



# Chemistry 111, General Chemistry Laboratory A

## Spring 2020 Syllabus

The following syllabus applies to *all* of the lab sections: Chem 111-001 to 111-003.

Lab Location: Flanner Hall 204 , depending on section enrolled.

Students can only attend the section in which they are enrolled in LOCUS. Be mindful of day/time and location.

Pre/Co-requisite: Chem 101

Prerequisite: Math Placement Test or Math 117

Laboratory Coordinator: Dr. Corey Lin

Office Hours: Mondays 11:30-13:00 & Friday 11:30-13:00 and by a scheduled appointment (Check Sakai!) \* office hour will be held in STEM Center at Centennial Hall 1<sup>st</sup> floor.

Office Location: 104 Flanner Hall

Office Phone: 773-508-2598

Email: [ylin21@luc.edu](mailto:ylin21@luc.edu)

**Put Chem 111, your section #, and your TA's name in the subject line of all emails**

Section 001, 002, and 003:

TA: Amanda Scarpitti

Email: [ascarpitti@luc.edu](mailto:ascarpitti@luc.edu)

Office Hour:

TA: Brona O'Sullivan

Email: [bosullivan2@luc.edu](mailto:bosullivan2@luc.edu)

Office Hour:

Teaching Assistants (TAs) will be assisting all of the laboratory coordinators during this course. Specific TAs and TA information will be listed in Sakai, along with the Primary Lab Coordinator for your section.

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Welcome to Chem 111. We are looking forward to working with you this semester. Read the entire syllabus to understand the expectations of this course.

## **COURSE DESCRIPTION**

This lab course emphasizes introductory application of topics/theory covered in the lecture course (Chem 101). It introduces students to basic chemical laboratory skills & techniques including lab safety, accuracy/precision, net ionic equations, pH, enthalpy, spectrophotometry, use indicators, a variety of laboratory equipment & glassware, basic statistics, etc. This list is not exhaustive but mentions the highlights.

Goals of course: 1) teach lab safety, 2) teach basic laboratory skills, 2) apply theory to practical use Outcomes: 1) students know safe lab practice, 2) students properly identify & use glassware, analytical balances, hot plates based on the task at hand, 3) compute calculations and theoretical analysis questions coupled to each lab experiment.

## **REQUIRED ITEMS**

- 1) Chem 111 Laboratory Packet (provided). Bring manual every week.
- 2) Composition style notebook (not spiral bound & cannot have tear-out perforations). Line ruled.
- 3) Safety goggles (we provide to you). These must be type G, H or K goggles and must meet or exceed ANSI Z87.1 requirements. Safety glasses do not meet our requirements and are not allowed.
- 4) Long-sleeve Laboratory Coat (white is preferred coat color). You must purchase this.
- 5) Appropriate clothing and footwear. See below for details\*
- 6) Scientific calculator for most experiments and the practical quizzes. Cell phones are not calculators.
- 7) A non-erasable pen is required for all written work. No white out is allowed.
- 8) Sakai access via the internet to watch pre-lab video content and complete all Sakai work.

**\*Appropriate clothing must be worn that minimizes potential chemical contact with your skin. Shoes that adequately cover the entire foot are required. Sandals, open-toes shoes, perforated shoes, openbacked shoes are not acceptable. No skin should be exposed on your feet or legs, so clothing that covers and protects your body from the waist down (including your ankles) must be worn. Lab coat required.**

## **GENERAL POLICIES**

- Attendance is mandatory. All written & Sakai work, as well as TA observations, serves as the basis for earning points and showing progress. Written work will be graded with an emphasis on correct significant digits, consist results (do data & observations match conclusions), appropriateness/correctness of analysis, and thoroughness in responses. Following directions of reporting calculated answers are taken into account in grades too.
- All work must be completed in non-erasable pen. This includes the Composition notebook, any worksheets/handouts, homework assignments, and exams. Work not completed in pen or containing “white-out” is subject to a point deduction and is not eligible for any regrade requests.
- The Composition notebook is to contain all laboratory experiment information [Date, Title, Introduction, data/observations/calculations, and lab experiment conclusions]. It is the major component of your course grade. Losing this Composition notebook may result in failure of the course, as one cannot be graded on work that does not exist if the notebook is lost. Follow the guidelines given on how to appropriately set-up a laboratory notebook.

