

## Term Information

Effective Term Spring 2024

## General Information

Course Bulletin Listing/Subject Area Chemistry  
Fiscal Unit/Academic Org Chemistry - D0628  
College/Academic Group Arts and Sciences  
Level/Career Undergraduate  
Course Number/Catalog 1208  
Course Title Foundations 2 of General Chemistry  
Transcript Abbreviation FoundationGenChem2  
Course Description CHEM1208 is second course in a two-course series, for science majors, covering the mole, stoichiometry, chemical reactions, thermochemistry, gases, liquids, and solids, paired with metacognitive learning strategies. CHEM1208 also includes a laboratory experience, that covers labs from both CHEM1206 and CHEM1208 content. Please see the laboratory syllabus for a detailed description.  
Semester Credit Hours/Units Fixed: 4

## Offering Information

Length Of Course 14 Week, 12 Week, 8 Week, 7 Week  
Flexibly Scheduled Course Never  
Does any section of this course have a distance education component? No  
Grading Basis Letter Grade  
Repeatable No  
Course Components Laboratory, Lecture  
Grade Roster Component Lecture  
Credit Available by Exam No  
Admission Condition Course No  
Off Campus Never  
Campus of Offering Columbus, Lima, Marion, Newark

## Prerequisites and Exclusions

Prerequisites/Corequisites CHEM1206 AND a grade of C- or above in Math 1120, 1130, 1131, 1148, 1150, or above.  
Exclusions Not open to students with credit for 1210, 1220, 1610, 1620, 1910H, 1920H, 1250.  
Electronically Enforced Yes

## Cross-Listings

Cross-Listings

## Subject/CIP Code

Subject/CIP Code 40.0501  
Subsidy Level Baccalaureate Course  
Intended Rank Freshman, Sophomore, Junior, Senior

## Requirement/Elective Designation

Natural Sciences

## Course Details

### **Course goals or learning objectives/outcomes**

- Successful students are able to explain basic facts, principles, theories and methods of modern natural sciences; describe and analyze the process of scientific inquiry.
- Successful students are able to identify how key events in the development of science contribute to the ongoing and changing nature of scientific knowledge and methods.
- Successful students are able to employ the processes of science through exploration, discovery, and collaboration to interact directly with the natural world when feasible, using appropriate tools, models, and analysis of data.
- Successful students are able to analyze the inter-dependence and potential impacts of scientific and technological developments.
- Successful students are able to evaluate social and ethical implications of natural scientific discoveries.
- Successful students are able to critically evaluate and responsibly use information from the natural sciences.

### **Content Topic List**

- Chemical Reactions and Chemical Quantities
- Solutions and Aqueous Reactions
- Thermochemistry
- Gases
- Liquids, Solids and Intermolecular Forces
- Crystalline and Modern Materials

### **Sought Concurrence**

Yes

## Attachments

- Summary Request Letter.docx: Course Proposal  
*(Other Supporting Documentation. Owner: Ramirez, Ana G)*
- CHEM1208 ge-foundations-submission.pdf: GE Course Submission  
*(GEC Model Curriculum Compliance Stmt. Owner: Ramirez, Ana G)*
- Chem 1208 Rationale.docx: Rationale  
*(Other Supporting Documentation. Owner: Ramirez, Ana G)*
- Re\_ CHEM 1208 approval from BIO.pdf: Concurrence  
*(Concurrence. Owner: Ramirez, Ana G)*
- SP24 full session 4crdthr CHEM1208 Riccardo- Syllabus\_Proposal May11Contingencies.docx: Course Syllabus  
*(Syllabus. Owner: Ramirez, Ana G)*
- 1208 Lab Syllabus - SP24 5-15-23.docx: Lab Syllabus  
*(Syllabus. Owner: Ramirez, Ana G)*

## Comments

- Please see feedback email sent to department 05-11-2023 RLS *(by Steele, Rachel Lea on 05/11/2023 06:09 PM)*

**COURSE REQUEST**  
1208 - Status: PENDING

Last Updated: Vankeerbergen, Bernadette  
Chantal  
05/16/2023

**Workflow Information**

Status	User(s)	Date/Time	Step
Submitted	Ramirez, Ana G	04/25/2023 02:19 PM	Submitted for Approval
Approved	Jackman, Jane E	04/25/2023 02:21 PM	Unit Approval
Approved	Vankeerbergen, Bernadette Chantal	05/03/2023 12:14 PM	College Approval
Revision Requested	Steele, Rachel Lea	05/11/2023 06:09 PM	ASCCAO Approval
Submitted	Ramirez, Ana G	05/15/2023 11:58 AM	Submitted for Approval
Approved	Jackman, Jane E	05/15/2023 11:59 AM	Unit Approval
Approved	Vankeerbergen, Bernadette Chantal	05/16/2023 10:06 AM	College Approval
Pending Approval	Jenkins, Mary Ellen Bigler Hanlin, Deborah Kay Hilty, Michael Vankeerbergen, Bernadette Chantal Steele, Rachel Lea	05/16/2023 10:06 AM	ASCCAO Approval

April 24<sup>th</sup> 2023

Dear CLSE/Arts & Sciences Curriculum Committees,

I am proposing two new General Chemistry courses CHEM1206 and CHEM1208, as a new pathway for students needing CHEM1210 here at OSU and who cannot immediately enroll CHEM1210 due to a math placement. The foundations course CHEM1205 would potentially go away, depending on enrollment (see more information below). In summary, I am proposing a two-course series that would be equivalent in content coverage, rigor, and assessment to CHEM1210.

Foundations of General Chemistry CHEM1205 began in 2019 as a parachute course for students beginning in CHEM1210 but with poor course performance on early exam(s). In its first and second iteration nearly 100% of the population came from this pathway: CHEM1210, dropCHEM1210, pick up CHEM1205 same semester. In autumn of 2020, and beyond, a large amount of the CHEM1205 enrollment were students unable to take CHEM1210 due to not meeting the math pre-requisite. Students were self-selecting to take this 2-credit hour course that was not required. This past Autumn 2022 there was an enrollment near 140 students over two sections, and less than 5% were students from dropping current CHEM1210. Over its lifetime 86% of CHEM1205 student population has been from students not-meeting-the-math-requirement for CHEM1210, and opting to take a non-required class to prepare for CHEM1210, Figure 1a. This is different than initially anticipated. It is also noteworthy to share that the demographics of CHEM1205 have not mirrored that of CHEM1210, that is there is a larger population of URM students in CHEM1205 compared to CHEM1210, Figure 1b. CHEM1205 support a deficit model, and all student taking CHEM1205 must re-start in CHEM1210 to make progress in their course pathway at OSU.

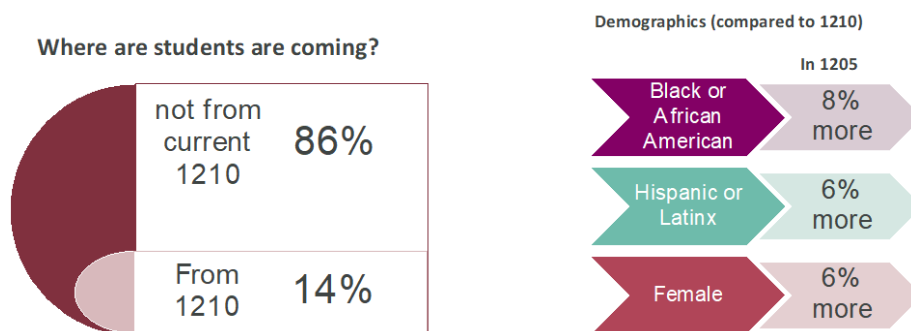


Figure 1a. Over the lifetime of CHEM1205 only 14% of the total population has been from the CHEM1210, dropCHEM1210, pick up CHEM1205 same semester pathway. Rather, 86% have been enrolled for the out-set, most unable to take CHEM1210 due to math pre-requisite. Figure 1b. Demographics of CHEM1205 relative to that of CHEM1210.

The two proposed courses CHEM1206 and CHEM1208 would be an alternate pathway for students in General Chemistry here at OSU. That is, both courses together would meet the General Chemistry 1 CHEM1210 requirement, and upon successful completion of both courses students could then enroll in CHEM1220, General Chemistry 2. These courses will allow for students with a lower math placement to begin General Chemistry at a

reduced pace, and then keep that reduced pace for the second course once meeting the math requirement. A summary of this alternate pathway and math requirements are shown in Figure 2.

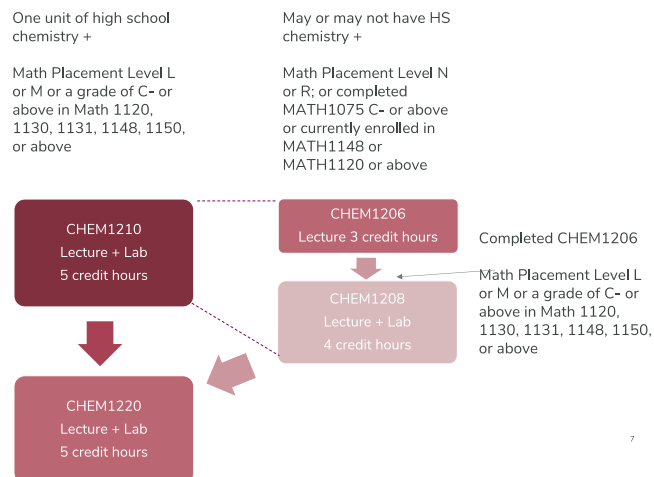


Figure 2. Two potential General Chemistry pathways: Left side traditional, Right side for students at a lower math placement initially.

In CHEM1206 students will learn about 1/2 of the CHEM1210 chemistry content, which is more chemistry language and structure based with less math required. This will be paired with metacognitive learning strategies (as is included in CHEM1205). This is shown in Figure 3, left side. Since the lecture course is 3-credit hours over a full semester but about 1/2 of the chemistry content the pace is reduced by about half compared to CHEM1210. It is anticipated that students will concurrently take the algebra math requirement.



Figure 3. Comparison of CHEM1210 content (middle) to CHEM1206 (left) and CHEM1208 (right)

Upon completion of CHEM1206 and meeting the same math prerequisite as CHEM1210, students can enroll in CHEM1208. CHEM1208 will contain the rest of the General Chemistry 1 content, more math-based content, Figure 3 right side. This will be a 4-credit hour lecture + in-person lab, foundation GEN course in alignment with the new GE program. All CHEM1208 students will complete the same exact lab experiments as CHEM1210 students. I am proposing that a student with CHEM1206 + CHEM1208 credit will have met the CHEM1210 requirement and can move on to courses for which CHEM1210 is a prerequisite, namely CHEM1220.

There is a well-studied chemistry content curriculum laid out in this manner and used in many college programs in the US. This is an Atoms First Approach and college level General Chemistry textbooks readily exist and will



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be used for this course. The Atoms First approach will naturally leave the math-heavy content for the 2<sup>nd</sup> half of general chemistry 1, in this case CHEM1208.

CHEM1210 is a co-requisite for BIO1113 and BIO1114. It is reasonable that students able to enroll in CHEM1208 (same math requirement for CHEM1210) should be able to co-enroll in these BIO courses. A letter of concurrence is being requested from the CLSE curriculum committee.

For the short term, CHEM1205 will also remain open, and if the enrollment from CHEM1210 drops warrants it, it will remain in place. Given recent enrollment history, it is likely that there will not be a high enough enrollment population to keep CHEM1205 on the schedule.

Sincerely,

Rebecca A. Ricciardo, PhD

Senior Lecturer

The Department of Chemistry & Biochemistry

The Ohio State University

110K Celeste Laboratory

[ricciardo.10@osu.edu](mailto:ricciardo.10@osu.edu)

Rationale:

This proposal is for a new course, CHEM 1208, which will be offered as the second course in a 2-course sequence designed to provide students with a pathway to maintain forward progress toward completing their general chemistry course requirements even if they do not immediately meet the math requirement needed for direct enrollment in the main General Chemistry course, CHEM 1210. Students must successfully complete the first course, CHEM 1206 and MATH 1148 or 1150 as a pre-requisite to enrollment in CHEM 1208. After successful completion of this course, students will have exposure to all of the content of CHEM 1210, and will have successfully completed an identical laboratory requirement as in CHEM 1210. The attached letter provides more detail about the motivation for proposing CHEM 1208 and our expectations that this will provide a productive pathway forward for students to complete their general chemistry requirement at Ohio State.

# CHEMISTRY 1208

## Foundations 2 of General Chemistry

### SP 2024 Syllabus **PROPOSAL**

**MWF in-person | 55 min | Active Learning Classroom**  
**ONE WEEK DAY in-person LAB | 2hr 55 min | New Celeste Lab Room**

**3 credit hours lecture**  
**1 credit hour lab**

#### Introduction

##### Instructor

**Lecturer:**

**Office:**

**Office Hours:**

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#### Welcome to CHEM 1208!

