

Read This First!

We have a good deal of material on the course website. Before reading this lab book, visit the website and become familiar with it.

Most importantly, find your one-page summary of due dates for all assignments throughout the semester. To do this:

- Go to www.chemistry.illinois.edu/clc
- Choose “Course Web Sites”
- Choose “Chemistry 103”
- Click on “Lab Schedule”
- Click on the day of your lab section. The one-page summary will look similar to the tables you will find on the next page of this lab book but it includes your specific due dates for your lab section. It is a good idea to print out the schedule—the due dates are set and **late assignments will NOT be accepted**.

Read through the material given on the course webpage. You will find general information, such as contact information of the course instructor and TAs, course material list, and links to LON-CAPA online assignments and the ATLAS grade book. Click on “LON-CAPA Homework” and make sure you can sign in.

Please watch the “Introduction to Chemistry 103” video located on the website. We explain the course policy and other useful details.

Safety is very important in the Chemistry Laboratory. There are safety-related assignments, located in LON-CAPA, that must be complete by each student before they will be permitted to gain access to the full course assignments in LON-CAPA and attend Labs 1–11. These assignments are:

- Lab Safety Video and Lab Safety Quiz
- Chemistry Annex Safety Scavenger Hunt
- Waste Disposal Activity
- Course Policy Assignment

If these assignments are not completed after 3 experiments, the student will fail the course.

Note: The Significant Figure assignment opens the first day of the semester. This is not a required assignment for access to the course, but is part of the student's semester grade.

Note: Students will have access to all of these assignments EXCEPT the Chemistry Annex Safety Scavenger Hunt and Waste Disposal Activity on the first day of the semester and are encourage to complete these assignments before attending Lab 0.

For this class you will need the following:

- Lab manual (this book)
- Bring goggles (required goggles: *Honeywell Uvex Stealth OTG safety goggles*) and a lab coat. Note: Students are permitted to purchase and wear either the standard white lab coat or the blue, fire-resistant, lab coat. It is recommended that students who plan to take upper-level (200 and above) lab courses purchase the blue, fire-resistant, lab coats since this is the coat that will be required for those upper-level labs.
- Wear the proper attire. The full safety policy is found on pages xxxiii–xxxvi of the lab manual.
- Students are encouraged to watch the Lab Safety video and complete the Safety Quiz before Lab 0.

REQUIRED ASSIGNMENT TO GAIN ACCESS TO THE COURSE MATERIALS

There are several activities that must be **correctly** completed by each student before they may attend lab this semester and gain access to the remainder of the assignments in Chemistry 103. All of these activities are found in LON-CAPA and described below. Failure to complete these activities will prevent the student from attending lab and will result in a zero for the lab and the PostLab assignments for each session that the listed activities are not complete. After 3 lab sessions without completing any of the activities listed below, the student will fail the course.

- **Assignment 1:** Course Policy Assignment
- **Assignment 2:** Safety Video and Quiz
- **Assignment 3:** Scavenger Hunt
- **Assignment 4:** Waste Disposal

Due Date: BEFORE the **Lab 1**.

Penalty if not complete by due date: Students who do not complete this assignment before Lab 1 will be removed from the lab and will receive a zero on Lab 1 and PostLab 1. Students who do not complete these assignments by Lab 2 will be removed from the lab and will receive a zero on Lab 2 and PostLab 2. Students who do not complete these assignments by Lab 3 will be removed from the lab and will receive a zero on Lab 3 and PostLab 3. Students who do not complete this assignment by Lab 4 will fail the course and will not be permitted to attend any future labs.

*****Additional Penalty information*****

If a student misses Lab 0 AND obtains an excused absence for that date, the student will be placed in an online Scavenger Hunt Assignment group and given the opportunity to complete the Scavenger Hunt before the second lab, for full credit.

If a student misses Lab 0 AND does not obtain an excused absence for that date, the student will be placed in an online Scavenger Hunt Assignment group and given the opportunity to complete the Scavenger Hunt before the second lab, **but the student will receive 2.5 points for this assignment.** The student must still successfully complete this assignment, as well as all of the other required

activities listed above by the deadlines, in order to gain access to the remainder of the Chemistry 103 course in LON-CACAPA.

If a student uses up all of the provided attempts to answer any of the questions in the the Course Policies assignment, the student must contact the Course Coordinator or Lab Coordinator to request that the necessary question(s) be reset. This is the only instance this semester when a question can be reset. If the student requires that a question(s) be reset so that they have additional attempts to correctly complete the assignment, **the student will receive up to 50% of the possible points for the entire assignment**, but the student must still correctly complete the full assignment in order to gain access to the remainder of the Chemistry 103 course assignments in LON-CAPA.

CHEMISTRY 103, FALL 2021

Experiment Dates

Experiment	Date
NO LABS – Course Policy, Safety Video/Quiz, Sig Fig Assignment OPEN	Week of 8/22
Lab 0: Laboratory Orientation and Safety (MANDATORY)	Week of 8/29
NO LABS – Week of LABOR DAY	Week of 9/5
Lab 1: Laboratory Equipment and the Balance	Week of 9/13
Lab 2: The Mohr Pipet, Serial Dilutions, and Standard Curves	Week of 9/19
Lab 3: Titrations and the Buret	Week of 9/26
Lab 4: Beer's Law and Food Dyes	Week of 10/3
Lab 5: The Stoichiometry of Baking Soda	Week of 10/11
Lab 6: Det. the Molar Mass of an Unknown Compound	Week of 10/18
Lab 7: Calorimetry and Enthalpies of Solution	Week of 10/25
Lab 8: Using Calorimetry to Measure Changes in State	Week of 11/1
Lab 9: Hess's Law	Week of 11/8
Lab 10: LeChâtelier's Principle	Week of 11/15
NO LABS – FALL BREAK	Week of 11/21
Lab 11: Det. the Value of an Eq. Constant for a Chem. Reaction	Week of 11/28

