



LOYOLA
UNIVERSITY CHICAGO

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General Chemistry Laboratory B

CHEM 112 Course Syllabus

Instructor: Murat Kahveci, Ph.D. & Katrina Binaku, Ph.D.

Institute: Loyola University Chicago Department of Chemistry & Biochemistry

Date: Spring 2023. 1/17/2023 - 5/6/2023

Version: 1/30/2023. Changes to this syllabus may be made when deemed appropriate.

Course: CHEM 112, General Chemistry Laboratory B, 1 Credit.



Flanner Hall - Room 305

<https://sakai.luc.edu>

1.1 Lab Location and Time

This is an in-person lab course and attendance is mandatory. See Table 1.1 for the class meeting times and places for CHEM 112.

Table 1.1: Class schedules for CHEM 112 in Spring 2023.

Class	Days & Times	Room	Class Dates
CHEM 112-001	Mo 10:25 AM - 1:10 PM	Flanner Hall - Room 305	Jan 17, 2023 – May 6, 2023
CHEM 112-002	Mo 1:40 PM - 4:25 PM	Flanner Hall - Room 305	Jan 17, 2023 – May 6, 2023
CHEM 112-003	Tu 8:30 AM - 11:15 AM	Flanner Hall - Room 305	Jan 17, 2023 – May 6, 2023
CHEM 112-004	Tu 11:30 AM - 2:15 PM	Flanner Hall - Room 305	Jan 17, 2023 – May 6, 2023
CHEM 112-005	Tu 2:30 PM - 5:15 PM	Flanner Hall - Room 305	Jan 17, 2023 – May 6, 2023
CHEM 112-006	Tu 5:30 PM - 8:15 PM	Flanner Hall - Room 305	Jan 17, 2023 – May 6, 2023
CHEM 112-007	We 11:30 AM - 2:15 PM	Flanner Hall - Room 305	Jan 17, 2023 – May 6, 2023
CHEM 112-008	We 2:45 PM - 5:30 PM	Flanner Hall - Room 305	Jan 17, 2023 – May 6, 2023
CHEM 112-009	We 5:45 PM - 8:30 PM	Flanner Hall - Room 305	Jan 17, 2023 – May 6, 2023
CHEM 112-010	Th 8:30 AM - 11:15 AM	Flanner Hall - Room 305	Jan 17, 2023 – May 6, 2023
CHEM 112-011	Th 11:30 AM - 2:15 PM	Flanner Hall - Room 305	Jan 17, 2023 – May 6, 2023

1.2 Pre/Co-requisite

CHEM 101 and 111 (or CHEM 105). Math Placement Test, Math 117, MATH 118 or equivalent.

1.3 Lab Coordinators

1. Katrina Binaku, Ph.D.

- Office Hours: Wednesdays 2-2:45pm, Thursdays 10:30-11:15am, and by a scheduled appointment in advance. Office hours are in the STEM Resource Center, St. Joseph's Hall and ZOOM.
- Office Location: Flanner Hall 304
- Office Phone: 773-508-8715
- Email: kbinaku@luc.edu

2. Murat Kahveci, Ph.D.

- Office Hours: Wednesdays 10:30-11:15am, Thursdays 2:30-3:15 pm and by a scheduled appointment in advance. Email to schedule.
- Office Location: Flanner Hall 409 and ZOOM
- Office Phone: 773-508-3764
- Email: mkahveci@luc.edu

1.4 Course Description

This second semester general chemistry lab course continues emphasis of lab experiments & data collection, data interpretation/analysis, and scientific writing. Lab topics are related to some topics/theory covered in the

lecture course (Chem 102). The course introduces students to intermolecular forces, matter and phase changes, chromatography, chemical kinetics, chemical equilibrium, acids & bases, net ionic equations, and UV-vis instrumentation. Continued exposure and enhancement of scientific writing skills is achieved through formal lab reports & keeping a lab notebook. Dimensional analysis and significant figures also play a continued role in the success of students in the course. These lists are not exhaustive but note the course highlights.

1.4.1 Goals of Course

1. Extend laboratory skill knowledge and use skills built on Chem 111 basics.
2. Apply qualitative and quantitative techniques to collect experimental data and appropriately interpret experimental results.
3. Improve scientific writing skills and documentation of laboratory data and analysis.
4. Continue to learn how to work safety in the lab and gain an understanding of chemical and laboratory safety practices.

