LOYOLA UNIVERSITY CHICAGO

Chemistry 272, Analytical Chemistry Laboratory & Lab Discussion Spring 2024 Syllabus

Chem 272-001, 272-003, 272-005 Lab (4hrs/week) And Chem 272-002, 272-004, 272-006 Lab Discussion (50min/week)

January 16th – April 26th, 2024

Prerequisite: CHEM 180, CHEM 181, & MATH 131 (or MATH 161)

Lab & Lab Discussion Location: Flanner Hall 313**

**In-person attendance is mandatory for every person. No online lab supplement work given to absent students. This is not an online course. No modifications to the course will be made. If there is graded work during a lab discussion, an absent student earns a 0 with no opportunity to make up lab discussion points.

Laboratory Coordinator: Dr. Katrina Binaku
Office Hours* simultaneously in person & ZOOM: Mondays 1:20-2:00pm, Tuesdays & Wednesdays 10:30-11am, or by a scheduled appointment*. *If you can't make office hours, email to schedule another time to meet.
Office: Flanner Hall 304 | **Email:** kbinaku@luc.edu | **Phone:** (773) 508-8715

Teaching Assistant (TA): For lab only, not lab discussion. See Syllabus tab in Sakai for TA info & office hours.

Course Meeting Times: Students are only allowed to attend the lab course section they are enrolled in according to LOCUS. No exceptions to that University rule. Lab discussion is tied to a specific lab section for a reason. This course has in-person lab experiments that students should expect will take the entire 4-hour lab period. There is a weekly 50-minute lab discussion that students must attend, as information presented in lab discussion is not presented elsewhere. Miss discussion? You are out of luck. There is also homework, asynchronous (online, out of lab recorded lectures, independent videos and other) activities. It is the student's responsibility to pay attention to all course information, including the course schedule for laboratory sessions and lab discussions at the end of this syllabus. As a student enrolled in the course, you agree to abide by the syllabus and complete all course aspects including rules, requirements, labs/experiments/activities, lab report, assignments, homework, quizzes, or other and abiding by due dates, etc. This course requires your full commitment. All times listed are Central Standard Time (CST).

Chem 272-001 Tuesdays 11:30am-3:30pm, TA: Shalom Nadoff	272-002 Discussion: Tuesdays 8:30-9:20am
Chem 272-003 Wednesdays 12:35-4:35pm, TA: Richa Khatiwada	272-004 Discussion: Wednesdays 9:20-10:10am
Chem 272-005 Thursdays 2:00-6:00pm, TA: Richa Khatiwada	272-006 Discussion: Thursdays 1:00-1:50pm

Academic Calendar: Students are responsible for knowing the course schedule and official **University Academic Calendar** and important dates in the calendar.

Health, Safety, and Well-Being On Campus: Adhere to all guidelines posted on Loyola Webpages

Welcome to Chem 272. I look forward to having you in the course and am excited for this semester! Check Loyola email & log-in to Sakai often. **Read the entire syllabus to understand the course, expectations, and commitment for success.** Please contact me [Dr. Binaku] if you have any questions. No question is too small.

Course Description:

This lab course emphasizes application of topics related to quantitative chemistry lab techniques. This is an independent and contained course, meaning any chemical concept theory will be covered in the required Panopto videos. Topics covered in the laboratory may also be seen in Chem 260 and Chem 280 lectures. The lab course reminds students of laboratory and chemical safety, introduces students to classical and modern methods of chemical analysis wet chemical laboratory techniques, demonstrates use of Excel for basic statistics and experimental data analysis, and exposes students to real-world standards of laboratory work. Topics covered will include Microsoft Excel, basic statistics and data analysis, titration, reaction kinetics, pH, buffers, equilibrium, pH titration curves and derivative graphs, chromatography such as High-Performance Liquid Chromatography (HPLC) and Ion Chromatography (IC), UV-Vis spectrophotometry, calibration methods external standards, standard addition, and internal standards. Students will also be introduced to quantitative analysis using ATR-FTIR spectroscopy. Chemical knowledge spanning from your first year chemistry lectures and labs will be used; students are expected to remember what they learned in previous courses. This list is not exhaustive but mentions the highlights. To be successful in any course [including this one], an honest effort and time commitment on the students' part is vital. Students must choose to commit to learning course material, adequately manage time, complete course work, and ask for assistance when things are unclear.

Course Goals & Outcomes for Students:

Goals:

1) Demonstrate basic use of Microsoft Excel and capabilities for data organization, graphing, data analysis, and statistics to note the importance of accuracy & precision of laboratory work
2) Acquaint students with common classical and modern techniques in analytical chemistry
3) Expose students to classical conventional data collection and instrumental data similar to what is gathered in both commercial and academic laboratories
4) Convey importance of interpretation and evaluation of experimental results, as well as being able to effectively report experimental results through scientific writing. Also introduce students to the peer review process

Outcomes:

- Apply knowledge of Microsoft Excel capabilities to organize and analyze data through basic statistics; generate experimental graphs that are up to the standard of scientific publications
- Evaluate accuracy, precision, and validity of experimental data through applied techniques learned in MS Excel
- Demonstrate proficiency in the set-up of lab equipment and completion of experiments using classical and modern techniques and understanding how changing instrument conditions affects analyte analysis
- Articulate experimental results in the format of scientific writing through lab reports; assess peer work

Teaching Assistant (TA) Role:

TAs help the Lab Coordinator facilitate learning, deliver course content, and provide help to students. TA monitors the laboratory during in-person labs, ensuring a safe and productive environment. TAs also help students develop critical thinking and problem-solving skills. TA responsibilities also include holding an office hour, grading some coursework, and answering questions via email. Dr. Binaku and TA are in constant communication and "CC" each other on email replies to students. This mitigates a student emailing both Dr. Binaku and TA with the same question; one reply is given and will be the same answer whether from Dr. Binaku or TA. Utilize both Dr. Binaku and TA for assistance but recognize Dr. Binaku has final authority in all matters related to the course.

Email Etiquette:

When sending emails please put Chem 272, section # noted in LOCUS, and TA name [lab only] in the email subject line or there will be a delayed response. Dr. Binaku teaches multiple courses and must know which course a student is in before replying to email. Weekday emails will get a response within a few hours when Dr. B is not teaching. Emails after 7:00 pm may not be replied to until the following morning. Dr. Binaku checks email on weekends; response times are longer [up to 24-hours]. TAs also need to know Chem 272 and section # when you send them emails. TA response time similar to Dr. Binaku but TAs are not expected to check email on weekends. *So only email Dr. Binaku on the weekends please.*

Required Materials:

1. Long-sleeve lab coat [white preferred, but any color is fine]. You must purchase this [LUC Bookstore or Amazon]. A lab coat is always required in the laboratory.
2. Lab goggles. Students should have these from a previous lab course Goggles are always required in lab. Safety glasses are not allowed.
3. Dressing appropriately for laboratory work, use of chemicals and glassware. See Footwear/Clothing section.
4. Composition style notebook (not spiral bound & no tear-out perforations). Line ruled. You must purchase this.
5. Chem 272 Lab Manual. Provided for free as a PDF in Sakai. Lab Coordinator will print 1 copy per student.
6. CamScanner app Android/iPhone or Notes app for iPhone. Free apps that convert phone pictures to a PDF file. It is required that you take pictures of your Composition notebook pages and upload them for grading as a PDF file. You may also use a scanner machine, there are several in the Information Commons.
7. A non-erasable pen. Pencil and white out are not allowed.
8. Scientific calculator. Suggested model: TI30XA SCIENTIF/STAT FRAC. A graphing calculator is not allowed. Cell phones are not calculators and cannot be used for in-lab calculation work.
9. Sakai access (free for LUC students) via the internet to review and complete course content, access resources, review grades, etc. Make sure your internet connection is stable.
10. Desktop or Laptop computer. Microsoft Excel, data analysis, and HPLC Excel sim, Sakai, webpages may not display on tablets nor mobile devices and Sakai does not display well on them. If you do not have a desktop or laptop computer, there are plenty in the Information Commons. Also see extended loan equipment program if applicable. Lab Coordinator is not responsible for coordinating this resource for students nor responsible for loaned device.
11. ZOOM video & web conferencing software (free for LUC students).
12. Panopto (free for LUC students). One format of recorded course content is Panopto videos. You may be prompted to log in with UVID username and password to view the videos. Links to videos will be provided in Sakai and via email when necessary.
13. Microsoft 365 (free for LUC students) to write a formal lab report. Information is supplied on how to download & access Microsoft 365 for free.
14. Periodic table. Here is a cool one provided by the Museum of Science & Industry

Mask Requirement:

Masks are optional. It is a student's choice to wear a mask or not. Just because a student wears a mask, they cannot expect those around them to wear one.

