



Course Information

Semester & Year:	Spring 2024
Course Title:	General Chemistry 2 with Lab
Course Prefix & Number:	CHM152AA
Section Number:	16063 with Lab Section 16062
Credit Hours:	4
Start Date:	Lecture & Lab start Tuesday 1/16/2024
End Date:	5/10/2024
Room Number:	NS-318
Meeting Days & Time:	Tuesdays & Thursdays, 12:00 noon - 2:40 pm

Course Format

The course format is In Person.

**Note:* In the case of instructor illness and in-person courses cannot be held, the class will utilize a Live-Online format, utilizing Google Meet to meet at the same scheduled day and time. Meeting Link will be posted in a Canvas Announcement in these instances.

Instructor Information

Instructor:	Philip Root, BAE Chemistry, MNS Physics
Email:	philip.root@scottsdalecc.edu
Phone:	Office: 480-423-6196 Text: 480-900-7697
Office Location:	NS-131 and online via https://maricopa.webex.com/meet/proot
Office Hours:	“Office Hours” are student support hours for YOU to get help, assistance, or just chat! I’m available each week at the times listed below. Any changes or updates on days/times will be posted weekly via a Canvas announcement.
	Mon/Wed: NS-131 or NS-314; 11:00 am to Noon
	Tu/Th: NS-131 or NS-314; 8:30 am to 9 am, NS-318 After 2:40 pm by appointment
	Fridays: by appointment, NS-131 (my office) or Google Meet

**I may be available at other times during the week by appointment! Message me to check availability and set up an office visit or a Google Meet!!!*

Course Description

A study of the chemical properties of the major groups of elements, equilibrium theory, thermodynamics, electrochemistry, and other selected topics.

Prerequisites

A grade of C or better in [(CHM150 or CHM151) and CHM151LL], or CHM150AA, or CHM151AA.

***Completion of the prerequisite courses within the last 2 years is strongly recommended.**

Course Competencies

There are a total of 30 competencies that students should be able to perform by the end of CHM152AA:

1. Complete and balance redox equations.
2. Describe the progress of a chemical reaction in terms of Collision Theory or Transition State Theory.
3. Determine the order of a reaction with respect to a reactant and overall order and the rate law expression.
4. Determine whether a proposed mechanism agrees with the rate law for a reaction.
5. Describe the influence of various factors on reaction rate and on position of equilibrium.
6. Write correct equilibrium expressions and calculate the value of K, or calculate concentrations of reactants and products at equilibrium.
7. Solve problems involving solubility equilibria.
8. Solve equilibrium problems involving weak acids, weak bases, and complex ions.
9. State the three laws of thermodynamics.
10. Calculate changes in enthalpy, entropy, and free energy from appropriate thermodynamic data.
11. Predict the spontaneity of chemical reactions from thermodynamic data.
12. Solve problems involving Faraday's Law of Electrolysis.
13. Use the Nernst Equation to calculate cell potentials.
14. Complete and write nuclear reactions.
15. Compare and contrast chemical and nuclear reactions.
16. Describe applications of radiochemistry.
17. Identify and evaluate chemical hazards and hazard warning signs (such as the 4-bar Hazardous Material Information System, the 4- diamond National Fire Protection Association System, and Material Safety Data Sheets).
18. Cite the location and operation of common laboratory safety equipment.
19. Measure and dispense reagents.
20. Determine the mass of a given substance using an electronic balance.
21. Use pH meters or sensors to measure the pH of solutions.
22. Record quantitative and qualitative data, using the proper number of significant figures where appropriate.
23. Perform dilutions to prepare solutions using volumetric glassware.
24. Standardize solutions and analyze samples by performing titration experiments.
25. Analyze collected data using graphical techniques.

26. Prepare written reports, present data in a logical format, analyze data, and report conclusions.
27. Use scientific measuring devices to obtain chemical data.
28. Apply principles, concepts, and procedures of chemistry to lab experiments.
29. Interpret chemical data generated by application of the scientific method.
30. Use lab equipment properly and safely to perform a variety of chemical procedures and techniques.