- Aspects of lab work must be done in the Composition notebook only. (No loose-leaf paper or other notebooks). Each week your TA will evaluate/grade your notebook. This functions as a way for TAs to grade along the way and to make sure you are on the right track with lab results. If there are any discrepancies in recorded grades, proof of having earned a specific grade on a particular lab is the presence of that graded work in your notebook.
- Each student is assigned a drawer with glassware and equipment. At the beginning of the semester & semester's end, the drawer contents will be checked for completeness. The drawer is shared with other students over the course of a week. Therefore, it is essential that you clean the equipment used after an experiment is done. Drawers may be checked sporadically. If glassware is broken, the student is responsible for requesting a replacement item; there is no penalty for broken glassware.
- A practical and/or written exam covering basic skills and comprehension will be given. In part, a laboratory exam requires a student to demonstrate knowledge/skills by performing tasks in the lab. In this way, a student's ability to use equipment properly, demonstrate correct technique, and understand calculations can be evaluated. An exam will also cover basic understanding of the fundamental models of chemistry illustrated in the lab experiments. **You may use your own lab notebook, lab manual, syllabus, pre-lab lectures from Chem 111 on the exam.**
- Homework can never be submitted via email. No exceptions.
- Sakai work cannot be made up. There are no exceptions to this rule. Late work is not accepted.
- Safety and Clean-up points will be earned on the basis of safe/professional conduct in the lab. A safe lab environment is essential. Unsafe actions will definitely result in grade degradation. The following is a partial list of ways you can lose safety/clean-up points:
  - Coming late to class, after the pre-lab lecture has started will result in deduction of safety points.
  - Not dressing appropriately for lab. Proper footwear/clothing are required.
  - Not bringing goggles to lab/not wearing your goggles consistently in lab can result in expulsion from the lab. Safety glasses do not meet our safety requirements.
  - Not bringing a lab coat to lab. Not wearing the lab coat properly [buttoned] during lab.
  - Not keeping your equipment drawer or lab space in good condition (i.e. dirty glassware/bench).
  - Engaging in horseplay/actions that may endanger you, your classmates, TA, or Lab Coordinator.
  - Not adhering to Disposal Instructions indicated in each lab handout.
  - The lab-pro equipment used is breakable and requires special care. You and your partner will be assigned a box to use, and if the equipment is found to have been handled negligently, points will be deducted from both your safety points and your lab score for the both of you.

\*An action, even if not herein, deemed unsafe by TA or Lab Coordinator will result in safety point deductions.\*  
**Failure to adhere to lab safety rules can result in expulsion from the lab session and/or course with no opportunity for make-up of the work. Safety must be taken very seriously.**

## **ATTENDANCE/PARTICIPATION**

**Attendance is mandatory.** You are required to come to class every week and can only attend the section in which you are officially enrolled in in LOCUS. There is a point value associated with the work accomplished in each class, and you cannot earn points for classes that you do not attend. **There are no makeups allowed i.e. students cannot make up a lab experiment that they missed due to absence, regardless of the excuse for being absent.** There are eight lab experiments and students are expected to complete all of them. If a student is absent, a zero (0) is recorded in the gradebook for the experimental work missed. No makeup work is given. Sample data is given so the student can complete the homework questions pertaining to the lab missed.

Students are not allowed to make up any of the Sakai work. Students are not allowed to make up a lab experiment in another section of Chemistry 111. Make-up exams (practical quizzes) are rarely allowed and handled on a case-by-case basis. Any granted practical quiz makeup must be completed by the student within 4 business days of the absence. If the university is open, you are expected to attend class and be on time. Points are deducted for those who arrive late. If you arrive after the conclusion of the pre-lab lecture, you will not be allowed to perform the lab. That counts as an absence; no makeup work allowed. Being sent home for improper clothing/footwear also counts as an absence and no makeup work is allowed.

Review the schedule at the end of the syllabus and consider the negative impact that missing a hands-on laboratory session will have on your educational experience. It is in your best interest to register for a section that does not conflict with other obligations. Students should not enroll in a lab section that they cannot fully attend. Missing 2 of the labs, which is nearly 25% of the lab work, is significant and unacceptable and will result in academic failure, as will missing a practical quiz or not turning in the assigned lab report.