Footwear/Clothing Safety:

Appropriate clothing must be worn that minimizes potential chemical contact with your skin. Closed toe, closed heel shoes that adequately cover the entire foot are required. Sandals, open-toes shoes, perforated shoes, open-backed shoes, slippers, Crocs, boat shoes, flats, Ugg or other branded slippers, and shoes without a back are not acceptable. No skin can be exposed on feet, ankles, or legs. Clothing that covers and protects your body from the waist down (including your ankles) must be worn [long pants or floor length skirt/covering]. Any type of shirt is OK because a long sleeve lab coat covers the arms, torso, shoulders, etc. A lab coat and goggles are required to be always worn, even when cleaning glassware. Lab coat protects arms and torso. Goggles protect eyes. *Lab Coordinator and TA have complete discretion to prohibit a student from completing lab work if the student has clothing/footwear exhibiting a potential safety hazard OR exhibits behavior deemed unsafe to self or students.*

Instructional Format:

- The lab and lab discussion are 100% in person. Lab experiments are completed as an individual. For a few later semester experiments students are split in to Group A and Group B. Both groups are in person and one group of students [Group A] are in person completing one lab experiment and the other group of students [Group B] are in person completing a different experiment. Then the next week, switch experiments. Pedagogically, this enhances the laboratory experience as students will work independently, relying on their own lab skills to collect data and earn grades based on the accuracy of that data. There will be no partner labs as a result. This course

design ensures students learn the skills first-hand in the laboratory and are responsible for their own mastering of the lab techniques, essential for real-world experience. Speaking from experience, when working in industry and in graduate school Dr. Binaku analyzed 100s of samples per week and could only rely on her lab skills. She had no lab mates or research partners. It is very important that students develop their own skills.

- **Attendance in person in the laboratory is mandatory**; same policy for lab discussion. I understand that "life happens" so if you must be absent for lab contact Dr. Binaku right away. There is no guaranteed opportunity to make up lab work due to the nature of the course. It can only be decided on a case-by-case basis and makeup work due to absence is not guaranteed. Due dates for course work are not adjusted for absences. All assigned items have specific due dates. As already mentioned, lab discussion points cannot be made up.
- Other than office hours or a scheduled appointment, the in-person sessions are the only other "real-time" opportunity to ask questions and communicate. Emails work great, but they are not "real-time." There is a delay with an email reply. Keep that in mind.
- The lab practical is the last week of classes. Students will not know what the practical lab experiment is in advance. Students are given a procedure to follow the day of the lab practical. If a student is absent for the lab practical they earn a 0. No exception. There are NO opportunities offered to make up the lab practical.
- Dr. Binaku will ask how things are going over the course of the semester. I care a lot about students, course content, and your progress!
- TA presence should enhance the educational experience in lab. If not the case, talk to Dr. Binaku at any time.

General Policies:

- Course work is graded with an emphasis on correct significant digits, consistent results (do data & observations match conclusions), accuracy of lab results when applicable, correctness of calculations, data analysis, or optimal instrument conditions for analyte applications, appropriate use of Excel functions, and thoroughness in responses. Following directions of reporting calculated answers are considered too.
- The Composition notebook must contain all laboratory experiment information [Student Name, Date, Title of Experiment, Purpose, Safety, Results & Data, and conclusion for an experiment]. Use the notebook as a resource. Feel free to take class notes in it to organize your thoughts too. The Lab Coordinator and TA see the lab notebook pages when uploaded to Sakai as a PDF using CamScanner app, Notes app or scanner machine.
- Aspects of course work must be completed in the avenue/medium that they are provided in and in the time allotted [i.e. be mindful of due dates]. This means that a quiz in Test and Quizzes in Sakai can only be submitted in Sakai Tests & Quizzes or a notebook PDF can only be submitted in Sakai Assignments. Course work items such as homework, quizzes, lab experiment results, lab notebook, activity results, lab report, etc. can never be submitted via email. No exceptions. Submit work in their required, respective medium and on time. This allows Lab Coordinator and TAs to see the submitted work in a central location [Sakai] and grade items quickly.
- Be mindful that everything in the course has a due date. Generally, graded course work cannot be made up if missed. **See late work policy in the Grading section of the syllabus.**
- There is a point value associated with all course work. Students cannot earn points for work not completed. Students are expected to complete all course work; no makeup work is given. Not completing work for 2 or more in-person lab experiments or activities is significant and unacceptable and will result in academic failure.
- Students should not enroll in courses that they cannot fully attend. If you must be absent, contact Dr. Binaku as soon as possible. Students know the schedule all semester long and have 24/7 access to Sakai and materials.
- If a student was previously enrolled in Chem 272 but didn't finish it [dropped/withdraw] or didn't pass, note that any data collected for experiments in a previous Chem 272 course or course assignments are NOT valid in the current semester. Students must complete all experiments & coursework in the current semester course.

Recording Policy and Course Content Policy:

- Panopto is used to record lectures and content information for the course. This content is posted to the Sakai site. If any content is recorded by Lab Coordinator it is done outside of class time and no students are included.
- The use of all video recordings will be in keeping with the University Privacy Statement shown below:

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, 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. Recordings are not shared outside of this course. The above bullet point states when recordings will occur in this course (synchronous sessions). Recordings including student activity that have been initiated by the Lab Coordinator may be retained by the Lab Coordinator only for individual use.

- All activities pertaining to the course should be completed as an INDIVIDUAL. Any collaboration on course material and/or graded materials can constitute cheating. Failure of the course may result if an instance of copying or sharing answers to graded content is discovered by TA or Lab Coordinator.
- **Chegg, Course Hero, Reddit, among other webpages, are monitored by the Lab Coordinator.** If any Chem 272 course content is posted on these sites or other, the Dean and University will be notified. Student(s) involved may fail the content the posted material pertains too and/or fail the course. Posting any course content online to facilitate getting answers is a form of cheating and will not be tolerated. These websites readily give up student information to Universities as evidence of cheating/posting content that does not belong to the student.

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 272 course the student is enrolled in. This office will send you reminders during the open period of feedback until the evaluation has been completed. I do read the Smart Evals and thank you in advance for completing it! The evaluation is completely anonymous. When the results are released after the semester is over, 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.

