly followed. Any questions or disputes should be directed to the [lab coordinator](#), not to the individual section instructor.

Late work and making up labs:

Late work will not be accepted under any circumstances. If Canvas is having technical problems when you need to submit your lab, you will need to have your instructor or TA vouch for your lab being completed on time in order for it to be accepted.

There is no way to make up a missed lab after the fact. As specified in the PLNU student [handbook](#), “Activities of a unique nature, such as labs... cannot be made up except in rare instances when instructors have given advanced, written approval for doing so.”

If you are aware *in advance* that you need to be absent during your usually scheduled lab time, you may [ask the lab coordinator](#) for permission to attend a different section that same week. Any such requests must be received by the lab coordinator by 5pm on the Thursday of the week *before* the lab in question. Please include the specific section or sections you would be able to attend that same week. If approval is granted, quiz deadlines and access times will be adjusted to match the section of actual attendance that week.

Approval to make up a lab by attending a different section is not guaranteed, and will depend on the capacity of the alternative lab section. We understand that the attendance policy in general is quite strict, so we want to offer this flexibility when we can. However, you are expected (by university policy) to attend your registered section if at all possible, so multiple requests to attend alternative lab sections are less likely to be approved unless it is a demonstrable necessity.

Make-ups will never be approved for times other than regularly scheduled lab sessions. Similarly, you cannot make up a lab by attending on a different week, when a different experiment is being performed. Offering make-up lab sessions outside of the scheduled times or offering lab activities outside of their specific scheduled week imposes an undue hardship on the staff and the general operation of the program. We also cannot allow students to attend labs beyond the official capacity, as this creates an unacceptable safety hazard.

Under no circumstances can any labs be made up remotely through Zoom participation or through some kind of at-home assignment. The American Chemical Society, our primary professional organization, actively discourages any use of virtual labs in the context of face-to-face courses. A significant part of the purpose of the general chemistry laboratory courses is to develop practical lab skills, and to use out-of-lab alternatives would fundamentally alter the academic standards of the course.

There is no such thing as an “excused” absence in CHE 1052L. Students who are required to be absent due to athletic events or similar activities are expected to make advance arrangements to make up the lab as described above. The policy of “dropping” your lowest grade is intended to account for cases where someone must be off-campus for the entire week. If you have only one absence throughout the semester, your grade will not be impacted.

Medical absences:

Missing lab due to illness will be counted as an absence in all cases, but we do not want you to feel like you must come in sick, which is why you drop your lowest lab grade. Please do not submit doctor's notes, as that will not change the absence and such notes frequently reveal an unnecessary level of personal medical information. Please do not ask the Wellness Center to provide a note, as they do not provide that service and have been inundated with fruitless requests in recent semesters.

If you have a chronic medical condition that you anticipate may result in multiple missed labs, please contact the Educational Access Center (EAC) about the possibility of getting an accommodation for attendance. Students with attendance accommodations should [contact the lab coordinator](#) at the beginning of the semester (or as soon they receive the accommodation) to discuss the specifics of their situation. In general, the same make-up procedure and requisite advanced notice will be followed for predictable events (such as appointments for specialized medical care).

Often when the EAC has set up an attendance accommodation, the need for medical absences are *not* known several days in advance. In such cases, and **ONLY** with the appropriate EAC accommodation, a plan may be made for a standing alternative lab section. Students who expect to need this sort of arrangement are strongly encouraged to register for lab sections that meet early in the week so as to maximize the available options for emergency makeups. (See also the other comments about EAC accommodations later in the syllabus.) This sort of emergency makeup is strictly limited to students who have a demonstrable need as evidenced by an EAC attendance accommodation, and who have made a specific plan with the lab coordinator *in advance*. For **ALL** other circumstances, makeups are not possible except with the advance notice and approval described above.

No changes, shifts, or swaps in lab schedule will be permitted except in the circumstances described above. Operating general chemistry labs on schedule requires significant logistical investment from a great many people; deviating from that schedule imposes an undue burden on our hardworking staff.

OTHER POLICIES

Technology: The use of portable electronic devices (phones, laptops, iPads, etc.) not related to the course is not permitted during the lab discussion and procedures. However, you will need to use a smartphone or some similar device to take the Canvas quizzes and to scan in your lab report at the end of each lab. Some lab activities may also require a phone or a laptop during the experiment. Speak with your instructor at the beginning of the semester if you do not own a suitable device so that alternative arrangements can be established.