**Students who are not concurrently enrolled in or have not completed General Chemistry 101 or 105 with a grade of C- or better will be removed from the class.**

Students participating in co-curricular activities must make information concerning time conflicts with University sponsored events available to the Laboratory Coordinator within the first two weeks of the semester. The Laboratory Coordinator reserves the right to contact the Athletics Department confirming time conflicts and regarding concerns. Students missing classes while representing Loyola University Chicago in an official capacity (e.g. intercollegiate athletics, debate team, model government organization) will need to discuss their needs with the Laboratory Coordinator. Sakai work cannot be made up in any circumstances, no exceptions. Laboratory work cannot be made up either; you cannot attend another lab section. These types of absences are handled on a case-by-case basis with remedy.

Students missing a lab experiment due to observing religious holidays must alert the Lab Coordinator no later than two weeks after the start of the semester to request a special accommodation. This is handled on a case by case basis. The Lab Coordinator reserves the right to contact Campus Ministry, which keeps information on a plethora of religions and holidays.

Students must discuss with the Lab Coordinator the consequences of missing laboratory and the ways [if any] they can be remedied, while also providing the Laboratory Coordinator with proper documentation describing the reason and date of the absence. The document must be signed by an appropriate Faculty/Staff member, and it must be provided as far in advance of the absence as possible. It is a student's responsibility to proactively ask what will be missed due to absence. If a student in co-curricular activities or religious observance will miss the practical quiz it is in the best interest of the student to schedule a makeup exam with the Laboratory Coordinator prior to the absence. Any missed practical quiz must be made up within 4 business days of the absence.

## **COURSE REPEAT RULE**

Effective as of the Fall 2017 semester, students are allowed only THREE attempts to pass Chemistry courses with a C- or better grade. The three attempts include withdrawals (W). After the second attempt, the student must secure approval for a third attempt. Students must come to the Chemistry Department, fill out a permission to register form or print it from the Department of Chemistry & Biochemistry website:

<https://luc.edu/chemistry/forms/> and personally meet and obtain a signature from either the Undergraduate Program Director, Assistant Chairperson, or Chairperson in Chemistry. A copy of this form is then taken to your Academic Advisor in Sullivan to secure final permission for the attempt.

## **ROLE OF TEACHING ASSISTANTS**

In each lab session, your primary interaction could be with a Teaching Assistant. The function of a TA is to help you safely get good data and provide individual help when necessary. The role of the Laboratory Coordinator is more behind the scenes: plan the curriculum, prepare handouts and Powerpoints, and train the TAs so the lab experience is educational, fair, and effectively run for students enrolled in all of the sections. Know that the Laboratory Coordinator will be in lab too, but may step outside of the lab from time to time to handle appropriate curriculum work. The Laboratory Coordinator is available to you during and outside of the laboratory hours if there are any questions or concerns that the TAs cannot handle appropriately. The Laboratory Coordinator has final authority in all matters relating to the course. TAs will keep office hours, which will be posted on Sakai. Utilize both your Lab Coordinator and TA if you need assistance. \*If at any point during the semester you want to talk to a Laboratory Coordinator regarding your TA, please do. The TA should enhance your educational experience. If this is not the case, talk to a Lab Coordinator so they know.

## **TUTORING**

The Tutoring Center offers free tutoring. To find more information visit: [www.luc.edu/tutoring](http://www.luc.edu/tutoring)

## **GRADING**

Reference the grading scale below. There will be no change in the grading scale nor the number of points allotted in this course. There is one (1) dropped lab experiment grade i.e. the top seven lab experiment grades will be included in the course grade calculation. It is in your benefit to attend all 8 lab experiments to know the content for homework, quiz, and/or lab report. Then, the lowest experiment grade is dropped. For an absence, only one (1) experiment is dropped and it is the absence zero (0). There are no weighted grades in the course; it is points earned divided by total points possible. A zero (0) is earned for work not completed. Remember that there is no makeup work for lab absences. If you do not bring your lab notebook to lab, points will be deducted.