Program Level Competencies

By the end of the course, you will increase your ability to:

- Distinguish between processes of change at a particle level
- Develop and use models that closely represent actual physical situations.
- Use fundamental physical laws and principles to solve problems encountered in academic and non-academic environments.
- Apply qualitative and quantitative problem solving techniques in terms of logic, efficiency, and effectiveness.

Note: specific Learning Objectives will be provided during each Unit to help you achieve these outcomes.

Texts and Course Materials

1. COURSE TEXTBOOK:

- a. Course and Lab Manual - The Course Manual for this course, including class and lab activities, will be distributed during the first week or two of the semester. An electronic version will also be available on Canvas. You are responsible for keeping this packet in a 3-ring binder and bringing the appropriate handouts to class each day.
- b. “*Chemistry: Atoms First*” 2nd edition by Openstax. This is an Open Educational Resource (OER) textbook available **at no cost** at this link:

<https://openstax.org/details/books/chemistry-atoms-first-2e>

Please see the “Our Course Textbook - Openstax Chemistry: Atoms First 2e” page in Canvas for more information on textbooks and to view or download our textbook.

2. THREE RING BINDER: This binder will help you keep and organize your Course and Lab Manual and any other materials for the course. If you like to work electronically, I also suggest keeping files & folders in an organized Google Drive, using your school provided MEID account with Google access included.
3. COMPOSITION BOOKS: You will need **two** bound composition books for this course, one for a Class/Lab Notebook and one for your Learning Journal. Plain composition books can usually be purchased for \$1-\$2. *For more info on keeping a scientific lab notebook, see: <https://bit.ly/2C8HEGa>. More info on Learning Journals is available in [Canvas](#).

4. **SCIENTIFIC CALCULATOR:** A scientific calculator is one that allows you to enter and display numbers in scientific notation. If you need to purchase one, you can find a good one for less than \$15. Graphing calculators are also permitted during class, but may not be used on exams. Ask me for advice if you need it.
5. **GOGGLES:** We will provide you with protective eyewear for use during the class. At the end of the class, you will return the eyewear in undamaged condition. If you fail to return the eyewear or the eyewear is excessively scratched or damaged from mishandling, you will be charged a \$7.00 replacement fee.

**SCC is not responsible for damaged clothing or jewelry.*

6. **CANVAS:** We will use the Canvas Learning Management System (LMS) for a variety of purposes. Please familiarize yourself with the site and our Course in Canvas. Log in at: <https://learn.maricopa.edu/login>

Course Technologies

View the [Accessibility Statements & Privacy Policies](#) of technologies used in this course.

Maricopa Systems

This course uses key Maricopa systems for course management and communication.

- Canvas Learning Management System
- Student Maricopa Gmail Account
- Maricopa Open Educational Resource Learning System (MOER)

Synchronous Communication Tools

This course may implement the use of web conferencing and/or other synchronous course tools.

- Webex

Streaming Media/Audio/Video Tools

This course uses webcasting, lecture capture systems, YouTube, and/or other streaming media services.

- YouTube

Student Assignment Tools

This course may require students to participate in or submit assignments using desktop or cloud-based applications.

- Google Products
- [Logger Pro](#)

Course Policies

The following are policies specific to this course. Students are also responsible for the college policies included on the [Student Regulations](#) page of the Maricopa Community College District website.

Participation & Group Work Expectations:

Participation is a requirement! Students are expected to come to class prepared. If one group member comes unprepared, then the entire group will be impacted. Students are expected to work together, assist and teach each other, and present to the class. Students should not expect a lecture style of instruction from the instructor. For more information, please consult the research article, "[Large-scale comparison of science teaching methods sends clear message.](#)"

Cell Phone Policy:

There will be times that you will use your cell phone to research a topic in class or lab, or to communicate with each other during live online group discussions. Appropriate use is understood and acceptable. However, personal or social use of cell phones in lecture is a distraction and, in the lab, is a danger. I will ask you to leave the lab or lecture hall for personal use of cell phones, both texting or talking.

