CHEMISTRY 105

General Chemistry Experiments

Summer **2021**

Department of General Chemistry
University of Illinois

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Name _____

Campus Address _____

Telephone Number _____

Laboratory Section Information

Section Number _____

Time _____

Room _____

TA's Name _____

Introduction to Chemistry 105

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.chem.illinois.edu
- Click on the day of your lab section. The one-page summary will look like what you can find on pages xii and xiii of this lab book but it includes your specific due dates. 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 homepage (you will find general information, including a course materials list). In addition, click on "LON-CAPA Homework" and make sure you can sign in.

Please watch the "Introduction to Chemistry 105" video located on the website. We explain the course policy and other useful details.

There will be a Safety Orientation (including the Safety Features Scavenger Hunt and Waste Disposal Activity) in addition to a Lab 1 experiment on the first day of lab. Students will need their lab manual to complete these activities. Correct attire, a lab coat and goggles are mandatory to attend lab this week.

Before you go to your first lab, make sure you have/do the following:

- Bring your lab manual (this book).
- All data will be recorded first into the provided tables in this lab manual. An image of these completed tables will be uploaded to your LON-CAPA lab report. **Failure to upload an image of your data will result in a loss of points on the lab report.** ADDITIONALLY, all lab data must be recorded into LON-CAPA. This data will be checked by your TA before you leave the lab. At this time, you TA will enter a code into your lab report that will allow you to gain access to the PostLab Assignment. Failure to have your TA check your data and enter their code will mean you will not be able to open the PostLab assignment and will lose all points for the PostLab assignment.
- 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 Safety Video, located in LON-CAPA, and the Safety Policy, located in this lab manual, provide information on proper lab attire.

- Complete the Course Policy Assignment before attending Lab 1.
- Complete the Safety Quiz, Scavenger Hunt, and Waste Disposal activities before attending Lab 2. Note, the Safety Quiz will be available for completion before Lab 1. Students may complete this assignment in advance to Lab 1 with the Course Policy Assignment.

REQUIRED ASSIGNMENTS TO ATTEND LAB AND 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 105. All of these activities are found in LON-CAPA and described below. Failure to complete any one of these activities will prevent the student from attending lab and will result in a zero for the lab and the Postlab assignments for each week that any one of the listed activities is not complete. After 3 in-person lab sessions without completing any one of the activities listed below, the student will fail the course.

Assignment 1: Course Policy Assignment.

Due Date: BEFORE the **second** lab.

Penalty if not complete by due date: Students who do not complete this assignment before their second lab session will be removed from the lab and will receive a zero on Lab 2 and Postlab 2. Students who do not complete this assignment 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 be removed from the lab and will receive a zero on Lab 4 and Postlab 4. Students who do not complete this assignment by Lab 5 will fail the course and will not be permitted to attend any future labs.

Assignment 2: Safety Video and Quiz.

Due Date: BEFORE the **second** lab.

Penalty if not complete by due date: Students who do not complete this assignment before their second lab session will be removed from the lab and will receive a zero on Lab 2 and Postlab 2. Students who do not complete this assignment 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 be removed from the lab and will receive a zero on Lab 4 and Postlab 4. Students who do not complete this assignment by Lab 5 will fail the course and will not be permitted to attend any future labs.

Assignment 3: Scavenger Hunt (completed during Lab 1)

Due Date: BEFORE the **second** lab.

Penalty if not complete by due date: Students who do not complete this assignment before their first lab session will be removed from the lab and will receive a zero on lab 2 and Postlab 2. Students who do not complete this assignment 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 be removed from the lab and will receive a zero on Lab 4 and Postlab 4. Students who do not complete this assignment by Lab 5 will fail the course and will not be permitted to attend any future labs.

Assignment 4: Waste Disposal (completed during Lab 1; however, this assignment is available to the student at the same time as the Course Policy Assignment. If the student feels comfortable reading the lab manual they may use the material presented in Lab 1 to complete the Waste Disposal assignment before attending lab so long as they understand the penalty explained below (indicated with **) regarding exhausting their attempts to correctly complete the assignment.)

Due Date: BEFORE the **second** lab.