We are so glad you are here and are excited to explore general chemistry concepts with you this semester. Our goal is that you leave this course with an appreciation of how chemistry impacts your everyday lives. We also want to provide you with the foundational chemistry concepts that will facilitate your success in future science courses and careers. Our team of lecturers and administrators are deeply committed to supporting your learning journey.

Chemistry 1208 is about ½ of the same content covered in CHEM1210 here at OSU, and follows CHEM1206 (a pre-requisite). This course will be a reduced content-pace relative to CHEM1210. Additionally, this CHEM1208 course will incorporate active learning approaches in the classroom, and emphasis on metacognitive learning strategies will be consistently included. There is also an in-person lab component to this course. The combination of CHEM1206 + CHEM1208 are equivalent to CHEM1210.

This syllabus outlines the resources, policies, and procedures that will ensure your success in this course. Please familiarize yourself with this syllabus and keep it in a convenient place for reference throughout the semester. If you have questions or concerns about the syllabus itself, please contact your lecturer. Please see the laboratory syllabus for a detailed description of the lab content and work.

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#### COURSE DESCRIPTION CHEM1208

CHEM1208 is second course in a two-course series, for science majors, covering the mole, stoichiometry, chemical reactions, thermochemistry, gases, liquids, and solids, paired with metacognitive learning strategies. CHEM1208 also includes a laboratory experience, that covers labs from both CHEM1206 and CHEM1208 content. Please see the laboratory syllabus for a detailed description.

Prereq/Coreq: CHEM1206 AND Math Placement Level L or M or a grade of C- or above in Math 1120, 1130, 1131, 1140, 1148, 1150, or above. Not open to students with credit for 1210, 1220, 1610, 1620, 1910H, 1920H, 1250.

GEN nat sci phys course. GEN foundation natural sci course

The combination of CHEM1206 + CHEM1208 are equivalent to CHEM1210.





**Carmen:** [carmen.osu.edu](http://carmen.osu.edu): Carmen is the Learning Management System (LMS) used at Ohio State. It is the central hub from which your course will be conducted. Everything you need for the course is available in and communicated through Carmen, so daily engagement with it is crucial to your success in this course. It is important that you check your Carmen notification settings to ensure you receive course announcements in a timely manner. You can find instructions on how to set your Carmen notifications if you click option #2 [on this webpage](#).

Log in to Carmen to:

- Access your textbook, homework, and course materials
- Read important announcements
- Interact with your instructor
- Complete assignments
- Take quizzes or exams
- View your grades
- Find complete policies
- Locate learning and personal resources

A free Canvas app is available to download for both [Android](#) and [iOS](#), making it easy to log in to your course from anywhere. Some functionality is limited when in the Canvas app version.

**Required Text and Online Homework:** The textbook and online homework software for the lecture portion of this course are provided by and accessible through Carmen. You do not need to purchase a textbook for the course; instead, you will be charged for your access to the e-text and online homework software through a “Carmenbooks fee” of \$XX.XX on your statement of account. You can learn more about the e-textbook fee for this course by visiting the “Textbook Information” Carmen page.

If you work better with a hard copy of the textbook, you can purchase one at a bookseller of your choice. A hard copy of the text is *not* sold in the university bookstore.

The textbook is Chemistry: Structure and Properties 2<sup>nd</sup> edition by Nivaldo J. Tro

### **Other Required Materials:**

If you do not have access to the technology necessary to succeed in this class, you can review options for technology and internet access at [go.osu.edu/student-tech-access](http://go.osu.edu/student-tech-access).

**Calculator:** A scientific calculator

**Computer:** current Mac (MacOS) or PC (Windows 10) with high-speed internet connection, webcam, and microphone

**BuckeyePass:** a mobile device (smartphone or tablet) to use for authentication

**Microsoft Office 365:** All Ohio State students are eligible for free Microsoft Office 365. Visit the [installing Office 365](#) ([go.osu.edu/office365help](http://go.osu.edu/office365help)) help article for full instructions.

### **Core technology skills:**

- [Navigating CarmenCanvas](http://go.osu.edu/canvasstudent) ([go.osu.edu/canvasstudent](http://go.osu.edu/canvasstudent))

For help with your password, university email, CarmenCanvas, or any other technology issues, questions or requests, contact the IT Service Desk, which offers 24-hour support, seven days a week: <https://it.osu.edu/students>

## Health and Safety

**Classroom Safety Measures:** We will follow all university guidelines regarding classroom safety. Since these guidelines may change during the semester given the unpredictable nature of the COVID-19 pandemic,



you can find the latest updates to university safety guidelines [here](#). As of the time this syllabus is released, all students, faculty, and staff are not required to wear masks in shared indoor spaces. If the mask policy is changed by the university during the semester then we will follow the policy.

**COVID-19 Absences:** The university's office of Student Life Disabilities Services (SLDS) will give you the documentation and resources you need if you contract COVID-19, must quarantine due to COVID-19, or have a high-risk factor that leaves you vulnerable to COVID-19. Please request temporary accommodations for COVID-related conditions through SLDS's [online form](#) and reach out to the instructor to make a personalized plan for your academic progress while you recover.

**Accommodations for other illnesses:** If you experience a serious illness that necessitates an extended absence, please reach out to the instructor to make alternative arrangements for your success. We will request documentation if your absence requires you to take a makeup exam.

## Course Information and Policies

**Communication:** Your instructor will communicate important information to you throughout the term via Carmen announcements and your Buckeyemail email account. Please verify that your OSU email is set up appropriately on your electronic devices so we can keep in touch. We highly recommend that you check email and Carmen at least once per day.

**Enrollment Information:** In accordance with [federal regulations \(Title IV\)](#), we must report your attendance status to the University Registrar after the first week of classes. The Course Introduction Quiz (QUIZ 0) is the assignment we use to gauge your enrollment in the course. Plan to complete this quiz by DAY MONTH DATE, If you do not complete the quiz by **11:59 PM, DAY MONTH DATE**, you will be reported to the Registrar as "non-attending," which may lead to disenrollment and problems with your financial aid.

## Goals and Outcomes

Chemistry 1208 is a physical science foundation course in the natural science category of the GEN, which has the following goals and learning outcomes:

**Goal 1. Successful students will engage in theoretical and empirical study within the natural sciences while gaining an appreciation of the modern principles, theories, methods, and modes of inquiry used generally across the natural sciences.**

**ELO1.1 Successful students are able to explain basic facts, principles, theories and methods of modern natural sciences; describe and analyze the process of scientific inquiry.**

*Throughout this course there are opportunities to learn about and practice the basic facts, principles, theories, and methods of modern science. One example is in the thermodynamics chapter content: students will learn, and practice in class and on homework how to take calorimetry measurements and calculate enthalpies from data. In the lab students will have the opportunity to experiment with a coffee cup calorimeter to collect and analyze their own data. Every homework assignment and exam will have questions about scientific facts, principles, theories, or methods.*

**ELO1.2 Successful students are able to identify how key events in the development of science contribute to the ongoing and changing nature of scientific knowledge and methods.**

*Throughout this course there are opportunities to learn development of science and recognize that science is an evolving body of knowledge. One example is in the gases chapter content: students will learn, and practice in class and on homework about the gas laws and the ideal gas law along with kinetic molecular theory.*



**ELO1.3 Successful students are able to employ the processes of science through exploration, discovery, and collaboration to interact directly with the natural world when feasible, using appropriate tools, models, and analysis of data**

*In Chemistry lab is a significant aspect of your chemistry learning experience in lab, and the following are the goals and learning outcomes you will accomplish in the lab:*

- *Qualitatively and quantitatively examine curriculum presented in lecture, such as atomic and molecular structure, chemical reactivity, thermochemistry, and chemical calculations in an active laboratory setting.*
- *Practice laboratory methods applicable to chemists of all levels.*
- *Create, and demonstrate the proper use of, a well-prepared laboratory notebook and evaluate the importance of organized scientific data collection and data integrity.*
- *Demonstrate the ability to interpret data, evaluate conclusions supported and not supported by experimental results, and compare and contrast chemical methods, as communicated through Post-Labs.*
- *Demonstrate the safe handling and proper disposal techniques for all materials used in the lab.*

**Goal 2. Successful students will discern the relationship between the theoretical and applied sciences while appreciating the implications of scientific discoveries and the potential impacts of science and technology.**

**ELO2.1 Successful students are able to analyze the inter-dependence and potential impacts of scientific and technological developments.**

*One example is in the aqueous chapter content: students will learn, and practice in class and on homework about how experimentation was used to generate the activity series and how these data tables can inform if reactions will naturally happen. Students will be assessed on homework and exams. Another example is in lab, where students will be making Quantitative Analysis of the Citric Acid Content in Juices. The students will be assessed in a post lab assignment.*

**ELO2.2 Successful students are able to evaluate social and ethical implications of natural scientific discoveries.**

*One example is in the solids chapter content: students will learn, and practice in class and on homework about the structure of solids and how many of these solid materials are currently used in technological devices that society is dependent upon. Another example will be providing content about Flint MI water crisis when aqueous solubility is presented. Parallel content will be provided to foster an in-class discussion about ethical responsibility paired with scientific knowledge.*

**ELO2.3 Successful students are able to critically evaluate and responsibly use information from the natural sciences.**

*One example is from laboratory reports required for one or more of the laboratory experiments. Students will articulate their conclusions and explain their rationale using collected data and interpretation. Additionally, in this course students will be asked several times to find and bring related-content resources to class from popular media. We will use these as an opportunity to discuss science portrayal in the media. We will discuss that the idea of "chemicals" as "bad" is misleading, and that all things are made of chemicals. Also, when discussing inorganic naming conventions we will have a class discussion about hard/easy to pronounce names is not a reliable method to determine the consumption or usage safety/toxicity of a chemical, and rather it depends on the nature of chemical reactions and begin looking at chemical reaction types and aqueous reactions.*

## Pre-requisites

CHEM1206 + Math Placement Level L or M or a grade of C- or above in Math 1120, 1130, 1131, 1140, 1148, 1150, or above

## Course Components



Your CHEM 1208 course consists of two components that meet at different times.

## 1. Three lecture sessions

(55 minutes)

- Your lecture schedule appears on the table below.
- Your lecturer will assign homework through Mastering Chemistry. While each assignment may have a unique due date set by your lecturer, no homework assignments will be accepted after **LAST DAY SEMESTER at 11:59 PM.**
- During this course, foundational chemistry skills will be practiced during class. There will be times when students can earn points for participation and engagement during class. It is anticipated that there may be times when a student must miss class, to adjust for this, there will be 300 points possible, but a maximum of 200 points will be counted.
- Your point of contact for lecture is [Instructor].

## 2. One lab

(2 hours 55 minutes)

- The policies, procedures, and schedules for the lab component of this course appear in your lab syllabus.
- The lab portion of this course is worth 20% of your total course grade. However, **a minimum of 50% of the total lab points is required to pass the overall course.** See your lab syllabus for more information.
- Your first point of contact for lab is your lab TA, who you will meet on the first day of lab. For more complicated questions and concerns about lab, contact your Lab Supervisors at [chem1210labsupervisor@osu.edu](mailto:chem1210labsupervisor@osu.edu).

Your performance in this course will be evaluated based on the components below. Sixty days after grades are posted, your grade in Carmen is considered final and all other records are destroyed. If you have a concern or question about a grade, please contact the instructor promptly and we will work to adjust any inconsistencies in a timely manner.

Individual assignments within these categories will be scaled to contribute toward the established percentage of your total course grade:

Item	Weighting %
Online Homework	10%
Learning Portfolio in PebblePad	5%
Participation & Engagement	10%
Laboratory	25%
In-person Exams on Carmen (3 of them)	30%
Cumulative Final Exam	20%

**Mandatory Introduction Quiz 0:** The QUIZ 0 must be completed with a 100% score to pass this course. The Course Introduction Quiz 0 not only confirms your enrollment in the course, but also teaches you about course policies. Therefore, please complete this quiz by **11:59 pm, DAY MONTH DATE.** You may take the quiz as many times as you need to receive 100%. Please note that if you do not receive a 100% on this quiz by the due date, ***you will be assigned an "E" as your final course grade.***

**Online Homework:** Your course will be utilizing online homework, accessed through Carmen. There will be weekly assignments, due dates on the calendar shown below. You will be graded on completion. It is recommended that you keep a homework notebook to show your work as a learning resource. You should



always work on your own initially, no supports, and commit to an answer. Then, as needed, seek out support from notes, video, textbook, to check your work. Weekly homework will be about 1 hour in duration, but can be split up into smaller work sessions. Weekly due dates are meant for students to keep pace, but homework will be accepted up until the last day of the semester. The last day of semester classes is the absolute last deadline for all homeworks. No homework submitted beyond the last day of semester classes will be graded for credit.