Blanket Statement About "technical difficulties" with Technology and/or Software:

It is *strongly encouraged* that all required submissions to Sakai as well as typing lab reports, opening course/data/experiment files, be completed on a reliable wired or wireless internet connection. WI-FI is perfectly o.k. if the connection is reliable. The internet user must determine the reliability of their WI-FI. Excuses of "technical difficulties" are not accepted as this syllabus is stating all students should ensure their internet connection is reliable [not prone to outages]. The Lab Coordinator realizes campus is closed and University computer labs may not be accessible. Even so, students should ensure their internet connection is reliable enough to complete an online course without interruption. If an outage arises, the Lab Coordinator does reserve the right to ask for proof. The best advice the Lab Coordinator can give is to NOT complete assignments at the last minute, so to avoid glitches with internet, since every part of the course work needs reliable internet to submit. Lab Coordinator is not responsible for technical difficulties of personal devices [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 devices do not count as reliable internet connection tools [and the Sakai website display on these mobile devices isn't reliable]. This syllabus is stating all students should use a reliable internet to submit work in Sakai, take quizzes, type & submit lab reports, open course/data/ experiment files. Emailing lab reports, notebooks, lab results, or other is not allowed in place of the required means of turning in lab reports or required submission of items in Sakai. This list is not exhaustive and do note that any activities this course may require a computer or internet connection for should be completed using University computers with wired internet connection.

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

Students participating in co-curricular activities must make information concerning time conflicts with University sponsored events available to the Laboratory Coordinator no later than 10 calendar days after the start of the semester. The Laboratory Coordinator reserves the right to contact the Athletics Department confirming time conflicts, absence, 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 generally cannot be made up, but this will be decided case by case when appropriate. Students must still watch Panopto, PowerPoints for content missed, as quizzes or other still required on same schedule as rest of the course. Students must discuss with faculty the potential consequences of missing lab or lab discussion and the ways in which they can be remedied. Students must provide Lab Coordinator with proper documentation describing the reason for and date of the absence. This documentation must be signed by an appropriate Faculty/Staff member in the Athletics Department, 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 under the timeline the Lab Coordinator decides upon.

Loyola University Absence/Accommodations Policy for Religious Reasons:
Students missing an in-person lab experiment due to observing religious holidays must alert the Lab Coordinator no later than 10 calendar days 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. Students must plan ahead for Sakai deadlines; work ahead if a due date is on a religious holiday as students know their religious holidays well in advance. Students must discuss with the Lab Coordinator the consequences of missing lab and the ways [if any] it can be remedied, while also providing the Lab Coordinator with proper documentation describing the reason and date of the absence. It is a student's responsibility to proactively ask what will be missed due to religious holiday absence. It is the responsibility of the student to make up any assignments under the timeline the Lab Coordinator decides upon.

Course Repeat Rule:
Effective with 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: http://www.luc.edu/chemistry/forms/ and obtain a signature from 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.

Previous Course Work Does Not Count When Repeating the Course:
If you were enrolled in a Chem 214 or 272 lab course in a previous semester and are re-taking it for any reason [withdraw, drop, unfavorable grade, etc.], note that any coursework, data, etc. from a previous term does NOT count in the current semester the course is being taken. Students must complete all coursework within the same semester of the enrolled course. Any previous data or coursework taken in prior semesters does not count in the current semester.

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 current semester, students can convert a class to "Pass/No-Pass" or "Audit" through January 29th. Students must submit a request for Pass/No-Pass or Audit to their Academic Advisor.

Accommodations via Student Accessibility Center (SAC) Policy:
If a student has a documented disability and wishes to discuss academic accommodations, discuss with the Lab Coordinator as soon as possible, ideally the first week of the semester. The Coordinator of Student Accessibility Center (SAC) is in the Sullivan Center and must be contacted independently by you, the student. Necessary accommodations are 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 Lab Coordinator receives proper SAC documentation. Furthermore, accommodations are not retro-active and begin only once appropriate SAC documentation is received by the Lab Coordinator in a timely manner. Only those accommodations specifically listed in the formal SAC letter will be provided. If a SAC letter suggests the Testing Center be utilized, it does not apply for this course as there are no written exams. Read up on SAC Policies and Procedures. Please understand that flexible attendance in most cases cannot be honored in this course. It is in-person laboratory and experiments can only be completed in lab time; that includes a lab practical.

Laboratory Procedures:

PowerPoints will serve as the basis for theory, application, instrument information, and instruction for in-person lab experiments as well as homework activities. A lab manual is provided free and contain information about each in-person lab experiments and homework lab activities. Students are expected to read lab procedures *several times* before coming to lab, to comprehend and complete labs safely in the laboratory and watch any provided Panopto video information about the topics. The pre-lab lecture slides are provided in Sakai, for further information and will only include safety and technique information. Other media for the course includes JoVE videos, original experiment videos, virtual simulations, etc. Other handouts will be provided as needed. All course information is posted in Sakai Resources or Experi Lessons.

Lab Experiments/Activities:

All in-person lab experiments and online simulated lab experiments, activities, and/or data analysis are completed *individually* by students, emphasizing development of an individual's skillset. The experiment/activity topics are in the lab schedule at the end of this syllabus. Each laboratory topic is approached uniquely. For some in-person lab experiments, accuracy of lab results are separately graded [i.e., there is a separate grade other than the lab notebook score, related to accuracy and precision of a students' generated lab experiment data. Students must be present in the laboratory to complete the experiments and collect the necessary data to satisfy the purpose of the experiment. Students may have their own "real word" or "unknown" sample and have to process [experiment with] it, collect and analyze data, and report final results. There is no substitute for the in-person lab work. For homework activities there may be required protocol videos to watch. For activities that utilize a virtual simulator of the technique or instrument, students may have to define instrument parameters for the best result of the instrument function, change instrument parameters and discuss the results, to name a few. All of this mimic instrument technique, method development, and/or other key skills needed in the real-world. This combined with the in-person lab skills learned will set students up with a fantastic foundation of laboratory and data analysis skills/knowledge. Each lab experiment/activity is completed in the order shown in the lab schedule. All experiments requires data analysis [calculations, etc.] students report the work as a part of their lab notebook. Experiments with multiple trials of data of each individual determination (trials), mean/average concentration (or percent composition), standard deviation, and parts per thousand (ppt) associated with the overall determination are required to be computed. When there is class data collected, students must discuss it in their lab notebook conclusions in addition to a student's own lab data. *Students are NOT permitted to repeat/redo a lab experiment/activity.* No exceptions.

If the Lab Coordinator finds a calculation error in submitted work, it will be explained to the student AND a 5-point **deduction** is applied to the grade it relates to. If a student finds a mistake in their own work and requests an extra Sakai submission and the additional submission is granted, a 5-point **deduction** is applied to the related grade. Therefore, ask Lab Coordinator and TA questions before submitting work in Sakai. TA and Lab Coordinator offer assistance 5-days a week [and on weekends via email to Dr. Binaku]. All Sakai Assignments submissions have directions for what to do.

Laboratory Notebook:

One physical lab notebook is required. A bound Composition style is needed as pages are bound [can't be torn out]. Complete notebook pages in PEN. Detailed notebook requirements are in a document in Sakai Resources and Panopto video. This course requires electronic submission of notebook pages as a single PDF file for grading purposes. Use CamScanner app [Android and iPhone] or Notes app [iPhone only] or scanner machine to take pictures of notebook pages and combine to a single PDF file for upload to Sakai Assignments for grading. All in-person lab experiments must have a complete notebook entry written in a lab notebook. Therefore, students physically keep their notebooks 24/7.

If the lab has Excel components you do NOT have to put Excel work in lab notebook, but you must sketch graphs and show example calculations written in the lab notebook [even if the calculation work was done via Excel] if applicable.

Laboratory Report:

Lab reports must be 100% computer generated [typed] and follow the format defined the documents in Sakai Resources. Formal lab reports must be completed individually. Generative AI cannot be used for formal lab reports. Plagiarizing other students' reports (current or former), lab manual, book or internet sources, will not be tolerated. You CANNOT copy course resources word for word; that is plagiarism. Cite course resources and outside sources when applicable in a Reference section in the report. Reports will be checked for plagiarism via Turn It In software.

