



## Chemistry 214, Quantitative Analysis Lab Spring 2021 Syllabus

**Chem 214-001 to 214-003, Quantitative Analysis Lab (1 credit hour)**  
**January 19<sup>th</sup> – April 30<sup>th</sup>, 2021**

**Prerequisite:** Chem 106/102 and 112, as well as active attendance or completion of lecture Chem 212.

**Lab Location:** ONLINE; there are no on-campus meetings.

**Laboratory Coordinator:** Dr. Katrina Binaku

**Office Hours in ZOOM:** [Mondays 12-1pm](#), [Thursdays 8:30-9:30am](#), and by a scheduled appointment.

**Email:** [kbinaku@luc.edu](mailto:kbinaku@luc.edu)

**Teaching Assistants and Their Role:** There will be 2 teaching assistants (TA) assigned to the course. Their information is posted in the Sakai Syllabus tab; students will be assigned a specific TA to contact. TAs help the Lab Coordinator facilitate online learning content and also provide help to students. TAs monitor the chat during ZOOM and help answer questions. TAs will not do the course work for you. TA will help students develop critical thinking and problem-solving skills. Students can always email Dr. Binaku; TAs are present to help answer questions too. Dr. Binaku has final authority in all matters relating to the course. Utilize both Dr. Binaku and TAs for assistance. TAs should enhance the educational experience in the course. If this is not the case, talk to Dr. B.

**Course Meeting Times:** This course has both synchronous (real-time, virtual in ZOOM) and asynchronous (pre-recorded lectures, independent videos and/or virtual labs, other activities) components. It is the student's responsibility to pay attention to all information regarding the course, including the course schedule which is at the end of this email. As a student enrolled in the course, you agree to abide by, follow, and complete all course aspects including rules, requirements, virtual labs, lab reports, assignments, homework, quizzes/tests/exams, due dates, etc. This course requires your full commitment. All times listed are Central Standard Time (CST).

**Synchronous sessions in ZOOM:** The ZOOM link for class is accessed from the ZOOM tool in Sakai. You log in to Sakai to join. Make sure your ZOOM name is full First Name and Last Name. Odd usernames will not be allowed into ZOOM to combat any unauthorized access & that will count as an absence. Be mindful of this!

**Asynchronous sessions (not meeting in real-time):** Days listed as this means the class does not meet via ZOOM. Listed lab activities for that week must be completed on one's own time during the week and be mindful of due dates of the items [usually one week].

**Academic Calendar:** It is the student's responsibility to not only know the schedule for this course but also the official [University Academic Calendar](#) and important dates in the calendar.

Welcome to Chem 214. I look forward to having you in the course! Check Loyola email & log-in to Sakai often.

**Read the entire syllabus to understand the course plan, expectations, and commitment needed to succeed.**

**Commit fully, view and complete all required work, adhere to due dates, and know all expectations. We will have a great time learning the principles of Analytical Chemistry together!**

### **Course Description:**

This lab course emphasizes application of topics/theory covered in the lecture course (Chem 212). It reminds students of laboratory and chemical safety, introduces students to classical and modern methods of chemical analysis wet chemical laboratory techniques in an online environment, demonstrates use of Excel for basic statistics and experimental data analysis, and exposes students to real-world experimental data to be prepared for future use of lab techniques and instrumentation. Topics covered will include Microsoft Excel, basic statistics and data analysis, acid-base titration, pH titration curves and corresponding derivative graphs, a module on chromatography focused on High-Performance Liquid Chromatography (HPLC), Ion Chromatography (IC), and Gas Chromatography (GC), and a UV-Vis spectrophotometry module with a focus on external standards use and standard addition use to answer chemical questions about two analytes. Students will also be introduced on how to evaluate an analyte using ATR-IR quantitatively. Chemical knowledge spanning from general chemistry to new topics in Chem 212 lecture is vital. 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. In an online environment, the student must choose to commit to learning course material, adequately manage time, complete all course work, and ask for assistance when things are unclear.

### **Email Etiquette:**

When sending emails please put Chem 214, section # noted in LOCUS, and TA name in the email subject line or there will be a delay in response. Dr. Binaku teaches multiple courses (111, 112, and 214) and must know which course a student is in before replying to email. Weekday emails will get a response within a few hours. Emails after 8:00 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 214 and section # when you send emails. TA responsibilities include but are not limited to holding one weekly office hour, presence in synchronous sessions, grading materials, and answering student questions. Dr. Binaku and TAs 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.