**Learning Portfolio in PebblePad:** Throughout the semester you will work to generate a learning assets which will contain specific learning strategies for you. Several of these will be edited and collected as assets in PebblePad. You will share a Learning Portfolio of these with your instructor for a graded work. While drafting assets, two peers will provide you feedback, and you will make edits before submitting the final copy to your e-portfolio. You will also review two peers' drafts and provide feedback to them. Your overall grade for the portfolio will be a combination of 1) the final portfolio shared from PebblePad, 2) the quality of feedback that you provide to your peers, and 3) completion of draft assignments leading up to the final asset submission. There will be 7 instances of graded work (this includes the peer review) related to the learning portfolio. It is anticipated that you will spend less than 1 hour for each of the 6 graded works. Due the nature of peer feedback, late work on portfolio assignments will not be accepted, unless extenuating circumstances (that is, illness, unanticipated life event, etc. exist.) In this case a late request must be made to the instructor within one week of the due date.

**Participation & Engagement:** During this course, foundational chemistry skills will be practiced during class. There will be times when students can earn points for participation and engagement during class. These will be a mix of chemistry content questions and metacognitive questions, delivered in class for points, via one or more Carmen function (assignment, quiz, or discussion). These will be opened during class, and students present in class will be given time to complete these. These will be geared to peer-peer discussion and problem solving and will make sense for students within the space. That is, it is unreasonable for an absent student to make these up or complete them independently later. It is anticipated that there may be times when a student must miss class, to adjust for this, there will be 300 points possible, but a maximum of 200 points will be counted. No make-up participation & engagement points will be available.

**Laboratory:** Please consult your Lab Syllabus for lab schedules, policies, and procedures. Note, you will need at least 50% of the laboratory points to successfully pass the CHEM1208 course. Pre and post lab work will take place outside of lab space, and it is anticipated you spend 1 hour per week on direct-lab-content, that is, the pre and post lab assignments.

**In-person Carmen Exams and Cumulative Final Exam:** Three exams will be given in class and will be administered using the Carmen Quizzing function. Exams will be 55 minutes in duration, these exams will be during class and will only cover select topics according to the schedule below. A program called Lockdown Browser will be used in conjunction with Carmen. More details about acquiring this free software will be given once the course begins. There will be a 4<sup>th</sup> Cumulative Final Exam that will cover Chapters 7 – 12. The Final exam will follow the university finals schedule and will be 105 minutes in duration. The final will also be administered via Carmen quizzing function in conjunction with Lockdown Browser. Due the nature of exams, make-up exams will only be available in extenuating circumstances (that is, illness, unanticipated life event, etc. exist.) In this case a late request must be made to the instructor within one week of the exam.

Exam	Chapters	Date
Exam 1	7	Feb 2 <sup>nd</sup>
Exam 2	8, 9	Mar 8 <sup>th</sup>
Exam 3	10, 11, 12	Apr 19 <sup>th</sup>
Final Exam (During finals week)	7 – 12	Finals Schdl.

**Course Workload Expectation:** This course is a four credit-hour course. In accordance with Faculty Rule 3335-8-24, a semester credit hour is defined as the following: One credit hour shall be assigned for each three



hours per week of the average student's time, including class hours, required to earn the average grade of "C" in this course. That is, you may anticipate spending ~12 hours of time on this class per week. Three of those hours will be in-class lecture meetings, and three hours will be in-lab meeting per week. The other ~6 hours will be working on course homework, pre and post lab assignments, learning portfolio take-home tasks, and self-directed studying the content for this course.

### Lecture Topics

**Chapter 7** **Chemical Reactions and Chemical Quantities:** Chemical and physical change, Writing and balancing chemical equations, Stoichiometry, Limiting reactant, theoretical yield, percent yield, excess, Three examples of chemical reactions  
**Building a learning plan for this class**

**Chapter 8** **Solutions and aqueous reactions:** Concentration, Solution stoichiometry, Solubility, Precipitation reactions, Net ionic equations, Acid-base reactions, Gas-evolution reactions, Redox reactions  
**Using practice exams**

**Chapter 9** **Thermochemistry:** Nature of energy, First law of thermodynamics, Heat and work, Delta E, Enthalpy, Calorimetry, Enthalpy of reactions, Bond energies, enthalpy of formation, Lattice energies for ionic compounds

**Chapter 10** **Gases:** Kinetic molecular theory, Pressure, Simple gas laws, Ideal gas law and applications, Mixtures and partial pressures, temperature and molecular velocities, Mean free path, effusion, diffusion, Stoichiometry, Real gases.

**Chapter 11** **Liquids, Solids, and Intermolecular Forces:** Solids, liquids, gases, Intermolecular forces, Properties of IMFs, Vaporization and vapor pressure, Sublimation and fusion, Water heating curve, Phase diagrams

**Chapter 12** **Crystalline and Modern Materials:** Unit cells and basic structures, Fundamental crystalline types, Structures of ionic solids, network covalent atomic solids

Week		Monday	Wednesday	Friday
1	Date	Jan 8	Jan 10	Jan 12
	Content	Introduction	7.1 – 7.2	7.3
	Graded Work			<b>Portfolio Assignment #1</b>
2	Date	MLK day – No Classes Jan 15	Jan 17	Jan 19
	Content		7.3	7.4
	Graded Work		<b>HW#1</b>	
3	Date	Jan 22	Jan 24	Jan 26
	Content	7.5	7.5	7.5, 7.6
	Graded Work		<b>HW#2</b>	<b>Portfolio Assignment #2</b>
4	Date	Jan 29	Jan 31	Feb 2
	Content	7.6	Review	
	Graded Work		<b>HW#3</b>	<b>EXAM 1 Chapter 7</b>
5	Date	Feb 5	Feb 7	Feb 9
	Content	8.1, 8.2	8.4	8.5
	Graded Work		<b>HW#4</b>	
6	Date	Feb 12	Feb 14	Feb 16
	Content	8.6	8.7	8.8
	Graded Work		<b>HW#5</b>	
7	Date	Feb 19	Feb 21	Feb 23
	Content	8.9	8.9	9.1 – 9.3



	Graded Work		HW#6	Portfolio Assignment #3
8	Date	Feb 26	Feb 28	Mar 1
	Content	9.4, 9.5	9.6, 9.7	9.8, 9.9
	Graded Work		HW#7	
9	Date	Mar 4	Mar 6	Mar 8
	Content	9.10, 9.11	Review	
	Graded Work		HW#8	EXAM 2 Chapters 8 & 9
SPRING BREAK MAR 11 - 15				
10	Date	Mar 18	Mar 20	Mar 22
	Content	10.1 – 10.3	10.4, 10.5	10.5, 10.6
	Graded Work		HW#9	
11	Date	Mar 25	Mar 27	Mar 29
	Content	10.6, 10.7	10.8, 10.9	10.10, 10.11
	Graded Work		HW#10	Final Portfolio Draft Due
12	Date	Apr 1	Apr 3	Apr 5
	Content	11.1 – 11.3	11.4, 11.5	11.6, 11.7
	Graded Work		HW#11	
13	Date	Apr 8	Apr 10	Apr 12
	Content	11.8, 11.9	12.1 – 12.3	12.4
	Graded Work	Portfolio Peer Reviews Due	HW#12	
14	Date	Apr 15	Apr 17	Apr 19
	Content	12.5, 12.6	Review	
	Graded Work	Final Portfolio Due	HW#13	EXAM 3 Chapters 10, 11, 12
15	Date	Apr 22	Apr 24 Finals	Apr 26 Finals
	Content	Flex Day		
	Graded Work			
16	Date	Apr 29 Finals		
	Content			
	Graded Work			



## Course Final Grade Assignments

To ensure consistent and fair grading, grading scales in all 1000-level chemistry courses are assigned by your lecturer in consultation with the Director of General Chemistry, Dr. Patrick Woodward.

**Course Letter Grade Assignment:** Once your overall point total (final score) has been calculated using the weighting scheme shown above, your letter grade will be assigned based on the following scale:

Total Score (%)	Letter Grade
$92 \leq \text{score} \leq 100$	A
$88 \leq \text{score} < 92$	A-
$84 \leq \text{score} < 88$	B+
$80 \leq \text{score} < 84$	B
$76 \leq \text{score} < 80$	B-
$72 \leq \text{score} < 76$	C+
$67 \leq \text{score} < 72$	C
$62 \leq \text{score} < 67$	C-
$56 \leq \text{score} < 62$	D+
$50 \leq \text{score} < 56$	D
$< 50$	E

*If exam performance falls outside of historical norms the department retains the right to make changes in the grading scale.*

*The instructor is happy to clarify the grading process and discuss your performance in this course.*





## Important Resources for Academic Success

**Supplemental Lecture Videos:** To support your learning, we provide short lecture videos to *supplement* (not replace) *some* of the topics covered in your in-person lectures. Your actual lecture will be more interactive, personalized to your needs, tailored to the content on your exams, and, of course, fun, fun, fun. That said, the videos can help you review or better understand some of the topics covered in lecture. Links to the videos are—you guessed it—available on Carmen Modules.

**Learning Resource Center (LRC):** Located in Celeste Lab (CE) 170, the LRC is where TAs hold office hours and where students can come for individual help and instruction. While there are no TA's for CHEM1207, you are welcome to use this help room. These TA's teach General Chemistry. Stop by when convenient during posted hours. You do not need to make an appointment. Limited evening and weekend hours will also be available through Zoom. [Check here and the LRC for the schedule.](#)

Additionally, the LRC has computers with general chemistry instructional programs. These programs offer single-concept problems that must be understood in order to grasp the more difficult multi-concept questions on exams. Computers are available for student use any time the LRC is open, and on a first-come, first-serve basis.

**Additional Resources:** The Resources module in your Carmen page offers links for help with everything from course content to mental health to finances and extracurricular involvement. It is a good place to start if you aren't sure where to go for information or assistance. Carmen is truly the beginning and end of all things.

**Disability Services:** The University strives to make all learning experiences as accessible as possible. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's request process, managed by Student Life Disability Services. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: [slds@osu.edu](mailto:slds@osu.edu); 614-292-3307; [slds.osu.edu](http://slds.osu.edu); 098 Baker Hall, 113 W. 12<sup>th</sup> Avenue.

The general chemistry department strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), reasonable accommodations can be established in partnership with Student Life Disability Services (SLDS).

*Please note:* Applying for SLDS accommodations in general chemistry is a multi-step process that involves working with both the SLDS office and our office. To start, first register with SLDS using [this webpage](#).

We understand that this setting up SLDS accommodations can be a confusing and daunting process, but Holly Wheaton is especially good at navigating the process, so please reach out to her if you have any questions or uncertainties. You can stop in the office, call (614-292-6009), or [email Holly](#) for help.



## Disability Services Contacts

### Contact SLDS

Email: [slds@osu.edu](mailto:slds@osu.edu)

Phone: 614-292-3307

Address: 098 Baker Hall

### Contact Holly Wheaton

Email: [wheaton.4@osu.edu](mailto:wheaton.4@osu.edu)

Phone: 614-292-6009

Address: 110 Celeste Lab

**Commitment to Diversity:** Advancing diversity, inclusion, and student success is central to the mission of the Department of Chemistry and Biochemistry. We are excited to serve and support students from diverse backgrounds with respect to race, ethnicity, gender, sexual orientation, socioeconomic status, disability, religion, and national origin. The department's faculty and staff have collectively committed to create a welcoming and inclusive learning environment, both virtually and in-person. We want every student to successfully learn and achieve their academic and career goals.

We acknowledge that systemic racism and various forms of injustices have contributed to the marginalization and exclusion of many student populations in scientific fields of study including chemistry. As a department, we have made progress towards enacting equity-minded actions to address systemic inequities and barriers that students encounter in the classroom, department, and university. However, we continually strive to do more to advance the success of our diverse student body. As we do the important work of teaching and supporting students, we welcome your feedback and look forward to learning from you! Please email Dr. Ricciardo or the Vice Chair of Undergraduate Studies, [Dr. Jane Jackman](#), with your suggestions, concerns, and questions. We value each student's perspectives and are excited to collectively work towards ensuring Black, Latinx, Indigenous, LGBTQ+, and female students are well-represented in scientific disciplines and professions.

**Mental Health Resources:** As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, feeling down, difficulty concentrating and/or lack of motivation. Mental health concerns or stressful events may lead to diminished academic performance or impact a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing.

You can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting [ccs.osu.edu](https://ccs.osu.edu) or calling 614-292-5766. You can reach an on-call counselor when CCS is closed at 614-292-5766 and 24 hour emergency help is also available through the 24/7 National Suicide Prevention Hotline at the new 3 digit number: 988 or at [suicidepreventionlifeline.org](https://suicidepreventionlifeline.org).

## Academic Conduct

### ACADEMIC CONDUCT IN GENERAL CHEMISTRY

The university expects us all to know and adhere to the University Code of Student Conduct, so please do check it out [here](#). Below are some highlights you need to know for the purposes of CHEM 1207.

Any graded material you submit (for any component of this course) must be your own work. We are obligated by university rules to report any suspicions that you have compromised academic integrity or committed academic misconduct.