The University uses the +/- grading scale system and that system is implemented in this course. Rounding only applies to the final course grade percentage. Sakai reports course grades to TWO digits past the decimal (XX.XX%); this final course grade percentage is rounded to the closest integer. For example, an 89.50% or 89.90% (B+) rounds up to a 90% (A-), BUT an 89.30% or 89.45% (B+) round to the integer 89% (B+).

Grades are posted on Sakai within one week of completing the work [hard-copy homework, notebook checks, Sakai pre/post work]. Any grading discrepancies must be resolved the day the graded work is handed back. Discrepancies in Sakai [grade incorrect, for example] must be resolved no later than one week after reviewing the graded assignment. A student must show proof the work was graded wrong or in the gradebook incorrectly. Grade disputes will not be entertained past 1 week nor be acknowledged the last day of class. Be mindful of this policy. Efforts are made to ensure that all Chem 111 TAs uniformly grade. On very rare occasions, if it is found there are differences between TA's grading a lab section's averages may be scaled to adjust. When this is necessary, the average lab score mean is adjusted to the average quiz mean.

### Grading Scale:

% total	Grade	% total	Grade
94 – 100	A	77 – 79	C+
90 – 93	A-	74 – 76	C
87 – 89	B+	70 – 73	C-
84 – 86	B	65 – 69	D+
80 – 83	B-	60 – 64	D

### Point Breakdown:

Activity	Origin	Points
Intro to Data Analysis (SF) worksheet	lab	10
Lab 1a: Berman Intro to Data Lab	Lab notebook	20
Lab 1b: Clean-up/Safety during and after the lab experiment	lab	3
Lab 1c: Post lab homework in Sakai	Sakai	10
Lab 2a: Accuracy and Precision Date/Title/Intro	lab notebook	5
Lab 2b: Accuracy and Precision Results	lab notebook	10
Lab 2c: Accuracy and Precision Disc/Conc.	lab notebook	5
Lab 2d: Clean-up/Safety during and after the lab experiment	lab	3
Lab 2e: Accuracy and Precision graph homework	print out graph	5
Lab 2f: Post lab homework in Sakai	Sakai	5
Lab 3a: Vitamin C Content in Juice Date/Title/Intro	lab notebook	5
Lab 3b: Vitamin C Content in Juice Results	lab notebook	10
Lab 3c: Vitamin C Content in Juice Disc/Conc.	lab notebook	5
Lab 3d: Clean-up/Safety during and after the lab experiment	lab	3
Lab 3e: Post lab homework in Sakai	Sakai	10
Lab 4a: % H <sub>2</sub> O <sub>2</sub> in Dental Whiteners Date/Title/Intro	lab notebook	5
Lab 4b: % H <sub>2</sub> O <sub>2</sub> in Dental Whiteners Results	lab notebook	10
Lab 4c: % H <sub>2</sub> O <sub>2</sub> in Dental Whiteners Disc/Conc.	lab notebook	5
Lab 4d: Clean-up/Safety during and after the lab experiment	lab	3
Lab 4e: Post lab homework in Sakai	Sakai	10
Lab 4f: Introduction section practice lab report paragraph	typed and print out	N/A