### **Course Goals & Outcomes for Students:**

#### Goals:

- 1) Teach the basics 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

#### 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 sets through application of techniques learned in Microsoft Excel
- Demonstrate proficiency in describing the set-up of experiments using classical and instrument techniques and understanding how changing instrument conditions affects analyte analysis
- Articulate experimental results in the format of scientific writing through lab reports

## **Required Materials:**

1. Desktop or Laptop computer. Instrument simulation webpages may not work on tablets nor mobile devices. Computer must have a microphone and speakers to participate in synchronous sessions and for office hours. If you do not have a desktop or laptop computer, contact the Information Commons [extended loan equipment program](#) within the first week of the semester and arrange this resource. Lab Coordinator is not responsible for coordinating this resource for students nor responsible for the loaned device. Everything in this online course requires a computer for access.
2. High-speed Internet access: Wired (ethernet cable) preferred but WI-FI is ok. Make sure WI-FI connection is reliable. Lab Coordinator is not responsible if internet goes out when you are working on course items. Contact the Information Commons [extended loan equipment program](#) within the first week of the semester and arrange this resource if you do not have internet at home. Lab Coordinator is not responsible for coordinating this resource nor responsible for the loaned device.
3. Scientific OR graphing calculator. Suggested model: CALC TI30XA SCIENTIF/STAT FRAC. A graphing calculator is o.k. too. Cell phones are not calculators; do not use them for calculations.
4. [Sakai access](#) (free for LUC students) via the internet to review and complete course content, access resources, review grades, etc.
5. [ZOOM video & web conferencing software](#) (free for LUC students). UVID username and password may be required to access and download ZOOM, enter synchronous course meetings, office hours, etc. See [ZOOM participation instructions](#) supplied by the University for more info. Links to ZOOM for synchronous sessions and office hours will be provided in Sakai.
6. 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.
7. Microsoft 365 (free for LUC students) to write a formal lab report. Information is supplied on [how to download & access Microsoft 365 for free](#).
8. Composition style notebook (not spiral bound & no tear-out perforations). Line ruled.
9. CamScanner app, for iPhone or Android. This is a free app that will convert a phone picture to a PDF file. It may be necessary to take pictures of your Composition notebook pages and upload them for grading as a PDF file. Genius Scan is another free app.
10. A non-erasable pen. Pencil does not scan well.
11. Periodic table. There is a cool one provided for free by the [Museum of Science & Industry](#).

## **Instructional Format:**

- Attendance in synchronous sessions in ZOOM is required. The lecturing portion of synchronous sessions will be recorded if you do have to miss sessions due to unforeseen circumstances. I understand that “life happens” so if you are absent just make sure to review the recorded session(s). Due dates are not adjusted for absences. Recording each ZOOM lecture means students do not miss out on information [you can review over and over again].
- Other than office hours or a schedule appointment, the synchronous sessions are the only other “real-time” opportunity to ask questions and communicate with us (TAs and Dr. Binaku) in ZOOM. Emails work great, but they are not “real-time.” There is a delay with an email reply. Keep that in mind.
- The asynchronous sessions are designed as time set aside for you to work on assigned items for that day, instead of meeting in ZOOM. Of course, you have access to the week’s content all week; use time wisely to complete the necessary work. All assigned items have specific due dates that will not be adjusted. Do not schedule extra work hours during asynchronous sessions.
- 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!

## General Policies:

- Course work will be graded with an emphasis on correct significant digits, consistent results (do data & observations match conclusions), 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 taken into account too.
- The Composition notebook needs to contain all laboratory experiment information [Date, Title, data/observations/calculations, and conclusion for an experiment]. Use the notebook as a resource. Feel free to take class notes in it to organize your thoughts which is important in an online course. Much of the success in an online course is due to a student being organized. The Lab Coordinator and TAs see the lab notebook pages when uploaded to Sakai as a PDF using the app mentioned.
- 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 or a notebook entry can only be submitted in Assignments. Course work items such as homework, quizzes/tests/exams, lab simulation results, lab report, etc. can never be submitted via email. No exceptions. Submit them in their required, respective medium and do so on time. This allows Lab Coordinator and TAs to organize the items and grade them in a timely fashion.
- Be mindful that everything in the course has a due date. Generally, graded course work cannot be made up if missed. Late work is not accepted other than what is noted below.

**LATE POLICY:** Test & Quizzes cannot be completed/done late. A zero results if any of these are missed.

Notebooks can be submitted up to 1 week late; there is a 4pt penalty to the graded item.

Data analysis work can be submitted up to 1 week late; there is a 3pt penalty PER DAY of lateness.

Formal lab reports can be submitted up to 1 week late; there is a 5pt penalty PER DAY of lateness.