Here are some examples of academic misconduct in chemistry courses:

On exams:



- Having another person take your exam.
- Receiving assistance from another person while taking the exam.
- Taking screenshots or photos of the exam.
- Having a secondary device out during the exam, like a phone
- Using screen sharing software during the exam.
- Sharing or receiving exam questions or materials in group chats, text messages, phone calls, or on websites, apps, and the like.

#### On Lab Assignments – Notebooks, Post-Labs, and/or Smart Worksheets:

- Altering or “making-up” lab data in your lab notebook, Post-Labs, and/or Smart Worksheets.
- Submitting a previously completed lab assignment (whether completed by yourself or someone else).  
Self-plagiarism (i.e.: submitting your own work from another course or semester) is expressly forbidden.
- Copying lab assignments from another individual (assignments may be submitted to TurnItIn, an originality checker.)
- Working in a group to complete your Post-Lab/Smart Worksheet.
- For more information about academic misconduct and data integrity policy in the lab portion of your course, see your lab syllabus.

And here are some hints on how you can avoid academic misconduct<sup>1</sup>:

1. **Acknowledge Your Sources.** Whenever you use words or ideas that are not your own, use quotation marks, cite your source in a footnote, and end your work with a list of sources consulted.
2. **Protect Your Work.** In examinations, do not allow your neighbors to see what you have written; you are the only one who should receive credit for what you know.
3. **Avoid Suspicion.** Do not put yourself in a position where you can be suspected of having copied another person's work, or of having used unauthorized notes to complete an assignment or exam.
4. **Do your own work.** The purpose of assignments is to develop your skills and measure your progress. Letting someone else do your work defeats the purpose of your education and may lead to serious charges against you.
5. **Know Your Rights.** Do not let other students in your class diminish the value of your achievement by taking unfair advantage. Report any academic dishonesty you see.

*If you are unsure about what constitutes academic misconduct in CHEM 1207, PLEASE ASK Dr. R*

### **ACADEMIC CONDUCT IN THE UNIVERSITY**

The university requires that all course syllabi include the following statement on academic integrity:

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct <http://studentlife.osu.edu/csc/>.

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<sup>1</sup> From Northwestern University, “Academic Integrity: A Basic Guide.” Pg. 5. Sept 2020. Available at <https://www.northwestern.edu/provost/policies/academic-integrity/academic-integrity-guide-20201.pdf>

# CHEMISTRY 1208 LAB – SPRING 2024

## General Chemistry I Lab Syllabus

### INTRODUCTION

Instructional Team	
Lab Supervisors:	<a href="#">Dr. Bernice Opoku-Agyeman</a> <a href="#">Dr. Camila Fontes Neves da Silva</a>
Lecturer:	(Varies with lecture section)
Course Coordinator:	<a href="#">Sophie White</a>
Office & SLDS Contact:	<a href="#">Holly Wheaton</a>
TA:	(Varies with recitation/lab section)

Please see the “Contacts” page in Carmen for information on your instructors and who to contact for your unique needs.

Lab Supervisor Email: [chem1210labsupervisor@osu.edu](mailto:chem1210labsupervisor@osu.edu)

Lab Supervisor Office Hours: TBD  
Note: Lab Supervisor office hours are on Zoom ([go.osu.edu/labsupoh](https://go.osu.edu/labsupoh)). The link is also available on Carmen. In-person office hours are available upon request.

TA Office Hours:  
Information regarding your TA's office hours may be found on Carmen. They will reach out during the first week of class to communicate their office hours.

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**Welcome to CHEM 1208 Lab!** We are excited to explore General Chemistry concepts and laboratory skills with you this semester. This lab is the same as the CHEM1208 lab. Our goal is that you leave this course with an appreciation of how chemistry impacts your everyday lives. We also want to provide you with laboratory skills in chemistry that will facilitate your success in future science courses and careers.

This syllabus outlines the resources, policies, and procedures that will ensure your success in the General Chemistry lab. Please familiarize yourself with this syllabus and keep it in a convenient place for reference throughout the semester. You may find it helpful to download the syllabus on the Notability iPad app (or a similar app) to make personal notes on it. If you have questions or concerns about the syllabus itself, please contact the lab supervisors at the email address listed at the top of this syllabus.

### REQUIRED LAB MATERIALS

**LECTURE TEXTBOOK:** Refer to the CHEM1208 Lecture syllabus

**LAB MANUAL:** You will be using *Chemistry 1208 General Chemistry Laboratory Manual*. Hayden-McNeil Publishing, Inc. New 2022-2023 e-book Edition. **Students are required to purchase access to the current version of the lab manual through the Achieve website or the University Bookstore.**



**ACHIEVE WEBSITE:** Access to the laboratory manual e-book can be purchased at the following link: <https://achieve.macmillanlearning.com/>. You are not able to sign up on the Achieve website before January 7<sup>th</sup>. A 14-day free trial may be used. After the 14-day trial period is up, you must purchase a code from the bookstore or purchase access with a credit or debit card on the site to continue using the platform. Please use your official OSU email when creating your Achieve account. Your purchase of the lab manual also includes access to Smart Worksheets that are used with some experiments to grade your data and calculations (SCM, Pbl, LLT, IHT and GAS).

When registering on the Achieve website, be sure you are in the correct lab section. You will need a Course ID for your specific lab section to ensure you enroll in the correct section. Consult the *Chemistry 1208 Achieve Course (Lab Manual & SmartWorksheets)* page in the Laboratory page of your Carmen course for the list of Course IDs.

If you enrolled in a different lab section, be sure to switch to the correct lab section by Sunday January 22<sup>nd</sup>. Instructions of how to switch section can be found via this link: [Achieve > Switch courses if you enrolled in the wrong course \(site.com\)](#). To ensure fairness, students who do not appear in their lab section in the Achieve course by January 22<sup>nd</sup> will not receive credit for any Smart Worksheet assignments they complete in the incorrect section even if they switch to their section later on during the semester.

This semester, we will provide you with a bound paper copy of the lab manual. If you are *re-taking* this class and have already purchased access to the lab manual and Smart Worksheets within the last year, please reach out to the Lab Supervisors via email to be added to this semester's class before **January 22<sup>nd</sup>**. Please be sure to provide the following information in your email: First and last name, email address used on HM account, current lecturer's name, and your 5-digit lab section number.

All worksheets and the electronic version of your lab manual can be accessed at <https://achieve.macmillanlearning.com/courses>. A link to the Achieve website can also be found on Carmen.

**LAB NOTEBOOK:** Students may use Notability (or a similar app) on an iPad (University-owned recommended) or a paper notebook. See page 6 for more information about lab notebooks for this semester.

**REQUIRED SOFTWARE:** Microsoft Office Suite (specifically Word and Excel). All Ohio State students are eligible for free Microsoft Office 365 ProPlus through Microsoft's Student Advantage program. See [office365.osu.edu](http://office365.osu.edu) for more information.

## GENERAL COURSE INFORMATION

### WILL YOU MISS MORE THAN ONE LAB?

If you know you will miss more than one in-person laboratory period (for OSU athletic competitions, military training/duties, religious observances, etc.), you are responsible for **contacting the general chemistry office** ([genchem@osu.edu](mailto:genchem@osu.edu)) during the first week in order to move to a laboratory section that minimizes scheduling conflicts, space permitting. Unfortunately, we cannot accommodate more than one lab absence, so we strongly encourage you to plan ahead.

**CARMEN:** Carmen is the central hub where the course is conducted. You will find important resources and information such as announcements, overview pages for each experiment, and lab assignments on Carmen. To ensure that you have successful lab experience, we encourage students to carefully read the syllabus to become familiar with the course content, procedures, and grading policies. Please note that information presented in the syllabus, overview pages, and announcements on Carmen supersede any other source and are the most reliable resources to keep you on track to successfully complete your lab-related tasks and assignments.

**LAB TEAM COMMUNICATION:** The Lab Supervisors will be posting "Announcements" in your Carmen course that outline experiment tips, preparation instructions, and important details. Go to the Announcements area in the Carmen navigation bar to see all these messages. They are never deleted and are searchable. You can also set Carmen to send you an email every time an announcement is posted; explicit instructions on how to do so are at the following web address: [www.go.osu.edu/notificationsettings](http://www.go.osu.edu/notificationsettings). We highly encourage students to regularly read announcements posted by the Lab Supervisors on Carmen.

The lab supervisors are here to support you on your chemistry journey, so please reach out to us with your questions and concerns about lab. If you have a question about a policy, procedure, or need clarification, please email the Lab



Supervisors at [chem1210labsupervisor@osu.edu](mailto:chem1210labsupervisor@osu.edu). You will not receive a response if your message is sent to an incorrect email address or via the Carmen Inbox system. You must use your OSU email account when emailing the Lab Supervisors. Be sure to include the following information in your email to help the Lab Supervisors get back to you faster:

- Your TA's name
- Your Lecturer's name
- The day and time of your lab
- 5-digit lab section number

Please note that emails sent over the weekend, or a holiday may not be answered until after the weekend/ break.

**ZOOM OFFICE HOURS:** This semester, the lab supervisors will have their office hours on Zoom. You can click on the link to the right ([go.osu.edu/labsupoh](https://go.osu.edu/labsupoh)), or simply type it into your web browser.

**ZOOM MEETINGS:** The last lab of the semester, experiment MGB, will be online via Zoom during your regularly scheduled lab time. Please see the Laboratory Activity Schedule and Laboratory Assignment Type sections below for more information.

To ensure we cultivate a safe and comfortable online learning environment, we encourage all of us to be professional, respectful, and focused when joining office hours on Zoom or attending online discussion for the class. Please be mindful of others while online. Links and information posted in the chat window are only available to students who are present at the time the links are posted. Please make sure your first and last name are displayed during any online interactions and online office hours.

**OVERVIEW PAGES:** This is where to start for every lab! For each experiment, there is an Overview page in the Lab Modules section of Carmen. The Overview pages contain helpful information, experiment videos, and required assignments for each experiment.

## MANDATORY QUIZZES

Introductory assignments do not contribute to your course grade but must be completed with a 100% score to pass this course.

The **Academic Misconduct Quiz** not only confirms your enrollment in the course, but also teaches you about academic integrity, which we take very seriously. Therefore, please complete this quiz by **11:59 pm, DATE**. Please note that if you do not receive a 100% on this quiz by the due date, **you will be assigned an "E" as your final course grade**. You may take the quiz as many times as you need to receive 100% and your score will be recorded in the Grades section of Carmen. Also, you may take this quiz online from any location (does not need to be completed while physically present for class). Please reach out to the **general chemistry office** ([genchem@osu.edu](mailto:genchem@osu.edu)) if you have any concerns about this policy.

In addition to the Academic Misconduct Quiz, you are required to complete the following assignments before you can participate in laboratory activities. Please check Carmen for the specific due dates of these assignments. You should complete these assignments in the order listed below.

1. **Lab Safety Statement:** A score of 100% on this assignment unlocks the *Safety and Lab Policies Quiz*. Be sure to complete this assignment before your first in-person lab session.
2. **Safety and Lab Policies Quiz:** A score of 100% unlocks the remainder of the lab module. Please bear in mind that any assignment you miss as a result of failing to complete this assignment will not be reopened. You can only access the *Safety and Lab Policies quiz* after completing the *Lab Safety Statement*.

Completing the assignments above before your first lab section should prepare you well for the lab. Please note that any lab assignments you miss because you failed to complete the Introductory quizzes will not be re-opened for you.



## DISABILITY SERVICES (SLDS)

The university strives to make all learning experiences as accessible as possible. Students seeking to request COVID-related accommodations may do so through the university's request process, managed by Student Life Disability Services. If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let the Lab Supervisor know immediately so that we can privately discuss options. To establish reasonable accommodation, the Lab Supervisor may request that you register with Student Life Disability Services. SLDS contact information: [slds@osu.edu](mailto:slds@osu.edu); 614-292-3307; [slds.osu.edu](http://slds.osu.edu); 098 Baker Hall, 113 W. 12th Avenue.

If you are a student with SLDS accommodation or who require accommodation, we've provided information in the Disability Services Resources Module in your Carmen course. You will find information on how the accommodation is applied to the different aspects of your General Chemistry course such as lab assignments, lecture, exams, online homework, and recitations. We therefore strongly encourage you to familiarize yourself with this resource in your Carmen course.

## EXPECTED LEARNING OUTCOMES

In Chemistry 1208 lab is a significant aspect of your chemistry learning experience in CHEM 1208, and the following are the goals and learning outcomes you will accomplish in the lab:

- Qualitatively and quantitatively examine curriculum presented in lecture, such as atomic and molecular structure, chemical reactivity, thermochemistry, and chemical calculations in an active laboratory setting.
- Practice laboratory methods applicable to chemists of all levels.
- Create, and demonstrate the proper use of, a well-prepared laboratory notebook and evaluate the importance of organized scientific data collection and data integrity.
- Demonstrate the ability to interpret data, evaluate conclusions supported and not supported by experimental results, and compare and contrast chemical methods, as communicated through Post-Labs.
- Demonstrate the safe handling and proper disposal techniques for all materials used in the lab.