Penalty if not complete by due date: Students who do not complete this assignment before their first lab session will be removed from the lab and will receive a zero on lab 2 and Postlab 2. Students who do not complete this assignment 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 be removed from the lab and will receive a zero on Lab 4 and Postlab 4. Students who do not complete this assignment by Lab 5 will fail the course and will not be permitted to attend any future labs.

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

If a student misses Lab 1 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 1 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 zero points for this assignment**. The student must still successfully complete this assignment, despite receiving zero points, as well as all of the other required activities listed above by the deadlines, in order to gain access to the remainder of the Chemisty 105 course in LON-CAPA.

If a student uses up all of the provided attempts to answer questions within the listed Assignments 1–4, the student must contact the Lab Coordinator (sdesmond@illinois.edu) and request the necessary questions or assignment be reset. This is the only instance this semester where a question can be reset. If the student requires that a question or assignment be reset so that they may have additional attempts to correctly complete the assignment, **the student will receive zero points for the question or assignment,** but must still correctly complete the full assignment in order to gain access to the remainder of the Chemistry 105 course in LON-CAPA.

CHEMISTRY 105, SUMMER 2021

Experiment Dates – Monday/Wednesday Section

Experiment	Date
Lab 1: Laboratory Orientation, Safety and the Balance	6/14
Lab 2: The Mohr Pipet, Serial Dilutions, and Standard Curves	6/16
Lab 3: Titrations and the Buret	6/21
Lab 4: Determination of the Acid Content in Lemonade Kool-Aid	6/23
Lab 4: Determination of the Acid Content in Lemonade Kool-Aid cont.	6/28
Lab 5: Spectroscopic Analysis of Aspirin/Safety Activity 1	6/30
NO LAB	7/5
Lab 6: Determination of Acetylsalicylic Acid in Aspirin/Safety Activity 2	7/7
Lab 7: Buffers/Safety Activity 3	7/12
Lab 8: Determining the pKa of Aspirin	7/14
Lab 9: Gibbs Free Energy/Safety Activity 4	7/19
Lab 10: Electrochemistry	7/21
Lab 11: Differential Rate Laws	7/26
Lab 12: Integrated Rate Laws	7/28
Lab 13: Hydrolysis of Aspirin	8/2
NO LAB	8/4

PreLab HW Dates

All HW due by 10:00 PM on Lon-Capa

PreLab HW For:	Due
(Policies/Safety)*	6/15
Lab 2 (Mohr Pipet)	6/15
Lab 3 (Titrations)	6/20
Lab 4 (Lemonade)	6/22
Lab 5 (Spec Aspirin)	6/29
Lab 6 (Acetyl. Aspirin)	7/6
Lab 7 (Buffers)	7/11
Lab 8 (pKa Aspirin)	7/13
Lab 9 (Free Energy)	7/18
Lab 10 (Electrochem)	7/20
Lab 11 (Diff Rate Law)	7/25
Lab 12 (Int Rate Law)	7/27
Lab 13 (Hydrolysis)	8/1

PostLab HW Dates

All HW due by 5:00 PM on Lon-Capa

PostLab HW For:	Due
Lab 1 (Safety/Balance)	6/15
Lab 2 (Mohr Pipet)	6/20
Lab 3 (Titrations)	6/22
Lab 4 (Lemonade)	6/29
Lab 5 (Spec Aspirin)	7/6
Lab 6 (Acetyl. Aspirin)	7/11
Lab 7 (Buffers)	7/13
Lab 8 (pKa Aspirin)	7/18
Lab 9 (Free Energy)	7/20
Lab 10 (Electrochem)	7/25
Lab 11 (Diff Rate Law)	7/27
Lab 12 (Int Rate Law)	8/1
Lab 13 (Hydrolysis)	8/3

**Students must correctly complete the Course Policy Assignment and Safety Quiz BEFORE 6/15 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.*