- There is a point value associated with the work, and one 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 of the lab experiments/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, the class is recorded and posted to Panopto. The recording must be reviewed to catch up on content. Absence from synch sessions does not equal due date extensions. Students know the schedule all semester long and have 24/7 access to Sakai and materials.
- Although probably not applicable, since all University activities are suspended: 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. 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 this with the Laboratory Coordinator. No extensions nor modifications will be made; this is an online course and 24/7 access to it means extensions are not granted to anyone on any course work.
- Students missing a lab experiment due to observing religious holidays must alert the Lab Coordinator no later than two weeks after the start of the semester. The Lab Coordinator reserves the right to contact Campus Ministry, which keeps information on a plethora of religions and holidays. Since lab is online and access to course work is twenty-four hours & seven days a week; there should be no conflicts to complete the work on time.
- Students must discuss with faculty the potential consequences of missing online class. Students must provide the Instructor with proper documentation describing date and reason for the absence. The document must be signed by an appropriate Faculty/Staff member, and it must be provided within 10 days after the start of the semester. It is the responsibility of the student to proactively ask about what will be missed during an absence.

### **Recording Policy and Course Content Policy:**

- ZOOM does automatically record attendance and the time spent in the ZOOM synchronous lectures.
- ZOOM and recording software will be used to record live synchronous sessions. Lab Coordinator intends to only record the lecture portion(s), but as a student in this class, it is possible your participation in live class discussions may be recorded and that is an artifact of being in this course. The synchronous recordings will be made available only to students enrolled in the course, via Panopto, to assist those who cannot attend the live session or to serve as a resource for those who would like to review content that was presented. All recordings will become unavailable to students in the class when the Sakai course is unpublished (i.e. shortly after the course ends, per the [Sakai administrative schedule](#)). Students who prefer to participate via audio only will be allowed to disable their video camera so only audio will be captured. Lab Coordinator will announce when recording starts so that students can turn their cameras off. Otherwise, students should have their camera on during the synchronous sessions as it allows for a more interactive experience and a way to get to know your classmates and Lab Coordinator.
- 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 instructor only for individual use.
- ZOOM chats are not private. Be mindful of what you type in the chat box when messaging other students, the TA, and the Lab Coordinator. Breakout rooms are sometimes utilized too & are monitored.
- 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 214 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.

### **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 generally 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.

### **Laboratory Procedures:**

PowerPoints will serve as the basis for theory, application, instrument information, and instruction for lab experiments/activities online. Other media for demonstration and topics includes JoVE videos, original experiment videos, virtual simulations, etc. Other handouts will be provided as needed. All information and resources will be posted in Sakai.

### **Lab Experiments/Activities:**

All simulated lab experiments, activities, and/or data analysis are completed *individually*, emphasizing development of an individual's skills. The experiment/activity topics are located in the lab schedule at the end of this syllabus. Each laboratory topic is approached uniquely. For some lab experiments/activities there will be assigned, required protocol videos to watch and then video of the actual experiment being done. In some lab experiments/activities, the student must record raw data from the video; for other lab experiment activities raw data will be provided after the student watches the procedural video of data collection. Each student will have unique raw data from experiments or instruments and have to process that data and draw conclusions from the final results. In other lab experiment/activities that utilize a virtual simulator of the technique, students may have to develop a protocol, define instrument parameters for the best result, to name a few. All of this mimics what would have happened if we were in a lab on campus; students would each have their own "real-world" or "unknown" sample and have to process [experiment with] it, collect and analyze data, and report final results.

Lab experiments/activities and the resources will be organized by Lessons folders. Each week will have its own folder filled with resources to complete the lab experiment/activity. The actual raw data will likely be emailed to students by Dr. Binaku, as each student will have a unique dataset. Each lab experiment/activity is completed in the order shown in the laboratory schedule. If the lab experiment/activity requires data analysis [calculations, etc.] students report the work VIA Sakai Assignments, their data of each individual determination (trials), mean/average concentration (or percent composition), standard deviation, and parts per thousand (ppt) associated with the overall determination. *Students are NOT permitted to repeat/redo a lab experiment/activity so take care to ask Instructor/TA questions during ZOOM & office hours, etc. to comprehend the tasks at hand. Grades for this work are based on correctness of data processing and interpretation of results.*

If the Instructor finds a calculation error in submitted work, has to ask a student to double check their work due to invalid results, or finds an uploaded results file cannot be opened in the student's Sakai submission a **deduction** is applied to the grade. A student must submit revised work if Instructor finds a mistake/errors in the calculations/results. If a student finds a mistake in their own work and has to request to Instructor that an additional submission be granted, a **deduction** is applied to the accuracy grade. Therefore, try to ask Instructor and TA questions before submitting results in Sakai. We are very helpful, but we must know you need the help in order to assist you. [all Sakai Assignments lab experiment/activity results submissions have directions for exactly what to submit].

### **Laboratory Notebook:**

One notebook is required. A bound Composition style is preferred but spiral notebooks are fine this semester [just make sure you don't lose pages]. Complete notebooks in PEN. Detailed notebook requirements are in a document in Sakai Resources; this process requires electronic submission of notebook pages as a PDF file for grading purposes.