## LABORATORY SCHEDULE

Your laboratory consists of one 2 hour and 55-minute session each week. All students will work in the laboratory only during their scheduled laboratory period. Students will only work on the experiment listed on the syllabus for that day. The lab schedule on the next page shows the experiment you will be completing each week in lab.

If you are unable to finish a laboratory experiment during the designated time, please contact the Lab Supervisor, via email, within **24 hours of the lab start time** so we can discuss the lab make-up process and procedures. Please, read details about the supplementary data and make-up policies on pages 8.

### Laboratory Schedule

1208 Laboratory Activity Schedule					
Week of	Monday	Tuesday	Wednesday	Thursday	Friday
Jan 8 – 12	X	X	X	X	X
Jan 15 – 19	MLK Day <sup>†</sup>	WRM	WRM	WRM	WRM
Jan 22 – 26	WRM	CPC	CPC	CPC	CPC
Jan 29 – Feb 2	CPC	SCM	SCM	SCM	SCM
Feb 5 – 9	SCM	X	X	X	X
Feb 12 – 16	Pbl Day 2*	Pbl Day 2*	Pbl Day 2*	Pbl Day 2*	Pbl Day 2*
Feb 19 – 23	CYC	CYC	CYC	CYC	CYC
Feb 26 – Mar 1	LLT	LLT	LLT	LLT	LLT
Mar 4 – 8	IHT	IHT	IHT	IHT	IHT



Mar 11 – 15	Spring Break <sup>†</sup>				
Mar 18 – 22	EMS	EMS	EMS	EMS	EMS
Mar 25 – 29	QUL	QUL	QUL	QUL	QUL
Apr 1 – 5	GAS	GAS	GAS	GAS	GAS
Apr 8 – 12	MGB Online	MGB Online	MGB Online	MGB Online	MGB Online
Apr 15 – 19	X	X	X	X	X
Apr 22 – 26	X	Reading Day	Final Exams		

X = Labs will be cancelled

<sup>†</sup> = University Holiday. Due dates for lab assignments that fall on University Holidays will be extended

\*Pbl Day 1 data will be provided on the Overview for experiment Pbl

Due to the Celeste renovation, Day 1 of Experiment Pbl will be completed digitally on your own; Day 2 will be completed in lab. Additionally, Experiment MGB will be completed digitally and will have an online discussion on Zoom during your regularly scheduled lab time. A link to the Zoom session will be available in the Zoom area of your Carmen course. To earn any credit for the MGB Post-Lab, you must attend the entirety of the online discussion on Zoom.

## PREPARING FOR FIRST DAY OF IN-PERSON LAB

**PROPER LABORATORY ATTIRE:** The clothing you wear to lab must provide skin protection from chemical spills and splashes. **Ankles and feet must be completely covered.** Please refer to the LABORATORY SAFETY REQUIREMENTS on page 9 for a more detailed discussion.

**LAB COATS:** Each student is required to purchase a department-approved lab coat from the Chemistry store to wear during General Chemistry labs. This lab coat has been specially selected to protect you from the hazards in the lab. Please come prepared with a lab coat for your first in-person lab, otherwise you will unfortunately be sent home from lab. Therefore, please give yourself plenty of time to purchase a lab coat before your first lab session.

**Lab Coat Purchase:** The Chemistry Store (<https://u.osu.edu/chems/>) is located in 180 Celeste Lab and is open Monday-Friday from 7:45 am – 4:00 pm (hours may vary). The Chemistry Store is a university-run store and is not affiliated with the Department of Chemistry and Biochemistry. Their hours vary during the semester. Credit cards, Apple Pay and Buck-ID are currently the only accepted methods of payment at the Chemistry Store. You must have your lab coat by your first in-person lab session. **The lab coat sold in the Chemistry Store is the ONLY acceptable model.** When you purchase your lab coat at the Chemistry Store, you will be provided with a plastic zip-top bag for storage and a lab coat care sheet. If you are re-taking General Chemistry, you will be provided with a bag in your first lab session.

You will keep your lab coat and goggles between lab sessions. Your TA will walk you through the lab coat protocol during your first laboratory session. At the end of the course, you will keep your lab coat for future lab experiences.

**Lab Coat Etiquette:** Lab coats should be fully buttoned up when in the laboratory. We are not able to loan lab coats to students if you forget your own lab coat. You should remove your lab coat before heading home, or to the bathroom or drinking fountain. You may wear your lab coat when obtaining items from the stockroom window. You are not permitted to sit on the benches in the hallway while wearing your lab coat. Never wear your lab coat at home. Always treat your lab coat as if it is contaminated.

**GOGGLES:** Each student in Chemistry 1208 will be provided goggles for use in the General Chemistry laboratory during their first in-person lab session.

## LABORATORY ASSIGNMENTS & GRADING

**LAB POINT DISTRIBUTION:** The laboratory component of CHEM 1208 is worth 25% of your overall course grade. Therefore, your total points earned (out of the total 1100) will be scaled to contribute this percentage to your overall course grade. For more information, see your lecture syllabus or Carmen gradebook. To ensure you develop the necessary skills and competencies critical for your success in chemistry, **you will need to earn 50% of the total**





lab points (550/1100) to pass the course. Regardless of your grades in lecture, if you do not meet this minimum, unfortunately you will be assigned an “E” grade in CHEM 1208.

### Point Distribution for Each Lab

Abbreviation	Activity	Pre-Lab	Post-Lab**	Smart Worksheet	Total
–	Introduction to Smart Worksheets	–	–	–	10
Check-In/WRM	Introduction to the General Chemistry Laboratory	–	–	–	60
CPC	Chemical and Physical Changes	15	85	–	100
SCM*	Scientific Measurements	15	55	30	100
Pbl*	Synthesis and Characterization of Lead Iodide	15	50	35	100
CYC	Investigation of a Copper Cycle	15	85	–	100
LLT*	Quantitative Analysis of the Citric Acid Content in Juices	15	50	35	100
IHT*	Investigating Heat Transfer and Calorimetry	15	45	40	100
EMS	Emission of Light and Atomic Models	15	85	–	100
QUL	Qualitative Determination of Selected Metal Cations	15	85	–	100
MGB†	Molecular Geometry, Bonding, and Polarity	15	85	–	100
GAS*	Exploring the Gas Laws with Alka-Seltzer®	15	50	35	100
-	End of Semester Survey	–	–	–	30
<b>Overall Lab Total:</b>					<b>1100</b>

\*This experiment has a Smart Worksheet; the score is entered into the Smart Worksheet assignment in Carmen

\*\*The Post-Lab scores in the table includes Notebook points except for MGB

†This experiment is fully digital with an online discussion

**GRADING REVIEW REQUESTS:** We are happy to review the grading of your lab assignments, if necessary. However, please note that all requests for re-grading (Pre-Labs, Post-Labs, etc.) should be made within **1 week** of receipt of the graded work. You are required to discuss the grade with your TA first before contacting the lab supervisors to request for re-grade. After receiving your request via email, the lab supervisors will first discuss the grading process with your TA and then one of the Lab supervisors will re-grade the entire assignment. This revised grade will then be final.

**DATA INTEGRITY:** Data integrity is critical to your success in chemistry. Thus, it is important to remember that data and procedural information in your lab notebook cannot be altered in any way after you have left the lab. The data and written procedures recorded in your Post-Lab or Smart Worksheet (see below) should match the data and procedures in your lab notebook, so we encourage students to be careful when copying procedure or data from your notebook to your Post-Lab or Smart Worksheet. Changing data or adding detail to a written procedure in a Post-Lab or Smart Worksheet is considered data fabrication. Common examples of data fabrication include adding zeros to values, changing exact values or observations, or adding details to procedures. For more information, review the “A Note About Data Integrity” page on Carmen and the “Standards of Academic Conduct in General Chemistry” below.

**LATE SUBMISSIONS:** All assignments are due by the date and time listed on Carmen. Considering students may encounter unexpected circumstances that may prevent them from submitting assignments on time, a 48-hour grace period will be implemented for Post-Labs & Smart Worksheets. To be clear, the due dates for these assignments have not been extended; Carmen has been programmed to continue accepting Post-Lab submissions for 48 hours after the due date. Students are strongly encouraged to work ahead on the Post-Labs and Smart Worksheets so they can contact the lab supervisors before the due date if they encounter issues while working on the assignments. This ensures that there is enough time to provide any assistance needed. Please note that the lab supervisors will not be able to help if a student contacts them once the due date of the assignment has passed and the 48-hour grace period has begun. Submissions will not be accepted 48 hours after the due date. The timestamp on your submission in Carmen is the official submission time and date. Even if 48 hours have not elapsed, *Post-Labs and notebook uploads will not be accepted after 11:59 PM on Friday, April 19<sup>th</sup>, 2024.* Again, the 48-hour grace period does not apply to Pre-Labs and lab notebook uploads.



## LABORATORY ASSIGNMENT TYPES

There are different ways lab supervisors will use to provide information about each lab assignment. The information may be provided in this lab syllabus, via email, or on Carmen. On Carmen, this can include posted announcements, the overview page in your laboratory module for each experiment, the instruction box for each assignment, and in some cases, information embedded in the question itself.

**PRE-LAB ASSIGNMENTS:** To ensure that you are well-prepared to conduct experiments each week, Pre-Labs need to be completed before the due date on Carmen. We highly encourage you to read all Pre-Lab instructions carefully before you start the assignment. Students will receive 2 attempts on each; Unfortunately, no credit (0) will be given if the Pre-Lab assignment is late. **The 48-hour grace period does not apply to Pre-Labs.** Please note that students cannot be excused from Pre-Labs of experiments that have been assigned to them.

**LABORATORY NOTEBOOK:** The laboratory notebook is a permanent record of purpose, procedures, observations, data, and conclusions. As one of our Learning Outcomes, it is important to learn how to create and keep a lab notebook as a General Chemistry student and scientist. This semester students may use the Notability app (or similar) on an iPad or a physical notebook that has lines or grids. Please note that laptops cannot be used as lab notebooks. Please also note that no information can be recorded on scratch paper or in the lab manual during an in-person laboratory session. It is critical to ensure that all information recorded in a lab notebook is not altered in any way after leaving the lab.

To ensure a productive in-person lab experience, your notebook should be prepared before the beginning of lab, and you will earn up to 5 points for a well-prepared notebook that has all components (purpose, all procedure and data) present. During grading, your TA will assess your notebook prep and its contents and then assign you notebook points. Please note that points will be deducted for missing components. Having a fully prepared notebook will ensure you understand lab procedures, what data is to be collected in lab, and any relevant safety concerns. When preparing your notebook, please manually make your own tables to record data. Please note that screen shots of your lab manual pages will not count as your procedure or tables for recording data, and your notebook will earn 0 points if they are included.

There are some experiments that require you to complete some in-lab activities in addition to collecting data prior to leaving lab. These activities have been designed to provide some conceptual insight into what the experiment is about and to encourage discussions among students and with the lab TA. Please note that points may be deducted from your notebook score and lab performance points if you are unable to complete these lab activities due to tardiness or lateness. You can read more about lab performance points below.

ALL entries in your lab notebook should be recorded in **Blue or Black** when using either a digital or physical notebook. Lab notebook guidelines are described in the 'Guide for Success in the General Chemistry Laboratory' section of your laboratory manual (beginning on page xiii). To protect your iPad from chemical contamination, students should place their iPad in a plastic bag during lab. You will be provided with one bag at the beginning of the semester. Please do not discard this bag since a replacement bag will not be provided.

For all in-person labs, a digital copy of your filled-in lab notebook should be submitted to Carmen within 48 hours **after** the start time of your in-person lab. You can submit your digital copy in one of two ways:

- 1) a PDF exported from Notability or a similar app.
- 2) Scans/photos of physical notebooks.

Specific instructions for your notebook upload can be found in the relevant Carmen upload assignment.

Please note the following about your Notebook Uploads.

- The only accepted file types for submitting digital copies of notebook pages are docx and PDF.
- You must use the following file naming system:  
**lastname.#\_firstname\_semester\_experimentcode\_notebook**. For example, a lab notebook upload for experiment SCM in Spring 2024 would have the file name "Smith.1234\_John\_SP24\_SCM\_notebook".
- Incorrect file name format will result in points deductions. An exception to the point deduction is the notebook upload assignment for experiment WRM, the Check-In lab.



Please submit only a single file. The purpose, procedure, and data to collect must be in the same file. Be sure to open your notebook in Carmen after submission to ensure that all the pages have been fully submitted. Unfortunately, if you do not submit a digital copy of your lab notebook on time, your TA will not be able to grade your Post-Lab assignment and you will not receive the 5 notebook points for the lab in question. In addition, for experiments that include Smart Worksheets, you will not receive credit for any work you complete on your worksheets if you do not submit a digital copy of your lab notebook on time. If a digital copy of your notebook, with all procedure and data included, is not received before the final deadline for lab work (**Friday, April 19<sup>th</sup>**), you will only earn your performance for your Post-Lab and receive a zero score on any accompanying smart worksheet. Please note that for each specific experiment, you can still submit your lab notebook after the 48-hour window for no credit unless the final deadline has passed. Also, note that students cannot be excused from notebook uploads of experiments that have been assigned to them.