1.4.2 Outcomes

1. Demonstrate knowledge of intermolecular forces, chemical kinetics, equilibrium, and acid – base theory through successful lab completion, data analysis & interpretation in notebook entries, online quizzes, and formal lab report writing.
2. Connect calculations to course concepts through successful lab notebook experiment calculations, data interpretation, and online quizzes.
3. Demonstrate enhanced scientific writing skills through experimental lab notebook and scientific lab reports.

1.5 Required Items

1. Chem 112 Laboratory Packet (provided as a PDF in Sakai). Printed manuals are provided during lab time to students. These hard copies are stored in the lab.
2. Composition style notebook (not spiral bound & cannot have tear-out perforations). Line ruled. The Chem 111 notebook can be used again!
3. Safety goggles (we provided to you in Chem 111). 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 clothing¹ and footwear.
6. Scientific calculator (non-programmable, non-graphing, and independent of another device such as a phone or tablet). Cell phones are not calculators.
7. A non-erasable pen is required for all written work. No white-out nor pencils allowed.
8. Sakai access via the internet to watch pre-lab video content, post-lab content, online content, lab simulations, submit lab work, and complete all Sakai work.

¹Appropriate 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, open-backed 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.

9. Labster. Access through Sakai. Virtual simulations to gain understanding and learn concepts. Unlimited attempts on simulation(s) during open time period / before due date.
10. Desktop or Laptop computer with internet access. Labster does NOT work on tablets nor mobile devices; Sakai does not display well on those devices. If you do not have a computer, the Information Commons (IC) on campus has plenty of available computer stations to do work at. You may also read about the extended loan equipment program within the first week of class to arrange a resource. Lab Coordinator is not responsible for coordinating resources for students nor responsible for a loaned device. Many coursework items require a computer to access and complete them.
11. Cam Scanner app OR a scanner machine. Cam scanner is a free app that converts a phone picture to a PDF file. You will take pictures of the Composition lab notebook pages and convert them to a PDF file in order to submit the notebook pages to Sakai for grading. This app works on android and iPhone. A scanner machine can be used as well.
12. Microsoft 365 (free for LUC students) to write a formal lab report. Information is supplied on how to download & access Microsoft 365 for free.
13. Panopto (free for LUC students). One format of recorded course content is Panopto video. You may be prompted to log in with UVID username and password to view the videos. Links to videos will be provided in Sakai (Panopto tool) and via email.
14. Periodic table. Here is a cool one provided by the Museum of Science & Industry
15. (Optional, but highly recommended) A face mask. See Masking Requirement below.

1.6 Spring 2023 Term Masking Requirement

For more information on the current mask policy, please see the [University's Health, Safety Website](#). A mask may be required depending on the preference of the lab coordinator and you may choose to properly wear one (e.g., over nose and mouth) at your own discretion based on your comfort level. If the University re-instates the masking requirement, this course will too.

1.7 General Policies

- **Attendance is mandatory.** All written & Sakai work, as well as TA and/or Instructor observations, serves as the basis for earning points and showing progress. Written work will be graded with an emphasis on correct significant digits, consistent results (does data & observations match conclusions), appropriateness/correctness of analysis, thoroughness in responses, and lab technique. Following directions of reporting calculated answers are considered in grades too. There are no online supplements to in-person lab experiments; students must be in attendance in person to complete labs.
- All work must be completed in non-erasable pen. This includes the Composition notebook, any worksheets/handouts and homework. Work not completed in pen or containing "white-out" is subject to deductions and is not eligible for a regrade requests.
- The Composition notebook is to contain all laboratory experiment information required [Date, Title, Introduction, Purpose, Safety, Results & Data, Conclusion] according to the lab notebook guidelines. 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). Your TA and/or Instructor will evaluate/grade your notebook. This functions 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.
- Homework can never be submitted via email. No exceptions.
- In general, Sakai work cannot be made up. See Late Policies section in the syllabus for information on late work policies!
- Safety² and Clean-up points will be earned based on safe/professional conduct in the lab. A safe lab environment is essential. Unsafe actions will 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 goggles consistently in lab can result in expulsion from the lab. Safety glasses do not meet our safety requirements.
 - Not properly wearing a face mask (when required).
 - Not bringing a lab coat to lab. Not wearing the lab coat properly [buttoned] in lab.
 - Not keeping 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.