Lab report due dates are in the laboratory schedule. Lab reports **are not** accepted via email. Reports must be submitted to the appropriate Sakai Assignment **as a Word Doc or PDF file** by official lab start time on the date the report is due. One cannot show TA or Lab Coordinator a lab report on a laptop or other device; that does NOT count as turning in a lab report on time. If a student is absent on the day a lab report is due, the report must still be turned in. If a student turns in the incorrect lab report i.e. a lab report that is not the required report(s) listed no credit is given so a zero (0) is recorded and the student is offered an opportunity to turn in the correct report, but it is considered late based on the late lab report policy. **Late lab reports will receive a 4pt penalty deduction each day the report is late and result in a grade of zero (0) if not received within one week of the due date.** "Day" is defined as the 7 days of the week Monday to Sunday. Late penalty applies to all students, including absent students. This means the weekend days count as late days i.e., if a student has an item due Friday but doesn't turn it in until Monday that is technically 3 days late. If a student has an item due Wednesday but doesn't turn it in until Monday that is 5 days late.

Writing skills are important to explain results and other important information in the "real world," but the Lab Coordinator realizes completing lab reports is labor intensive. **Students will only write two formal lab reports in this course, for these experiments:**

1) EDTA Titration and Ion Chromatography Analysis of a Water Sample
2) Determining the Experimental pK_a and Molar Mass of Nicotinic (NIC) Acid

To assist students in improving writing skills, students complete peer reviews for both typed lab reports. There is a Panopto to explain the concept. Anonymous peer review is completed on rough drafts of formal lab reports. Then a student sees the reviews of their own report, revises it, and submits a 'final' draft which TA or Lab Coordinator grades. The peer review experience is on par with the process scientists go through publish research.

Laboratory Quizzes (Tests & Quizzes):

There will be a short quiz on the content for some lab experiments. *A quiz can only be taken once.* Quizzes are open for on specific days/times (see lab schedule), then close and cannot be re-opened. **Take as an individual (no help from others; that is cheating). You ARE allowed to use any resources you want.** Quizzes may have questions on lab experiment/activity background information, calculations, error analysis, theory, etc. **Grades for each quiz are released after all sections of Chem 272 take the quiz and it closes.** If a quiz is completed early, you won't see grade/feedback until all classmates complete it. Absent/ill students do not get extensions on quiz deadlines. A quiz opens at the LOCUS end time of class and is open all week and until the next start LOCUS time for class. **See late policies.** Due dates are posted in Sakai and the lab schedule at the end of this syllabus.

Laboratory Safety Points:
Unsafe actions in the lab are NOT tolerated. Safety points are a weekly earned part of the course grade. Deductions are taken for being late and for any type of unsafe action in the lab. A student is told when a safety infraction is witnessed. TA & Lab Coordinator decide when an action is unsafe and that safety points were deducted. *They have final say on point deductions; students cannot negotiate safety points.* Deductions are documented on the sign-in sheet. **Potential safety point deductions:*** Coming late to lab, not signing the sign-in sheet when present, not having name, date, title of experiment, purpose, & safety sections written in lab notebook before entering lab for the day, not wearing and/or needing to borrow lab goggles or lab coat, eating/drinking in lab, chewing gum, taking goggles off in FH-313 when chemicals/glassware are still on any of the 3 lab benches (even if not your chemicals), not wearing goggles during cleaning or lab clean up, touching face/cell phone/personal belongings with gloves on, leaving lab with gloves on, not cleaning up chemical spills in laboratory, standing/kneeling on chairs, improper chemical disposal, not starting clean-up on time, etc. *The list is not exhaustive; if an [unlisted] action is unsafe, a student will lose safety points.

Lab Clean-up:
Students are REQUIRED to begin cleaning 10 minutes before the official end time of class listed in LOCUS. Students are not allowed to stay past lab time to do wet chemistry under any circumstances NOR can a student gain access to the laboratory room, FH-313, outside of their LOCUS scheduled class day & time.

Academic Integrity:
All students in this course are expected to read and abide by the standard of academic integrity and personal honesty in the College of Arts & Sciences Statement on Academic Integrity. Integrity is expected. Cheating can take many forms in a lab course, but the most common forms are copying another student's work [past or present], sharing files, plagiarism of information, submitting false documents, deliberately disrupting performance of classmates, completing Sakai or other electronic content with another person. The data and analysis, homework, quiz answers, etc. submitted for grading must be your own. If it is not, no credit will be awarded, and no make-up work for those points will be granted. Findings of dishonest academic behavior are reported to the Chair of the Chemistry Department and to the Dean's Office; it is also entered into an individual's record. Copied answers to course work or copied formal lab reports will result in penalty [score of 0] for all students involved. Turn It In is utilized for formal lab reports to identify plagiarism and other. AI detection software is also used. Students can converse, brainstorm, and work through strategies together but copying other students' (current or previously in Chem 214 or Chem 272) work and presenting it as one's own is unacceptable. There is a difference between sharing knowledge and cheating. If lab reports, data analysis, quizzes, or other materials in this course are plagiarized or have been shared between students (current or past), no credit will be given for the work in question. Cases of suspect academic dishonesty will be handled according to university guidelines.

Regarding the use of Artificial Intelligence (AI): Provost has expressed to "Let us all make sure we are learning and sharing best practices and not allowing AI to do the learning for us." In this course, any work submitted for credit must represent own's own ideas and understanding of the material. If uncertainty arises about any case where AI may conflict with university or course standards, please see Lab Coordinator to discuss. AI cannot be used for formal lab reports. Why? Lab Coordinator has seen AI produce false scientific information, plagiarized info, and given fake references].

Grading Policy:
The University uses the +/- grading scale system and it is implemented in this course. Grades are weighted. Grade rounding only applies to the final course grade percentage. Sakai reports course grades to TWO digits past the decimal (XX.XX%); this 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+), as it is the closest integer. There are no extra credit assignments because, frankly, there is nothing of the sort in the "real world." If you do not turn in work for 2 or more lab experiments, you cannot pass the course [I must report a student to the Dean's Office, Wellness Center, and their academic advisor about the lack of coursework completion]. There is a lab practical at the end of the course and it can only be taken in the last week of class. There is no final exam in the course [no lab period during finals week].

Grading Scale* (%): *subject to change at Lab Coordinator discretion.

Course Grade %	Letter Grade
94 – 100	A
90 – 93	A-
87 – 89	B+
83 – 86	B
80 – 82	B-
77 – 79	C+
73 – 76	C
70 – 72	C-
60 – 69	D
0 – 59	F

Late Work Policies:

QUIZZES: If not completed on time, a 24-hour grace period is allotted to take the quiz past its due date [1pt penalty applied to late quiz submission]. After the 24-hour grace period, if a quiz is not taken a 0 is the final grade. Quizzes cannot be accessed after the late 24-hour grace period as answers are automatically programmed to be released then.

LAB 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.

EXCEL WORK: If not completed on time, a 1-week grace period is allotted to turn the work in late [5pt penalty for lateness applied to grade]. After 1-week, if not turned in a 0 is the final grade.

HOMEWORK LAB ACTIVITY RESULTS (EXCAL STATS LAB, HPLC SIM LAB): If not completed on time, a 1-week grace period is allotted to turn the work in late [5pt penalty for lateness applied to grade]. After 1-week, if not turned in a 0 is the final grade.

FORMAL LAB REPORTS, first draft (for peer review): If not completed on time, a 24-hour grace period is allotted to turn the work in late. After 24-hours, if the lab report draft is not turned in a 0 is the final grade for the peer review portion of the report grade as a student cannot participate in peer review if they do not turn in their own formal lab report draft.