PreLab HW Dates

All HW due by 10:00 PM on LON-CAPA

PreLab HW For:	Due Week Of
Lab 1 (Equipment)	Week of 9/13
Lab 2 (Mohr Pipet)	Week of 9/19
Lab 3 (Titrations)	Week of 9/26
Lab 4 (Beer's Law)	Week of 10/3
Lab 5 (Stoichiometry)	Week of 10/11
Lab 6 (Molar Mass)	Week of 10/18
Lab 7 (Cal. Diss.)	Week of 10/25
Lab 8 (Change States)	Week of 11/1
Lab 9 (Hess's Law)	Week of 11/8
Lab 10 (LeChât)	Week of 11/15
Lab 11 (Eq. Constant)	Week of 11/28

PostLab HW Dates

All HW due by 5:00 PM on LON-CAPA

PostLab HW For:	Due Week Of
Lab 1 (Equipment)	Week of 9/19
Lab 2 (Mohr Pipet)	Week of 9/26
Lab 3 (Titrations)	Week of 10/3
Lab 4 (Beer's Law)	Week of 10/11
Lab 5 (Stoichiometry)	Week of 10/18
Lab 6 (Molar Mass)	Week of 10/25
Lab 7 (Cal. Diss.)	Week of 11/1
Lab 8 (Change States)	Week of 11/8
Lab 9 (Hess's Law)	Week of 11/15
Lab 10 (LeChât)	Week of 11/28
Lab 11 (Eq. Constant)	Week of 12/5

Students must **correctly complete the Course Policy Assignment, Safety Quiz, Scavenger Hunt and Waste Disposal Activity BEFORE week of 9/13 in order to gain access to the rest of the course in LON-CAPA. Prelab 1 will open as soon as these assignments are correct and complete.*

***PostLab 11 is due on or before 5pm on Reading Day, Thursday, December 9.*

Chemistry 103 Course Policies

You must read this section before coming to your first scheduled experiment.

CHEMISTRY 103

It is extremely important for you to familiarize yourself with the Chemistry 103 website. From this website you can access your schedule, the online grade book (Atlas), and the work you need to submit for the course.

We suggest you go to the website as soon as possible.

To access the course website, go to <http://www.chemistry.illinois.edu/clc> then go to “Course Web Sites” and then to “Chemistry 103”. You will need to do the first online assignment **before** the first experiment, so you might as well explore the rest of the site at the same time. Click on the following links and familiarize yourself with them:

1. Contact Information. This page provides you with the e-mail addresses of all of the Chem 103 TAs (along with the sections each teaches and their office hours). The office and contact information for the Chem 103 Course Coordinator and Lab Coordinator is also provided on this page.

2. Lab Schedule. This page provides you with the schedule for the semester for each section. The specific schedule depends on the day your lab meets. Go to your particular meeting time schedule and **print it out**. You will then have the schedule for the date each lab meets, along with due dates for all online assignments.

3. LON-CAPA Assignments. This link allows you to access all online assignments. You will have to complete a PreLab assignment before each lab, enter data during your lab session, and complete a PostLab assignment (which includes data analysis) after each lab. These assignments are described in more detail in *Required Components of the Course* (next) and the due dates for these are given in the Lab Schedule. Clicking on the LON-CAPA Assignments link will bring you to the login page for LON-CAPA. Enter your NetID as your login and enter your password (this is your Active Directory password). The online assignments can be found by clicking the *Course Contents* button at the top of the page.

The Course Websites page has help in logging on to LON-CAPA. If there are additional problems, please contact your TA, the Course Coordinator, or the Lab Coordinator.

4. Online Grade Book. This link takes you to the Chemistry 103 grade book in Atlas. This provides you with scores for all Chemistry 103 assignments. You will want to check this periodically throughout the semester to make sure the grades are entered correctly. Instructions and a sample for calculating your grade can be found in the Frequently Asked Questions section on pages xxvii–xxxi.

REQUIRED COMPONENTS OF THE COURSE

1. PreLab Assignments. These assignments have been developed to make sure that you understand the concepts and the calculations involved in the lab experiments. These are found online via LON-CAPA and must be completed by 11:00AM the morning of the corresponding in-person lab session (see the online Syllabus for the schedule). You will get immediate feedback concerning your answers, and before the deadline multiple attempts are allowed. As a general rule, 30 attempts are allowed on all questions unless stated otherwise. Questions will not be reset and additional attempts will not be provided. If a student uses their allowed attempts without correctly answering a question, they will receive zero points for the question. If subsequent questions require the answer from an unanswered question, then the student will not be able to answer those subsequent questions will also receive zero points for those questions. Students are strongly encouraged not to guess on questions and to seek assistance from their TA or the Course Coordinator if they submit 50% of their attempts without obtaining the correct answer. By reading the lab manual and having perseverance, there is no reason to not earn all possible points for the PreLab assignments. Again, the point is to do this before the in-person lab session, so once the deadline has passed your access to the PreLab will be closed and will not be re-opened. A student seeking to be excused from a PreLab assignment must provide documentation that supports that they were unable to complete any of the questions in that assignment for the entire period of time that the PreLab assignment was open. Note: only one PreLab assignment will be excused this semester.

2. Lab Assignments. There are eleven labs throughout the semester (see the online Lab Schedule for specific times). All lab data will be recorded into the provided tables in the lab manual, then recorded in LON-CAPA. See *The Laboratory Notebook* section for more information.

You are required to attend all laboratory periods. During the lab you will carry out the experiment, record your data in your laboratory notebook, and record your data in your LON-CAPA account. When you have completed the aforementioned tasks, you are expected to remain in the lab and complete as much of your PostLab as is possible with the remaining time. Students may only leave the laboratory early if their TA has verified that they have completed all of the PostLab questions.