PLNU's course-information website, Canvas (<http://canvas.pointloma.edu>), is used as a repository for course material such as grades and miscellaneous items. **Announcements will be sent out via Canvas. It is your responsibility to check Canvas regularly and to confirm that your correct email address is in the system.** Also, be prepared to interact with your instructor or the Lab Coordinator via your pointloma.edu email address. This means regularly checking your school email.

PLNU academic accommodations policy: PLNU is committed to providing equal opportunity for participation in all its programs, services, and activities. Students with disabilities may request course-related accommodations by contacting the Educational Access Center (EAC), located in the Bond Academic Center (EAC@pointloma.edu or 619-849-2486). Once a student's eligibility for an accommodation has been determined, the EAC will issue an academic accommodation plan ("AP") to all faculty who teach courses in which the student is enrolled each semester.

PLNU highly recommends that students speak with their professors during the first two weeks of each semester/term about the implementation of their AP in that particular course and/or if they do not wish to utilize some or all of the elements of their AP in that course. In this case, that means [speaking with the lab coordinator](#). Students should have this discussion with the lab coordinator even if they were using the same accommodations in the previous semester. Students should be aware that not all accommodations can be applied to the chemistry lab in the same way as in many lecture courses.

Students who need accommodations for a disability should contact the EAC as early as possible (i.e., ideally before the beginning of the semester) to assure appropriate accommodations can be provided. It is the student's responsibility to make the first contact with the EAC.

Note that the "hands-on" nature of the lab class limits how accommodations can be applied without fundamentally altering the academic standards of the course. Please discuss the specific accommodations you are interested in applying to CHE 1052L with the lab coordinator as early as possible.

PLNU academic behavior policy: Both faculty and students at Point Loma Nazarene University have the right to expect a safe and ordered environment for learning. Any student behavior that is disruptive or threatening is a serious affront to Point Loma Nazarene University as a learning community. Students who fail to adhere to appropriate academic behavioral standards may be subject to discipline. *In the context of chemistry lab courses, failure to comply with **any one** of the safety rules and policies may qualify as disruptive behavior.* See [Academic Policies](#) for additional definitions of different kinds of disruptive behavior and for further policy information.

PLNU academic honesty policy: Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. Academic dishonesty is the act of presenting information, ideas, and/or concepts as one's own when in reality they are the results of another person's creativity and effort. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for that assignment or examination, or, depending on the seriousness of the offense, for the course. Faculty should follow and students may appeal using the procedure in the university Catalog. See [Academic Policies](#) for definitions of kinds of academic dishonesty and for further policy information.

In the context of a lab course, academic honesty does not mean that you have to cite your lab partner on every line on a data table. If you were assigned to work together, and you put your partner's name on the lab report, it is already assumed that you both worked together to gather the data. However, if you were to use data from a different group, you would need to give them credit. Academic honesty *does* mean that you are not thoughtlessly copying your partner's answers for your own lab report. It also means that you should not copy from a lab report that someone turned in for some previous semester, *even if that someone was you*.

Academic dishonesty also includes lying in order to gain an advantage, especially lying about what another instructor has said.

Artificial Intelligence (AI) Policy: Use of Artificial Intelligence (AI) tools (e.g, ChatGPT, iA Writer, Marmot, Botowski) is not permitted, and use of these tools will be treated as plagiarism.

Sexual misconduct and discrimination: Point Loma Nazarene University faculty are committed to helping create a safe learning environment for all students. If you (or someone you know) have experienced any form of sexual discrimination or misconduct, including sexual assault, dating or domestic violence, or stalking, know that help and support are available through the Title IX Office at pointloma.edu/Title-IX. Please be aware that under Title IX of the Education Amendments of 1972, **it is required to disclose information about such misconduct** to the Title IX Office.

If you wish to speak to a confidential employee **who does not have this reporting responsibility**, you can contact Counseling Services at counselingservices@pointloma.edu or find a list of campus pastors at pointloma.edu/title-ix

PLNU copyright policy: Point Loma Nazarene University, as a non-profit educational institution, is entitled by law to use materials protected by the US Copyright Act for classroom education. Any use of those materials outside the class may violate the law.

Spiritual care: PLNU strives to be a place where students grow as whole persons. To this end, we provide resources for our students to encounter God and grow in their Christian faith. If you have questions, a desire to meet with the chaplain, or if you have prayer requests, you can contact the [Office of Student Life and Formation](#).