1.8 Attendance/Participation

Attendance is mandatory. You are required to come to class on your assigned "in-person days" and can only attend the lab section in which you are officially enrolled in LOCUS. There is a point value associated with the work accomplished in each class. You cannot earn points for classes that you do not attend. There are limited opportunities to make up missed labs! Students are expected to complete all the in-person lab experiments in the course. If a student is absent for both the lab and the make-up lab opportunity [if offered], a zero (0) is recorded in the gradebook for the experimental work missed. Sample data is given so the student can complete the homework questions pertaining to the lab missed but the sample data is not worth points. Students are not allowed to make up a lab experiment in another section of Chem 112. If the university is open, you are expected to attend class and be on time. Points are deducted for those who arrive late to lab. If you arrive after

²An 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.

the conclusion of the pre-lab lecture, you may not be allowed to perform the lab. Being sent home for improper clothing/footwear counts as an absence; 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 or more of the labs, which is nearly 25% of the lab work, is significant and unacceptable and will result in academic failure. This is also true as well for not turning in 1 or both of the assigned typed formal lab report(s).

1.9 Loyola University Absence Policy for Students in Co-Curricular Activities (including ROTC)

Students missing classes while representing Loyola University Chicago in an official capacity (e.g., intercollegiate athletics, debate team, model government organization) shall be allowed by the faculty member of record to make up any assignments and to receive notes or other written information distributed in the missed classes.

Students should discuss with faculty the potential consequences of missing lectures and the ways in which they can be remedied. Students must provide their instructors with proper documentation (develop standard form on web) describing the reason for and date of the absence. This documentation must be signed by an appropriate faculty or staff member, and it must be provided as far in advance of the absence as possible. It is the responsibility of the student to make up any assignments. *Athletic Advising Attendance Policy*.

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.

1.9.1 Accommodations for Religious Reasons

Students missing a lab experiment due to observing religious holidays must alert the Lab Coordinator no later than 1-day after the start of the course 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.

1.10 Health, Safety, and Well-Being on Campus

Please be familiar with and adhere to all guidelines posted on the On-Campus Guidelines in Classroom Scenarios: [Campus Info & Resources](#) and [Return to Campus Guidelines](#) site.

1.11 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](#) 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.

1.12 Pass/Fail Conversion Deadlines and Audit Policy

A student may request to convert a course into or out of the “Pass/No-Pass” or “Audit” status only within the first two weeks of the semester. For the Spring 2023 semester, students can convert a class to “Pass/No-Pass” or “Audit” through Monday, January 31st. Students must submit a request for Pass/No-Pass or Audit to their Academic Advisor.

1.13 Privacy Statement

Assuring privacy among faculty and students engaged in online and face-to-face instructional activities helps promote open and robust conversations and mitigates concerns that comments made within the context of the class will be shared beyond the classroom. As such, any recordings of instructional activities occurring in online or face-to-face classes may be used solely for internal class purposes by the faculty member and students registered for the course, and only during the period in which the course is offered. Students will be informed of such recordings by a statement in the syllabus for the course in which they will be recorded. Instructors who wish to make subsequent use of recordings that include student activity may do so only with informed written consent of the students involved or if all student activity is removed from the recording. Recordings including student activity that have been initiated by the instructor may be retained by the instructor only for individual use.

1.14 Tutoring

The Tutoring Center offers free tutoring. Visit the [Tutoring Center website](#).

1.15 Grading

Reference the grading scale in [Table 1.2](#). There will be no change in the grading scale, nor the number of points allotted in this course. It is in your benefit to attend all in-person lab experiments to know the content

for homework, quiz, and/or formal lab report. A zero (0) is earned for work not completed. If you do not bring your lab notebook to lab, points will be deducted. There is no final exam in this course.

The University uses the \pm grading scale system and that system is implemented in this course. Rounding only applies to the final course grade percentage. Sakai reports a course grade 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% ($B+$) rounds to the integer 89% ($B+$).