*The following lab experiments/activities require a formal lab notebook entry (this is also noted in the lab schedule):*

Acid-Base Titration

Polyprotic Acid

HPLC part 1 and HPLC part 2 (combined)

UV-Vis: Ext. Std., Iron Analyte

UV-Vis: Ext. Std. & Standard Addition, Artificial Dye

If the lab data has Excel components you do NOT have to put Excel in the physical lab notebook, but you need to show some example calculations written in the lab notebook [even if the calculation work was done via Excel]. Make a note.

### **Laboratory Reports:**

Lab reports must be computer generated [typed] and follow the format defined the documents in Sakai Resources. Formal lab reports are to be completed individually. Plagiarizing other students' reports (current or former), book or internet sources, or lab procedures 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.

Lab report due dates are located 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** within the first 15 minutes of the official lab start time on the date the report is due. Reports will be checked for plagiarism via Turn It In software. One cannot show TA or Instructor 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 [as online courses afford 24/7 access to resources and Sakai]. 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 5pt 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 Instructor realizes completing lab reports is labor intensive. **Students will only write lab reports for two (2) of the lab experiments/activities in this course.**

**The following list includes the lab experiments for which a written lab report is required:**

- 1) Acid-Base Titration
- 2) UV-Vis: External Standards, Iron Analyte

To assist students in improving writing skills and address any deficiencies, the first lab report (only), Acid-Base Titration, may be revised after the first version has been graded to receive at most  $\frac{1}{2}$  the lost points back. Discuss any questions or concerns about graded lab reports and revisions with the Instructor or TA before the lab report revision is due.

### **Laboratory Quizzes (Tests & Quizzes):**

There will be a short quiz on the content for each lab experiment/activity. *Each quiz can only be taken once. No late submissions are allowed* [i.e. if you forget to take a quiz it is a zero (0)]. Quizzes are open for a week, then close and cannot be re-opened. **Take it as an individual (no help from others as 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, to name a few. **Grades for each quiz are released after all three sections [001, 002, and 003] take the quiz and it closes.** If you complete a quiz early, you won't see a grade/feedback until all of your classmates complete it. Absent/ill students do not get extensions on quiz deadlines; one week of time is more than sufficient to complete the quiz. Typically they open at the LOCUS end time of class and are open all week and until the next start LOCUS time for class. Due dates are posted in Sakai and the lab schedule.

### **Accommodations via Student Accessibility Center (SAC) Policy:**

If you have a documented disability and wish to discuss academic accommodations, discuss this with the Lab Coordinator via ZOOM as soon as possible, ideally the first week of the semester. The Coordinator of Student Accessibility Center (SAC), formerly referred to as SSWD, is located in the Sullivan Center and must be contacted independently by you, the student.

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 Lab Coordinator receives proper SAC documentation. Furthermore, accommodations are not retro-active and begin only once appropriate SAC documentation has been received by the Lab Coordinator in a timely manner. Only those accommodations that are 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](#).

### **Academic Integrity:**

The standard of academic integrity and personal honesty delineated in the [College of Arts & Sciences Statement on Academic Integrity](#). Integrity is expected of every student and will be enforced. Cheating can take many forms in a lab course, but the most common forms are copying data/data analysis, answers to analysis questions, sharing files, or completing Sakai work 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 for all students involved. Turn It In is utilized for formal lab reports to identify plagiarism, cheating, and other. Students can converse, brainstorm, and work through strategies together but copying other students' (current or previously in Chem 214) 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.

### **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.



### **Grading Policy:**

The established grading policy is displayed below. The University uses the +/- grading scale system and it is implemented in this course. Grades are weighted; see table below. 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 in Chem 214 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/activities, you cannot pass the course [and I have to report to the Dean's Office, the Wellness Center, and your academic advisor the lack of coursework completion]. That is too much content to miss out on.

Grading Scale\* (%): \*subject to change at Instructor 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

Activity	Origin or Sakai (Location of Submission)	Points	Weighted % of Final Grade
<b>DATA ANALYSIS / PROTOCOLS / INSTRUMENT OPTIMIZATIONS</b>			
Week 2 LAB: Penny Statistics Using Excel (Data Analysis) Notes: student generated results when completing the lab	Excel File submitted to Sakai (Assignments)	100	<b>45%</b>
Week 5 LAB: Polyprotic Acid Titration (Data Analysis) Notes: students get unique raw data via email and have to process it, graph it, interpret it. Submit the final file with all analyses, results.	Excel File submitted to Sakai (Assignments)	100	
Week 6 LAB: Buffers (Protocols) Notes: Students work in simulation to successfully prepare a buffer. Type up detailed protocol.	Word Doc or PDF submitted to Sakai (Assignments)	100	
Week 8 LAB: HPLC part 2 (Simulation, Instrument Optimizing) Notes: Students work in the simulation and try various parameters to optimize separation. Document all parameters tried, find optimal parameter, submit ALL parameters and ID optimized settings.	Excel or Word Doc or PDF submitted to Sakai (Assignments)	100	
Week 9 LAB: IC (Data Analysis) Notes: students get unique raw data via email and have to process it, graph it, interpret it. Submit the final file with all analyses, results.	Excel File submitted to Sakai (Assignments)	100	