Activity	Origin	Points
Lab 5a: Deductive Chemical Reasoning Date/Title/Intro	lab notebook	5
Lab 5b: Deductive Chemical Reasoning Results (& NIE worksheet)	lab worksheet and notebook	10
Lab 5c: Deductive Chemical Reasoning Disc/Conc.	lab notebook	5
Lab 5d: Clean-up/Safety during and after the lab experiment	lab	3
Lab 5e: Deductive Chemical Reasoning Post Lab Discussion Hwk	Sakai	4
Lab 5f: Holmes Post Lab Discussion Quiz Hwk	Sakai	1
Lab 5g: Results section practice lab report paragraph	typed and print out	N/A
Lab 6a: Energy Relationships Date/Title/Intro	lab notebook	5
Lab 6b: Energy Relationships Results (& Hess' law worksheet)	lab worksheet and notebook	10
Lab 6c: Energy Relationships Disc/Conc.	lab notebook	5
Lab 6d: Clean-up/Safety during and after the lab experiment	lab	3
Lab 6e: Post lab homework in Sakai	Sakai	10
Lab 6f: Discussion/Conclusion section practice lab report paragraph	typed and print out	N/A
Lab 7a: Spectrophotometric Analysis of Sports Drink Date/Title/Intro	lab notebook	5
Lab 7b: Spectrophotometric Analysis of Sports Drink Results	lab notebook	10
Lab 7c: Spectrophotometric Analysis of Sports Drink Disc/Conc.	lab notebook	5
Lab 7d: Clean-up/Safety during and after the lab experiment	lab	3
Lab 7e: Post lab homework in Sakai	Sakai	10
Lab 8a: Spectrophotometric Analysis of Aspirin Date/Title/Intro	lab notebook	5
Lab 8b: Spectrophotometric Analysis of Aspirin Results	lab notebook	10
Lab 8c: Spectrophotometric Analysis of Aspirin Results Disc/Conc.	lab notebook	5
Lab 8d: Clean-up/Safety during and after the lab experiment	lab	3
Lab 8e: Post lab homework in Sakai	Sakai	10
Quiz 1 Practical	quiz	40
Laboratory Report (written on lab experiment #8)	typed lab report	40
Weekly Sign In sheet (being on time, having PPE)	lab	22
z Check out	lab	5
Total Overall Points		376
<b>Final Course Points (after 1 dropped lab experiment grade, 23pts)</b>		<b>353</b>

### Grade if Absent:

As stated earlier in the syllabus, makeup work is not given. A zero (0) is recorded for work not completed, absent or not. Sometimes life happens and the Laboratory Coordinator understands that. As a result, one (1) of the eight (8) lab experiment grades (23pts which includes notebook work and cleanup points) will be dropped regardless of the excuse of the absence. If a student is absent a second time, a zero (0) is recorded in the gradebook and there is no remedy for that. In this case, a student may be allowed to remain in the course but will have to earn enough points to pass. The Instructor also has the right to fail the student if two or more absences occur during the semester or if the midterm and/or lab report is not turned in.

**If you miss a lab, contact your primary Laboratory Coordinator immediately.** Request sample data for the lab experiment missed. The sample data is similar to what you may have obtained in lab and may help you study for homework and the practical quiz or lab report. You will be responsible for understanding the missed material, and **normal deadlines always apply for completing homework on Sakai. For graphs and homework where a hard copy is required, please turn the assignment into your Primary Laboratory Coordinator the next lab, with a note requesting full credit due to your absence the prior lab session.**

## **EDUCATIONAL GOAL**

In this general chemistry laboratory course, my purpose as your Chemistry instructor is to provide a hands-on introduction to experimental methods of scientific investigation in Chemistry. The fundamental models of chemistry discussed in lecture will provide the basis for understanding the experimental laboratory work. Each lab will provide a practical opportunity for you to gain competence with the basic techniques of lab work and the practical experience necessary to understand its significance. It is my wish that this laboratory experience will encourage students who are seeking intellectual challenges along with an understanding of the chemical principles in the laboratory.

Conducting experiments and collecting data to test the validity of theories and models requires a different set of skills than those required for success in the lecture part of a general chemistry course. During a laboratory activity, each student's hands, mind, eyes, as well as other senses are focused on the task at hand. Success in the lab involves skills in making perceptive qualitative observations and accurate quantitative measurements.

With each laboratory experiment, relevant questions are posed, and along with TAs, I help each student to execute a laboratory approach which will yield reliable data related to these questions. Each student is required to obtain data and to depend upon this data when answers to these questions are drafted. All labs are structured enough so that you should not feel lost or confused, but not so structured that you will find it unnecessary to think for yourself.

## **REGARDING SAKAI AND TECHNICAL DIFFICULTIES**

It is *strongly encouraged* that all required submissions to Sakai as well as writing lab reports, opening course/data/experiment files, be done on a reliable wired internet connection [not wireless], that of which the University itself provides in the Information Commons and various computer labs on the Lake Shore Campus.