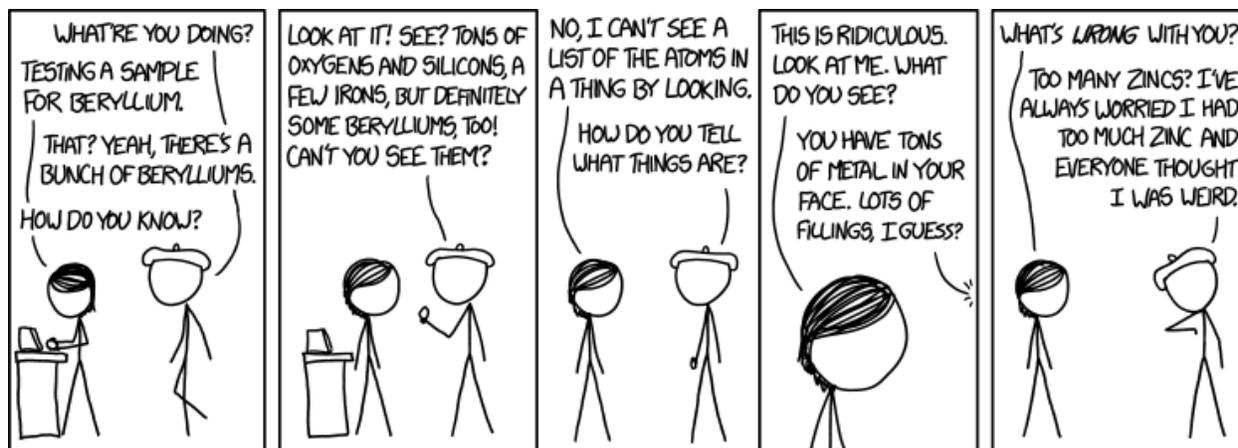
State authorization: State authorization is a formal determination by a state that Point Loma Nazarene University is approved to conduct activities regulated by that state. In certain states outside California, Point Loma Nazarene University is not authorized to enroll online (distance education) students. If a student moves to another state after admission to the program and/or enrollment in an online course, continuation within the program and/or course will depend on whether Point Loma Nazarene University is authorized to offer distance education courses in that state. It is the student's responsibility to notify the institution of any change in his or her physical location. Refer to the map on [State Authorization](#) to view which states allow online (distance education) outside of California.

PLNU Mission: To Teach ~ To Shape ~ To Send.

Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service becomes an expression of faith. Being of Wesleyan heritage, we aspire to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

Foundational Explorations Mission:

PLNU provides a foundational course of study in the liberal arts informed by the life, death, and resurrection of Jesus Christ. In keeping with the Wesleyan tradition, the curriculum equips students with a broad range of knowledge and skills within and across disciplines to enrich major study, lifelong learning, and vocational service as Christ-like participants in the world's diverse societies and culture.



xkcd.com/1490/

SCHEDULE for CHEMISTRY 1052L

The schedule may change during the semester. Watch Canvas for updates.

DATES	LABORATORY
Aug. 28 – Sep. 1	Check-in Exp. 0 – Safety, Equipment, Significant Figures, Measurements
Sep. 5-8*	Exp. 1 – Density *No lab meetings on Labor Day (Sep. 4). Monday lab students will meet on the following Friday (Sep. 8th) during their regularly scheduled lab times.
Sep. 11-14	Exp. 2 – Zinc Iodide
Sep. 18-21	Exp. 3 – Crystal Structures
Sep. 25-28	Exp. 4 – Acid-Base Titration
Oct. 2-5	Exp. 5 – Determining R, the Ideal Gas Constant
Oct. 9-12	Exp. 6 – Molar Volume of Oxygen
Oct. 16-19	No Lab due to Fall Break Note that CHE 1052 lecture courses still meet on Oct. 16 and Oct. 18
Oct. 23-26	Exp. 7 – Calorimetry
Oct. 30 – Nov. 2	Exp. 8 – Hess's Law
Nov. 6-9	Exp. 9 – Absorption and Emission
Nov. 13-16	Exp. 10 – Copper Cycle
Nov. 20-23	No Lab due to Thanksgiving Break Note that CHE 1052 lecture courses still meet on Nov. 20 (and Nov. 27)
Nov. 27-30	Exp. 11 – Lewis Structures, Molecular Models, and VSEPR
Dec. 4-7	Exp. 12 – Vaporization and Fusion Check-out