Generative Artificial Intelligence (AI) Policy

Opening Statement Regarding Generative Artificial Intelligence (AI)

The World Economic Forum defines generative AI as "a category of artificial intelligence (AI) algorithms that generate new outputs based on the data they have been trained on. Unlike traditional AI systems that are designed to recognize patterns and make predictions, generative AI creates new content in the form of images, text, audio, and more."

Some examples of generative AI tools include but are not limited to: ChatGPT, Google Bard, Microsoft Copilot, Stable Diffusion, GrammarlyGo, and Adobe Firefly.

Some Generative Artificial Intelligence (AI) Allowed in Specific Circumstances

There are situations and contexts within this course where you may be permitted to use generative AI tools. Specific guidelines are provided below. If you are unsure if the tool or website you are using is a generative AI tool or if it is permitted on a specific assignment, please contact the instructor for further clarification before submitting your work.

AI tools may NOT be used when completing the following assignments¹:

- Learning Journal Reflections
- In Class Assessments (i.e. Exams)

If you wish to try using AI tools, they may be used when completing Lab Work and Homework assignments (worksheets). If you choose to use an AI tool, you will need to provide the following in the assignment:

- Indicate what you used the AI tool for
- Clearly indicate what content and/or work the AI provided
- Provide an analysis or critique of the content and/or work the AI tool provided

Grading Standards & Practices

Grading Scale*:

Letter Grade	Range
A	89.0 – 100%
B	78.0 – 88.9%
C	67.0 – 77.9%
D	50.0 – 66.9%
F	<50.0%

Assignment Categories (weighted):

Category	Weight
Lab Work	15%
Daily Work	25%
Exams	60%
Total	100%

***Note:** The grading scale is not the typical “10 point scale” so that you don’t have to ask for your grade to be rounded up. For example, if you want to earn an A, shoot for an overall 90%, that way if you end up at an 89.4, your grade is still above an 89 and is an A. Anything below an 89, however, will not be rounded up.

Explanation of Assessment Categories:

Lab Work (15%):

One of the skills for success in this course (and life) is to reflect meaningfully on your learning. To help you develop this skill, you will keep a professional lab notebook that will be typically checked at the end of each lab period. More information is provided in the Lab Packet handout you will receive.

During each lab meeting you will be expected to engage with the investigation and actively participate with your group. Your participation in the lab, your lab notebook, and/or asynchronous work after the lab meeting may be assessed each week.

After the lab investigation, you will present your findings by completing a lab report or report form. Lab report work is completed *individually* and must be submitted electronically in Canvas by the posted due date regardless of absences.

¹ See the following section on Grading Standards & Practices for information on assignment categories

Daily Work:

Learning Journal Reflections (5%): Each week after you will go on Canvas and answer two short questions to *reflect* on your learning and provide feedback to your instructor.

Worksheets / Homework (10%): Worksheets containing conceptual questions and practice problems are assigned to help you develop and use the major concepts & models we are developing. These are a 'safe' way to learn, fail, and grow. Worksheets must be submitted electronically in Canvas by the posted due date regardless of absences.

Canvas Quizzes (10%): Quizzes over each activity's material are provided in Canvas. You should complete them as promptly as possible to check your understanding. You may retake each quiz once before the deadline to improve your learning and your score.

Exams (60%):

Midterm Exams: Three times during the semester we will complete midterm exams to celebrate our learning ☺. Midterm exams are cumulative, and are timed. Exams may include multiple choice questions, short answer, and/or free-response questions. You will be provided with a periodic table and reference sheet for each exam.