Under NO circumstances will excuses of "technical difficulties" be accepted as this syllabus is stating all students should use a wired internet University computer [not wireless internet] to submit work in Sakai, write lab reports, open course/data/experiment files. This list is not exhaustive and it should be noted that any activities this course may require a computer or internet connection for should be completed using University computers with wired internet connection. Use of home internet [wired or wireless], University wireless, or public wireless is at your, the student's, own risk. It is not prohibited but as Instructor has stated in this syllabus, Instructor is not responsible for technical difficulties of non-University devices [cell phone, tablet, home/work/public wireless internet or computer]. Do not submit items in Sakai using a cell phone or a tablet device as these do not count as reliable internet connection tools."



## **ACADEMIC INTEGRITY**

The standard of academic integrity and personal honesty delineated in the College of Arts & Sciences Statement on Academic Integrity is expected of every student and will be enforced. Details can be found at [http://www.luc.edu/cas/faculty\\_resources.shtml](http://www.luc.edu/cas/faculty_resources.shtml) Cheating can take many forms in lab, but the most common forms are copying data and answers to analysis questions, sharing files for homework, or completing Sakai work with another person. The data and analysis as well as the homework submitted for grading must be your own. If it is not, no credit will be awarded for the entire lab, nor will make-ups be granted. Findings of dishonest academic behavior are reported to the Chair of the Chemistry Department and to the Dean's Office, and are entered into an individual's record. Copied answer/report will result in penalty for all students involved.

## **DISABILITY ACCOMMODATIONS**

If you have a documented disability and wish to discuss academic accommodations, see your primary Laboratory Coordinator by the second meeting of lab. The Coordinator of Student Accessibility Center (SAC), formerly referred to as SSWD, is located in the Sullivan Center and must be contacted independently.

Necessary accommodations will be made for students with disabilities who procure a SAC letter. However, to receive any accommodations self-disclosure, proper documentation, and registration with the SAC office at Loyola University Chicago is required. Accommodations cannot be made until the Laboratory Coordinator receives proper documentation. Furthermore, accommodations are not retro-active and begin only once appropriate documentation has been received by the Laboratory Coordinator in a timely manner. Recognize that the course time scheduled in LOCUS is fixed. No extra time on wet chemistry is given to a student with an SAC letter; it is not possible and the SAC office has been made aware of this.

Only those accommodations that are specifically listed in the formal SAC letter will be provided. If an accommodation letter suggests the Testing Center be utilized to take an exam, it is the student's responsibility to schedule the testing time in the center. The student also must consult & arrange with the Laboratory Coordinator for the in lab practical portion of an exam, which cannot be done in the Testing Center.

SAC Policies and Procedures can be found here: <https://www.luc.edu/sac/>

### **Smart Evals:**

Feedback on the course is important so that a Lab Coordinator can gain insight into how to improve the course, the teaching style, and so the department can learn how best to shape the curriculum for future semesters. Towards the end of the semester, students will receive an email from the Office of Institutional Effectiveness with a reminder to provide feedback on the Chem 111 course the student is enrolled in. This office will send you constant reminders during the open period of feedback until the evaluation has been completed.

The evaluation is completely anonymous. When the results are released, no one will be able to tell which student provided the individual feedback. The feedback is not released until after the semester is over, therefore any feedback given will not impact student grades.

## **LOST AND FOUND**

Any items mistakenly left in lab will be taken to the Chemistry Department office, 125 Flanner Hall, and can be identified and claimed there. **Please put your name on your Composition notebook, lab manual, calculators, lab goggles, lab coat [tag], and other personal items.**

## **SAFETY IN THE LABORATORY**

**Laboratory safety is everyone's responsibility. By registering for and participating in this course you agree to abide by all of the safety precautions, information, and rules provided to you herein as well as in or outside of the laboratory. Failure to follow these rules constitutes grounds for withdrawing the offending student from the lab session and or course at any time.**

The Laboratory Coordinator, TA, and University take safety in the laboratory very seriously. Make sure to always listen to information regarding extra safety precautions when applicable. The rules of safety listed on the following page are reviewed during the first day of the laboratory course. Practice safe laboratory conduct during the entire semester and beyond. This list is not exhaustive and it is the student's responsibility to understand the proper, safe conduct when working in a laboratory. Students cannot complete experiments in the course unless the safety lecture and safety form are completed.

By using common sense and following all of the safety rules provided, it is unlikely that you or your classmates will be involved in or injured in a mishap in the laboratory. While it is very important that you do your part to prevent an accident from occurring, it is just as important to know what to do if someone is injured.