Week 10 LAB: Gas Chromatography (Simulation, Instrument Optimizing) Notes: Students work in the simulation and try various parameters to optimize separation. Document all parameters tried, find optimal parameter, submit ALL parameters and ID optimized settings.	Excel or Word Doc or PDF submitted to Sakai (Assignments)	100	
Week 11 LAB: UV-Vis: Ext. Std., Iron Analysis (Data Analysis) Notes: students get unique raw data via email and have to process it, graph it, interpret it. Submit the final file with all analyses, results.	Excel File submitted to Sakai (Assignments)	100	
Week 12 LAB: UV-Vis: Ext. Std & Standard Addition, Artificial Dye (Data Analysis) Notes: students get unique raw data via email and have to process it, graph it, interpret it. Submit the final file with all analyses, results.	Excel File submitted to Sakai (Assignments)	100	
Week 13 LAB: ATR-IR (Data Analysis) Notes: students get unique raw data via email and have to process it, graph it, interpret it. Submit the final file with all analyses, results.	Excel File submitted to Sakai (Assignments)	100	
<b>QUIZZES</b>			
Quiz on Microsoft Excel and Stats	Sakai (Tests & Quizzes)	20	<b>20%</b>
Quiz on Polyprotic Acids	Sakai (Tests & Quizzes)	20	
Quiz on Buffers	Sakai (Tests & Quizzes)	20	
Quiz on Chromatography	Sakai (Tests & Quizzes)	20	
Quiz on UV-Vis	Sakai (Tests & Quizzes)	20	
<b>NOTEBOOK ENTRIES (remember to use CamScanner, submit each entry as PDF file)</b>			
Notebook Entry for Acid-Base Titration	Sakai (Assignments)	30	<b>15%</b>
Notebook Entry for Polyprotic Acid Titration	Sakai (Assignments)	30	
Notebook Entry for HPLC part 1 and part 2 (combined in one submission)	Sakai (Assignments)	30	
Notebook Entry for UV-Vis: Ext. Std., Iron Analysis	Sakai (Assignments)	30	
Notebook Entry for UV-Vis: Ext. Std & Standard Addition, Artificial Dye	Sakai (Assignments)	30	
<b>SOCIAL JUSTICE (Forum)</b>			
Forum Topic Identifying Social Justice Issues in the Sciences Notes: Forum opens in Week 2 and closes in Week 12	Sakai (Forums)	20	<b>5%</b>
<b>LAB REPORTS (typed and submitted as Word or PDF file)</b>			
Formal Laboratory Report 1, typed: Acid-Base Titration [PDF or Word Doc]	Sakai (Assignments)	200	<b>15%</b>
Formal Laboratory Report 2, typed: UV-Vis Iron Analysis [PDF or Word Doc]	Sakai (Assignments)	200	
			<b>100%</b>

### **Lab Report and Notebook Grading Rubrics:**

<b>Lab Reports</b>	<b>Points</b>
Title Page	20
Introduction/Purpose	45
Results and Data	50
Discussion	30
Conclusion	20
Grammar/Formatting/Spelling	25
Proper File Type and Location Submission	10
<b>Total</b>	<b>200</b>

<b>Notebook Entries</b> (Each notebook entry is graded with this rubric)	<b>Points</b>
Table of Contents (experiment/activity title & page numbers listed). This is not graded but for the experimenter's benefit to keep track of notebook entries.	N/A
Student Name, Section #, Date at the top of each notebook page. Notebook is not graded if this information is not on all scanned notebook pages for each entry.	N/A
Title of Experiment/Activity clearly defined on first page of notebook entry	2
Introduction Section	5
Results and Data Section [Raw Data and Calculations, Graphs, Tables, Etc.] Each activity has different results and data processing.	13
Conclusion Section	7
Organization and Proofreading (sections clearly labeled, writing legible, sentences complete and spelling/grammar ok, etc.)	3
<b>Total</b>	<b>30</b>

### **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 214 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, 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.

### **Additional Student Resources:**

A considerable amount of technology is utilized in this course. On the next page are links of information guides in the event that students need more structured guidance on using the tools in the course in order 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 these links any time you need additional University Information.