FORMAL LAB REPORTS, final draft (post-peer review): If not completed on time, a 1-week grace period is allotted to turn the work in late [4pts penalty deducted as soon as due date/time pass and report is not turned in. Then 4pts deducted for every 24hrs past that due date/time]. After a full week past the due date/time, if the lab report draft is not turned in a 0 is the final grade for the final draft of the formal lab report grade.

SOCIAL JUSTICE FORUM/DISCUSSION POSTS: Late posting not possible. The forum is open all semester long. Once the forum/discussion closes it cannot be accessed.

Any course work forgotten in this list will have the standard 1-week late grace period.

See next few pages for itemized list of graded course work items.

Course Work Point Breakdown:

Activity	Origin	Points	% Final Grade
In Person Lab Experiments, PDF Notebook Pages			
Lab 1 – EDTA and Ion Chromatography Analysis of Water: Total Hardness	In Lab/Sakai (Assignments)	25	**20%**
Lab 2 – Iodination of Acetone Kinetics	In Lab/Sakai (Assignments)	25	
Lab 3 – Crystal Violet Kinetics	In Lab/Sakai (Assignments)	25	
Lab 4 – HBB Equilibrium	In Lab/Sakai (Assignments)	25	
Lab 5 – pH and Buffers	In Lab/Sakai (Assignments)	25	
Lab – 6 Determination of pKa and Molar Mass of Nicotinic (NIC) Acid	In Lab/Sakai (Assignments)	25	
Lab – 7 Diprotic Acid Titration: Determine ID and Molarity of an Acid	In Lab/Sakai (Assignments)	25	
Lab 8 – Solubility of a Salt	In Lab/Sakai (Assignments)	25	
Lab 9 –Specific Heat of Metals	In Lab/Sakai (Assignments)	25	
Lab 10 – UV-Vis Tartrazine Analysis in Food Products using External Standard and Standard Addition	In Lab/Sakai (Assignments)	25	
Lab 11 – Quantification of Eugenol Using ATR-FTIR and Internal Standard Method	In Lab/Sakai (Assignments)	25	
Total In-Person Experiment Notebook Points		**275**	
Accuracy of Data Collected/Results of Lab Experiments			
EDTA and Ion Chromatography Analysis of Water: Total Hardness	Lab Results	10	**22%**
Iodination of Acetone Kinetics	Lab Results	10	
Crystal Violet Kinetics	Lab Results	10	
Determination of pKa and Molar Mass of NIC	Lab Results	10	
Diprotic Acid Titration: ID and Molarity of Acid	Lab Results	10	
Specific Heat of Metals	Lab Results	10	
UV-Vis Tartrazine Analysis in Food Products	Lab Results	10	
Quantification of Eugenol Using ATR-FTIR	Lab Results	10	
Total Accuracy Points (based on student's lab data/results and its correctness, accuracy, and precision), different than notebook points	**All or nothing, earned or not based on actual lab data**	**80**	
Quizzes in Sakai			
Quiz 1 – Syllabus, Course Req., Safety	Sakai (Tests & Quizzes)	20	**10%**
Quiz 2 – Microsoft Excel	Sakai (Tests & Quizzes)	20	
Quiz 3 – HPLC and IC Chromatography	Sakai (Tests & Quizzes)	20	

Quiz 4 – Kinetics (Iodine & Crystal Violet)	Sakai (Tests & Quizzes)	20	
Quiz 5 – Chemical Equilibrium, pH and Buffers	Sakai (Tests & Quizzes)	20	
Quiz 6 – Advanced Acid-Base Titrations	Sakai (Tests & Quizzes)	20	
Quiz 7 – Specific Heat of Metals and Salt Solubility	Sakai (Tests & Quizzes)	20	
Quiz 8 – UV-Vis and Calibration Methods (External Standards and Standard Addition)	Sakai (Tests & Quizzes)	20	
Total Quiz Points	**Lowest (1) Quiz Grade Dropped**	**160**	
Excel, HPLC, Graphing Work, Social Justice			
Excel Statistics Homework Lab	Excel/Sakai (Assignments)	100	
Excel HPLC Instrument Sim Homework Results, type results in a Word Document	Excel/Sakai (Assignments)	100	
Crystal Violet Data Graphs Homework, 3 graphs	Excel/Sakai (Assignments)	20	
Social Justice in STEM (2) Postings	Sakai Discussions	20	
AI in STEM Activity for Lab TBA, Due Date TBA	Sakai Discussions	20	**13%**
Diprotic Acid Titration Curve, 1st Derivative, and 2nd Derivative Graphs	Excel/Sakai (Assignments)	20	
Salt Solubility Graph Homework, 1 graph	Excel/Sakai (Assignments)	20	
UV-Vis Tartrazine External Standard Curve and Standard Additions Curve, 2 graphs	Excel/Sakai (Assignments)	20	
ATR-FTIR Internal Standard Curve, 1 graph	Excel/Sakai (Assignments)	20	
Total Excel, HPLC, Graphing Points		**340**	
Typed Formal Lab Reports			
Formal Laboratory Report 1 on Lab #1, Peer Review Draft	Sakai (Assignments)	15	
Formal Laboratory Report 1 on Lab #1, Final Draft Submission	Sakai (Assignments)	85	
Formal Laboratory Report 1 on Lab #6, Peer Review Draft	Sakai (Assignments)	15	**10%**
Formal Laboratory Report 1 on Lab #6, Final Draft Submission	Sakai (Assignments)	85	
Total Formal Laboratory Report Points		**200**	
In Person Lab Points			
Clean Up, Safety, Lab Notebook/Lab Prep	In Lab	10/lab	**10%**
Total Clean Up, Safety, Lab Prep	**11 labs in 10 weeks**	**100**	
Lab Practical Experiment			
Lab Practical, Last week of class	In Lab	100	**10%**
Total Practical Points		**100**	

Discussion (only earned if present in Lab Discussion)			
Points Related to Attendance, Discussion Pop Quiz	In Discussion	10/week	5%
Total Discussion Points		**110**	

Grade if Absent in Lab:
A zero (0) is recorded for work not completed, absent or not. The Lab Coordinator also has the right to fail the student if two 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 the 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. Students are responsible for understanding missed material. **Normal deadlines always apply for homework on Sakai. There are limited to no makeup opportunities for missing lab experiments due to absence.**

Grade if Absent in Lab Discussion:
A zero (0) is recorded for discussion points due to absence. No exceptions. The Lab Coordinator will report students to the Dean's Office who skip more than 1 lab discussion. **There is no makeup opportunity for missing lab discussion. Points are only earned in-person and cannot be earned outside of class time.**

Additional Student Resources:
A considerable amount of technology is utilized in this course. Here are links of information guides if students need more structured guidance on using the tools in the course to be successful. A link to the University Help Desk is also provided for technology questions. Students can email the Lab Coordinator and TAs about various University information, but the links below may reveal the answer more quickly when a student reads them on their own. These guides are written by the pros. Use links any time additional University info is needed.

Career Services | Coronavirus Updates from University | First and Second Year Advising

Information Technology Service Desk (ITS Help Desk) | Panopto Information | Resource for Online Learning

SAKAI student guide | Success Coaching | Student Accessibility Center | Tutoring Center

Writing Center | ZOOM Information and Contacting ZOOM Support

DISCLAIMER: Dr. Binaku reserves the right to revise this syllabus to correct any unintentional mistakes found at any point of the semester. Students will be notified if any changes have been made.

COPYRIGHT DISCLAIMER: All portions of the Chem 272 syllabus, course materials in Sakai (PowerPoints, all handouts (Word or PDF), rubrics, directions, lab videos) are NOT allowed for distribution outside of class nor outside of the University. Uploading, posting, copying, or sharing electronic/non-electronic Chem 272 materials outside of class [i.e., share sites] is NOT allowed. If it is discovered a student completes such action, the University will be notified immediately as that is breaking copyright law.