You are not excused from the lab unless the reason falls under one of the categories described in *Attendance for the Course*. Two important points about missing the lab:

- Even if you are excused from a lab, you must still complete the online PreLab and PostLab assignments by their regularly scheduled due dates.
- Any student who misses more than three laboratory periods (excused or not) during the semester will automatically fail the course or receive an incomplete grade for the course if required reasonable excuse letters have been provided.
- The COVID-19 Pandemic is a dynamic situation. The University of Illinois-Urbana Champaign is constantly monitoring the situation and making policy adjustments as necessary. **At the time this lab manual was printed, all students, vaccinated or unvaccinated, are required to wear masks in the laboratory setting.** Students without a mask will not be permitted to attend lab and will receive an unexcused absence and the related grade penalties that go along with such an absence. Students should pay special attention to emails sent by the Course Coordinator, Lab Director and their TA for changes or updates to this policy throughout the semester.
- Vaccinated and unvaccinated individuals may be requested to show that they have fulfilled the University standards for safety during COVID-19 by showing their Illinois Safe App at the

entry of the Chem Annex in order to gain entry to the building and attend lab. Students may be requested to also show their Illinois Safe App a second time before entering their assigned lab space. **It is the responsibility of the student to make sure they meet the University's standards for attending lab during COVID-19. Failure to do so will be considered an unexcused absence.**

You may be familiar with LON-CAPA as a homework/quiz system. As such a system, LON-CAPA checks your answers and either provides you with immediate feedback, allowing you to change your answer, or accepts your answer and evaluates it after the due date, and credit is earned based on the correctness of your response. For data entry it is a bit different because LON-CAPA is not connected to a probe that gathers your data, so it has no way of knowing if what you enter is correct. You need to make sure you are entering the correct data as they will be used for subsequent calculations in the PostLab.

A few points about LON-CAPA data entry:

- **In the lab LON-CAPA accepts answers that may not be correct.** That is, you may make an error in the lab and get a poor result and LON-CAPA accepts it. This does not mean it is correct, even if accepted. In addition, you may measure a temperature as 25.2°C, for example, and enter it as 2.52°C. LON-CAPA will accept it because there is no way to know that you entered the value incorrectly. We sometimes put ranges of acceptable answers (for example, we may only accept temperatures between 0°C and 100°C for aqueous solutions). But do not think that just because data are accepted that they are correct. LON-CAPA does not know what you have measured and it is being used merely as data entry.
- **You cannot change data once you submit them.** Write your data in your tables in your laboratory notebook. Check to make sure what you have typed into LON-CAPA is correct and consistent with what is in your notebook before you hit the submit button. You may lose points on the PostLab because of poor data, even if it was accidentally entered. If your goal is to hurry to get out of lab, you will make a mistake. If your goal is to do it right, you will do it right, and you will still get out on time. We cannot change your data or clear your data once you submit it, so be careful.
- **Write everything in your laboratory notebook.** Do calculations in the notebook as well so that if you have questions later you can find what data you had and what you did with it. There will be at least one occasion where you will need data from a previous lab.
- **Wait until you have gathered all of your data before submitting any into LON-CAPA.** If your results are inconsistent or obviously in error, you should re-do any trials as needed before entering data.
- **In order for your PostLab to open, you must enter accepted data** (that is, to the correct number of significant figures and within any ranges that are set). You will get a message if not accepted, but be careful and take your time. Look to make sure your data are accepted. Additionally, your TA must check your data and enter a code into your LON-CAPA lab assignment before you leave the lab. The PostLab will NOT open if your TA does not enter their code. The TA code serves as a verification by the TA that the student has attended lab in their registered room and at their registered time. If the TA does not enter their code, the student will not be able to open and complete the PostLab assignment, resulting in zero points for the PostLab assignment.
- **We expect students to stay in the lab room for the entire lab period.** You may leave early only if you have completed the PostLab questions for the experiment. If you leave lab early before you

have finished your PostLab questions or without the consent of your TA, we will assume you are committing academic dishonesty and you will earn a zero for the lab and PostLab questions.

- **Students must upload an image of their handwritten data to LON-CAPA.** Failure to upload data will result in a penalty of 1 point deducted from the Lab Report grade in the Atlas gradebook. Students should notify their TA immediately if they have trouble uploading their data.

3. In-Lab PreLab Quiz.

In-Lab iClicker Questions

Students are required to answer 4 iClicker questions at the start of their lab session. These questions are based on the information (videos and questions) in the PreLab Assignment and this lab manual. These iClicker questions are designed to determine if the student has adequately prepared for the lab experiment.

Students must be in-attendance, in the lab in order to submit iClicker questions. If a student arrives late to the lab, for any reason, they will not be given an opportunity to answer any missed questions; therefore, prompt/on-time attendance is critical. If a student misses a lab session, and their absence is excused (as determined by the Course Coordinator and the policies outlined in the Course Attendance section on pages xxiii–xxiv of this lab manual), the individual will also be excused from the missed iClicker questions in the missed lab session. If the student's absence is UNEXCUSED (as determined by the Course Coordinator and the policies outlined in the Course Attendance section on pages xxiii–xxiv of this lab manual), then the missed iClicker questions from the missed lab session will also be unexcused and the student will receive zero points for these missed questions.

All iClicker questions will be answered individually by each student. Any sharing of information or answers will be considered Academic Dishonesty and appropriate penalties will be enforced.

iCLICKER STUDENT LAB SESSION QUESTIONS

44 points of your total points have been assigned via the iClicker STUDENT system. Please note that answering clicker questions posed during an in-person lab session using a registered iClicker STUDENT device is not mandatory, but these 44 points are part of your final point total and questions will be asked every in-person lab session.

It is the student's responsibility to register their device before using that device to answer questions posed in an in-person lab session. To earn iClicker STUDENT points, answers to questions must be submitted using the iClicker STUDENT app during the time given for the question and during the student's registered lab.

Please see the hand-out and email sent by the Course Coordinator about iClicker STUDENT to learn how to download the app and register your device. Directions can also be found by following the provided link on the Course website.

Please note that simply attending every in-person lab session will not earn you 44 points. You must work on getting the exam level questions that are posed by the TA correct as well.