[Career Services](#)

[First and Second Year Advising](#)

[Information Technology Service Desk](#) (ITS Help Desk)

[Panopto Information](#)

[Resource Guide 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 214 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 214 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 FOR A DETAILED PLAN OF TOPICS FOR THE SEMESTER. Note the days that are SYNCHRONOUS (we meet in ZOOM) and ASYNCHRONOUS (work assigned but not meeting in ZOOM).

WEEK	Meeting Type	Lecture and/or Lab Activity/Hwk* (type) *activity opens on the registered class date & time	Activity/Hwk Due Date
<b>WEEK 1</b> <b>Wednesday, Jan. 20<sup>th</sup></b> <b>and</b> <b>Friday, Jan. 22<sup>nd</sup></b>	Synchronous in ZOOM	ZOOM: Intro & Syllabus Lecture ZOOM: Glassware & Safety Lecture ZOOM: Sakai Demo  ZOOM: Calculation Review, Students Lead in Breakout Rooms  <b>Homework:</b> <i>Upload calculation review work as a PDF to Sakai (Assignments)</i>  <i>Read over the syllabus in Sakai (Syllabus)</i> <i>Explore features of the course Sakai site.</i>	At the start of your class in Week 2
<b>WEEK 2</b> <b>Wednesday, Jan. 27<sup>th</sup></b> <b>and</b> <b>Friday, Jan. 29<sup>th</sup></b>	Asynchronous	Panopto: Intro to Notebook Writing Req. Panopto: Excel Modules (Basics, Calcs & Stats, Graphing, Etc.) & Demonstration  <b>Homework:</b> <i>LAB 1: Penny Statistics in Excel; submit finished lab work Excel file to Sakai (Assignments)</i>  <i>Quiz on Excel &amp; Stats (Sakai Tests &amp; Quizzes)</i>	At the start of your class in Week 3
<b>WEEK 3</b> <b>Wednesday, Feb. 3<sup>rd</sup></b> <b>and</b> <b>Friday, Feb. 5<sup>th</sup></b>	Synchronous in ZOOM	ZOOM: Acid-Base Titration Lecture ZOOM: Writing Lab Reports Lecture  <b>Homework:</b> <i>LAB 2: Weak acid-strong base titration video in Panopto; gather appropriate data from video. Compute calculations and interpret results, which will be a part of the lab report.</i>  <i>Notebook Entry for Acid-Base Titration (Sakai Assignments)</i>  <i>Lab Report for Acid-Base Titration (Sakai Assignments)</i>	At the start of your class in Week 5

<p><b>WEEK 4</b></p> <p><b>Wednesday, Feb. 10<sup>th</sup></b>  <b>and</b>  <b>Friday, Feb. 12<sup>th</sup></b> is  <b>Spring Break part 1.</b></p>	<p>No Class</p>	<p>Work on lab and homework from week 3 to stay on track! Items are due in week 5.</p> <p><i>Both Wednesday sections and the Friday section do not meet this week.</i></p> <p><i>Spring Break Part 1: 4pm Wednesday, Feb. 10 – Sunday, Feb. 14<sup>th</sup></i></p>	<p>Week 3 work is due at the start of your class in Week 5</p>
<p><b>WEEK 5</b></p> <p><b>Wednesday, Feb. 17<sup>th</sup></b>  <b>and</b>  <b>Friday, Feb. 19<sup>th</sup></b></p>	<p>Synchronous In ZOOM</p>	<p>ZOOM: Polyprotic Acid Titration Lecture</p> <p><b>Homework:</b></p> <p><i>LAB 3: Polyprotic acid titration video in Panopto Raw data emailed to each student individually. Process and interpret results.</i></p> <p><i>Submit finished Excel file of lab results to Sakai (Assignments)</i></p> <p><i>Notebook Entry for Polyprotic Acid Titration (Sakai Assignments)</i></p> <p><i>Quiz on Polyprotic Acid Titration (Sakai Tests &amp; Quizzes)</i></p>	<p>At the start of your class in Week 6</p>
<p><b>WEEK 6</b></p> <p><b>Wednesday, Feb. 24<sup>th</sup></b>  <b>and</b>  <b>Friday, Feb. 26<sup>th</sup></b></p>	<p>Asynchronous</p>	<p>Panopto: Buffers Lecture</p> <p><b>Homework:</b></p> <p><i>LAB: Write up for a buffer preparation protocol after using the simulation to create buffers.</i></p> <p><i>Submit buffer write up as Word or PDF file to Sakai (Assignments)</i></p> <p><i>Quiz on Buffers (Sakai Tests &amp; Quizzes)</i></p>	<p>At the start of your class in Week 7</p>
<p><b>WEEK 7</b></p> <p><b>Wednesday, March 3<sup>rd</sup></b>  <b>and</b>  <b>Friday, March 5<sup>th</sup></b></p>	<p>Synchronous in ZOOM</p>	<p>ZOOM: High-Performance Liquid Chromatography (HPLC) Lecture</p> <p><b>Homework:</b></p> <p><i>LAB: HPLC part 1, Excel File simulation of chromatograms. Follow the directions to see how different settings change the separation.</i></p>	<p>At the start of your class in Week 8</p>