There are several key safety features of a laboratory that will be pointed out during the first day of class.

Preventing an accident or injury from occur is the ideal case scenario, which is why proactively being safe in the laboratory is desired. We live in the real-world and therefore have to be reactive in case of a lab incident.

Although not a requirement, it can be very helpful if a Laboratory Coordinator knows if a student has a condition that could possibly render an unsafe lab situation (allergies to latex, heart condition, seizure risk, etc.). Do feel free to discuss any concerns you may have regarding health conditions and laboratory work.

**Your commitment to safety [including the following rules] is very important:**

1. To always be on time to lab. Coming in late violates safety. Pre-lab lecture starts on time and missing any of its content is unsafe.
2. To wear approved safety goggles<sup>1</sup> and a [buttoned] long-sleeve laboratory coat at all times in the laboratory. Safety glasses are NOT allowed under any circumstances.
3. Non-latex, nitrile glove are optional but *highly* encouraged, especially when working with acids and bases or solvents. Do not wear gloves in the hallway or anywhere outside of lab.
4. To know both the location of and how to use eye washes.

5. Not to wear contacts in the laboratory. Eyeglasses are recommended.
6. To wear appropriate clothing that minimizes potential chemical contact with your skin. A lab coat is required, as are shoes that adequately cover the entire foot. Sandals, open-toe shoes, perforated shoes, open-backed shoes are not acceptable. No skin should be exposed on your feet, ankles, or legs, so clothing that covers and protects your body from the waist down (including ankles) should be worn. You must be dressed appropriately to do experiments.
7. To know both the location of and how to use the safety showers.
8. To know both the location of and how to use the fire extinguishers.
9. To know the proper clean-up and disposal procedure for broken glass.
10. Not to perform unauthorized and unknown experiments, nor work in the lab alone.
11. Not to take chemicals or equipment out of the laboratory.
12. Not to engage in horseplay or any clowning around that may endanger you or other students.
13. Not to eat, drink, chew gum, or smoke anything in the laboratory at any time. No headsets, cell phones, or any other audio devices.
14. Cell phones cannot be used as calculators.
15. To pull long hair back, keeping it away from chemicals and open flame.
16. To keep your lab space clean and tidy. This includes locking your lab locker when done.
17. To ask your Instructor or TA when in doubt about procedures.
18. Inform your Instructor of any health condition you have that might affect your performance or safety in the laboratory.

This list is not exhaustive. The Lab Coordinator and/or Teaching Assistants reserve the right to make a judgement call on an activity they deem unsafe taking place in the laboratory. Safety is a priority and students who do not follow the rules can be removed from the course, and if necessary Campus Safety will be called.

If you have any questions regarding the content of this syllabus, including the safety information provided, you are encouraged to discuss all questions/concerns with the Laboratory Coordinator.

The information provided on the following page are some basic reactive procedures to difference scenarios that have occurred in the laboratory.

## **FIRST AID BASICS**

*Minor Cuts:* Clean the wound, remove foreign material. Band-Aids are available. (Two Band-Aid rule: If you bleed through one Band-Aid, another should be applied over the first Band-Aid. If you bleed through two Band-Aids in a few minutes, you will be escorted to Health Services). Additionally, if there is any possibility of broken glass in a cut, you will be escorted to the Wellness Center.

*Minor Burns from Fire:* Immerse affected area in ice water.

*Chemicals in Eyes:* Immediately flush eyes with water at the eye wash. Continue with flush for at least 10 minutes. Hold the affected eye(s) open to do this properly.

*Chemicals on Skin:* Rinse affected area with water immediately at the sink or safety shower. If clothing is affected, remove clothes before rinsing! Continue to rinse for at least 10 minutes.

**Critical Injuries** may include: glass in his/her eye(s), serious cuts, severe chemical burns, severe fire burns, seizures. **Immediately call for help using either the lab phone (security number is taped to phone handle) or the emergency phone in the hallway directly outside the laboratory.** Anyone with chemicals or foreign objects in his/her eye(s) will be escorted to the Wellness Center or to the hospital.