Allowing others to use your iClicker STUDENT device to submit answers to posed questions, providing answers to another individual, discussing how to solve a question posed, or providing assistance to another individual in any way in an in-person lab session is considered an act of aca-

demic dishonesty. Please see http://admin.illinois.edu/policy/code/article1_part4_1-403.html for the penalties that are associated with academic dishonesty.

0.5 point will be awarded for participation and attempting each question posed by the TA in the lab session. These points will be awarded whether you answer the question posed correctly or not.

0.5 points will also be awarded for answering each iClicker Student question posed correctly.

For example: If two iClicker STUDENT questions were asked in an in-person lab session and you answer both questions correctly using your registered iClicker STUDENT device, then you would have earned 1 point for participation (0.5 pt for each question attempted) and 1 point (0.5 pt each) for answering the two questions correctly. You, thus, would have earned a total of 2 points for that in-person lab session.

If two iClicker STUDENT questions were asked in an in-person lab session and you answered both questions using your registered iClicker Student device but only one of them was answered correctly, then you would have earned 1 point for participation (0.5 pt for each question attempted) and 0.5 point for answering the one question correctly, for a total of 1.5 points that in-person lab session.

If two iClicker STUDENT questions were asked in an in-person lab session and you answered both questions using your registered iClicker STUDENT device but answered none of them correctly, you would have earned 1 point only for participation (0.5 pt for each question attempted) and 0 points for the questions answered incorrectly, for a total of 1 point for that in-person lab session.

After an in-person lab session, points for those iClicker STUDENT questions will be uploaded into the online ATLAS grade book. It is the student's responsibility to regularly check the online grade book to check that their iClicker STUDENT points have been uploaded.

If you used your device to answer posed questions during an in-person lab session, but do not see your iClicker STUDENT points in the online grade book when grades have been uploaded, it means YOU did not register your iClicker STUDENT device correctly and must do so AS SOON AS POSSIBLE. All points not recorded will be lost for the in-person lab sessions—i.e., the student will receive a grade of ZERO for the answers not recorded as well as their attendance for that in-person lab session.

Having issues with your device or using the app? Please contact iClicker student support <https://learn.iclicker.com/HowCanWeHelp>

4. PostLab Assignments. These assignments consist mainly of calculations and data analysis of what you have done in the lab. For some labs there will be some additional questions. The PostLab assignments are found online via LON-CAPA and must be completed by 2:00 PM the evening **before** your next lab (see the online Syllabus for the schedule). Before the deadline multiple attempts are allowed, but not unlimited attempts. Unless otherwise specified, 30 attempts are allowed on PostLab questions. Questions will not be reset and additional attempts will not be provided. If a student uses their allowed attempts without correctly answering a question, they will receive zero points for the question. If subsequent questions require the answer from an unanswered question, then the student will not be able to answer those subsequent questions will also receive zero points for those questions. Students are strongly encouraged not to guess on questions and to seek assistance from their TA or the Course Coordinator if they submit 50% of their attempts without obtaining the correct answer. There is generally no feedback until after the assignment is due. Once the deadline has passed, your access to the PostLab assignment will be closed and will not be re-opened.

All lab data must be correctly entered and accepted by LON-CAPA in order for the PostLab to open. Students should verify that their PostLab opens (by physically opening it while in the lab) before they leave the lab. Lab data cannot be re-entered or manipulated after the assignment closes at the end of the lab period, so all errors must be identified and corrected before the student leaves the lab. Failure to correctly enter and submit lab data will prevent the student from completing the PostLab and will result in a grade of “zero” points for the PostLab.

A student seeking to be excused from a postlab assignment must provide documentation that supports that they were unable to complete any of the questions in that assignment for the entire period of time that the postlab assignment was open. Note: only one PostLab assignment will be excused this semester.

5. Lab Cleanliness. Students are required to work in a clean and orderly manner in the Lab each week. This includes, but is not limited to, cleaning the benchtop area where you have worked with soap and water, cleaning all lab glassware with soap and water and returning it to its proper location, turning off/unplugging/wiping clean all lab equipment that you used (spectrophotometer, hotplate, etc.) ensuring that you left the balances clean, throwing away used weigh boats in the trash, disposing of all waste in the proper receptacle, closing the lids on chemicals before walking away from the balance stations or dispensing stations, and any other requests made by your TA.

At the end of each lab period, your TA will walk through the lab space and ensure that the class has left the space in the proper condition. You will be given points, ranging from 0–3, based on the condition of the lab each week. These points will be assigned to the class as a whole, not to individual students; therefore, it is not only important that you leave your area clean, but that you also encourage those students around you to do the same. 3 point is awarded if the lab space is completely clean and all conditions are met; 1 point if 1 or 2 of the conditions are not met; and 0 points if more than 2 of the conditions are not met.

It is important to note that lab cleanliness is not only important at the end of the lab, but also throughout the lab session; therefore, if the Lab Staff observes that students are repeatedly ignoring the instructions of the TA and failing to clean-up messes as they occur, such as walking away from a dirty balance instead of cleaning the spilled chemical first, the Lab Staff will deduct cleanliness points from the class.

Students may only receive Lab Cleanliness points if they attend lab. Students who miss lab are not awarded any points since they do not have the opportunity to contribute to the cleanliness of the lab. Students who miss lab, for an excused or unexcused reason as determined by the Course Coordinator, will have the possible points for the week missed removed from the total possible Lab Cleanliness points for the semester.

6. Policy for Broken Lab Glassware or Equipment. Students will use a variety of glassware and equipment in the Chemistry 103 laboratory. This equipment is expensive and requires careful handling. Broken lab glassware or equipment will incur the following penalty: a loss of cleanliness points for the week during which the breakage occurs. This penalty will be imposed on the individual student, not the lab section as a whole.

In instances where a student breaks glassware or equipment more than once, breaks lab equipment controls (for example the OAS, waste hood or dispensing station), or breaks equipment in a manner deemed potentially dangerous to other individuals in the lab the Course Coordinator and Lab Coor-

dinator reserve the right to enforce a more severe penalty to the student to include, but not limited to, the loss of points related to lab assignments or lowering of a full letter grade.