Grades are posted on Sakai within one week of completing the work [Excel homework, notebook entries, Sakai pre/post work]. Any grading discrepancies must be resolved the day the graded work is handed back/grade posted in Sakai. 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 entered in the Sakai gradebook incorrectly. Grade disputes will not be entertained past 1-week of the grade /graded work being returned to students nor be acknowledged after the last day of class. Be mindful of this policy. Efforts are made to ensure that all Chem 112 work is uniformly graded throughout all sections.

See the next few pages for an itemized list for all graded course work.

Table 1.2: Grading scale.

% Total	Grade
100 – 94	<i>A</i>
93 – 90	<i>A-</i>
89 – 87	<i>B+</i>
86 – 84	<i>B</i>
83 – 80	<i>B-</i>
79 – 77	<i>C+</i>
76 – 74	<i>C</i>
73 – 70	<i>C-</i>
64 – 60	<i>D</i>
0 – 59	<i>F</i>

1.15.1 Point Breakdown

Table 1.3 includes grade categories and their weights for calculating of the final course grade. Normally, students don't need to manually calculate final course grades. Gradebook module in Sakai shows the weighted scores for each categories and overall course.

Table 1.3: Grade categories and their percent weights in the final course grade.

Grade Category	Points	Weight	Activity
Lab Experiment Notebook Points	180	45%	Table 1.4
Labster Points	600	10%	Table 1.5
Quiz Points (Lowest Dropped)	120	20%	Table 1.6
Sci-Finder Scholar Activity Points	20	5%	
Formal Laboratory Report Points	200	15%	Table 1.7
Clean Up, Safety, Lab Prep	90	5%	
Overall	1190	100%	

Table 1.4: Lab Experiment Notebook Points

Activity	Origin	Points
Lab 1 - Paper Chromatography of Artificial Dyes	In Lab/Sakai (Assignments)	20
Lab 2 - Fatty Acid Melting Points and Freezing Point Depression	In Lab/Sakai (Assignments)	20
Lab 3 - Solubility of a Potassium Salt	In Lab/Sakai (Assignments)	20
Lab 4 - Deductive Chemical Reasoning – Sherlock Holmes	In Lab/Sakai (Assignments)	20
Lab 5 - The Kinetics of the Iodination of Acetone	In Lab/Sakai (Assignments)	20
Lab 6 - The Kinetics of Crystal Violet and NaOH	In Lab/Sakai (Assignments)	20
Lab 7 - Using Spectroscopy to Determine the Equilibrium Constant for Bromothymol Blue	In Lab/Sakai (Assignments)	20
Lab 8 - Determination of pKa and Molar Mass of Nicotinic Acid by Titration	In Lab/Sakai (Assignments)	20
Lab 9 – Amino Acid Titration	In Lab/Sakai (Assignments)	20
Overall		180

Table 1.5: Labster Points

Activity	Origin	Points
Labster – Thin Layer Chromatography	Sakai (Labster Sims)	100
Labster – Matter & Phase Change	Sakai (Labster Sims)	100
Labster – Reaction Kinetics	Sakai (Labster Sims)	100
Labster – Chemical Equilibrium	Sakai (Labster Sims)	100
Labster – Acids and Bases	Sakai (Labster Sims)	100
Labster – Advanced Acids and Bases	Sakai (Labster Sims)	100
Overall		600

1.15.2 Grade if Absent

A zero (0) is recorded for work not completed, absent or not. The Lab Coordinator also has the right to fail the student if one or more absences occur during the semester/term or if either typed formal lab report is not turned in.

If absent for a lab, contact your primary Laboratory Coordinator immediately via email or phone. Lab Coordinator has a right to request documentation to confirm the reason for absence. Request information on whether the in-person lab can be made-up. You will be responsible for understanding the missed material, and **normal deadlines always apply for completing homework on Sakai.**

There are limited to no makeup opportunities for missing lab experiments due to absence.