See the remaining pages of the syllabus for the semester lab schedule and lab discussion.

LAB DISCUSSION SCHEDULE AND TOPICS:

*You are only allowed to attend the lab discussion section you are enrolled in in LOCUS. You may not attend another discussion section. If you skip a lab discussion and miss a quiz/points for in person work, you cannot make up the points. No exceptions.

Dates for Lab Discussions (sections 002,004,006)	**Lab Discussion Topic (Flexibility based on pace of concept understanding)**
January 16, 17, 18 First Week	Welcome, Excel, Stats, Graphing Tips
January 23, 24, 25	Standardization, EDTA
January 30, 31, February 1	Chromatography IC & HPLC
February 6, 7, 8	Kinetics/Rate Law
February 13, 14, 15	**UV-Vis, Formal Lab Report**
February 20, 21, 22	Buffers, pH
February 27, 28, 29	Peer Review
March 5, 6, 7 SPRING BREAK	SPRING BREAK, NO DISCUSSION
March 12, 13, 14	Titration Curves, Excel *bring a laptop or tablet if you have one [you can rent laptop from the IC for free]
March 19, 20, 21	Titration Curves Excel and Derivatives; bring your lab data and questions you have
March 26, 27, 28	NO DISCUSSION
April 2, 3, 4	Calibration Method: External Standards
April 9, 10, 11	Calibration Methods: Standard Addition
April 16, 17, 18	Calibration Methods: Internal Standards and ATR-FTIR
April 23, 24, 25 Last Week	Careers in Chem / Wrap Up / Questions about Lab Practical

There are weekly participation points for lab discussion. The only way to earn them is to be present. Points earned range from working on lab data in discussion, taking a short quiz, answering a question during lab discussion, active participation. None of these actions are accomplishable if you are absent for lab discussion. Therefore, 0 for absence.

See next pages for a calendar view of labs and then a WEEKLY view of experiments and homework.

LAB CALENDER SCHEDULE:

The schedule is designed is to MAXIMIZE lab time, minimize instrument wait time, AND develop individual skills.

Month	Monday	Tuesday	Wednesday	Thursday	Friday
January 2024	**15** **MLK JR DAY, NO CLASSES**	**16** Safety/Glassware Review/EDTA Solutions Preparation And Excel Stats Lab	**17** Safety/Glassware Review/EDTA Solutions Preparation And Excel Stats Lab	**18** Safety/Glassware Review/EDTA Solutions Preparation And Excel Stats Lab	**19**
	22	**23** EDTA & IC Analysis of Water: Total Hardness	**24** EDTA & IC Analysis of Water: Total Hardness	**25** EDTA & IC Analysis of Water: Total Hardness	**26**
	29 Last day to withdraw from course without a W	**30** EDTA & IC Analysis of Water: Total Hardness AND HPLC lab sim	**31** EDTA & IC Analysis of Water: Total Hardness AND HPLC lab sim	**1** EDTA & IC Analysis of Water: Total Hardness AND HPLC lab sim	**2**
February 2024	**5**	**6** Iodination of Acetone Kinetics	**7** Iodination of Acetone Kinetics	**8** Iodination of Acetone Kinetics	**9**
	12	**13** Crystal Violet Kinetics	**14** Crystal Violet Kinetics	**15** Crystal Violet Kinetics	**16**
	19	**20** HBB Equilibrium/ Lab Make Up Day	**21** HBB Equilibrium/ Lab Make Up Day	**22** HBB Equilibrium/ Lab Make Up Day	**23**
	26	**27** pH and Buffers	**28** pH and Buffers	**29** pH and Buffers	**1**
March 2024	**4** Spring Break, No Class	**5** Spring Break, No Class	**6** Spring Break, No Class	**7** Spring Break, No Class	**8** Spring Break, No Class
	11	**12** NIC Titration	**13** NIC Titration	**14** NIC Titration	**15**
	18	**19** Diprotic Acid Titration	**20** Diprotic Acid Titration	**21** Diprotic Acid Titration	**22**
	25 Last day to withdraw from a course with a "W"	**26** No Chem 272 lab, your other classes DO meet	**27** No Chem 272 lab, your other classes DO meet	**28 Holy Thursday** Easter Break NO CLASSES	**29 Good Friday** Easter Break NO CLASSES

Month	Monday	Tuesday	Wednesday	Thursday	Friday
April 2024	**1** Easter Break NO CLASSES	**2 Classes Resume** Two experiments in 1 day: Salt Solubility And Specific Heat of Metals	**3** Two experiments in 1 day: Salt Solubility And Specific Heat of Metals	**4** Two experiments in 1 day: Salt Solubility And Specific Heat of Metals	**5**
	8	**9** **Group A:** UV-Vis Tartrazine **Group B:** ATR Eugenol/ Lab Make Up Day	**10** **Group A:** UV-Vis Tartrazine **Group B:** ATR Eugenol/ Lab Make Up Day	**11** **Group A:** UV-Vis Tartrazine **Group B:** ATR Eugenol/ Lab Make Up Day	**12**
	15	**16** **Group B:** UV-Vis Tartrazine **Group A:** ATR Eugenol// Lab Make Up Day	**17** **Group B:** UV-Vis Tartrazine **Group A:** ATR Eugenol// Lab Make Up Day	**18** **Group B:** UV-Vis Tartrazine **Group A:** ATR Eugenol// Lab Make Up Day	**19**
	22	**23** Lab Practical	**24** Lab Practical	**25** Lab Practical	**26** Semester Ends

WEEKLY BREAKDOWN OF LAB CALENDER SCHEDULE:

Weekly schedule is color-coded by assignment type. Paratheses text is where in Sakai work is due or a resource/video is located. For example, Practice submitting notebook pages online, submit review sheet answers as PDF file to Sakai (*Assignments*), means the work must be submitted in Sakai Assignments or Watch the Intro to Lab Notebook (Panopto), which indicates a video is assigned & located in Sakai Panopto. Follow schedule; key to student success in the course.

WEEK And Class Dates	Tuesday (001 lab), Wednesday (003 lab), Thursday (005 lab) Do the work you are supposed to by start of lab time, based on lab section days
WEEK 1 **Tuesday, Wednesday, Thursday** **January 16-18th** See next page for rest of week 1 hwk list	**SYNCHRONOUS – IN PERSON** **Lecture Content in Class:** Welcome, Glassware, Equipment, & Safety Lecture, Calc Review Worksheet **Lab Activity/Experiment in Class:** Equipment check-in, calculation review, Q & A, AND prepare EDTA Solution and $CaCO_3$ Solution **Homework Due By Start of Lab Time Next Lab, WEEK 2:** 1. Read entire syllabus AND explore the features of the Sakai course site. Purchase lab coat, Composition notebook, scientific calculator, pen. 2. Practice submitting work online, submit review sheet answers as PDF file (*Assignments*) 3. Watch Intro to Lab Notebook Lecture (*Panopto*), read related PDFs in Sakai (*Resources*) 4. Watch 4 technical videos: *Lab Techniques, Common Glassware and Uses, Solutions & Conc., and Making Solutions in Lab (Exper. Lessons)* 5. Quiz on Syllabus, Course Req., Safety, Lab Techniques (*Tests & Quizzes*) 6. *Watch* Panopto: EDTA Titration and Ion Chromatography *(Panopto)* 7. Read Lab Manual, Total Hardness: EDTA Titration and IC Analysis of Water Sample