Only pdf and docx submissions on Carmen will be accepted for lab notebooks. Submissions only containing links to OneDrive, etc. folders, submissions via email, and submissions via comments in Carmen will not be accepted. **It is important to note that the 48-hour grace period does not apply to uploading your notebook** after the deadline. Please make sure you submit your notebook pages to the correct assignment dropbox in Carmen. Turning in notebook pages to the wrong assignment dropbox will result in no credit for the notebook or the corresponding Post-Lab once the final deadline to submit labs has passed on April 19<sup>th</sup> 2024. If you submit your notebook pages for any experiment within a week of the final deadline, please contact your lab TA and notify them of your submission in order for them to grade your Post-Lab for that experiment.

Please do not re-upload your notebook pages once they have been graded with the intention of getting a higher score. Since notebooks uploaded after the 48-hour submission window are considered late, re-uploading your notebook pages will result in your notebook grade being changed to zero as a result of a late submission.

**LABORATORY PERFORMANCE:** To foster a safe and positive learning environment for all students, each in-person laboratory grade includes 5 points for laboratory performance. In the bullet points below, we discuss some of the items that contribute to your performance points.

- To make sure you (and your lab partner) complete lab in time, we highly encourage you to arrive outside the laboratory by the official start time and wait for the TA to welcome you into the lab room.
- You are expected to be prepared. Proper attire must be worn, and safety policies must be followed; see page 9 and the Safety Statement on Carmen for more information.
- As the laboratory is a common space, you are expected to treat all equipment respectfully and use it properly.
- You must follow instructions given in the lab manual and by your TA, and if a mistake is made, adjust your technique or behavior to adhere to these instructions.
- **Cell phones must be put away in a backpack or bag during lab.** Laptops and tablets should never be set directly on the lab bench (due to chemical contamination) before cleaning. Headphone use is strictly prohibited.
- Gloves must be taken off before leaving the lab room. Please do not touch the doorknobs or any food or drink items while wearing gloves.
- You are expected to complete any in-lab activities before leaving lab unless extenuating circumstances apply.
- Make sure your TA check you out before you leave the lab.

Every student will begin each lab period with all 5 performance points. Your TA will deduct points for not following the above guidelines. "Lab Performance" is the first item in each Post-Lab for an in-person lab. When each Post-Lab has been graded and returned, your lab performance score will be included.

Please note that students who are continuously late to lab will be asked to meet with the lab supervisors to chat about the recurring lateness first before they can continue working in the lab.

**ONLINE DISCUSSION & COMPLETION POINTS:** The very last lab of the semester (MGB) is a digital lab. To encourage active participation, the digital experiment includes 5 completion points as the first item in the Post-lab. Five points are earned by attending the entirety of the online lab discussion session via Zoom. The discussion will start at the regular start time of your lab. Make sure your first and last name are displayed during the online lab discussion. To receive the five points, you must participate in the online discussion.

To be eligible to make up the online lab discussion session, you must have a documented university-approved absence. Please email the Lab Supervisors using the email address listed on the front of this syllabus within 24 hours of the missed online session and provide your documentation (please cc your TA on the email) unless extenuating circumstances arise. The Lab Supervisor will consider extenuating circumstances as they arise.



When you are on Zoom for your online discussion, we recommend closing any apps on your device that are not relevant and turn off notifications to make sure we all can stay focused without any distractions. Be sure to use the chat window for questions and comments that are relevant to class. Be mindful to others in the meeting and **stay on the topic being discussed**. Please mute your microphone when you are not talking. If you do not attend the entirety of the online discussion for the lab of the semester, you will receive a zero (0) even if you complete the accompanying Post-Lab.

**POST-LABS:** Post-Labs, available on Carmen, will be completed after most experiments. You will have two attempts and your highest autograded attempt will be graded, not the most recent. Each attempt can be open for 48 hours. Some Post-Labs include a Smart Worksheet while others include a Presentation of Data file upload question. Refer to the Achieve website section below for a discussion of Smart Worksheets.

Please note the following information about the Presentation of Data uploads.

- The only accepted file type is PDF.
- The file should be named with the following format:  
**lastname.#\_firstname\_semester\_experimentcode\_data**. For example, a Presentation of Data file for experiment SCM in Spring 2023 would have the file name "Smith.1234\_John\_SP23\_SCM\_data".
- Incorrect file type or name format will result in points deductions.

Any submitted files that are not the required file type (PDF only) will result in zero credit for your Presentation of data question in your Post-Lab. We encourage you to review your Presentation of Data after your first submission to ensure you have submitted what you intend to submit for that question. Submissions only containing links to OneDrive, etc. folders, submissions via email, and submissions via comments in Carmen will not be accepted. We can only accept the work you submit to the appropriate question in your Carmen assignment.

Students will be given one exception to submit their data on their data upload for instances where submission requirements are not followed. If you want to use your exception, you must contact the lab supervisors within a week of your graded assignment. Conditions under which a pass will be granted are:

- Submitting any other file type other than a pdf
- Naming the file incorrectly and
- Accidentally submitting a blank file
- Extenuating circumstances as determined by the lab supervisors

Please note that instances that do not qualify for an exception includes but not limited to forgetting to submit the Presentation of data file, uploading incomplete work and submitting work completed from a previous semester.

Post-Labs are due one week after the completion of the experiment by the start time of your lab period. No credit (0) will be given to Post-Labs and submitted after the 48-hour grace period. Even if 48 hours have not elapsed, Post-Labs, and notebook uploads will not be accepted after **Friday, April 19<sup>th</sup> at 11:59 pm**. As stated in the Laboratory Notebook section of this syllabus, you will only earn performance points on the Post-Lab if you do not upload a digital copy of your notebook including all procedure and data before the final deadline for lab work.

Please note that if the due date of a Post-Lab coincides with a University Holiday, an extension will be applied to that assignment. Please note that the due dates will not be extended beyond the final deadline i.e. **Friday, April 19<sup>th</sup> at 11:59 pm**.

**SMART WORKSHEETS:** Your Post-Lab assessments for experiments SCM, Pbl, LLT, IHT and GAS include Smart Worksheets that you will use to analyze the data you collected. The worksheets can be accessed via the Achieve website at <https://achieve.macmillanlearning.com/courses>. This link can also be found on Carmen. See the General Information below to learn about the Achieve website.

You may only submit a worksheet once; they will not be reset for any reason. Worksheets are due at the same time as the accompanying Post-Lab. The Smart Worksheet autosaves as you work on it therefore you do not need to submit the worksheet when you are finished. Please note that students cannot be excused from Smart Worksheets for Post-Labs that have been assigned to them. Only have the worksheet open when you are working on it. If the worksheet has been idle for more than an hour, refresh the page before continuing your work. Failure to purchase access will result in forfeiture of these points. No credit (0) will be given to Smart Worksheets submitted after the 48-hour grace period. Even if 48 hours have not elapsed, Smart Worksheets will not be accepted after **Friday, April 19<sup>th</sup> at 11:59 pm**. For experiments that includes smart worksheets, no credit will be given for the worksheets if you do not upload a digital copy of your notebook including all procedure and data before the final deadline for lab work.

Just like the Post-Lab, if the due date of a Smart Worksheet coincides with a University Holiday, an extension will be



applied to that assignment. Again, no assignment will have due dates extended beyond the final deadline i.e **Friday, April 19<sup>th</sup> at 11:59 pm.**

**Introduction to Smart Worksheets:** We highly encourage you to complete the Introduction to Smart Worksheets assignment found on the Achieve website. This assignment is **due on DATE at 11:59 pm for credit but will remain open until Friday, April 19<sup>th</sup> at 11:59pm.** It is designed to introduce you to key features of the Smart Worksheets you will be completing this semester and shows you how to get the most out of them. The score of this assignment will count towards your grade for this class. You will complete this worksheet once and they will not be reset for any reason. Regardless of whether you complete this assignment or not, you are responsible for understanding how data analysis and calculations work in the Smart Worksheets.

## LABORATORY POLICIES

**SUPPLEMENTARY DATA POLICY:** If you are unable to collect all the data needed in lab, you should email the lab supervisors within 24 hours of the start of lab. The lab supervisors will review your circumstance and make a decision as to whether you will receive the data you are missing. Depending on the type of data you need, points may be deducted from your Smart Worksheet, Presentation of Data, and/or procedure questions in the Post-Lab. Please note that contacting the lab supervisors is not an assurance that you will receive data.

**MISSED LABORATORY POLICY:** To ensure a successful and productive lab experience, students are required to attend all in-person labs this semester. Students can make-up only one lab without a university approved absence. However, failure to have an approved excuse for missing a lab will result in a 40-point penalty. The 40-point grade penalty is applied in a separate column in the Carmen grade book so students can easily see when a grade penalty is applied. Please know that absences resulting from extenuating circumstances will be reviewed by the Lab Supervisor and decide whether the 40-point penalty can be waived.

Unfortunately, the 40-point penalty cannot be waived for the following reasons: Lack of preparation, negligence, work schedules, planned vacations, failure to have proper PPE (goggles and Lab coat) and/or lab attire, and exams held during regularly scheduled lab sessions. The 40-point penalty will be waived for the following reasons with proper documentation: Student-athlete commitments, military commitments, religious obligations, medical emergencies, illness, death of a family member, childcare issues, or SLDS attendance/deadline modifications. The lab supervisors may request for some form of documentation to have the 40-point penalty waived. Please be sure to email the requested documentation to the email listed at the front of the syllabus by the final deadline for submitting all lab works i.e **Friday, April 19<sup>th</sup> at 11:59 pm.**

You may miss a second lab if you have a university approved absence. If you miss an in-person lab and want to request a make-up, you should email the Lab Supervisors within one week of the missed lab. The make-up lab for your first missed lab will be a digital make-up lab assigned towards the end of the semester. This make-up lab will be unrelated to the lab you missed. The make-up lab for a second missed lab with an approved absence will be a digital alternate version of the in-person lab you missed.

If you are registered with SLDS with Intermittent Flex Plan, please refer to the Intermittent Flex Plan Agreement in your Carmen course for specific policies about missed labs.

If you do not attend the lab, please do NOT submit a Post-Lab or Smart Worksheet. You must email the lab supervisor within one week of the missed lab unless extenuating circumstances make it so you cannot. The Lab Supervisor will determine if a circumstance is extenuating. If you do not contact the lab supervisors within a week of an in-person missed lab and submit the in-person Post-Lab or Smart Worksheet for that experiment, you will automatically receive a zero on the assignments, including the notebook upload, and will forfeit the opportunity for a make-up assignment for that experiment.

**COVID-19 ABSENCE:** In the event, you need to miss your in-person lab due to COVID-related issues, including but not limited to, illness and/or quarantine, please request accommodations from Student Life Disability Services as soon as possible. <https://slds.osu.edu/covid-19-info/covid-related-accommodation-requests/>. Once an accommodation is granted, please forward the accommodation letter to the Lab Supervisors as documentation.

**LATE ENROLLMENT:** Please note that if you enrolled in Chem 1208 once the semester begins, you are responsible for ensuring that you did not miss any lab assignments. We strongly suggest that you check the Laboratory Modules in Carmen and note any assignments you may have missed due to your late enrollment. Then reach out to



the lab supervisors *within one week* of your enrollment in the class to request make-ups for any lab assignments you have missed.

**INCOMPLETE POLICY:** While nobody begins the semester anticipating they will receive an incomplete for a course, there are circumstances that may warrant that a student takes an incomplete in the course. In such situations, the Incomplete Policy for General Chemistry Lab will allow you to make-up a maximum of four (4) experiments. All incomplete requests must be made in writing to the lab supervisors by **Friday, April 19<sup>th</sup> at 11:59 pm**. Requests made after the final deadline will only be approved in the case of significant extenuating circumstances.

## HEALTH AND SAFETY REQUIREMENTS

**MEDICAL INSURANCE COVERAGE:** Due to the potentially dangerous nature of laboratory work, you are required to maintain medical insurance coverage through the Ohio State student health insurance or a private agency when enrolling in chemistry laboratory courses.

**COVID-19 SAFETY MEASURES:** All students, faculty and staff are required to comply with and stay up to date on all university health and safety guidance (<https://safeandhealthy.osu.edu>), which includes following university mask policies. Non-compliance will be warned first, and disciplinary actions will be taken for repeated offenses. Any changes to health and safety requirements may be found on the Safe and Healthy website and will be communicated through a Carmen announcement, if needed. In the event of a positive test or exposure to COVID, please visit <https://safeandhealthy.osu.edu/tracing-isolation-quarantine> for the current University guidance on isolation and quarantine.