EXTENSIONS ON LON-CAPA ASSIGNMENTS

The PreLab and PostLab Assignments in LON-CAPA are each open, and available for students to complete, for several days. General Due Dates for these assignments are found on page xii of the lab manual. Specific due dates, for individual lab sections, can be found by following the links on the Course Website (www.chem.illinois.edu). Due dates are set at the beginning of the semester. In the rare instance when a student may require an extension on an assignment, the following steps should be followed. Students will be granted no more than 3 extensions during the semester based on their supporting documentation and the discretion of the Course Coordinator. **Failure to complete any of the listed steps will result in the denial of an extension.**

1. Extension requests must be received a minimum of 5 hours before the due date (5:00 PM for PreLab Assignments; 12:00 PM for Postlab Assignments). Once an assignment has closed it will not be reopened and extensions will not be considered.
2. To qualify for an extension, the student must have completed at least one question in the assignment for which the extension is requested before submitting their request for an extension.
3. The student must provide detailed information for why the extension is needed, with supporting documentation, to the Course Coordinator. This information should NOT be provided to your TA. Waiting until the last minute to complete an assignment or forgetting a due date do not qualify as reasonable reasons for an extension and will not be considered. Examples of reasonable requests for an extension include: COVID-19 quarantine without access to a computer or internet connection, Hospitalization (for any reason), a broken computer, loss of internet connection as a result of a problem with the internet provider, etc. (Note, each of these list reasons must comply with item #2).

BONUS ASSIGNMENT

There will be one bonus assignment available to all Chemistry 103 students. This is a cumulative assignment, covering topics from all experiments and LON-CAPA assignments assigned during the Fall 2021 semester. The bonus assignment is worth up to 10 points. The earned points will be added to the student's final point total at the end of the semester.

The bonus assignment will be available for completion in LON-CAPA during the final week of the semester, between 12/2–12/9. The assignment is due at 5:00 PM, Thursday, December 9. This is an optional bonus assignment; therefore, extensions will not be provided.

Students must complete the bonus assignment individually. Since this is a bonus assignment, rewarding the cumulative knowledge gained by the student during the semester, students are not permitted to seek assistance/help in answering the questions in this assignment from other students, their teaching assistant, the Chemistry Learning Center, the instructor, the lab coordinator, or any other source. Technology problems, should they arise, should be directed to the lab coordinator.

ACADEMIC INTEGRITY

All responses submitted to the online administration systems, such as LON-CAPA or any other, must only be based on individual effort under all circumstances. Any portion of submitted responses that matches either information previously made available or answers submitted by other students will be considered plagiarized.

Specifics related to LON-CAPA and iClicker use in this course:

- LON-CAPA Lab Assignment involves the entry of data collected by the individual student during the in-person lab session. This work is not collaborative and is not the result of lab partners working together. Entering of any data into the LON-CAPA Lab assignment that was not collected, recorded and evaluated by the individual student will be considered a violation of the student code and appropriate penalties will be enforced.
- LON-CAPA Assignments (PreLab, PostLab) are intended to be collaborative, as defined as two or more learners working together to solve problems. Under this definition, students in this course may seek assistance from the Course Coordinator, the lab manager, the lab staff or a Chemistry 103 teaching assistant. Collaborative learning in this course does not involve one individual providing answers to another individual, posting questions online, giving or receiving answers from online sources such as email, an online chat service or similar forums. This type of collaboration will be considered a violation of the student code and appropriate penalties will be enforced.
- iClicker answers must be the independent effort of the individual with whom the grade in the course will be assigned to at the end of the semester. During an iClicker session, individuals enrolled in Chemistry 103 are not permitted to share or receive answers (on paper, via text or other online platforms including, but not limited to, GroupMe, Email, Reddit, Chegg, Zoom chat, etc.). Any questions should be directed to the Teaching Assistant (or other individual directed by the Course Coordinator) administering the questions. Sharing or receiving of answers, in any capacity, will be considered a violation of the student code and appropriate penalties will be enforced.

The course administrators will use all available tools to track abnormal matches between answers submitted. For example, certain data points in a plot may be considered plagiarized even if the values are numerically 'tweaked' yet with a matching 'trend'. Students are cautioned in the strongest terms, as the ability to establish potential plagiarism has vastly improved with new tools even when the source is typically presumed 'untraceable' electronically. Examples include handwritten notes and documents that exist only in image form.

The university policy on plagiarism can be found under in the student code (<https://studentcode.illinois.edu/>). The penalty for violation of academic integrity rules in a single assignment, fully or partially, is a failing grade for the entire course. Assisting plagiarism also carries the same penalty. Keeping student login information secure is the student's responsibility. Therefore, allowing access to your information is also assisting plagiarism.

Violations are not limited to online submission systems. Any member of the faculty, the lab manager, the teaching lab staff, teaching assistants, students or other Department staff members have the authority to bring potential violations to the attention of the Course Coordinator. The Course Coordinator reserves the right to use such evidence, personal observations and available tools to determine whether a violation has occurred before proceeding into an official inquiry process.

There are too many students and too many sections to allow students to switch sections; that is, you must attend the section in which you are enrolled (for an excused absence, see “Attendance for the Course”). Do NOT go to a different section and then submit your data during your scheduled time. You will not be counted as being present in the lab session, and if data are entered, they will be considered to be fabricated.

REQUIRED MATERIALS FOR THE COURSE

You are required to purchase the following for Chemistry 103:

1. Lab Coat

A lab coat can be purchased at any of the campus bookstores. Note: students are permitted to purchase and wear either the standard white lab coat or the blue, fire-resistant, lab coat. It is recommended that students who plan to take upper-level (200 and above) lab courses purchase the blue, fire-resistant, lab coats since this is the coat that will be required for those upper-level labs.

2. Goggles

All students, teaching assistants, and visitors in the laboratory must wear regulation safety goggles as required by STATE LAW. You must wear goggles at all times in the laboratory or you will be asked to leave immediately. If you must be reminded to wear goggles in the laboratory, your TA will deduct points from your laboratory grade.