	8. Write Name, Date, Experiment Title, Intro, Purpose, Safety sections in lab notebook, will be checked at start of lab class. 9. Watch Panopto: Excel Modules (Basics, Calcs & Stats, Graphing, Etc.) & Demo *(Panopto)* 10. Read Lab Manual, Penny Statistics. Download Excel file from Sakai *(Exper. Lessons)* 11. Complete the LAB: Penny Statistics in Excel entirely outside of class time; Submit finished lab Excel file AND separate pdf answer sheet from lab manual to Sakai *(Assignments)*
WEEK 2 **Tuesday, Wednesday, Thursday** **January 23-25th**	**SYNCHRONOUS – IN PERSON** **Lab Activity/Experiment in Class:** Complete Lab Experiment EDTA Titration of Water Sample; Ion Chromatography Analysis of Water Sample. Work on calculations in lab. **Homework Due By Start of Lab Time Next Lab, WEEK 3:** 1. Work on calculations and review data. Decide if you need to do additional standardization of EDTA titration trials next week and/or unknown water analysis titration trials. Prepare for ion chromatography (IC) analysis if you didn't complete it this week. 2. *Watch* 5 content related videos on IC posted in Sakai *(Exper. Lessons)* 3. Take the quiz on Microsoft Excel *(Tests and Quizzes)* 4. Getting ahead (optional): there is a typed formal lab report on this experiment, rough draft due in week 5. Review materials in Sakai to get ahead; can write introduction and experimental sections early.
WEEK 3 **Tuesday, Wednesday, Thursday** **January 30,31 & February 1st**	**SYNCHRONOUS – IN PERSON** **Lab Activity/Experiment in Class:** FINISH remaining lab experiment work for Lab Experiment EDTA Titration of Water Sample; Ion Chromatography Analysis of Water Sample. Work on calculations in lab. **Homework Due By Start of Lab Time Next Lab, WEEK 4:** 1. Submit EDTA/IC PDF notebook pages [1 set, not separate entry] to Sakai *(Assignments)* 2. *Watch* Panopto: HPLC Simulation *(Panopto)* 3. *Read* Lab Manual info on High Performance Liquid Chromatograph (HPLC) 4. Download HPLC simulator Excel file in Sakai (Exper. Lessons) 5. Complete HPLC simulator activity. Follow manual directions. *Submit* Word Doc with all HPLC results and answers to questions *(Assignments)* 6. Watch Panopto: Iodination of Acetone Kinetics *(Panopto)* 7. *Watch* 2 content related videos posted in Sakai *(Exper. Lessons)* 8. Read Lab Manual, Kinetics of the Iodination of Acetone 9. Write Name, Date, Experiment Title, Intro, Purpose, Safety sections in lab notebook, will be checked at start of lab class.
WEEK 4 **Tuesday, Wednesday, Thursday** **February 6-8th**	**SYNCHRONOUS – IN PERSON** **Lab Activity/Experiment in Class:** Complete Lab Experiment Kinetics of the Iodination of Acetone **Homework Due By Start of Lab Time Next Lab, WEEK 5:** 1. Submit Iodine Kinetics PDF notebook pages *(Assignments)* 2. Watch Panopto lecture: Formal Lab Reports *(Panopto)*, review PDF handout *(Resources)* 3. Type first draft formal lab report draft on EDTA Titration of Water Sample; Ion Chromatography Analysis of Water Sample. Submit report as Word or PDF *(Assignments)* 4. Watch Panopto: Crystal Violet Kinetics *(Panopto)* 5. Read Lab Manual, Crystal Violet Kinetics 6. Write Name, Date, Experiment Title, Intro, Purpose, Safety sections in lab notebook, will be checked at start of lab class. 7. Take the quiz on HPLC and IC Chromatography *(Tests and Quizzes)*

WEEK And Class Dates	Tuesday (001 lab), Wednesday (003 lab), Thursday (005 lab) Do the work you are supposed to by start of lab time, based on lab section days
WEEK 5 **Tuesday, Wednesday, Thursday** **February 13-15th**	**SYNCHRONOUS – IN PERSON** **Lab Activity/Experiment in Class:** Complete Lab Experiment Crystal Violet Kinetics **Homework Due By Start of Lab Time Next Lab, WEEK 6:** 1. Submit Crystal Violet Kinetics PDF notebook pages *(Assignments)* 2. Re-generate the 3 Crystal Violet data graphs in Excel. Submit finished Excel file to *(Assignments)*, separate from lab notebook submission 3. *Watch* Peer Review *(Panopto)* and read PDF for the Peer Review Process. 4. Compete the peer reviews assigned to you for the formal lab report draft EDTA Titration of Water Sample; Ion Chromatography Analysis of Water Sample (*Assignments*) 5. Make sure to do the peer review work and turn it in on time! No late reviews accepted! 6. Watch Panopto: HBB Chemical Equilibrium, Equilibrium Constant of Bromothymol Blue *(Panopto)* 7. Read Lab Manual, Equilibrium Constant of Bromothymol Blue (HBB) 8. Write Name, Date, Experiment Title, Intro, Purpose, Safety sections in lab notebook, will be checked at start of lab class.
WEEK 6 **Tuesday, Wednesday, Thursday** **February 20-22nd**	**SYNCHRONOUS – IN PERSON** **Lab Activity/Experiment in Class:** Complete Lab Experiment Equilibrium Constant of Bromothymol Blue (HBB) And If applicable Lab Make Up Day **Homework Due By Start of Lab Time Next Lab, WEEK 7:** 1. Submit HBB PDF notebook pages *(Assignments)* 2. Take the quiz on Kinetics (Iodine and CV) in *(Tests and Quizzes)* 3. Watch Panopto: Ph and Buffers *(Panopto)* 4. *Watch* 3 content related videos posted in Sakai *(Exper. Lessons)* 5. Read Lab Manual, pH and Buffers Write Name, Date, Experiment Title, Intro, Purpose, Safety sections in lab notebook, will be checked at start of lab class. 6. Read peer reviews on first draft of formal report. Revise your lab report. Submit FINAL DRAFT of formal lab report as Word or PDF file to Sakai *(Assignments)*
WEEK 7 **Tuesday, Wednesday, Thursday** **February 27-29th**	**SYNCHRONOUS – IN PERSON** **Lab Activity/Experiment in Class:** Complete Lab Experiment pH and Buffers **Homework Due By Start of Lab Time Next Lab, (Two weeks because of Spring Break), WEEK 9:** 1. Submit pH and Buffers PDF notebook pages *(Assignments)* 2. Take the quiz on Equilibrium, pH, Buffers *(Tests and Quizzes)* 3. Watch Panopto: pKa and Molar Mass of Nicotinic Acid *(Panopto)* 4. *Watch* content related videos posted in Sakai *(Exper. Lessons)* 5. Read Lab Manual, pKa and Molar Mass of Nicotinic Acid Write Name, Date, Experiment Title, Intro, Purpose, Safety sections in lab notebook, will be checked at start of lab class.
WEEK 8 **March 5-7th**	**SPRING BREAK March 4-8th – NO CLASSES** **Work listed in WEEK 7 is due after Spring Break**