Table 1.6: Quiz Points

Activity	Origin	Points
Quiz 1 – Paper Chromatography of Artificial Dyes	Sakai (Tests & Quizzes)	20
Quiz 2 – Melting Points of Fatty Acids	Sakai (Tests & Quizzes)	20
Quiz 3 – Solubility of a Salt	Sakai (Tests & Quizzes)	20
Quiz 4 – Sherlock Holmes	Sakai (Tests & Quizzes)	20
Quiz 5 – Kinetics	Sakai (Tests & Quizzes)	20
Quiz 6 – Bromothymol Blue Equilibrium	Sakai (Tests & Quizzes)	20
Quiz 7 – Advanced Acid-Base Titrations	Sakai (Tests & Quizzes)	20
Overall		120

Table 1.7: Formal Laboratory Report Points

Activity	Origin	Points
Formal Laboratory Report 1 on Lab #1, Peer Review	Sakai (Assignments)	15
Formal Laboratory Report 1 on Lab #1, Final Submission	Sakai (Assignments)	85
Formal Laboratory Report 2 on Lab #6, Final Submission	Sakai (Assignments)	100
Overall		200

1.15.3 Late Work Policies

- QUIZZES: If not completed on time, a 0 is the final grade. Quizzes cannot be accessed after the due date. Answers and feedback are released when the quiz closes.
- LABSTER SIMULATIONS: If not completed on time, a 0 is the final grade. Simulations cannot be accessed after the due date.
- NOTEBOOK ENTRIES: If not completed on time, a 1-week grace period is allotted to turn the work in late [2pt penalty for lateness applied to grade]. After 1-week, if the notebook is not turned in a 0 is the final grade.
- SCHOLAR SEARCH WORK: If not completed on time, a 1-week grace period is allotted to turn the work in late [2pt penalty for lateness applied to grade]. After 1-week, if the work is not turned in a 0 is the final grade.
- FORMAL LAB REPORT 1: If the first draft is not completed on time, a 24-hour grace period is allotted because there is a peer review involved. If draft is not turned in, student forfeits 15pts allotted to peer review [since a peer's review cannot be done if a student doesn't turn in a draft of their own typed formal lab report]. For the final draft of the report, a 1-week grace period is allotted to turn the work in late [2pt penalty per day for lateness applied to grade]. After 1-week, if the final draft of the typed formal lab report is not turned in a 0 is the final grade.
- FORMAL LAB REPORT 2: If not completed on time, a 1-week grace period is allotted to turn the work in late [2pt penalty per day for lateness applied to the grade]. After 1-week, if the final draft of the typed formal lab report is not turned in a 0 is the final grade.
- As a student, by enrolling in this course you agree to follow and abide by all syllabus policies & regulations, due dates, and understand grades will suffer if work is not turned in on time or if not turned in at all.

1.16 Educational Goal

In this general chemistry laboratory course, my purpose as the Lab Coordinator 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 students 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. After all, Chemistry is all around us in our everyday lives!

Conducting experiments and collecting data to test the validity of theories and models requires a different set of skills that 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, the Lab Coordinator assists 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 the student should not feel lost or confused, but not so structured that a student will find it unnecessary to think for themselves.

1.17 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 and Downtown.

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.”

1.18 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. Cheating can take many forms in lab, but the most common forms are copying data & answers to analysis questions, sharing files for homework, or completing Sakai work with another person. Data and analysis as well as 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 & Biochemistry Department, the Dean’s Office, and are entered into an individual’s record. Copied answer/report will result in penalty for all students involved.

1.19 Disability Accommodations

If you have a documented disability and wish to discuss academic accommodations, talk to your primary Laboratory Coordinator by the second week 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. Note there are no exams in this course. If flexible attendance and/or extended deadlines are a listed accommodation, the student must meet with the Lab Coordinator and agree to specific terms by filling out the extra form with the Lab Coordinator regarding the accommodations and what can/cannot be offered per the nature of the course. Review the [SAC Policies and Procedures](#).

1.20 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 112 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 100% 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.

1.21 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.**

1.22 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 a face mask, approved safety goggles¹ 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.
19. When required, wear a face mask correctly and at all times 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 following information provided is some basic reactive procedures to difference scenarios that have occurred in the laboratory.

1.23 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 or there is any possibility of broken glass in a cut, you will be escorted to 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 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.

1.24 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 & un-plugged 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 lab; a fire extinguisher is located at the west end of the 3 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.

1.25 Tentative Course Schedule

There are no groups [A & B]. ALL students are expected to attend lab every day that is listed as Synchronous (i.e. in-person meeting). The tentative schedule is shown on the following pages. Be very mindful that there are limited to no make-up opportunities; do not be absent for an in-person lab unless there is an emergency or valid medical reason. Lab Coordinator has a right to ask for proof of the absence reason.