The approved goggles for Chem 103 is: *Honeywell Uvex Stealth OTG safety goggles*. Other models of goggles are not permitted in the lab. Questions regarding goggles should be directed to the lab director (3015 Chem Annex). Goggles can be purchased at any of the campus bookstores or online.

It is strongly advised that you do not wear contacts while in the laboratory. They readily absorb vapors from solvents that are detrimental to the eye. Safety goggles are not “air tight” and therefore do not completely eliminate this absorption. If you choose to wear contacts in the laboratory, you must notify your TA and wear a “*CONTACTS*” badge on your lab coat each week.

3. Chemistry 103 Laboratory Manual “General Chemistry Experiments”

You cannot use an old version of this manual this semester, as the course has been redesigned to include new experiments and policies. You must purchase the current version of the manual from the University Bookstore.

ATTENDANCE FOR THE COURSE

Students are required to attend all in-person lab sessions. You must attend the section in which you are enrolled. All absences will be considered unexcused except in the following cases. Excuses must be submitted in a timely manner, as defined as within 5 days after the scheduled experiment. **Documentation will not be accepted and absences will not be excused, under any circumstances, after the due date of the assignment.**

NOTE: Any student who misses more than 3 in-person lab sessions (excused or not) during the semester will automatically fail the course or receive an incomplete grade for the course if required reasonable excuse letters have been provided.

1. **Medical excuse.** You must provide a signed doctor's note from a physician or from McKinley Health Center to the Course Coordinator. "Dial a nurse" is not an acceptable medical excuse. This information should NOT be given to your TA.

If you are sick and unable to attend your assigned in-person lab session, please email the Course Coordinator as soon as possible.

2. **Family emergency.** If you cannot attend class because of an unexpected emergency you must provide documentation from the Emergency Dean to the Course Coordinator. This information should NOT be given to your TA.

If you miss a lab due to an emergency, please email the Course Coordinator as soon as possible.

3. **Participation in a University-sponsored activity.** Examples include participation in the Marching Illini or a University sports team. You must provide documentation regarding your absence to the Course Coordinator at least one week prior to your absence. This information should NOT be given to your TA. Intramurals, student-sponsored clubs and activities, or registered student organization (SRO) events are not considered University-sponsored and do not excuse you from lab.

4. **COVID-19 Excuse.** If you cannot attend class because of a mandated quarantine, directed by a physician, or a COVID-19 related hospitalization, you must provide supporting documentation to the Course Coordinator. COVID-19 medical excuses must originate from a physician and include as signature and the length of quarantine (if applicable). This information should NOT be given to your TA.

MANDATORY I-CARD SCANNING POLICY AND PROCEDURE

The Department of Chemistry requires that students scan their official University of Illinois i-card/UIN card upon arrival to lab in order to attend and receive credit for the experiment and receive access to the PostLab assignment. Scanning must occur within the first 10 minutes of the lab period. If a student forgets to scan their card, arrives late, or does not have their i-card/UIN card with them, then they will receive a zero for the experiment, *even if they remain in lab and complete the work.* This policy applies to all students enrolled in CHEM 103 and CHEM 105.

Listed below are frequently asked questions regarding this policy.

1. **Why do students need their official University of Illinois i-card/UIN card?**

Scanning of official University of Illinois i-card/UIN cards is required for safety purposes and will ensure the student attends the lab section for which s/he is registered.

2. **When does the scanning of the card occur?**

Each lab contains an i-card/UIN card scanning station. Students will scan their card immediately upon arriving to their Chem 103 or Chem 105 lab. All scanning must occur within the first 10 minutes of the lab period, for example by 8:10:01AM for a lab session that begins at 8AM.

3. What happens if a student does not scan their card by 10 minutes after the start of lab?

Students must scan their card no later than 10 minutes after the start of lab. Any student that scans their card after this time, or fails to scan their card at all, will receive a zero for the lab experiment.

For example, a student is registered for the Tuesday 8AM lab session. This student must scan their official University of Illinois i-card/UIN card by 8:10:00AM. If the student scans their card at 8:10:01AM, their scan will be considered late and they will receive a grade of “zero” for that week’s experiment.

Note: What happens if a student does not scan their card by 10 minutes after the start of lab, but remains in the lab and completes the experiment?

Students who fail to scan their card by the 10-minute mark of the lab session, will receive a grade of “zero” for the experiment, EVEN IF they attended lab anyway and completed the work. In these cases, the teaching lab coordinator will manually replace whatever grade they obtained on the lab experiment with a grade of “zero” because the student did not fulfill the requirements of this policy.

4. What will happen if a student forgets their i-card or has a temporary ID?

A temporary ID card cannot be used instead of an i-card to check into the lab.

The student should report directly to the General Chemistry Main office (1026 Chemistry Annex) to report that s/he forgot their i-card.

Please note, this option does not change or extend the time by which the student must arrive to the lab space. Arrival to the lab space must still occur before the 10-minute mark of the lab.

For this option, the Office Manager or the Office Support Associate will record the following information: student name, NetID, Section Number and verify that this is the first time the student has tried to attend lab without their card. A message will then be sent to the student’s TA alerting him/her that the student will be allowed to attend lab without their card this ONE TIME. **This allowance will only be made one time per student per semester.**

If the student chooses this method, s/he will not be permitted to begin work on the experiment until their TA has received a message stating that student has been approved to attend lab and receive credit for the experiment, for this one and only time, without his/her i-card. If the student misses the pre-lab instruction during this process, the TA will provide the student with this information, before s/he is allowed to begin working.

All subsequent instances when the student reports their card as misplaced, lost or stolen, will result in the student receiving a grade of “zero” for the lab experiment and PostLab assignment. It is the responsibility of the student to go to the Illini Union Bookstore and replace his/her i-card before trying to gain access to the lab again. Student must present their new official University of Illinois i-card/UIN card the next time they attempt to access the lab.