WEEK And Class Dates	Tuesday (001 lab), Wednesday (003 lab), Thursday (005 lab) Do the work you are supposed to by start of lab time, based on lab section days
WEEK 9 Tuesday, Wednesday, Thursday March 12-14th	**SYNCHRONOUS – IN PERSON** **Lab Activity/Experiment in Class:** Complete Lab Experiment Determine pK_a and Molar Mass of Nicotinic Acid **Homework Due By Start of Lab Time Next Lab, WEEK 10:** 1. Submit Determine pK_a and Molar Mass of Nicotinic Acid PDF notebook pages *(Assignments)* 2. Watch Panopto: Polyprotic [Diprotic] Acid Titration *(Panopto)* 3. Read Lab Manual, Polyprotic [Diprotic Acid] Titration with a pH Meter 4. Write Name, Date, Experiment Title, Intro, Purpose, Safety sections in lab notebook, will be checked at start of lab class.
WEEK 10 Tuesday, Wednesday, Thursday March 19-21st	**SYNCHRONOUS – IN PERSON** **Lab Activity/Experiment in Class:** Complete Lab Experiment Polyprotic [Diprotic Acid] Titration with a pH Meter **Homework Due Next Week, WEEK 11 WEDNESDAY MARCH 27 BY 11:55PM FOR ALL 3 LAB SECTIONS:** 1. Submit Polyprotic [Diprotic Acid] Titration with a pH Meter PDF notebook pages *(Assignments)* 2. Submit Excel file containing Titration Curve, 1st Derivative, and 2nd Derivative graphs of polyprotic acid (*Assignments)*, different submission as notebook pages 3. Watch Panopto lecture: Formal Lab Reports *(Panopto)*, review PDF handout *(Resources)* 4. Type first draft formal lab report draft on Determine pK_a and Molar Mass of Nicotinic Acid Submit report as Word or PDF *(Assignments)*
WEEK 11 Tuesday, Wednesday, Thursday March 26-28th	**NO LAB ON TUESDAY, WEDNESDAY, THURDAY BUT YOU HAVE WORK DUE** WEEK 10 WORK IS DUE FOR ALL 3 SECTIONS THIS WEEK, ON WEDNESDAY MARCH 27TH 11:55PM, BEFORE EASTER BREAK STARTS. **Homework Due by Start of Lab Time Next Lab, WEEK 12:** 1. *Watch* Panopto: Solubility of a Salt *(Panopto)* 2. *Read* in Lab Manual, Solubility of a Salt 3. Write Name, Date, Experiment Title, Intro, Purpose, Safety sections in lab notebook, will be checked at start of lab class. 4. Leave 4 pages blank in lab notebook and do this now: 5. *Watch* Panopto: Specific Heat of Metals *(Panopto)* 6. *Read* in Lab Manual, Specific Heat of Metals 7. Write Name, Date, Experiment Title, Intro, Purpose, Safety sections in lab notebook, will be checked at start of lab class. 8. YES, you all are complete two separate lab experiments during the next lab session.

WEEK And Class Dates	Tuesday (001 lab), Wednesday (003 lab), Thursday (005 lab) Do the work you are supposed to by start of lab time, based on lab section days
WEEK 12 **Tuesday, Wednesday, Thursday** **April 2-4th**	**SYNCHRONOUS – IN PERSON** **Lab Activity/Experiment in Class:** Complete Lab Experiment Solubility of a Salt Complete Lab Experiment Specific Heats of Metals **Homework Due by Start of Lab Time Next Lab, WEEK 13:** 1. Take the quiz on Advanced Titrations (Nicotinic acid lab and Diprotic Acid lab) in *(Tests and Quizzes)* 2. Submit Solubility of a Salt PDF notebook pages *(Assignments)* 3. Submit Excel solubility curve graph *(Assignments)*, separate from lab notebook submission 4. Submit Specific Heat of Metals PDF notebook pages *(Assignments)* 5. Complete the peer reviews assigned to you for the formal lab report draft Determine pK_a and Molar Mass of Nicotinic Acid(*Assignments*) 5. **Make sure to do the peer review work and turn it in on time! No late reviews accepted!** Then: 6. Group A students: *Watch* Panopto: UV-Vis Tartrazine *(Panopto)* 7. **Read Lab Manual, UV-Vis Tartrazine Analysis of Marshmallow or Sports Drink Using External Standards and Standard Addition** 8. **Write Name, Date, Experiment Title, Intro, Purpose, Safety sections in lab notebook, will be checked at start of lab class.** 9. Group B students: *Watch* Panopto: ATR-FTIR Quantitative Analysis of Eugenol *(Panopto)* 10. **Read Lab Manual, Quantification of Eugenol in Unknown Using ATR-FTIR** 11. **Write Name, Date, Experiment Title, Intro, Purpose, Safety sections in lab notebook, will be checked at start of lab class.** EVERYONE IS IN LAB NEXT WEEK, CLASS IS SPLIT IN HALF AND WORKING ON DIFFERENT LABS
WEEK 13 **Tuesday, Wednesday, Thursday** **April 9-11th**	**SYNCHRONOUS – IN PERSON** **Lab Activity/Experiment in Class:** GROUP A: Complete Lab Experiment UV-Vis Tartrazine Analysis Using External Standards & Standard Addition GROUP B: Complete Lab Experiment Quantification of Eugenol in Unknown Using ATR-FTIR AND Lab Make Up Day **Homework Due by Start of Lab Time Next Lab, WEEK 14:** 1. Take quiz on Specific Heat of Metals and Solubility of a Salt experiments *(Tests & Quizzes)* 2. Submit PDF notebook pages for the lab you completed today *(Assignments)* 3. Submit Excel file with graph(s) generated for the lab you completed today *(Assignments)* Then: 4. Group B students: *Watch* Panopto: UV-Vis Tartrazine *(Panopto)* 5. **Read Lab Manual, UV-Vis Tartrazine Analysis of Marshmallow or Sports Drink Using External Standards and Standard Addition** 6. Group A students: *Watch* Panopto: ATR-FTIR Quantitative Analysis of Eugenol *(Panopto)* 7. **Read Lab Manual, Quantification of Eugenol in Unknown Using ATR-FTIR** 8. **BOTH GROUPS: Write Name, Date, Experiment Title, Intro, Purpose, Safety sections in lab notebook, will be checked at start of lab class.** 9. Read peer reviews. Revise your lab report. Submit FINAL DRAFT of formal lab report as Word or PDF file to Sakai *(Assignments)*

WEEK And Class Dates	Tuesday (001 lab), Wednesday (003 lab), Thursday (005 lab) Do the work you are supposed to by start of lab time, based on lab section days
WEEK 14 **Tuesday, Wednesday, Thursday** **April 16-18th**	**SYNCHRONOUS – IN PERSON** **Lab Activity/Experiment in Class:** GROUP B: Complete Lab Experiment UV-Vis Tartrazine Analysis Using External Standards & Standard Addition AND Locker cleanout of solutions and other chemicals GROUP A: Complete Lab Experiment Quantification of Eugenol in Unknown Using ATR-FTIR AND Lab Make Up Day AND Locker cleanout of solutions and other chemicals **Homework Due By Start of Lab Time Next Week, WEEK 15:** 1. Submit PDF notebook pages for the lab you completed today *(Assignments)* 2. Submit Excel file with graph(s) generated for the lab you completed today *(Assignments)* 3. Take the quiz on UV-Vis and Calibration Methods External Standards and Standard Addition *(Tests and Quizzes)* 4. Make 2 discussion posts on STEM Social Injustices *(Discussions)* 5. Check grades in Sakai (Gradebook). Contact Dr. B with any question/issue. 6. Prepare for the lab practical experiment. Review lab techniques, how to use equipment, sig figs, and calculations completed on all labs this term. 7. Bring lab materials as usual. If you are absent next week you forfeit ALL points that the lab practical is worth. THERE IS NO MAKE UP LAB OFFERED FOR THE LAB PRACTICAL, NO EXCEPTIONS.
WEEK 15 **Tuesday, Wednesday, Thursday** **April 23-25th**	**SYNCHRONOUS – IN PERSON** **Lab Activity/Experiment in Class:** Complete the Lab Practical Experiment **Work Due By End of Lab Period, Before you Leave TODAY:** 1. Submit PDF notebook pages containing lab practical work *(Assignments)* 2. Ask any last-minute grading questions before leaving lab YOU HAVE FINISHED THE COURSE! BRAVO! ☺