Experiment Dates – Tuesday/Thursday Section

Experiment	Date
Lab 1: Laboratory Orientation, Safety and the Balance	6/15
Lab 2: The Mohr Pipet, Serial Dilutions, and Standard Curves	6/17
Lab 3: Titrations and the Buret	6/22
Lab 4: Determination of the Acid Content in Lemonade Kool-Aid	6/24
Lab 4: Determination of the Acid Content in Lemonade Kool-Aid cont.	6/29
Lab 5: Spectroscopic Analysis of Aspirin/Safety Activity 1	7/1
NO LAB	7/6
Lab 6: Determination of Acetylsalicylic Acid in Aspirin/Safety Activity 2	7/8
Lab 7: Buffers/Safety Activity 3	7/13
Lab 8: Determining the pKa of Aspirin	7/15
Lab 9: Gibbs Free Energy/Safety Activity 4	7/20
Lab 10: Electrochemistry	7/22
Lab 11: Differential Rate Laws	7/27
Lab 12: Integrated Rate Laws	7/29
Lab 13: Hydrolysis of Aspirin	8/3
NO LAB	8/5

PreLab HW Dates

All HW due by 10:00 PM on Lon-Capa

PreLab HW For:	Due
(Policies/Safety)*	6/16
Lab 2 (Mohr Pipet)	6/16
Lab 3 (Titrations)	6/21
Lab 4 (Lemonade)	6/23
Lab 5 (Spec Aspirin)	6/30
Lab 6 (Acetyl. Aspirin)	7/7
Lab 7 (Buffers)	7/12
Lab 8 (pKa Aspirin)	7/14
Lab 9 (Free Energy)	7/19
Lab 10 (Electrochem)	7/21
Lab 11 (Diff Rate Law)	7/26
Lab 12 (Int Rate Law)	7/28
Lab 13 (Hydrolysis)	8/2

PostLab HW Dates

All HW due by 5:00 PM on Lon-Capa

PostLab HW For:	Due
Lab 1 (Safety/Balance)	6/16
Lab 2 (Mohr Pipet)	6/21
Lab 3 (Titrations)	6/23
Lab 4 (Lemonade)	6/30
Lab 5 (Spec Aspirin)	7/7
Lab 6 (Acetyl. Aspirin)	7/12
Lab 7 (Buffers)	7/14
Lab 8 (pKa Aspirin)	7/19
Lab 9 (Free Energy)	7/21
Lab 10 (Electrochem)	7/26
Lab 11 (Diff Rate Law)	7/28
Lab 12 (Int Rate Law)	8/2
Lab 13 (Hydrolysis)	8/4

**Students must correctly complete the Course Policy Assignment and Safety Quiz BEFORE 6/17 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.*

Preface

Welcome to Chemistry 105! This course is an introduction to the chemistry laboratory at the college level. You will complete thirteen chemistry experiments in the laboratory designed to help you better understand the chemistry you are learning or have learned in Chemistry 104 or a similar course. You will do some deducing, as you determine the identity, composition, or qualities of several systems or chemicals.

This manual is designed to help you on your way in Chemistry 105. Its aim is to guide you through the experiments you will undertake and help introduce you to several topics, techniques, and principles of chemistry. The experiments are intended to introduce you to laboratory work and it is our hope that you will find these laboratory experiences challenging and interesting.

Finally, we understand that our students are coming to us with different levels of experience in the lab. The teaching staff and Course Coordinator welcome your concerns and questions, whenever they arise throughout the semester.

Chemistry 105 Course Policies

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

CHEMISTRY 105 ONLINE

It is extremely important for you to familiarize yourself with the Chemistry 105 website. From this website you can access your schedule, the online gradebook, 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://chem.illinois.edu then go to "Course Web Sites" and then to "Chemistry 105". You will find the following sections in tab-format on the website. Each section is summarized below; however, you are encouraged to familiarize yourself with them online. You will also need to complete the first online assignment, located in LON-CAPA (https://lon-capa.illinois.edu) **before** the first lab. You will use LON-CAPA often this semester, so it is a good idea to take a few minutes to familiarize yourself with this website, as well, before the semester begins.

1. Contact Information. This tab provides you with the e-mail addresses of all of the TAs (along with the sections each teaches and their office hours) and the e-mail address of the Course Coordinator and the Lab Coordinator.

2. Lab Schedule. This tab 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 syllabus and **print it out**. You will then have the schedule for the date each labs meets, along with due dates for all online assignments.

3. LON-CAPA Assignments. This tab 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. In some cases you will also complete Lab Video Assignments (Labs 8, 11–13) and Safety Assignment. These assignments are described in more detail in *Required Components of the Course* (next) and the due dates for these are given in the Syllabus. 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 105 grade book in Atlas. This provides you with scores for all Chemistry 105 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 xxx–xxxiv.