		<i>Notebook Entry for HPLC part 1 should be written but it does not have to be submitted until you complete HPLC part 2 so you can submit them as one.</i>	
<b>Monday, March 8<sup>th</sup> to Wednesday, March 10<sup>th</sup> is Spring Break part 2.</b>	No Class, ONLY applies to Wed. sections	<b>Spring Break Part 2:</b> <i>Saturday March 6<sup>th</sup> – 4pm Wednesday, March 10<sup>th</sup></i>  <i>Classes resume Thurs and Fri!</i> <b>YES Friday section DOES MEET &amp; homework is due!</b>	
<b>WEEK 8</b>  <b>Friday, March 12<sup>th</sup> and Wednesday, March 17<sup>th</sup></b>	Asynchronous	Panopto: HPLC Simulation Lecture  <b>Homework:</b> <i>LAB: HPLC part 2 online simulation. Create data tables for instrument conditions used. Include all trials.</i>  <i>Submit Word Doc and/or Excel file with the data tables of all trials and instrument conditions to Sakai (Assignments)</i>  <i>Notebook Entry for HPLC part 1 and HPLC part 2 online simulation submitted together, i.e. one PDF file for both activities (Sakai Assignments)</i>	At the start of your class in Week 9
<b>WEEK 9</b>  <b>Friday, March 19<sup>th</sup> and Wednesday, March 24<sup>th</sup></b>	Synchronous in ZOOM	Panopto: Ion Chromatography (IC) Lecture  <b>Homework:</b> <i>LAB: Sample data of IC water analysis. Raw data sent to each student via email. Process data and interpret results.</i>  <i>Submit finished Excel file to Sakai (Assignments)</i>	At the start of your class in Week 10
<b>WEEK 10</b>  <b>Friday, March 26<sup>th</sup> and Wednesday, March 31<sup>st</sup></b>	Asynchronous	Panopto: Gas Chromatography (GC) Lecture  <b>Homework:</b> <i>LAB: GC online simulation. Create data tables for instrument conditions used. Include all trials.</i>  <i>Submit Word Doc and/or Excel file with the data tables of all trials and instrument conditions to Sakai (Assignments)</i>  <i>Quiz on General Chromatography Principles for HPLC &amp; IC &amp; GC (Sakai Tests &amp; Quizzes)</i>	At the start of your class in Week 11

<p><b>Friday April 2<sup>nd</sup></b></p>	<p>No class on Good Friday</p>	<p><b>Easter Break:</b>  <i>Thursday, April 1<sup>st</sup> to Monday, April 5<sup>th</sup></i>  <i>Classes resume Tuesday April 5<sup>th</sup>!</i></p>	
<p><b>WEEK 11</b>  <b>Wednesday, April 7<sup>th</sup></b>  <b>and</b>  <b>Friday, April 9<sup>th</sup></b></p>	<p>Synchronous in ZOOM</p>	<p>ZOOM: UV-Vis External Standards, Iron Analyte Lecture</p> <p><b>Homework:</b>  <i>LAB: Sample data of UV-Vis iron standard and unknown sample analysis. Raw data sent to each student via email. Process data and interpret results.</i></p> <p><i>Submit finished Excel data file with all values, calculations, and graph to Sakai (Assignments)</i></p> <p><i>Notebook Entry for UV-Vis Ext. Standards and Iron Analyte (Sakai Assignments)</i></p> <p><i>Lab Report for UV-Vis: External Standards, Iron Analyte (Sakai Assignments)</i></p>	<p>At the start of your class in Week 12</p>
<p><b>WEEK 12</b>  <b>Wednesday, April 14<sup>th</sup></b>  <b>and</b>  <b>Friday, April 16<sup>th</sup></b></p>	<p>Asynchronous</p>	<p>Panopto: UV-Vis Ext. Std. and Standard Addition, Artificial Dye Lecture</p> <p><b>Homework:</b>  <i>LAB: Sample data of UV-Vis standards and sample analysis with artificial dye. Raw data sent to each student via email. Process data and interpret results.</i></p> <p><i>Submit finished Excel data file with all values, calculations, and graphs to Sakai (Assignments)</i></p> <p><i>Notebook Entry for UV-Vis Ext. Std. &amp; Standard Addition, Artificial Dye (Sakai Assignments)</i></p> <p><i>Quiz on UV-Vis Principles (Sakai Tests &amp; Quizzes)</i></p>	<p>At the start of your class in Week 13</p>