Note *Labs 1 – 9 are IN-PERSON. There are no online substitutes for lab work!*

MONDAY	TUESDAY	WEDNESDAY	THURSDAY
Jan 16th MLK JR Day (No Class)	17th Intro / Syllabus / Safety Glassware Review	18th Intro / Syllabus / Safety Glassware Review	19th Intro / Syllabus / Safety Glassware Review
23rd Intro / Syllabus / Safety Glassware Review / Lab 1: Paper Chromatography	24th Lab 1: Paper Chromatography	25th Lab 1: Paper Chromatography	26th Lab 1: Paper Chromatography
30th Lab 2: Melting Point of Fatty Acids	31st Lab 2: Melting Point of Fatty Acids	Feb 1st Lab 2: Melting Point of Fatty Acids	2nd Lab 2: Melting Point of Fatty Acids
6th Lab 3: Solubility of a Potassium Salt	7th Lab 3: Solubility of a Potassium Salt	8th Lab 3: Solubility of a Potassium Salt	9th Lab 3: Solubility of a Potassium Salt
13th Lab Make Up Day/Peer Review – paper chromatography report	14th Lab Make Up Day/Peer Review – paper chromatography report	15th Lab Make Up Day/Peer Review – paper chromatography report	16th Lab Make Up Day/Peer Review – paper chromatography report
20th Lab 4: Sherlock Holmes	21st Lab 4: Sherlock Holmes	22nd Lab 4: Sherlock Holmes	23rd Lab 4: Sherlock Holmes
27th Lab 5: Iodine Kinetics	28th Lab 5: Iodine Kinetics	Mar 1st Lab 5: Iodine Kinetics	2nd Lab 5: Iodine Kinetics
6th Spring Break (No Class)	7th Spring Break (No Class)	8th Spring Break (No Class)	9th Spring Break (No Class)
13th Lab 6: Crystal Violet Kinetics	14th Lab 6: Crystal Violet Kinetics	15th Lab 6: Crystal Violet Kinetics	16th Lab 6: Crystal Violet Kinetics
20th Lab 7: Bromothymol Blue (HBB) Chem Eq	21st Lab 7: Bromothymol Blue (HBB) Chem Eq	22nd Lab 7: Bromothymol Blue (HBB) Chem Eq	23rd Lab 7: Bromothymol Blue (HBB) Chem Eq
27th Lab 8: pKa and MM Nicotinic Acid	28th Lab 8: pKa and MM Nicotinic Acid	29th Lab 8: pKa and MM Nicotinic Acid	30th Lab 8: pKa and MM Nicotinic Acid
Apr 3rd No lab today, but your other classes meet!	4th No lab today, but your other classes meet!	5th No lab today, but your other classes meet!	6th Easter Break (No Class)

MONDAY	TUESDAY	WEDNESDAY	THURSDAY
10th Easter Break (No Class)	11th Lab 9: Amino Acid Titration	12th Lab 9: Amino Acid Titration	13th Lab 9: Amino Acid Titration
17th Lab 9: Amino Acid Titration	18th Check out / Lab Make Up Day	19th Check out / Lab Make Up Day	20th Check out / Lab Make Up Day
24th Check out / Lab Make Up Day	25th No lab today, but your other classes meet!	26th No lab today, but your other classes meet!	27th No lab today, but your other classes meet!



Note *Changes to this syllabus may be made when deemed appropriate.*

1.25.1 Weekly Tentative Chem 112 Order of Lab Experiments and Course Work

1.25.1.1 Week of 1/17–1/19

- Before coming to the lab:
 1. Read the syllabus PDF in Sakai (Syllabus)
 2. Buy required equipment [see required items list in course syllabus]
- Synchronous – In Person:
 1. Syllabus and Course Intro
 2. Safety, Glassware review
 3. Check-in
- Due by Start of Next Class Period:
 1. Read Notebook Requirements (Resources) and watch Lab Notebook Requirements video in Sakai (Panopto)
 2. Watch lecture on Paper Chromatography in Sakai (Panopto)
 3. Read PDF lab manual for Paper Chromatography experiment (Resources)
 4. Write Date, Title, Intro, Purpose, Safety in lab notebook, will be checked at start of class.