REQUIRED COMPONENTS OF THE COURSE

1. PreLab Assignments. These assignments have been developed to help you prepare to successfully complete the lab experiments in the provided time and to successfully complete an in-lab pre-experiment quiz using iClicker REEF. These assignments are dependent on the provided tutorials, videos, and this lab manual. The PreLab assignments are found online via LON-CAPA and must be completed by 10:00 PM on the evening before the corresponding 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, watching the provided materials, 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 lab session, so once the deadline has passed your access to the PreLab will be closed and will not be re-opened.

2. Laboratory Reports. There are thirteen labs throughout the semester (see the online Syllabus for the schedule). Lab data will be recorded directly into the tables provided in your lab manual. See *The Laboratory Notebook* on page xxx 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.
- Per the University of Illinois-Urbana Champaign, students are required to undergo COVID-19 testing every 4-days. They must show proof of their recent negative test, using their Illinois App, at the entry of the Chem Annex in order to gain entry to the building and attend lab. Students may be requested to show evidence of their negative test result a second time before entering their assigned lab space. **It is the responsibility of the student to make sure they have a negative COVID-19 test result by the time they must attend lab. Failure to obtain a test result in time to attend lab 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 it 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 note pages.** 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 were 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, two things must happen:**
  (1) 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.
  (2) Your TA must review your lab data and enter their code into your LON-CAPA lab report page.
- **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.

3. 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 section "Attendance for this Course" on page xxvi 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 section "Attendance for this Course" on page xxvi 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 REEF LAB SESSION QUESTIONS

60 points of your total points have been assigned via the iClicker REEF system. Please note that answering clicker questions posed during a lab session using a registered iClicker REEF device is not mandatory, but these 60 points are part of your final point total and questions will be asked every lab session starting the second lab session.

It is the student's responsibility to register their device before using that device to answer questions posed in a lab session. To earn iClicker REEF points, answers to questions must be submitted using the iClicker REEF 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 REEF 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 lab session will not earn you 60 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 REEF device to submit answers to posed questions in a lab session is considered an act of academic dishonesty. Please see http://admin.illinois.edu/policy/code/article1_part4_1-403.html for the penalties that are associated with academic dishonesty.

0.60 points will be awarded for participation in each lab session. These points are awarded the first time you use your clicker whether you answered the question posed correctly or not.

1.1 points will also be awarded for answering each iClicker REEF question posed correctly.

For example: If two iClicker REEF questions were asked in a lab session and you answer both questions correctly using your registered iClicker REEF device, then you would have earned 0.6 points for participation, i.e. when you first used your registered iClicker REEF device and 2.2 points (1.1 pts each) for answering the two questions correctly. You, thus, would have earned a total of 2.8 points for that lab session.

If two iClicker REEF questions were asked in a lab session and you answered both questions using your registered iClicker REEF device but only one of them was answered correctly, then you would have earned 0.6 points for participation, i.e. when you first used your registered iClicker REEF device, and 1.1 points for answering the one question correctly for a total of 1.7 points that lab session.

If two iClicker REEF questions were asked in a lab session and you answered both questions using your registered iClicker REEF device but answered none of them correctly, you would have earned 0.6 points only for participation, i.e. when you first used your registered iClicker REEF device, and 0 points for the questions answered incorrectly, for a total of 0.6 points that lab session.

After a lab session, points for those iClicker REEF 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 REEF points have been uploaded.

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

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

4. Lab Video Assignments. These assignments are located in LON-CAPA and are composed of a series of short videos covering topics including, procedural information, chemical safety, experimental considerations, and data analysis. These videos serve to provide the student with information that they would have been exposed to if they were able to complete the experiment in-person. There is a short assignment located at the end of each series of videos that is to be completed by the student. This assignment checks the student's knowledge of the material presented in the videos.

Each question has a limited number of attempts. This information is listed at the end of the question. 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. 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.

Lab Video assignments are available at the start of each week, at the time of the lab session, and remain open for completion in LON-CAPA until 5:00 PM the night before the next lab session. (Note, this assignment is due on the same day and time as the PostLab Assignment.)

5. Safety Assignments. Safety is an important component to Chemistry 105. These assignments are designed to build upon your existing knowledge of proper lab attire and increase your awareness of safety terminology, pictograms on chemical labels, and general safety practices. Background information and instructions are found within your lab notebook.