**LAB ROOM SANITIZATION:** Students will be required to sanitize all equipment and glassware using the supplied 70% ethanol used before leaving lab. Cleaning and sanitizing are part of our regular standard operating procedures that have been approved by the University's Department of Environmental Health and Safety. Failure to clean and sanitize your equipment and glassware will result in loss of performance points for the experiment of the day.

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**LABORATORY SAFETY REQUIREMENTS:** Students are required to read, understand, and implement the safety precautions indicated in the laboratory manual. The precautions are summarized on a safety statement which must be digitally signed on Carmen by all students during their first laboratory period. Until this statement is signed, students are not permitted to participate in laboratory activities. Some particularly important parts are:

1. You must wear department-authorized ANSI code goggles in the laboratory. If your goggles are lost, a new pair must be purchased from 180 Celeste Lab. Students in the lab without goggles will incur a 5-point deduction from their grade for the experiment (all lab performance points). Continued violations will result in a more severe point penalty and may result in dismissal from the course. Wearing contact lenses is not recommended.
2. According to University policy, wearing a face covering in lab is optional (<https://safeandhealthy.osu.edu/personal-protection-hygiene>). Students will need to provide their own face mask if the opt to wear a mask. We recommend bringing a second mask to change into after the lab is complete. You should wash any reusable face covering that you wore in lab before wearing again. Please note in the unlikely event your face covering is contaminated by a spill or splash, it may need to be disposed of as hazardous waste. In that case, you will be provided with a disposable mask to complete the day's lab.
3. Each student must wear adequate clothing to reduce the possibility of injury from chemicals or broken glass, including long pants and shoes that cover your entire foot. **Students wearing inappropriate attire - including but not limited to shorts, sandals, spandex or other thin, skin-tight pants, pants with holes, tank tops, or short skirts - will be sent home.** These students are expected to change and return to complete the experiment in proper attire. Confine long hair. Ankles should be completely covered. Please note that this policy is to protect you from chemical burns or spills.
4. Familiarize yourself with the location of the fire extinguisher and eye wash in the laboratory.
5. Promptly report all accidents, no matter how small, to your lab instructor.
6. Your work area and common glassware must be cleaned before you leave lab. After cleaning all glassware, you must sanitize your glassware with the provided 70% ethanol solution. Once you have sanitized all glassware, clean your bench with the provided 70% ethanol. This ensures that you, and other students who use the space, will have a clean and sanitized workstation. Clean up spills in the balance room by brushing chemicals into a weighing dish.
7. No unauthorized experiments are allowed. No chemicals may be removed from the lab.



*Requirements in this syllabus (assignments, due dates, policies etc.) may be altered ONLY by a Lab Supervisor or the Vice Chair for Undergraduate Studies. Please see the lecture syllabus for prerequisites, goals and learning outcomes, commitment to diversity, and details about recitation, online homework, and exams. All lecture policies still apply to the laboratory.*

## ACADEMIC CONDUCT

### STANDARDS OF ACADEMIC CONDUCT IN GENERAL CHEMISTRY LAB

**Violations of academic standards in General Chemistry will be referred to the University Committee of Academic Misconduct (COAM) as required by Faculty Rules.** It is the responsibility of COAM to investigate all reported cases of student academic misconduct; illustrated by, but not limited to, cases of plagiarism and any dishonest practices in connection with examinations, quizzes, and graded assignments. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information see the Code of Student Conduct: [studentlife.osu.edu/csc](http://studentlife.osu.edu/csc)

**Student Responsibilities:** *Any graded material submitted in General Chemistry must represent your own work.* This includes exams, quizzes, homework, and laboratory assignments, which are to be an individual effort. Unauthorized group efforts by students, use of another student's course materials, or assistance from individuals who already have taken the course, could place you in jeopardy of violation of the standards for General Chemistry. In some courses, group work is acceptable on certain activities (as explicitly stated by your instructor). In these cases, it is important that you know and understand where authorized collaboration (working in a group) ends and collusion (working together in an unauthorized manner) begins. Identical answers indicate copying or unacceptable group efforts - always answer questions in your own unique words. It is important that you consult with your instructor for clarification on whether or not collaboration is appropriate on an activity.

*You should not assist others in violating academic standards.* Students supplying materials for others to "look at" may be charged with academic misconduct. Never allow another student access to your Pre-Laboratory exercises, lab reports, or other assignments – even after completion of the course. "I didn't know they were going to copy my work" is not an acceptable excuse.

**Laboratory:** Laboratory work is the essence of the science of chemistry. All laboratory work in General Chemistry is to be an individual effort and any lab assignments may be sent through Turnitin, an originality checker. You are expected to perform all parts of the experiments with your own equipment, chemicals, and unknowns. The accumulation of data, calculations derived from that data, and any conclusions or answers to questions associated with that experiment are to be your own work. Academic misconduct involving lab work includes but is not limited to the following:

- Laboratory data may not be altered or "made up". All laboratory work must be done in your assigned laboratory room, during your scheduled time period, and under the supervision of your assigned teaching assistant.
- Plagiarism or the submission of work based on old material is considered to be academic misconduct no matter how small the infraction. Possession of another student's lab report(s) will raise immediate concerns about academic misconduct.
- Evidence of copying or unauthorized "working together" on laboratory course work will be submitted to COAM.
- Individuals retaking the course must complete all work for the course during the current semester, and may not submit any parts of any laboratory assignment from a previous semester (see item #6 in "Ten Suggestions for Preserving Academic Integrity", <http://oaa.osu.edu/coamtensuggestions.html>).
- If you are found in violation, COAM will decide what disciplinary and/or grade sanctions you receive. Additional information about COAM policies and procedures can be found at <https://oaa.osu.edu/academic-integrity-and-misconduct>.

## CONCLUSION

We are going to have a great semester learning and experimenting together. We know this syllabus is a lot of information to digest at once but remember that the lab team is there to guide you when you have questions. You can find out more about us and the other General Chemistry team members on the "Contacts" page in Carmen, and also to find which one of us has the specific expertise to address your unique needs. We cannot wait to meet you!

# GE Foundation Courses

## Overview

Courses that are accepted into the General Education (GE) Foundations provide introductory or foundational coverage of the subject of that category. Additionally, each course must meet a set of Expected Learning Outcomes (ELO). Courses may be accepted into more than one Foundation, but ELOs for each Foundation must be met. It may be helpful to consult your Director of Undergraduate Studies or appropriate support staff person as you develop and submit your course.

This form contains sections outlining the ELOs of each Foundation category. You can navigate between them using the Bookmarks function in Acrobat. Please enter text in the boxes to describe how your class meets the ELOs of the Foundation(s) to which it applies. Because this document will be used in the course review and approval process, you should use language that is clear and concise and that colleagues outside of your discipline will be able to follow. Please be as specific as possible, listing concrete activities, specific theories, names of scholars, titles of textbooks etc. Your answers will be evaluated in conjunction with the syllabus submitted for the course.

## Accessibility

If you have a disability and have trouble accessing this document or need to receive the document in another format, please reach out to Meg Daly at [daly.66@osu.edu](mailto:daly.66@osu.edu) or call 614-247-8412.

## GE Rationale: Foundations: Race, Ethnicity, and Gender Diversity (3 credits)

Requesting a GE category for a course implies that the course fulfills **all** the expected learning outcomes (ELOs) of that GE category. To help the reviewing panel evaluate the appropriateness of your course for the Foundations: Race, Ethnicity, and Gender Diversity, please answer the following questions for each ELO.

### A. Foundations

Please explain in 50-500 words why or how this course is introductory or foundational for the study of Race, Ethnicity and Gender Diversity.



**B. Specific Goals of Race, Ethnicity, and Gender Diversity**

GOAL 1: Successful students will engage in a systematic assessment of how historically and socially constructed categories of race, ethnicity, and gender, and possibly others, shape perceptions, individual outcomes, and broader societal, political, economic, and cultural systems.

**Expected Learning Outcome 1.1: Successful students are able to describe and evaluate the social positions and representations of categories including race, gender, and ethnicity, and possibly others.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

**Expected Learning Outcome 1.2: Successful students are able to explain how categories including race, gender, and ethnicity continue to function within complex systems of power to impact individual lived experiences and broader societal issues.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Course Subject & Number: CHEM1208

**Expected Learning Outcome 1.3: Successful students are able to analyze how the intersection of categories including race, gender, and ethnicity combine to shape lived experiences.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

**Expected Learning Outcome 1.4: Successful students are able to evaluate social and ethical implications of studying race, gender, and ethnicity.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

GOAL 2: Successful students will recognize and compare a range of lived experiences of race, gender, and ethnicity.

**Expected Learning Outcome 2.1: Successful students are able to demonstrate critical self- reflection and critique of their social positions and identities.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

**Expected Learning Outcome 2.2: Successful students are able to recognize how perceptions of difference shape one's own attitudes, beliefs, or behaviors.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

**Expected Learning Outcome 2.3: Successful students are able to describe how the categories of race, gender, and ethnicity influence the lived experiences of others.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met.

**GE Rationale: Foundations: Social and Behavioral Sciences (3 credits)**

Requesting a GE category for a course implies that the course **all** expected learning outcomes (ELOs) of that GE category. To help the reviewing panel evaluate the appropriateness of your course for the Foundations: Social and Behavioral Sciences, please answer the following questions for each ELO.

**A. Foundations**

Please explain in 50-500 words why or how this course is introductory or foundational in the study of Social and Behavioral Sciences.

## **B. Specific Goals of Social and Behavioral Sciences**

GOAL 1: Successful students will critically analyze and apply theoretical and empirical approaches within the social and behavioral sciences, including modern principles, theories, methods, and modes of inquiry.

**Expected Learning Outcome 1.1: Successful students are able to explain basic facts, principles, theories and methods of social and behavioral science.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

**Expected Learning Outcome 1.2: Successful students are able to explain and evaluate differences, similarities, and disparities among institutions, organizations, cultures, societies, and/or individuals using social and behavioral science.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Course Subject & Number: CHEM1208

GOAL 2: Successful students will recognize the implications of social and behavioral scientific findings and their potential impacts.

**Expected Learning Outcome 2.1: Successful students are able to analyze how political, economic, individual, or social factors and values impact social structures, policies, and/or decisions.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

**Expected Learning Outcome 2.2: Successful students are able to evaluate social and ethical implications of social scientific and behavioral research.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

**Expected Learning Outcome 2.3: Successful students are able to critically evaluate and responsibly use information from the social and behavioral sciences.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

**GE Rationale: Foundations: Historical or Cultural Studies (3 credits)**

Requesting a GE category for a course implies that the course fulfills the expected learning outcomes (ELOs) of that GE category. To help the reviewing panel evaluate the appropriateness of your course for the Foundations: Historical and Cultural Studies, please answer the following questions for each ELO. Note that for this Foundation, a course need satisfy either the ELOs for Historical Studies or the ELOs for Cultural Studies.

**A. Foundations**

Please explain in 50-500 words why or how this course is introductory or foundational in the study of History **or** Cultures.

**B. Specific Goals of Historical *or* Cultural Studies**

**Historical Studies (A) Goal:** Successful students will critically investigate and analyze historical ideas, events, persons, material culture and artifacts to understand how they shape society and people.

**Expected Learning Outcome 1.1A: Successful students are able to identify, differentiate, and analyze primary and secondary sources related to historical events, periods, or ideas.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

**Expected Learning Outcome 1.2A: Successful students are able to use methods and theories of historical inquiry to describe and analyze the origin of at least one selected contemporary issue.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)



**Expected Learning Outcome 1.3A: Successful students are able to use historical sources and methods to construct an integrated perspective on at least one historical period, event or idea that influences human perceptions, beliefs, and behaviors.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

**Expected Learning Outcome 1.4A: Successful students are able to evaluate social and ethical implications in historical studies.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Cultural Studies (B) Goal: Successful students will evaluate significant cultural phenomena and ideas to develop capacities for aesthetic and cultural response, judgment, interpretation, and evaluation.

**Expected Learning Outcome 1.1B: Successful students are able to analyze and interpret selected major forms of human thought, culture, ideas or expression.** Please link this ELO to the course goals and topics and identify the *specific* activities/assignments through which it will be met. (50-700 words)

**Expected Learning Outcome 1.2B: Successful students are able to describe and analyze selected cultural phenomena and ideas across time using a diverse range of primary and secondary sources and an explicit focus on different theories and methodologies.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

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**Expected Learning Outcome 1.3B: Successful students are able to use appropriate sources and methods to construct an integrated and comparative perspective of cultural periods, events or ideas that influence human perceptions, beliefs, and behaviors.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

**Expected Learning Outcome 1.4B: Successful students are able to evaluate social and ethical implications in cultural studies.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met.

### **GE Rationale: Foundations: Writing and Information Literacy (3 credits)**

Requesting a GE category for a course implies that the course fulfills **all** expected learning outcomes (ELOs) of that GE category. To help the reviewing panel evaluate the appropriateness of your course for the Foundations: Writing and Information Literacy, please answer the following questions for each ELO.

### A. Foundations

Please explain in 50-500 words why or how this course is introductory or foundational in the study of Writing and Information Literacy.