<p><b>WEEK 13</b></p> <p><b>Wednesday, April 21<sup>st</sup></b>  <b>and</b>  <b>Friday, April 23<sup>rd</sup></b></p>	<p>Synchronous  in ZOOM</p>	<p>ZOOM: Using Attenuated Total Reflectance – Infrared Spectroscopy (ATR-IR) in Quantitative Analysis Lecture</p> <p><b>Homework:</b></p> <p><i>LAB: Sample data of standards and sample analysis. Raw data sent to each student via email. Process data and interpret results.</i></p> <p><i>Submit finished Excel data file with all values, calculations, and graphs to Sakai (Assignments)</i></p>	<p>At the start of your class in Week 14</p>
<p><u><b>LAST DAY OF CLASS</b></u></p> <p><b>WEEK 14</b></p> <p><b>Wednesday, April 28<sup>th</sup></b>  <b>and</b>  <b>Friday, April 30<sup>th</sup></b></p>	<p>Synchronous  in ZOOM</p>	<p>ZOOM: Wrap up concepts and last-minute general questions  ZOOM: Grad School &amp; Job Info</p> <p><i>TA Evaluation (Sakai Tests &amp; Quizzes)</i></p> <p>All grading questions must be resolved in ZOOM Breakout Rooms during class time. Grades are final and put in LOCUS after students log off ZOOM.</p>	<p>All grades are final when you log off ZOOM this week. ASK ANY last-minute questions during class in allotted time for individual Breakout Rooms!</p>

**CHECK OUT THE NEXT PAGE FOR A COLOR-CODED MAP OF THE TOPICS EACH LAB DAY. The only difference is the next page just lists the lab experiment topics so you can see the spread of everything we are doing.**

Month	Monday	Tuesday	Wednesday	Thursday	Friday
January 2021	<b>18</b> MLK DAY No Classes	<b>19</b>	<b>20</b> Intro, Syllabus, Safety/Glass, Sakai Demo, Calc Review	<b>21</b>	<b>22</b> Intro, Syllabus, Safety/Glass, Sakai Demo, Calc Review
	<b>25</b>	<b>26</b>	<b>27</b> Lab Notebooks Info  Excel Modules: The Basics, Calcs & Stats, Graphing, Etc.  Penny Statistics	<b>28</b>	<b>29</b> Lab Notebooks Info  Excel Modules: The Basics, Calcs & Stats, Graphing, Etc.  Penny Statistics
February 2021	<b>1</b>	<b>2</b>	<b>3</b> Acid-Base Titration  Writing Quant Lab Reports	<b>4</b>	<b>5</b> Acid-Base Titration  Writing Quant Lab Reports
	<b>8</b>	<b>9</b>	<b>10</b> No Class today, Spring Break pt 1. starts at 4pm	<b>11</b> No Classes, Spring Break pt 1.	<b>12</b> No Classes, Spring Break pt 1.
	<b>15</b>	<b>16</b>	<b>17</b> Polyprotic Acid Titration	<b>18</b>	<b>19</b> Polyprotic Acid Titration
	<b>22</b>	<b>23</b>	<b>24</b> Buffers	<b>25</b>	<b>26</b> Buffers
March 2021	<b>1</b>	<b>2</b>	<b>3</b> HPLC part 1	<b>4</b>	<b>5</b> HPLC part 1
	<b>8</b> No Classes, Spring Break pt 2.	<b>9</b> No Classes, Spring Break pt 2.	<b>10</b> No Classes, Spring Break pt 2.	<b>11</b>	<b>12</b> HPLC part 2
	<b>15</b>	<b>16</b>	<b>17</b> HPLC part 2	<b>18</b>	<b>19</b> IC
	<b>22</b>	<b>23</b>	<b>24</b> IC	<b>25</b>	<b>26</b> GC
	<b>29</b>	<b>30</b>	<b>31</b> GC	<b>1</b> Easter Break No Classes	<b>2</b> Good Friday No Classes

Month	Mon	Tue	Wed	Thu	Fri
April 2021	<b>5</b> Easter Break No Classes	<b>6</b>	<b>7</b> UV-Vis: External Standards, Iron Analyte	<b>8</b>	<b>9</b> UV-Vis: External Standards, Iron Analyte
	<b>12</b>	<b>13</b>	<b>14</b> UV-Vis: Ext. Std. & Standard Addition, Artificial Dye	<b>15</b>	<b>16</b> UV-Vis: Ext. Std. & Standard Addition, Artificial Dye
	<b>19</b>	<b>20</b>	<b>21</b> ATR-IR	<b>22</b>	<b>23</b> ATR-IR
	<b>26</b>	<b>27</b>	<b>28</b> Last Day Wrap UP, Grad School and Job Info	<b>29</b>	<b>30</b> Last Day Wrap UP, Grad School and Job Info