These safety assignments will be completed concurrently with some of the laboratory experiments this semester and will be completed in LON-CAPA. Each question has a limited number of attempts. This information is listed at the end of the question. 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. 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.

Due to COVID-19 and ongoing social distancing requirements, students will complete all safety activities online. These assignments will open on the same day as the corresponding lab and will be due at the same time as the corresponding PostLab. Refer to the specific schedule for your lab section for Safety Assignment Deadlines.

6. PostLab Assignments. These assignments consist mainly of calculations and data analysis of what you have done in the lab. Refer to *2. Laboratory Reports* on page xviii for information on the wet lab experiments this semester (1–7, 9–10). For labs 8, 11–13, students will automatically receive simulated data in their Postlab at the time of the lab session. For some labs there will be some additional questions. The PostLab assignments are found online via LON-CAPA and must be completed by 5:00 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.

7. 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 0–1, 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. 1 point is awarded if the lab space is completely clean and all conditions are met; 0.5 points 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.

8. Policy for Broken Lab Glassware or Equipment. Students will use a variety of glassware and equipment in the Chemistry 105 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 Coordinator 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, Lab Video, Safety, 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 pages xii–xiii 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 a reasonable number of 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 2 hours* before the due date (10:00 PM for PreLab Assignments; 5:00 PM for Lab Video, Safety, 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 be incapacitated, and thereby unable to complete the requested assignment, for a *80% of the time* it is open.
3. The student must provide supporting documentation detailing the reason for the requested extension 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 105 students. This is a cumulative assignment, covering topics from all experiments, safety activities, and LON-CAPA assignments assigned during the Summer 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 8/2–8/5. The assignment is due at 5:00 PM, Thursday, August 5. 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 permit-

ted 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, Safety, Lab Video 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 105 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 105 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 105:

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 105 is: Honeywell Uvex Stealth OTG safety goggle. Other models of goggles are not permitted in the lab. A pair of goggles can be purchased at any of the campus bookstores or online through Amazon. If the bookstore does not have it, this is not a valid excuse to not wear them for lab and you will be asked to leave.

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 or apron each week.

3. Chemistry 105 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 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 3 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 lab sessions (excused or not) during the semester will automatically fail the course (even if all other assignments are successfully completed) 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 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.

GRADING FOR THE COURSE

Please note: Chemistry 105 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
12 Prelab Assignments	120 pts
9 Lab Reports (Labs 1-7, 9-10)	90 pts
4 Lab Video Assignments (Labs 8, 11, 12, 13)	40 pts
12 iClicker REEF sessions(up to 5 points can be earned per session)	60 pts
13 Postlab Assignments	260 pts
4 Safety Assignments	20 pts
9 Lab Cleanliness Points (up to 1 point each)	9 pts
Total	**624 pts**
Bonus Assignment – up to 10 points possible	

This course is not curved (i.e. 70–72% is a C–, 73–76% is a C, 77–79% is a C+, 80–82% is a B–, 83–86% is a B, 87–89% is a B+, 90–92% is an A–, and 93–100% is an A).

Grading Scheme for Chem 105:

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 Laboratory Coordinator. The contact information is included online.

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 in lab 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 course instructor 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 office of the Teaching Laboratory Coordinator (3015 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 Teaching Laboratory Coordinator 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 office of the Teaching Laboratory Coordinator (3015 Chemistry Annex) to report that s/he misplaced, lost or had their card stolen. The Teaching Laboratory Coordinator 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.

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 105

1) What should I do if I missed my scheduled Lab and am seeking to be excused?

Please read the Course Attendance section on page xxvi 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 are not valid forms of medical excuses.

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.

Here 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 105 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 105 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 105 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: 1 point if the lab space is complete clean and all of the above listed conditions are met; 0.5 points 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.

Individual students within a lab section may receive an assignment of "zero" for lab cleanliness if lab equipment or glassware is broken during a lab period.

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 page xxxv 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 xxviii–xxix 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:**01**AM, 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:

EX = excused assignment = ((sum of all student's non-excused scores for that kind of assignment) / (sum of all student's non-excused possible points for that kind of assignment)) * (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 105 students. This is a cumulative assignment that must be completed individually be the student (without any outside assistance) during the final during the final week of the semester (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 a the end of the semester.