1.25.1.2 Week of 1/23–1/26

- Synchronous – In Person:
 1. Complete Lab #1 – Paper Chromatography of Artificial Dyes.
 2. There will be a typed formal lab report written for this experiment. Get a head start!
- Due by Start of Next Class Period:
 1. Complete the Thin Layer Chromatography Labster in Sakai (Labster Sims)
 2. Submit Lab #1 notebook pages to Sakai (Assignments)
 3. Watch lecture on Lab #2 Melting Point of Fatty Acids in Sakai (Panopto)
 4. Read PDF lab manual for Melting Point of Fatty Acids experiment (Resources)
 5. Write Date, Title, Intro, Purpose, Safety in lab notebook, will be checked at start of class.
 6. Complete the Matter & Phase Change Labster in Sakai (Labster Sims)
 7. Get a head start on the typed formal lab report on lab #1. Watch the lecture on formal lab reports in Sakai (Panopto) and read over PDF materials about lab reports (Formal Lab Reports).

1.25.1.3 Week of 1/30–2/2

- Synchronous – In Person:
 1. Complete Lab #2 – Melting Point of Fatty Acids, collect classroom data.
- Due by Start of Next Class Period:
 1. Submit Lab #2 notebook pages to Sakai (Assignments)
 2. Take quiz #1 on Lab 1 Paper Chromatography in Sakai (Tests and Quizzes)
 3. Watch video (Panopto) and read handout on Sci-Finder Scholar (Assignments) for researching science articles. Complete Sci-Finder Scholar assignment and submit work to Sakai (Assignments)
 4. Watch lecture on Lab #3 Solubility of a Salt in Sakai (Panopto)
 5. Read PDF lab manual for Solubility of a Salt experiment (Resources)
 6. Write Date, Title, Intro, Purpose, Safety in lab notebook, will be checked at start of class.

1.25.1.4 Week of 2/6–2/9

- Synchronous – In Person:
 1. Complete Lab #3 – Solubility of a Salt, collect classroom data.
- Due by Start of Next Class Period:
 1. Submit Lab #3 notebook pages to Sakai (Assignments)
 2. Take quiz #2 on Lab 2 Melting Point of Fatty Acids in Sakai (Tests and Quizzes)
 3. Watch lecture on Lab #4 Sherlock Holmes in Sakai (Panopto)
 4. Read PDF lab manual for Sherlock Holmes experiment (Resources)
 5. Write Date, Title, Intro, Purpose, Safety in lab notebook, will be checked at start of class.
 6. Submit the first draft of formal lab report for Lab #1 Paper Chromatography to Sakai (Assignments)

1.25.1.5 Week of 2/13–2/16

- Lab Make Up Day - Absent students MUST attend to make up lab(s)
- Watch the video on Peer Review Process in Sakai (Panopto) and also read over the Peer Review handout in Sakai (Resources)
- Complete Peer Reviews assigned to you – paper chromatography report in Sakai (Assignments) by the start of next lab period!

1.25.1.6 Week of 2/20–2/23

- Synchronous – In Person:
 1. Complete Lab #4 – Deductive Chemical Reasoning Sherlock Holmes.
- Due by Start of Next Class Period:
 1. Submit Lab #4 notebook pages to Sakai (Assignments)
 2. Take quiz #3 on Lab 3 Solubility in Sakai (Tests and Quizzes)
 3. Watch lecture on Lab #5 Iodine Kinetics in Sakai (Panopto)
 4. Read PDF lab manual for Iodine Kinetics experiment (Resources)
 5. Write Date, Title, Intro, Purpose, Safety in lab notebook, will be checked at start of class.
 6. Complete the Reaction Kinetics Labster in Sakai (Labster Sims)
 7. Read over peer reviews and make revisions to draft of paper chromatography formal report. Turn in FINAL draft of typed formal lab report to Sakai (Assignments)

1.25.1.7 Week of 2/27–3/2

- Synchronous – In Person:
 1. Complete Lab #5 – Iodine Kinetics, collect classroom data.
- Due by Start of Next Class Period (after spring break):
 1. Submit Lab #5 notebook pages to Sakai (Assignments)
 2. Take quiz #4 on Lab 4 Sherlock Holmes in Sakai (Tests and Quizzes)
 3. Watch lecture on Lab #6 Crystal Violet Kinetics in Sakai (Panopto)
 4. Read PDF lab manual for Crystal Violet Kinetics experiments (Resources)
 5. Write Date, Title, Intro, Purpose, Safety in lab notebook, will be checked at start of class.