5. What will happen if a student misplaces, loses or has had his/her i-card stolen?

The student should report directly to the General Chemistry Main Office (1026 Chemistry Annex) to report that s/he misplaced, lost or had their card stolen. The Office Manager or the Office Support Associate will record the following information: student name, NetID, Section Number and verify that this is the first time the student has tried to attend lab without their card. A message will then be sent to the student's TA alerting him/her that the student will be allowed to attend lab without their card this ONE TIME. **This allowance will only be made one time per student per semester.**

Please note, this option does not change or extend the time by which the student must arrive to the lab space. Arrival to the lab space must still occur before the 10-minute mark of the lab.

If the student chooses this method, s/he will not be permitted to begin work on the experiment until their TA has received a message stating that student has been approved to attend lab and receive credit for the experiment, for this one and only time, without his/her i-card. If the student misses the pre-lab instruction during this process, the TA will provide the student with this information, before s/he is allowed to begin working.

All subsequent instances when the student reports their card as misplaced, lost or stolen, will result in the student receiving a grade of "zero" for the lab experiment and PostLab assignment. It is the responsibility of the student to go to the Illini Union Bookstore and replace his/her i-card before trying to gain access to the lab again. Student must present their new official University of Illinois i-card/UIN card the next time they attempt to access the lab.

GRADING FOR THE COURSE

Please note: Chemistry 103 follows the University plus/minus system for grading.

The grading for the course will be as follows:

Course Policy Assignment	10 pts.
Safety Quiz	5 pts.
Safety Feature Scavenger Hunt	5 pts.
Waste Disposal Activity	5 pts.
11 PreLab Assignments	110 pts.
11 Lab Reports	110 pts.
11 iClicker STUDENT (up to 6 points can be earned per session)	44 pts.
11 PostLab Assignments	220 pts.
13 Lab Cleanliness Points (up to 3 points each)	33 pts.
Total	542 pts.
Bonus Assignment – up to 10 pts. possible	

This course is not curved (i.e. 70.0–72.9% is a C–, 73.0–76.9% is a C, 77.0–79.9% is a C+, 80.0–82.9% is a B–, 83.0–86.9% is a B, 87.0–89.9% is a B+, 90.0–92.9% is an A–, and 93.0–100% is an A).

Grading Scheme for Chem 103:

Percentage %	Final Grade
(97.0–100.0%)	A+
(93.0–96.9%)	A
(90.0–92.9%)	A–
(87.0–89.9%)	B+
(83.0–86.9%)	B
(80.0–82.9%)	B–
(77.0–79.9%)	C+

Percentage %	Final Grade
(73.0–76.9%)	C
(70.0–72.9%)	C–
(67.0–69.9%)	D+
(63.0–66.9%)	D
(60.0–62.9%)	D–
(0.0–59.9%)	F

OTHER IMPORTANT COURSE INFORMATION ITEMS**1. Medical Insurance**

Each student at the University is responsible for providing his/her own medical insurance coverage. If a student is injured or becomes ill during laboratory, costs of transportation and treatment are the responsibility of the student. Check to be sure that your insurance coverage is adequate.

2. Contact Information

If you have any questions or concerns throughout the semester, you should contact the Course Coordinator or Lab Coordinator. The contact information is included online.

THE LABORATORY NOTEBOOK

Students must purchase the current Laboratory Notebook for the semester. Changes are made to the manual each semester, preventing students from using old versions of this lab manual.

Students will record data in the provided tables at the end of each experiment. All data should be recorded in INK. Pencil will not be accepted. Students will take an image of their completed data tables and upload these images to their LON-CAPA Lab Assignment before leaving the lab. Late uploads will not be permitted.

FREQUENTLY ASKED QUESTIONS FOR CHEMISTRY 103**1) What should I do if I missed my scheduled Lab and am seeking to be excused?**

Please read the Course Attendance section on pages xxiii–xxiv of your lab manual to ascertain types of situations that will allow you to be excused from Lab.

If you missed Lab due to one of these allowed situations, i.e. you have a legitimate excuse for missing Lab, then contact the Course Coordinator and provide the reason why you missed Lab, the actual name of your section and provide the documentation that supports the reason that you missed Lab so you can earn an excused absence from that Lab.

The documentation sent can be a pdf, a clear scanned image of the document(s) or a very clear picture of the document(s).

The latter things must be sent to the Course Coordinator in a reasonable time, i.e. no less than 24 hours BEFORE the deadline for the PostLab of the lab missed.

Failure to submit the latter items to the Course Coordinator in a timely manner means that student will earn an unexcused absence for the Lab they missed. Please note that McKinley notes MUST confirm that you visited McKinley and saw a health practitioner if this form of documentation is being used to earn an excused absence from the Lab missed. Dial a nurse or other phone consultations do not qualify as medical documentation and may not be used to excuse a student from a lab.

2) What does receiving an excused absence from Lab means?

It means that the average grade of all of the Labs that student actually completes will be used in place of that excused absence when calculating that student's grade.

The student will see EX in the online grade book for the Lab grade if they have been excused absence from Lab.

When a student is excused from Lab they must still complete the PostLab for that Lab by the deadline for their section. Simulated data will be generated and provided in LON-CAPA, once the Lab excuse is granted.

PostLabs nor PreLabs are excused for this course unless there is documentation provided that supports that the student was incapacitated and thus unable to do either one or both of these assignments **for the entire time** the assignment(s) was open in LON-CAPA.

3) How do I calculate my point total for one Lab?

Grades for this class, the points/grades that are used to calculate your grade, are NOT kept in LON-CAPA and are NOT the same grades as those seen in LON-CAPA.

The grades/points used to calculate your grade are kept in the online gradebook and are taken out of LON-CAPA and converted to scores out of 10 for PreLabs, 10 for most Labs and 20 for PostLabs.

Following is an example of how to calculate the different parts of your Lab each week. I will use the different components of Lab 2 for this example.

PreLab 2:

For PreLab 2, assume for the purpose of this sample calculation, there were 15 questions asked in LON-CAPA and a student correctly answered 13 of them.

The student therefore earned 13 out of 15 for PreLab 2 in LON-CAPA.