Laboratory Conduct and Safety

RULES

Students are required to purchase, and wear, regulation safety goggles for their personal use in the laboratory. These goggles form a complete seal around all sides of the eyes and may be obtained at any campus bookstore (*Note: the current approved safety goggles is the Honeywell Uvex Stealth OTG safety goggles*). Any other type of glasses, including but not limited to regular prescription glasses or sunglasses, do not provide sufficient eye protection and are unacceptable in the laboratory. Safety goggles are to be worn **AT ALL TIMES** in the laboratory, not just when an experiment is in progress. To this end, students are expected to put their safety goggles on **BEFORE** entering the lab. If a student must remove their safety goggles for any reason, they must first leave the lab. The student may then return, once they have properly replaced their safety goggles to cover their eyes. Cleaning of safety goggles should only be done with soap and water; never with organic solvents. Failure of a student to bring, and wear, safety goggles for eye protection, will result in removal from the laboratory and a grade of a zero for the experiment on that particular day.

Students are required to purchase, and wear, a regulation lab coat for their personal use in the laboratory. These may be obtained at any campus bookstore. Lab coats are to be worn **AT ALL TIMES** in the laboratory, not just when an experiment is in progress. To this end, students are expected to put their lab coat on **BEFORE** entering the lab.

- Specific policies for lab coats include: (1) Lab coats must fit properly such that it will cover the arms to the wrist without excess length or bagginess and will cover the legs to just above the knee at minimum. (2) Lab coats must be fully buttoned closed. Open lab coats will not be permitted at any time.
- All students are permitted to purchase and wear either the standard white lab coat or the blue, fire-resistant, lab coat.

In addition to safety goggles and a lab coat, the following lab attire policies will be enforced for all persons in the lab:

- The following items are **NOT** permitted: tank tops, spaghetti straps, midriff tops, short sleeve shirts, shirts with cut-out holes. Shirts must be long enough that when the student bends forward to work at the lab bench, skin is not exposed. Students wearing lab coats may wear shirts that do not provide maximum coverage so long as they put their lab coat on **BEFORE** entering the lab and wear it the **ENTIRE** time they are in the laboratory, i.e. from the time the enter the laboratory, until the time they leave the laboratory.

- Pants must be worn that cover the entire leg, ending at the top of the shoes. Pants must cover the ankles, including the socks. Exposed ankles or socks will not be permitted. The following items of clothing are **NOT** permitted: shorts, cropped or capri pants, skirts/dresses that are not full length (i.e. must reach the tops of the shoes). Tights, leggings, exercise pants, and other tight-fitting synthetic materials are **NOT** permitted because they can accelerate the transfer of chemicals to the skin and are difficult to remove in the case of an emergency. Students will **NOT** be permitted to tuck their pants in their shoes, or to pull their socks up over their pants to cover their ankles.
- Shoes must completely cover the foot (socks should not be exposed). Sandals, flip flops, clogs, open-toe shoes, open-back shoes, boat shoes, and ballet shoes are **NOT** permitted under any circumstances. Note: for example, sandals or boat shoes and socks are not appropriate lab attire because the sandal/boat shoe does not completely cover the foot. The significant area of exposed sock does not provide adequate coverage because it will easily allow the absorption of a spilled chemical to the skin. Boots (including rain boots) that go over the pants are also **NOT** permitted as they create a space between the pant leg and the boot. This is dangerous because chemicals can easily spill into the boot, potentially exposing the foot to contamination and/or chemical damage.
- Socks must be worn with ALL shoes as an extra layer of protection.
- Long hair must be tied back (or confined) for both male and female students. Note: Long hair is defined as hair that is at a length that can be tied back.
- Loose clothing is not recommended; however, if it is worn it must be confined. This includes scarves. If a scarf is worn in the laboratory, it must be securely tucked into the apron or lab coat.
- Students may not wear ball caps or other hats in lab.
- It is important to note the following about lab attire:
  - **Lab attire does NOT vary with the weather or temperature!**
  - **There will be NO exceptions made with respect to lab attire!**
  - Students who are not dressed properly will not be permitted to attend lab and will receive a zero on the Lab and PostLab assignments for that week.