**Tentative Midterm Exam Dates: 2/15, 3/28, 4/30*

Exams are typically administered during class time through Canvas. **Any navigating away from the Canvas Exam to a different browser window, to your computer desktop, or any other app (as noted by Canvas or Respondus) will result in a "0" for individual questions and/or the entire exam.**

Nomenclature Quiz: All students in CHM151 at SCC must complete a quiz to ensure understanding of the particle nature of matter, naming, and formulas. This quiz may be taken once a day in the Natural Science Tutor Center (NS-107) until you achieve a passing score of at least 16 out of 20 or 80%. Passing the quiz will earn 50/50, which is worth half the value of an exam. Deadlines and scoring info:

Nomenclature Quiz Deadline: end of week 5, Friday 2/16

**Not passing this quiz results in 0/50 exam score. As the exam portion of your grade constitutes 60% of your overall grade, and the nomenclature quiz itself is worth 50 of the 450 exam points, your overall grade will drop by 6.7% if you do not pass the quiz. So please take this seriously and get help when needed!*

Final Exam:

During Final Exam Week, students will take a comprehensive final, assessing all material from the course. The percentage obtained from the final exam will also be used to replace your lowest unit exam score. The final is an in person, pencil and paper exam, and is not an optional exam.

**Tentative Final Exam Date: Tuesday 5/7*

Exam Absence Policies:

- If you are going to miss an exam due to an excused absence, you must inform the instructor at least 2 weeks prior and include documentation.
- If you miss an exam for an unexpected reason, you must contact the instructor within 24 hours of the exam, and when able, provide appropriate documentation.

- **All exams must be taken to avoid being withdrawn from the course.**

*Note: if health protocols dictate an exam must be given online, the exam will be administered during a live online meeting and through Canvas.

Late Work Policy:

- Due dates are posted in Canvas. Email the instructor immediately if you notice any issues/mistakes with a due date, as instructors are human and also make mistakes.
- You are encouraged to still complete assignments late for feedback and learning. Credit can be earned for late assignments IF you contact your instructor to discuss the issue.
- Any late work must be completed prior to each midterm exam to receive any partial credit.

Cheating and Plagiarism: I encourage students to work together when doing homework and labs; however, I would not expect your solutions to be identical. There will at times be group assignments in which I expect only one solution or project. Discussing and sharing ideas is different from copying. Cases of cheating or plagiarism (as defined in the SCC Student Handbook) will not be tolerated and I will pursue the strongest punishment allowed by the College. This is not limited to any student who submits copied/plagiarized work, but also to the student that supplies the material. I will punish both the copier and the person they copy equally, as both are equally guilty. If in doubt, just say No when someone asks to use your work!!!

Academic Support: We care about your success! In addition to meeting with your instructor, SCC students may use the Academic Success Center/Tutoring services located in the Natural Sciences building (NS-107) to reinforce and supplement classroom instruction. Free of charge on-campus and online tutoring services are available for most courses offered at SCC.

How to get the most in tutoring: 1) The sooner and the more often you come to tutoring, the better. 2) Come prepared. Bring your class notes and textbook. Look over the readings and try problems. If you can, bring a list of specific questions to tutoring.

Please see the “First Steps: Helping You Succeed” module in Canvas for additional resources that may be beneficial to your success in this class!

Response Time

I prefer that you contact me via the Canvas Conversations (Inbox Messaging) feature within Canvas whenever possible. The second choice of communication is via direct email. For Canvas Inbox and emails you can expect a response within 24-48 hours (often faster) during work days (M-F). While I will not guarantee that I will respond to inbox messages or emails during the weekend, it is likely that I will, so please do not wait if you have a question!

In regard to grading, students can expect assignments to be graded within one week of the assignment's submission.

Attendance Policy

Attendance is required for this course! Attendance will be recorded for all class and lab sessions. To be considered in attendance:

- Engage in breakout sessions / group work: You will often work together in breakout session groups, allowing you to converse with your group and at times, your instructor. Converse with your group and actively use whiteboards and any other idea sharing technology!
- Engage in whole class discussions: Participate and share ideas, questions, and concerns with the instructor and/or the class.

Failure to follow these guidelines results in an absence, even if you attended class.

If you physically miss any class it is **your** responsibility to contact the instructor and make up the work. I am not inclined to give make-ups on quizzes or exams, unless you have a valid excuse with written documentation and you have spoken with me beforehand.