All PreLabs are each worth 10 points.

To convert 13/15 to a score out of 10, multiply both 15 and 13 by (10/15).

When this is done the student, therefore, earned 9/10 (grades are rounded to the nearest whole number) for PreLab 2.

This student will see 9/10 in the online gradebook for their PreLab 2 grade and 9/10 will be used to calculate their CHEM 103 grade.

Lab 2:

For Lab 2, assume for the purpose of this sample calculation, there were 4 questions asked in LON-CAPA and a student correctly answered 4 of them during their 2 hour lab period in their assigned lab space.

The student therefore earned 4 out of 4 for Lab 2 in LON-CAPA.

Lab 2 is worth 10 points.

To convert 4/4 to a score out of 10, multiply the numerator and denominator, i.e. 4 by (10/4).

This gives you an answer of 10/10.

This student will see 10/10 in the online gradebook for their Lab 2 grade and 10/10 will be used to calculate their CHEM 103 grade.

PostLab 2:

For PostLab 2, assume for the purpose of this sample calculation, there were 14 questions asked in LON-CAPA and a student answered 7 of them correctly.

The student therefore earned 7 out of 14 on PostLab 2 in LON-CAPA.

All PostLabs are out of 20 points.

To convert 7/14 to a score out of 20, multiply both 14 and 7 by (20/14).

This student will see 10/20 in the online grade book for their PostLab 2 grade and 10/20 will be used to calculate their CHEM 103 grade.

4) How are lab cleanliness points awarded?

During the Lab the TA and the Lab Staff will regularly check the condition of the lab space and evaluate whether or not students are working in a clean and orderly manner. Failure to, for example, close chemical lids at the balance stations, close waste container lids in the waste hood, or clean up chemical spills at the balance, will result in a loss of cleanliness point.

At the end of each lab session, the TA will complete a final walk-through of the lab space and check the condition of the lab. The following items are assessed,

- Are the waste containers open?
- Are the reagent containers open?
- Are there glassware, weigh boats, or other equipment left on lab counters or in sinks?
- Are the balances and areas around the balances clean?
- Is there broken glassware left in the sinks, on the floor, or at the work stations?

- Are there weigh boats that contain chemicals left anywhere in the lab space?
- Are there cuvettes left in the spectrometers?
- Have the lab counters been cleaned and dried?
- Is there garbage in the sinks or on the lab counters?
- Has all used glassware been washed with soap and returned to their proper bins?

Points are assigned to the class as a whole, not to individual students based on the following criteria: 3 points if the lab space is complete clean and all of the above listed conditions are met; 1 point if 1 or 2 of the above listed conditions are not met; 0 points if more than 2 of the above listed conditions are not met.

5) What does completing the Lab in LON-CAPA to gain access to the PostLab mean?

Each Lab for this course occurs over a 2 hour period. For each lab, students must enter accepted lab data for ALL questions for that lab using LON-CAPA during this 2 hour period.

Students who fail to do the latter will be unable to access the PostLab exercise (worth the bulk of the grade) for that Lab.

Students will NOT be given access to the PostLab in LON-CAPA for any lab that they failed to submit accepted lab data for all questions for that Lab during the 2 hour period in their lab space for that lab.

6) How many times can I miss Lab for the semester?

Any student who misses more than 3 laboratory periods (excused or not) during the semester will automatically fail the course or receive an incomplete grade for the course if required reasonable excuse letters have been provided. Please note that an unexcused absence DOES mean that the student loses points for the lab they missed, as well as the PostLab for that lab.

Why does the student lose points for the PostLab too? The opening of a PostLab in LON-CAPA for each lab is dependent on a student entering acceptable data for ALL questions during their two hour assigned lab period, in their assigned lab space.

If a student has not been excused from lab, they therefore also forfeit their PostLab points for that lab as well as they will not be given access to the PostLab with an unexcused absence for a Lab.

7) What happens if I forget my lab coat/goggles or if I am not dressed properly?

Students are required to wear a lab coat and approved safety goggles (also referred to as personal protective equipment or PPE), in addition to dressing properly each time they attend lab. The specific details for these items are listed in the "Laboratory Conduct and Safety" section on pages xxxiii–xxxvi of the lab manual and in the course safety video that students are required to watch before participating in the first experiment of the semester.

Each student is checked for proper dress and PPE by both the TA and a member of the lab staff. This typically occurs within the first 20–30 minutes of lab. If the student forgets their PPE or is not

dressed properly, s/he may not attend lab and will receive a zero on their Lab and PostLab assignments for that week of lab.

8) What happens if I arrive after the first 10 minutes of lab?

Students are required to be in lab, properly dressed, including proper PPE, ready to work and with their i-card scanned (see I-Card Scanning Policy on pages xxiv–xxvi of the lab manual), by the 10-minute mark of the lab in order to attend lab for a grade and have access to the PostLab. For example, for a 10AM lab, a student must meet these requirement by 10:10:00AM. If any of these requirements are met at or after 10:10:01AM, the student will not be allowed to attend lab for a grade and will receive zero points for the lab and PostLab assignments in LON-CAPA. This will count as an unexcused absence for the student.

9) Is this course curved at the end?

No. Students must earn the point total that is stated under “Grading for the Course” in the Lab manual to earn the grade they desire for this course.

10) How does the online grade book use an excused absence grade to calculate your point total?

If you have an EX grade in the gradebook for a lab then the following formula is used by the grade book to calculate the number of points for that excused assignment:

$$\text{EX} = \text{excused assignment} = \left(\frac{\text{sum of all student's non-excused scores for that kind of assignment}}{\text{sum of all student's non-excused possible points for that kind of assignment}} \right) * (\text{possible points the excused assignment is worth})$$

11) Is there extra credit available in this course?

There is an optional bonus assignment available to all Chemistry 103 students. This is a cumulative assignment that must be completed individually by the student (without any outside assistance) during the final week (8/2–8/5) of the semester. Up to 10 bonus points can be earned on this assignment. Any earned points will be added to the student's final point total at the end of the semester.