1.25.1.8 Week of 3/13–3/16

- Synchronous – In Person:
 1. Complete Lab #6 - Crystal Violet Kinetics, collect classroom data.
- Due by Start of Next Class Period:
 1. Submit Lab #6 notebook pages to Sakai (Assignments)
 2. Watch lecture on Lab #7 HBB Equilibrium Constant in Sakai (Panopto)
 3. Read PDF lab manual for HBB Equilibrium Constant experiments (Resources)
 4. Write Date, Title, Intro, Purpose, Safety in lab notebook, will be checked at start of class.
 5. Complete the Chemical Equilibrium Labster in Sakai (Labster Sims)

1.25.1.9 Week of 3/20–3/23

- Synchronous – In Person:
 1. Complete Lab #7 HBB Equilibrium Constant, collect classroom data.
- Due by Start of Next Class Period:
 1. Submit Lab #7 notebook pages to Sakai (Assignments)
 2. Take quiz #5 on Labs 5 and 6 Kinetics in Sakai (Tests and Quizzes)
 3. Watch lecture on Lab #8 pKa and Molar Mass of Nicotinic Acid in Sakai (Panopto)
 4. Read PDF lab manual for pKa and Molar Mass of Nicotinic Acid Titration experiment (Resources)
 5. Write Date, Title, Intro, Purpose, Safety in lab notebook, will be checked at start of class.
 6. Complete the typed formal lab report #2, on Lab #6 Crystal Violet Kinetics. Turn in the FINAL DRAFT of the formal lab report to Sakai (Assignments). There is no peer review for this one!

1.25.1.10 Week of 3/27–3/30

- Synchronous – In Person:
 1. Complete Lab #8 pKa and Molar Mass of Nicotinic Acid Titration, collect classroom data.
- Due by Start of Next Class Period:
 1. Submit Lab #8 notebook pages to Sakai (Assignments)
 2. Take quiz #6 on Lab 7 HBB Equilibrium Constant in Sakai (Tests and Quizzes)
 3. Watch lecture on Lab #9 Amino Acid Titration in Sakai (Panopto)
 4. Read PDF lab manual for Amino Acid Titration experiment (Resources)
 5. Write Date, Title, Intro, Purpose, Safety in lab notebook, will be checked at start of class.
 6. Complete the Acids and Bases Labster in Sakai (Labster Sims)
 7. Complete the Advanced Acids and Bases Labster in Sakai (Labster Sims)

1.25.1.11 Week of 4/3–4/10

EASTER BREAK WEEK (Your other classes meet on Monday, Tuesday, Wednesday 4/3-4/5; however NO CLASSES meet on Thursday 4/6, Friday 4/7, or Monday 4/10 due to the Easter Break and Holiday. Classes resume on Tuesday 4/11.

Be mindful to keep up with the course work! There are only a couple weeks left of the semester.

1.25.1.12 Week of 4/11–4/17

- Synchronous – In Person:
 1. Complete Lab #9 Amino Acid Titration, collect classroom data.
- Due by Start of Next Class Period:
 1. Submit Lab #9 notebook pages to Sakai (Assignments)
 2. Take quiz #7 on Lab 8 and 9 Acid Titration Content in Sakai (Tests and Quizzes)
 3. Check over gradebook of ALL items graded up to this point in Sakai (Gradebook)
 4. If you were absent for any of the lab experiments, next week is the very LAST CHANCE to make up a lab experiment.

1.25.1.13 Week of 4/18–4/24

- Synchronous – In Person:
 1. Checkout of lab equipment drawer.
 2. Address any last minute grade questions in person with the lab coordinator.
 3. Notes and Information on Undergraduate Research, optional to stay for this.
 4. MAKE UP DAY for absent students.
- Due by Next Class Period (there is no next class period):
 1. N/A if you have completed all the labs and turned in all items, you have finished the course!
 2. ABSENT students, you must complete any missed lab experiment. Notebook pages are due to Sakai the same day the lab is made up. If there is a quiz related to the missed lab, it is due to Sakai the same day the lab is made up. Same goes if a formal lab report is related to a missed lab, it is due the same day the makeup lab is completed.