- If you show up late to a lab, you will miss key procedural and safety information and will not be permitted to participate in that day's lab.
- If you have 3 absences that are not considered "official absences," I have the option to withdraw you (with grade of W or Y, depending).
- If you miss an exam and I don't hear from you by e-mail (or phone if you can verify email is not possible) with a valid excuse within 24 hours after the exam ends, you may be given a 0% for that exam and I may withdraw you (with grade of W or Y, depending).

If you have any special needs or considerations related to attendance, contact your instructor immediately. I understand that life is happening all around us. So just notify me before or as soon as possible if something comes up in your life or if you have concerns that attendance will be an issue. I will work with students who will work hard to learn.

For all MCCCDC attendance policies, please consult Section 2.3.2 at:

<https://district.maricopa.edu/stewardship/maricopa-governance/common-pages/student-regulations>

Student or Instructor Illness Considerations and Class Access

Students who are not feeling well **should not attend class**. Notify your instructor prior to the start of class on a given day. Your instructor will connect with you if there is an option to attend class remotely or will provide information about how to stay current with assignments and lessons online.

If your instructor is ill and cannot attend class, updates and announcements will be provided in Canvas, Maricopa email, or other class communication channels prior to class that day if possible.

Withdrawal Information:

If you must withdraw from the course, see the Withdrawal Policy information located in the **College Policies & Student Services** page found in the First Steps module of your Canvas course.

**Notes: Deadline to withdraw without instructor approval: End of Week 7
 Final Deadline to withdraw: End of Week 14 (requires instructor approval)*

Instructional Contact Hours (Seat Time)

This is a four(4) credit-hour course. In addition to time spent in class and lab, plan to spend at least eight hours on learning activities **outside of class time** each week (i.e. notebook reflections, homework, practice, lab work and reports, etc.)

Online Tutoring

SCC's tutors are available online to help with your courses. You may work with an SCC tutor remotely using Google Meet, your phone, or email. Visit the [SCC Tutoring & Learning Centers](#) page for detailed information on the five learning center's hours and procedures.

As much as possible, it is highly recommended that you utilize SCC tutors since they are more familiar with SCC coursework, instructor expectations, and assignments; however, if you need to work with a tutor outside regular hours, online and hybrid students now have access to a 24/7 online tutoring service called Brainfuse. Brainfuse provides online tutoring in a variety of academic subjects. Each student may utilize up to 6 hours of online tutoring through Brainfuse per semester, and has the option of requesting additional time if needed.

To access Brainfuse and begin working with a tutor:

1. Visit the [SCC Online Tutoring Services Through Brainfuse](#) page
(<https://www.scottsdalecc.edu/students/tutoring/online-tutoring>)
2. Click the **Visit a tutor online** button
3. Enter your MEID and password
4. Choose your topic and subject
5. Click the **Connect** button

Please use your time effectively and be prepared with your questions before you connect to a tutor. Tutors and students communicate in real-time so whatever you type, draw, or share on the screen, the tutor sees, and vice versa. You may also want to have screenshots ready if applicable. All Brainfuse sessions are recorded for review later.

Learning Tools and Your Privacy and Security

SCC utilizes a variety of software applications and web-based tools operated by third party vendors to support student learning. To allow student access to the application, site or tool, certain identifiable information may be required to establish a user name or password, and submit work and/or download information from these tools. Inherent with all internet-based tools, there is a risk that individuals assume when electing to use these tools, as they may place information at risk of disclosure.

To use learning tools responsibly, please observe all laws and the Maricopa Community College District [Student Conduct Code](#), such as copyright infringement, plagiarism, harassment or interference with the underlying technical code of the software. As a student using a learning tool, you have certain rights. Any original work that you produce belongs to you as a matter of copyright law. You also have a right to the privacy of your educational records. Your contributions to learning tools constitute an educational record. By using the tool, and not taking other options available to you in this course equivalent to this assignment that would not be posted publicly on the internet, you consent to the collaborative use of this material as well as to the disclosure of it in this course and potentially for the use of future courses.

Students are responsible for the information contained in this syllabus, the Syllabus page in your Canvas course and the **College Policies & Student Services** page found in the First Steps module of your Canvas course. Students will be notified by the instructor of any changes in course requirements or policies.