It is strongly recommended that students do **NOT** wear contacts lenses in the laboratory. Chemical vapors may penetrate the contact lens material and cause the lens to adhere to one's eye, which could be detrimental to the eye. Goggles are not vapor tight and do not completely eliminate this absorption; however, the final decision is up to the student provided s/he understands the aforementioned risk. If the student decides to wear contact lenses, s/he must notify the TA and wear a **"CONTACTS"** badge on his/her apron or lab coat each week. Note: If any chemical gets into the eyes of a person wearing contact lenses, the contacts are to be removed and thrown away immediately, followed by a thorough flushing with water at the nearest eye wash station for at least 15 minutes.

Students should avoid direct contact to their skin with all chemicals. Non-latex, regulation approved, gloves will be provided for student use during all laboratory experiments.

Students should know the location of the essential safety features in the laboratory:

- Exits, Fire Extinguisher, safety shower, eye wash station, fume hood (if applicable), chemical spill kit, first aid kit

There is **NO** food (opened or unopened) or drink permitted in the laboratory **AT ANY TIME**. Students may be allowed, with permission of their TA, to leave the lab for food or drink, if medically necessary. Chewing gum is not permitted in the laboratory as it can easily be contaminated with chemical vapors. Students should **NEVER** put anything found in the laboratory (equipment, chemicals) in their mouth. When pipetting a solution in the laboratory, students should **ALWAYS** use a pipet bulb; pipetting by mouth is **NEVER** allowed.

There is **NO** smoking or chewing tobacco permitted in the laboratory **AT ANY TIME**.

Treat all chemicals as if they are toxic and hazardous; therefore, **ALL** chemicals should be discarded in the proper waste container, using the approved method, as instructed by the TA. Always check the label of the waste container **BEFORE** discarding waste in any container. **NEVER** pour solutions down the sink or dispose of solid waste in the trash cans.

Waste paper should **ONLY** be discarded in the designated containers, as instructed by the TA. Waste chemicals and glass should **NEVER** be discarded in these containers. Waste paper should **NOT** be disposed of in the trash cans.

Students should always be careful with glassware in the laboratory. Never use cracked or broken glassware. The TA should be notified immediately when any piece of glassware is broken. Any glass or ceramic equipment/material that breaks should be handled with care and disposed of properly, as instructed by the TA, in the blue and white designated "glass only" container located in the laboratory.

Students are **NOT** permitted to sit or lean on the laboratory benches. Chemicals may be present, though not seen with the naked eye, from previous experiments that could be harmful to skin or clothing.

Laboratory experiments involving chemicals that produce harmful vapors will be dispensed under the ventilated hoods (or other ventilated stations) located in the labs, when available.

Students are **NOT** allowed to work in the laboratory unless the TA is present. Students should wait in the hallway until the TA arrives. Students should wait to begin the experiment until **AFTER** the TA has given instructions.

Reagents should **ONLY** be used in the designated areas. Students should only take the amount of chemical needed from the reagent bottles, as instructed in the procedure, using the appropriate size beaker and funnel. **NEVER** pour chemicals from stock reagent bottles directly into graduated cylinders, test tubes, etc. **NEVER** place pipets in the reagent bottles. In the situation where too much of a chemical has been obtained, the surplus reagent **MUST** be placed in the appropriate waste container, as instructed by the TA; **NEVER** pour unused or excess reagent back into their original stock containers as it can contaminate the entire supply.

Accidents should be reported to the TA and the lab personnel immediately, regardless of how minor the injury may seem.

Students should **ALWAYS** leave the balances clean. Balances are sensitive instruments and should be used with care. To this end, (a) the students should **NEVER** move the balances and (b) if a student spills a chemical on a balance, or the surrounding area, the student should seek assistance from the TA for help in cleaning the spill. Problems with the balances should be reported to the TA.

Music is **NOT** allowed in the laboratory, under any circumstance, as it can be distracting and prevent the TA or others from hearing if a student is hurt and requires help.

Students should do the following before leaving the laboratory:

- Students should wipe down their work area with soap and water.
- Lab benches should be free of equipment.
- All glassware should be washed, dried and returned to its designated location.
- Wash hands with soap and water, even if gloves were used during the experiment.
- Ensure the sinks are free of glass, paper, debris, and standing water.
- All gas outlets and water taps should be turned off.