### B. Specific Goals of Writing and Information Literacy

GOAL 1: Successful students will demonstrate skills in effective reading, and writing, as well as oral, digital, and/or visual communication for a range of purposes, audiences, and context.

**Expected Learning Outcome 1.1: Successful students are able to compose and interpret across a wide range of purposes and audiences using writing, as well as oral, visual, digital and/or other methods appropriate to the context.**

Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. Explain how the course includes opportunities for feedback on writing and revision. Furthermore, please describe how you plan to insure sufficiently low instructor-student ratio to provide efficient instruction and feedback. (50-700 words)

**Expected Learning Outcome 1.2: Successful students are able to use textual conventions, including proper attribution of ideas and/or source, as appropriate to the communication situation.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. Is an appropriate text, writing manual, or other resource about the pedagogy of effective communication being used in the course? (50-700 words)

**Expected Learning Outcome 1.3: Successful students are able to generate ideas and informed responses incorporating diverse perspectives and information from a range of sources, as appropriate to the communication situation.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Course Subject & Number: \_\_\_\_\_

**Expected Learning Outcome 1.4: Successful students are able to evaluate social and ethical implications in writing and information literacy practices.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

GOAL 2: Successful students will develop the knowledge, skills, and habits of mind needed for information literacy.

**Expected Learning Outcome 2.1: Successful students are able to demonstrate responsible, civil, and ethical practices when accessing, using, sharing, or creating information.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

**Expected Learning Outcome 2.2: Successful students are able to locate, identify and use information through context appropriate search strategies.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

**Expected Learning Outcome 2.3: Successful students are able to employ reflective and critical strategies to evaluate and select credible and relevant information sources.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

**GE Rationale: Foundations: Literary, Visual, or Performing Arts (3 credits)**

Requesting a GE category for a course implies that the course fulfills **all** expected learning outcomes (ELOs) of that GE category. To help the reviewing panel evaluate the appropriateness of your course for the Foundations: Literary, Visual, and Performing Arts, please answer the following questions for each ELO.

**A. Foundations**

Please explain in 50-500 words why or how this course is introductory or foundational in the study of Literary, Visual, or Performing Arts.

**B. Specific Goals**

Goal 1: Successful students will analyze, interpret, and evaluate major forms of human thought, cultures, and expression; and demonstrate capacities for aesthetic and culturally informed understanding.

**Expected Learning Outcome 1.1: Successful students are able to analyze and interpret significant works of design or visual, spatial, literary or performing arts.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)



**Expected Learning Outcome 1.2: Successful students are able to describe and explain how cultures identify, evaluate, shape, and value works of literature, visual and performing art, and design.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

**Expected Learning Outcome 1.3: Successful students are able to evaluate how artistic ideas influence and shape human beliefs and the interactions between the arts and human perceptions and behavior.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

**Expected Learning Outcome 1.4: Successful students are able to evaluate social and ethical implications in literature, visual and performing arts, and design.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Goal 2: Successful students will experience the arts and reflect on that experience critically and creatively.

**Expected Learning Outcome 2.1: Successful students are able to engage in informed observation and/or active participation within the visual, spatial, literary, or performing arts and design.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

**Expected Learning Outcome 2.2: Successful students are able to critically reflect on and share their own experience of observing or engaging in the visual, spatial, literary, or performing arts and design.**

Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

### **GE Rationale: Foundations: Natural Science (4 credits)**

Requesting a GE category for a course implies that the course fulfills **all** expected learning outcomes (ELOs) of that GE category. To help the reviewing panel evaluate the appropriateness of your course for the Foundations: Natural Sciences, please answer the following questions for each ELO.

#### **A. Foundations**

Please explain in 50-500 words why or how this course is introductory or foundational in the study of Natural Science.

This course is both introductory and foundational in the study of natural science. General Chemistry is a central science, and a prerequisite for many science major pathways. This gateway CHEM1210 course is well established. The new courses proposed CHEM1206 and CHEM1208 would be equivalent to CHEM1210. CHEM1208 specifically would be the GE component of this two-course series. CHEM1208 is half of CHEM1210 and includes a lab component exactly the same as CHEM1210. The difference is that the chemistry content is covered at a reduced pace when compared to CHEM1210.

The atoms first textbook was selected to present these concepts at an undergraduate level appropriate for college general chemistry. Homework will be paired that will be a combination of reading questions, application questions and problem solving questions. Exams will assess learning of these concepts.

## B. Specific Goals for Natural Sciences

GOAL 1: Successful students will engage in theoretical and empirical study within the natural sciences, gaining an appreciation of the modern principles, theories, methods, and modes of inquiry used generally across the natural sciences.

**Expected Learning Outcome 1.1: Successful students are able to explain basic facts, principles, theories and methods of modern natural sciences; describe and analyze the process of scientific inquiry.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Throughout this course there are opportunities to learn about and practice the basic facts, principles, theories, and methods of modern science. One example is in the thermodynamics chapter content: students will learn, and practice in class and on homework how to take calorimetry measurements and calculate enthalpies from data. In the lab students will have the opportunity to experiment with a coffee cup calorimeter to collect and analyze their own data. Every homework assignment and exam will have questions about scientific facts, principles, theories, or methods.

**Expected Learning Outcome 1.2: Successful students are able to identify how key events in the development of science contribute to the ongoing and changing nature of scientific knowledge and methods.** Please link this ELO to the course goals and topics and indicate specific activities/assignments through which it will be met. (50-700 words)

Throughout this course there are opportunities to learn development of science and recognize that science is an evolving body of knowledge. One example is in the gases chapter content: students will learn, and practice in class and on homework about the gas laws and the ideal gas law along with kinetic molecular theory.

**Expected Learning Outcome 1.3: Successful students are able to employ the processes of science through exploration, discovery, and collaboration to interact directly with the natural world when feasible, using appropriate tools, models, and analysis of data.** Please explain the 1-credit hour equivalent experiential component included in the course: e.g., traditional lab, course-based research experiences, directed observations, or simulations. Please note that students are expected to analyze data and report on outcomes as part of this experiential component. (50-1000 words)

Students will complete a 1 credit hour in person lab. This lab will be the exact same as the CHEM1210 lab.

In Chemistry 1208, lab is a significant aspect of chemistry learning experience in CHEM 1208, and the following are the goals and learning outcomes you will accomplish in the lab:

- Qualitatively and quantitatively examine curriculum presented in lecture, such as atomic and molecular structure, chemical reactivity, thermochemistry, and chemical calculations in an active laboratory setting.
- Practice laboratory methods applicable to chemists of all levels.
- Create, and demonstrate the proper use of, a well-prepared laboratory notebook and evaluate the importance of organized scientific data collection and data integrity.
- Demonstrate the ability to interpret data, evaluate conclusions supported and not supported by experimental results, and compare and contrast chemical methods, as communicated through Post-Labs.
- Demonstrate the safe handling and proper disposal techniques for all materials used in the lab.

GOAL 2: Successful students will discern the relationship between the theoretical and applied sciences, while appreciating the implications of scientific discoveries and the potential impacts of science and technology.

**Expected Learning Outcome 2.1: Successful students are able to analyze the inter-dependence and potential impacts of scientific and technological developments.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

This will be done consistently throughout the semester.

One example is in the aqueous lecture content: students will learn, and practice in class and on homework about how experimentation was used to generate the activity series and how these data tables can inform if reactions will naturally happen. Students will be assessed on homework and exams.

Another example is in lab, where students will be making Quantitative Analysis of the Citric Acid Content in Juices. The students will be assessed in a post lab assignment.

**Expected Learning Outcome 2.2: Successful students are able to evaluate social and ethical implications of natural scientific discoveries.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

This will be done consistently throughout the semester.

One example is in the solids chapter content: students will learn, and practice in class and on homework about the structure of solids and how many of these solid materials are currently used in technological devices that society is dependent upon.

Another example will be providing content about Flint MI water crisis when aqueous solubility is presented. Parallel content will be provided to foster an in-class discussion about ethical responsibility paired with scientific knowledge.

**Expected Learning Outcome 2.3: Successful students are able to critically evaluate and responsibly use information from the natural sciences.** Please link this ELO to the course goals and topics and indicate *specific* activities/ assignments through which it will be met. (50-700 words)

Students will have consistent opportunities to evaluate and responsibly use information from the natural sciences.

One example is from laboratory reports required for one or more of the laboratory experiments. Students will articulate their conclusions and explain their rationale using collected data and interpretation.

Additionally, in this course students will be asked several times to find and bring related-content resources to class from popular media. We will use these as an opportunity to discuss science portrayal in the media. We will discuss that the idea of "chemicals" as "bad" is misleading, and that all things are made of chemicals. Also, when discussing inorganic naming conventions we will have a class discussion about hard/easy to pronounce names is not a reliable method to determine the consumption or usage safety/toxicity of a chemical, and rather it depends on the nature of chemical reactions and begin looking at chemical reaction types and aqueous reactions.

**GE Rationale: Foundations: Mathematical and Quantitative Reasoning (or Data Analysis) (3 credits)**

Requesting a GE category for a course implies that the course fulfills **all** expected learning outcomes (ELOs) of that GE category. To help the reviewing panel evaluate the appropriateness of your course for the Foundations: Mathematical and Quantitative Reasoning (or Data Analysis), please answer the following questions for each ELO.

**A. Foundations**

Please explain in 50-500 words why or how this course is introductory or foundational in the study of Mathematical & Quantitative Reasoning (or Data Analysis).

**B. Specific Goals for Mathematical & Quantitative Reasoning/Data Analysis**

Goal: Successful students will be able to apply quantitative or logical reasoning and/or mathematical/statistical analysis methodologies to understand and solve problems and to communicate results.

**Expected Learning Outcome 1.1: Successful students are able to use logical, mathematical and/or statistical concepts and methods to represent real-world situations.** Please link this ELO to the course goals and topics and indicate *specific* activities/ assignments through which it will be met. (50-700 words)



Course Subject & Number: CHEM1208

**Expected Learning Outcome 1.2: Successful students are able to use diverse logical, mathematical and/or statistical approaches, technologies, and tools to communicate about data symbolically, visually, numerically, and verbally.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

**Expected Learning Outcome 1.3: Successful students are able to draw appropriate inferences from data based on quantitative analysis and/or logical reasoning.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Course Subject & Number: CHEM1208

**Expected Learning Outcome 1.4: Successful students are able to make and evaluate important assumptions in estimation, modeling, logical argumentation, and/or data analysis.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

**Expected Learning Outcome 1.5: Successful students are able to evaluate social and ethical implications in mathematical and quantitative reasoning.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

**From:** [Fisk, Harold](#)  
**To:** [Jackman, Jane](#); [Andrews, Adam](#)  
**Subject:** Re: CHEM 1208 approval  
**Date:** Tuesday, April 25, 2023 1:52:44 PM  
**Attachments:** [image001.png](#)

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Hi Jane,

As mentioned at the recent CLSE Curriculum Meeting, we are very happy with your plan to create Chem 1206 and 1208. Specifically, we see no issues with allowing enrollment in Chem 1208 as a co-requisite for enrollment in Bio 1113 and/or Bio 1114. We are excited about your new courses, and look forward to having them available for students who are struggling, and to allow those students who did not get a sufficiently high math placement score to be making progress toward completing the Biology major pre-requisites while working on their math.

Sincerely,  
Harold

**Harold A. Fisk, Ph.D.** (he/him/his)  
Associate Professor | **The Ohio State University**  
Department of Molecular Genetics  
Interim Director, Center for Life Sciences Education  
484 W. 12<sup>th</sup> Ave., Columbus, OH 43210-1292 | 614-292-0318 | [fisk.13@osu.edu](mailto:fisk.13@osu.edu)

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**From:** "Jackman, Jane" <jackman.14@osu.edu>  
**Date:** Tuesday, April 25, 2023 at 1:01 PM  
**To:** "Fisk, Harold" <fisk.13@osu.edu>, "Andrews, Adam" <andrews.171@osu.edu>  
**Subject:** CHEM 1208 approval

Jackman, Jane has shared a OneDrive for Business file with you. To view it, click the link below.

 [1208.Lab.Syllabus - SP24-2.docx](#)

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Hi Adam and Harold,

I am wondering if it would be possible for (one of) you to send me a quick email on behalf of BIO confirming that the new course we discussed at the curriculum committee meeting last week, CHEM 1208, will be acceptable as a co-requisite for enrollment in BIO 1113 or BIO 1114?

I think all I need is a one line email (reply is fine) confirming this to send with our submission. The syllabus for lecture and lab components of the course are attached. Just to remind you, since CHEM 1206 is a pre-req for enrollment in CHEM 1208, students will be directly equivalent to students who are already enrolled in CHEM 1210 in terms of their exposure to General Chemistry if they enroll in this course while they are taking either BIO class.

Please let me know if either of you have any questions and thanks,  
Jane

**Dr. Jane E. Jackman**

*Professor and Vice Chair for Undergraduate Studies*

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She/her pronouns