## **FIRE HAZARDS**

The primary heat source in this laboratory is the Bunsen burner, which is fueled by natural gas. A lit Bunsen burner is a small, controllable fire, but the heat generated by the burner fire can be quite hazardous in certain circumstances. It can serve as an ignition source for other combustible materials in the lab, such as paper (lab handouts, paper towels, filter paper, etc.), plastics (wash bottle), flammable liquids (acetone, ethanol). A burner fire can also ignite clothing and hair. Proper operation of a burner and the absence of combustible materials in the proximity of the burner will significantly reduce the risk of a fire.

Keep chords and paper products away from laboratory hotplates. Always make sure hot plates are off & unplugged before leaving the lab. Avoid spilling chemicals on hot plates.

Each lab is equipped with several fire extinguishers, fire blanket, and safety showers, which should be used in a fire emergency.

### *In a case of a fire:*

Remain calm; alert the instructor and your immediate neighbors.

Personal safety, yours and others in the labs, is always the top priority.

A small fire in a small container can be suffocated by covering it with a watch glass or inverted beaker.

With a somewhat larger fire, decide whether or not you think you can control it with a fire extinguisher.

### *Use of a Fire Extinguisher:*

Located by the doors in both labs; a back-up fire extinguisher is located at the west end of the floor.

Maintain an escape position; i.e. stay between the fire and the doorway.

**Break the plastic ring, pull out the metal ring, release the hose from the bracket, direct the hose at the base of the flames, and press the lever down. PASS (pull, aim, squeeze, sweep).**

Note: Fire extinguishers are heavy and not particularly easy to direct. These are multi-purpose, dry chemical extinguishers, safe for anything we use in lab.

The Laboratory Coordinators reserve the right to revise this syllabus in order to correct any unintentional mistakes and/or to change the labs or lab directions for the class if necessary. Students will be notified if any changes have been made.

## Tentative Chem 111 Order of Lab Experiments

Intro/Safety	Syllabus, safety, glassware/drawer check-in
SF/Lab #1	Significant Figures (SF) / Beanium Intro to Data
Lab #2	Accuracy and Precision in Measurement of a Salt Solution
Lab #3	Determination of the Vitamin C Content
Lab #4	Percent (%) Hydrogen Peroxide in Dental Whiteners
Quiz 1 Practical	Midterm exam; Notebooks due
Intro to Reports	Formal lab report writing
Lab #5	Deductive Chemical Reasoning
Lab #6	Energy Relationships in Chemical Equations
Lab #7	Sport Drink Analysis via Spectrophotometry
Lab #8	Spectrophotometric Analysis of Aspirin
Revise Day	Formal Report Revise section & Turing your notebooks. Attendance Req.
Report Day	Lab report and notebook due; attendance especially required
Check Out	Wrap up semester, attendance especially required to earn course grade

**Semester schedule of laboratory on the next page**



**Tentative Semester Schedule of Chem 111 Laboratory  
Fall 2019**

Month	Mon	Tue	Wed	Thu	Fri
<b>Jan 2020</b>		<b>14</b> Intro/Safety			
	<b>20</b> MLK DAY	<b>21</b> SF/ Lab 01			
	<b>27</b>	<b>28</b> Lab 02			
<b>Feb 2020</b>	<b>3</b>	<b>4</b> Lab 03			
	<b>10</b>	<b>11</b> Lab 04			
	<b>17</b>	<b>18</b> Quiz 01 Practical			
	<b>24</b>	<b>25</b> Intro to Reports			
<b>Mar 2020</b>	<b>2</b> Spring Break	<b>3</b> Spring Break	<b>4</b> Spring Break	<b>5</b> Spring Break	<b>6</b> Spring Break
	<b>9</b>	<b>10</b> Lab 05			
	<b>16</b>	<b>17</b> Lab 06			
	<b>23</b>	<b>24</b> Lab 07			
<b>Apr 2020</b>	<b>30</b>	<b>31</b> Lab 08			
	<b>6</b>	<b>7</b> Revise Day!		<b>9</b> Easter Break No Lab	<b>10</b> Easter Break No Lab
	<b>13</b> Easter Monday	<b>14</b> Final Report Day	<b>15</b>	<b>16</b>	<b>17</b>
	<b>20</b>	<b>21</b> Check Out	<b>22</b>	<b>23</b>	<b>24</b>